
OYAK
MINING
METALLURGY

Ereğli Demir ve Çelik Fabrikaları T.A.Ş.

WE ARE OYAK MINING METALLURGY

We are there for you at any time and in every sphere of life with the steel we produce. We adopt an environment-friendly production philosophy, and still work with the same enthusiasm we had on our very first day in the business.

Erdemir, Turkey's largest integrated flat steel producer, entered operation in 1965. Unwaveringly continuing its investments in line with the needs of the country's industry, the Company has reached a final product capacity of approximately 4 million tons of crude steel and approximately 5 million tons of final products. Erdemir produces hot rolled steel, cold rolled steel, sheet, tin, chrome and galvanized coated sheet at international quality standards in its plants established in Ereğli, in Turkey's Black Sea region. The company provides basic inputs for a wide range of industries including the automotive, white goods, energy, pipe profile, rolling mill, general manufacturing, electrical-electronics, machinery, heat insulators, shipbuilding, defence, and packaging sectors. Erdemir is Turkey's only steel sheet manufacturer, while also being home to Turkey's first steel R&D center in the Turkish steel industry to have been approved by the Ministry of Science, Industry and Technology of the Republic of Turkey and one of Turkey's biggest ports in the Black Sea region.

OYAK MADEN METALÜRJİ

Address : Barbaros Mah. Ardıç Sok. No: 6 PK: 34746 Ataşehir / İstanbul / Turkey
Telephone : +90 216 578 80 00
Fax number : +90 216 469 48 10
Email : grupiletisim@erdemir.com.tr
Website : www.oyakmadenmetalurji.com.tr

EREĞLİ DEMİR VE ÇELİK FABRİKALARI T.A.Ş.

Address : Uzunkum Cad. No.7 67330 Kdz. Ereğli / Turkey
Telephone : +90 372 323 25 00
Fax number : +90 372 333 15 00
Email : iletisim@erdemir.com.tr
Website : www.erdemir.com.tr

PAZARLAMA VE SATIŞ KOORDİNATÖRLÜĞÜ

Address : Barbaros Mah. Ardıç Sok. No: 6 PK: 34746 Ataşehir /İstanbul / Turkey
Telephone : +90 216 578 82 00
Fax number : +90 216 578 82 01
Email : erdemir.sales@erdemir.com.tr
Website : www.erdemironline.com

İskenderun Demir ve Çelik A.Ş.

Founded in Hatay, part of the İskenderun region, in 1970, İsdemir is an integrated iron and steel plant with the highest liquid steel capacity in Turkey. İsdemir is Turkey's largest integrated iron and steel factory based on its long product production capacity and was the third to be established. It was transferred to Erdemir in 2002 on the condition that İsdemir would initiate production of flat products. İsdemir, the only integrated plant producing flat and long products in Turkey, now commands an annual capacity of approximately 5.8 million tons of liquid
steel, 3.5 million tons of flat products, 0.6 million tons of wire rod and 2.5 million tons of billet.

Address : Karşı Mahalle Şehit Yüzbaşı Ali Oğuz Bulvarı No.1 Payas / Hatay / Turkey
Telephone : +90 326 758 40 40
Fax number : +90 326 758 53 51 - 758 38 38
Email : info@isdemir.com.tr
Website : www.isdemir.com.tr

Erdemir Çelik Servis Merkezi Sanayi ve Ticaret A.Ş.

Erdemir Çelik Servis Merkezi San. ve Tic. A.Ş. (Ersem) was established in October 2001 and began operating in Gebze in 2002 with an annual capacity of 150 thousand tons of cold slitting line and 100 thousand tons of cold cut-to-length line. The company offers steel service center services to companies operating in various branches of the industry such as general machinery and manufacturing, heat industry, electric electronics as well as automotive and white goods.
Ersem quickly responds to customers' instant requests, dispatches products of the desired quality and size, on time and at the demanded location, manages stocks, responds to expectations such as production in narrow tolerances and delivery in small batches. Ersem, Turkey's largest steel service center with a total of slitting and length cutting capacity of 1,950,000 tons, has four production plants in Gebze, Ereğli, İskenderun and Manisa

GEBZE
Address : Gebze Organize Sanayi Bölgesi
700.Sok. No.724 Gebze /
Kocaeli / Turkey
Telephone : +90 262 679 27 27
Fax number : +90 262 679 27 97
Email : info@ersem.com.tr
Website : www.ersem.com.tr

İSKENDERUN
Address : İskenderun Demir Çelik A.Ş. (Hadde Ürünleri Deposu 281) Şehit Yzb. Ali Oğuz Bulvarı No:1 Payas
Hatay TURKEY
Telephone : +90 326 758 51 12
Fax number : +90 326 758 58 13

EREĞLİ
Address : Ereğli Demir Çelik Fabrikaları T.A.Ş.
Uzunkum No:7 Gülüç Kapı Yanı.
Karadeniz Ereğli Zonguldak TURKEY
Telephone : +90 372 329 84 27
Fax number : +90 372 318 02 55

MANİSA
Address : Manisa Organize Sanayi Bölgesi
Hasan Türek Bulvarı No.16
Manisa / Turkey
Telephone : +90 236 214 06 04
Fax number : +90 236 214 06 04

Erdemir Madencilik Sanayi ve Ticaret A.Ş.

Erdemir Maden, which began ore production in Divriği, in the Sivas region, in 1938 and has continued its operations as the Iron Mines Enterprise since 1940, joined Erdemir in 2004. Erdemir Maden meets 12% of Turkey's iron ore needs with 9 iron ore fields, one manganese and one coal field which it owns and performs 32% of iron ore production. Erdemir Maden, which is our country's only pellet plant that responds to the needs of iron and steel industry, has a pellet capacity of 1.5 million tons and lump ore production capacity of 750 thousand tons. Erdemir Maden produces hematite fragment and fine ore as well as pellet.

Address : Cürek Yolu 5. Km Divriği / Sivas / Turkey
Telephone : +90 0346 419 1121 (5 lines)
Fax number : +90 0346 419 1150
Email : ermaden@erdemirmaden.com.tr
Website : www.erdemirmaden.com.tr

Erdemir Mühendislik Yönetim ve Danışmanlık Hizmetleri A.Ş.

Erdemir Mühendislik offers the Group companies a wide range of engineering and project management services ranging from planning to implementation in their investments to ensure that the companies achieve their profitability, product diversity, efficiency and quality objectives.

ERDEMİR MÜHENDİSLİK YÖNETİM VE DANIŞMANLIK HİZMETLERİ A.Ş

Address : Barbaros Mah. Ardıç Sok. No: 6 PK: 34746
Ataşehir / İstanbul / Turkey
Telephone : +90 216 578 80 00
Fax number : +90 216 469 48 30
Email : erdemirmuhendislik@erdemir.com.tr
Website : muhendislikerdemir.com.tr

Erdemir Romanya S.R.L

Erdemir Romania, which was founded in the city of Targoviste in Romania, joined the Group in 2002. Erdemir Romania produces electrical steel (silicon flat steel), which is a key input in the electric motors, transformers and generators. Erdemir Romania is in an important position in Europe in terms of electrical steel production, with 20% of its protection used in the Romanian domestic market, with the remaining 80% exported to various countries, mainly in Europe.

Address : 18,Soseaua Gaesti, Targoviste,
130087 Dambovita County / Romania
Telephone : +40 245 60 71 00
Fax number : +40 245 60 60 70
Website : www.erdemir.ro

Erdemir Asia Pacific Pte. Ltd.

The company was founded in Singapore as a 100% Erdemir subsidiary and has been carrying out Erdemir's commercial activities in the Far East since its establishment in 2014.

Address : 10 Science Park Road #03-11
The Alpha Singapore 117684
Telephone : +65 68830057-59
Fax number : +65 03267585351-7583838
Email : info@isdemir.com.tr
Website : isdemir.com.tr

İsdemir Linde Gaz Ortaklığı A.Ş.

In line with İsdemir's goal of meeting the additional industrial gas needs and reducing the costs associated with the existing industrial gas system, theİsdemir Linde Gas Partnership Joint Stock Company was established in a 50% -50% partnership with Linde Gas Turkey. The company started operations in December 2016.

Address : Karşı Mahalle Şehit Yüzbaşı Ali Oğuz Bulvarı No:1
Payas Hatay TURKEY
Telephone : +90 326 758 41 00
Fax number : +90 326 758 3991

ErdemİR Enerji Üretim A.Ş.

The company was established to produce renewable energy, with 100% of its capital owned by Erdemir. The Group's support to Erdemir Energy aims to create value by utilizing potential energy opportunities, primarily renewable energy projects.

Address : Barbaros Mahallesi Ardıç Sokak No: 6 Batı Ataşehir 34746
İstanbul TURKEY
Telephone : +90 0216 578 80 00
Fax number : +90 0216 469 48 07
Website : erdemirenerji.com.tr

Press : 2002

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Reminder, Abbreviations and Symbols

- If further assistance is required about steel grades, services or for additional information, please contact our “Sales & Marketing Department.”

Symbols and Abbravitions Used For Chemical Elements

Symbol	Element
C	Carbon
Mn	Manganese
P	Phosphorus
S	Sulphur
Si	Silicon
Al	Aluminum
Cu	Copper
N	Nitrogen
O	Oxygen
H	Hydrogen
Ca	Calcium
Ti	Titanium
V	Vanadium
Cr	Chromium
Ni	Nickel
Mo	Molybdenum
Nb	Niobium
B	Boron
Sn	Tin
Fe	Iron
Zn	Zinc
Pb	Lead
As	Arsenic
W	Wolfram (Tungsten)
Zr	Zirconium

Symbols and Abbravitions Used For Mechanical Tests

Symbol	Explanation
R_e	Yield strength
R_m	Tensile strength
$R_{p0.2}$	Proof strength at 0.2% elongation
$R_{t0.5}$	Proof strength at 0.5% elongation
BH_2	Increase in proof strength after heating
A	Elongation (%)
A_5	Elongation (L_0=5,65x$\sqrt{S_o}$)
A_{50}	Elongation (L_0=50 mm)
A_{80}	Elongation (L_0=80 mm)
A_{100}	Elongation (L_0=100 mm)
A_{200}	Elongation (L_0=200mm)
S_0	Cross-sectional area of the specimen (mm^2)
L_0	Original gauge length of the specimen
d	Nominal thickness (mm)
t	Ton
r	Plastic stain ratio
n	Strain hardening exponent
R_a	Surface roughness (µm)
Impact	Impact test
KV_c	Impact energy (J)
Temp.	Test temperature (˚C)
Bend	Bend test
mrb	Mandrel radius for bending
mdb	Mandrel diameter for bending
trans.	Transverse test piece
long.	Longitudinal test piece
HRB	Hardness of Rockwell “B”
HRC	Hardness of Rockwell “C”
min.	Minimum
max.	Maximum
=	Equal to
<	Smaller than
≤	Smaller than or equal to
>	Larger than
≥	Larger than or equal to

Standard	Grade	Erdemir Steel Grade	Product Group	Pages No.
TSG3100G	SPC270C	120	COLD	178
TSG3100G	SPC270C	121	COLD	178
11-04-013	XES	130	COLD	181
TSG3100G	SPC270D	131	COLD	181
TSG3100G	SPC270D	132	COLD	181
EN 10130:2006	DC04	145	COLD	179
52814	FEE 220 BH	171	COLD	183
11-04-002	XE-320DR	250	COLD	187
WSB-M1A215	Gr. 300	251	COLD	187
EN 10268:2006 + A1:2013	HC340LA Mod1	255	COLD	187
11-04-002	XE-360DR	260	COLD	187
52811	FEE 340 F	261	COLD	187
EN10268:2006+A1:2013	HC460LA Mod	262	COLD	187
EN 10338:2015	HCT590X Mod	290	COLD	185
WSD-M1A333	A2 DC05	311	GALVANIZED (Zn coated)	221
11-04-013	XE	312	GALVANIZED (Zn coated)	221
WSS-M1A365	A13	320	GALVANIZED (Zn coated)	221
WSS-M1A365	A14	321	GALVANIZED (Zn coated)	221
WSD-M1A333	A3 DC06	323	GALVANIZED (Zn coated)	221
11-04-013	XES	324	GALVANIZED (Zn coated)	221
B53 3106	XSG	325	GALVANIZED (Zn coated)	221
52806/9.52873	FEP04-ZNT/F/2S	326	GALVANIZED (Zn coated)	221
52806/9.52873	FEP05-ZNT/F/2S	327	GALVANIZED (Zn coated)	221
52806/9.52873	FEP05-ZNT/F/2S	328	GALVANIZED (Zn coated)	221
11-04-002	XE 280 D	331	GALVANIZED (Zn coated)	231
WSB-M1A215-F1	Gr. 250	355	GALVANIZED (Zn coated)	228
52811/9.52873	FEE 270 F - ZNT/F/2S	360	GALVANIZED (Zn coated)	230
52811/9.52873	FEE 300 F - ZNT/F/2S	365	GALVANIZED (Zn coated)	230
11-04-002	XE-320D	366	GALVANIZED (Zn coated)	230
WSB-M1A215-F1	Gr. 300	367	GALVANIZED (Zn coated)	230
F-52811/9.52873	FEE 340 F - ZNT/F/2S	368	GALVANIZED (Zn coated)	230
52811/9.52873	FEE 420 F - ZNT/F/2S	369	GALVANIZED (Zn coated)	230
11-04-002	XE-360D	372	GALVANIZED (Zn coated)	230
52814/9.52873	FEE 220 BH-ZNT/F/2S	380	GALVANIZED (Zn coated)	224
WSS-M1A367	A22	381	GALVANIZED (Zn coated)	224
WSS-M1A367	A23	382	GALVANIZED (Zn coated)	224
WSS-M1A341	A5	383	GALVANIZED (Zn coated)	224
11-04-013	XE260BH	384	GALVANIZED (Zn coated)	224
52814	FEE180IF	385	GALVANIZED (Zn coated)	225
52814	FEE210IF	386	GALVANIZED (Zn coated)	225
50002	IF280Y380T	387	GALVANIZED (Zn coated)	225
11-04-002/L	XE280P	388	GALVANIZED (Zn coated)	226
52815/9.52873	FE 600 DP F ZNT/F/2S	390	GALVANIZED (Zn coated)	233
WSS-M1A348	A1	391	GALVANIZED (Zn coated)	233
52815/9.52873	FE 600 DP F ZNT/F/2S	392	GALVANIZED (Zn coated)	233
11-04-002 / - - L	XE360B	393	GALVANIZED (Zn coated)	233
WSS-M1A368	A14	397	GALVANIZED (Zn coated)	232
50002	DPC420Y780T	398	GALVANIZED (Zn coated)	233
TSG3109G	SCGA 270C	410	GALVANNEALED (Zn+Fe alloy coated)	235
TSG3109G	SCGA 270C	411	GALVANNEALED (Zn+Fe alloy coated)	235
TSG3109G	SCGA 270D	430	GALVANNEALED (Zn+Fe alloy coated)	235
TSG3109G	SCGA 270D	431	GALVANNEALED (Zn+Fe alloy coated)	235
HES C071	JAC270F	432	GALVANNEALED (Zn+Fe alloy coated)	235
TSG3109G	SCGA 440	440	GALVANNEALED (Zn+Fe alloy coated)	235
TSG3109G	SCGA 340BH	482	GALVANNEALED (Zn+Fe alloy coated)	238
EN 10209:2013	DC04ED Mod	504	COLD	182
EN 10209:2013	DC05EK	513	COLD	46
11-04-013	HES-HC	700	HOT	45
400.240.003.C	DD13	712	HOT	45
400040101	VAW HRC1/HRC3	713	HOT	71
FG52806	FEP13	714	HOT	56
DBL 4050	StW24H	720	HOT	56
400.240.004.D	18Mn5	721	HOT	65
SAE J403-2014 / B105-10	1022 Mod	735	HOT	73
EN 10149-2:2013/11-04-002	S315MC / HE-320 D / HE-320 DR	800	HOT	73

Steel Grades

Standard	Grade	Erdemir Steel Grade	Product Group	Pages No.
WSS-M1A346	A3 Gr.300	801	HOT	73
EN 10149-2:2013/11-04-002	S355MC / HE-360 D / HE-360 DR	810	HOT	73
WSB-M1A215-E1	Gr.350	811	HOT	73
WSS-M1A346	A4 Gr.350	812	HOT	73
52812	FEE 340	813	HOT	73
WSB-M1A215-E1	Gr.400	820	HOT	73
E116088 / EN10149-2	HR-500Y550T / S500MC Mod	835	HOT	73
MS.50002 / 52812	LAH420Y480T / FEE420	842	HOT	70
11-04-002	HE 450M	845	HOT	73
EN 10149-2:2013	S460MC	846	HOT	70
MS.50002	LAH500Y560T	850	HOT	70
CES 002	1.0986	855	HOT	73
DBL 4041	M590 MC	859(2)	HOT	71
MS.50002	MCH600Y650T	860	HOT	71
WSS-M1A368	HRDP600	890	HOT	72
EN 10346:2015	HX180BD+Z	1118	GALVANIZED (Zn coated)(BAKE HARDENED)	223
EN 10346:2015	HX220BD+Z	1122	GALVANIZED (Zn coated)(BAKE HARDENED)	223
WSS-M1A341	A7	1124	GALVANIZED (Zn coated)(BAKE HARDENED)	223
EN 10346:2015	HX260BD+Z	1126	GALVANIZED (Zn coated)(BAKE HARDENED)	223
EN 10346:2015	HX300BD+Z	1130	GALVANIZED (Zn coated)(BAKE HARDENED)	223
EN 10346:2015	HX180BD+ZF	1218	GALVANNEALED (Zn+Fe alloy coated)(BAKE HARDENED)	237
EN 10346:2015	HX220BD+ZF	1222	GALVANNEALED (Zn+Fe alloy coated)(BAKE HARDENED)	237
EN 10346:2015	HX260BD+ZF	1226	GALVANNEALED (Zn+Fe alloy coated)(BAKE HARDENED)	237
EN 10346:2015	HX300BD+ZF	1230	GALVANNEALED (Zn+Fe alloy coated)(BAKE HARDENED)	237
EN 10346:2015	DX53D+Z	1303	GALVANİZED (Zn coated)	220
EN 10346:2015	DX54D+Z	1304	GALVANIZED (Zn coated)	220
ASTM A653/A653M-20	CS TYPE B	1306	GALVANIZED (Zn coated)	221
EN 10346:2015	DX51D+Z	1311	GALVANIZED (Zn coated)	220
EN 10346:2015	DX52D+Z	1312	GALVANIZED (Zn coated)	220
EN 10346:2015	DX53D+Z	1313	GALVANIZED (Zn coated)	220
EN 10346:2015	DX54D+Z	1314	GALVANIZED (Zn coated)	220
EN 10346:2015	DX56D+Z	1315	GALVANIZED (Zn coated)	220
EN 10346:2015	DX57D+Z	1317	GALVANIZED (Zn coated)	220
EN 10346:2015	S220GD+Z	1322	GALVANIZED (Zn coated)	227
EN 10346:2015	S250GD+Z	1325	GALVANIZED (Zn coated)	227
EN 10346:2015	S280GD+Z	1328	GALVANIZED (Zn coated)	227
EN 10346:2015	S320GD+Z	1332	GALVANIZED (Zn coated)	227
EN 10346:2015	S350GD+Z	1335	GALVANIZED (Zn coated)	227
EN 10346:2015	DX51D+ZF	1411	GALVANNEALED (Zn+Fe alloy coated)	234
EN 10346:2015	DX52D+ZF	1412	GALVANNEALED (Zn+Fe alloy coated)	234
EN 10346:2015	DX53D+ZF	1413	GALVANNEALED (Zn+Fe alloy coated)	234
EN 10346:2015	DX54D+ZF	1414	GALVANNEALED (Zn+Fe alloy coated)	234
EN 10346:2015	DX56D+ZF	1415	GALVANNEALED (Zn+Fe alloy coated)	234
EN 10346:2015	S220GD+ZF	1422	GALVANNEALED (Zn+Fe alloy coated)	239
EN 10346:2015	S250GD+ZF	1425	GALVANNEALED (Zn+Fe alloy coated)	239
EN 10346:2015	S280GD+ZF	1428	GALVANNEALED (Zn+Fe alloy coated)	239
EN 10346:2015	S320GD+ZF	1432	GALVANNEALED (Zn+Fe alloy coated)	239
EN 10346:2015	S350GD+ZF	1435	GALVANNEALED (Zn+Fe alloy coated)	239
EN 10346:2015	HX180YD+Z	1518	GALVANIZED (Zn coated)	225
EN 10346:2015	HX220YD+Z	1522	GALVANIZED (Zn coated)	225
EN 10346:2015	HX 260YD+Z	1526	GALVANIZED (Zn coated)	229
EN 10346:2015	HX 260LAD+Z	1626	GALVANIZED (Zn coated)	229
EN 10346:2015	HX 300LAD+Z	1630	GALVANIZED (Zn coated)	229
EN 10346:2015	HX 340LAD+Z	1634	GALVANIZED (Zn coated)	229
EN 10346:2015	HX 380LAD+Z	1638	GALVANIZED (Zn coated)	229
EN 10346:2015	HX420LAD+Z	1642	GALVANIZED (Zn coated)	229
EN 10346:2015	HX460LAD+Z	1643	GALVANIZED (Zn coated)	229
EN 10346:2015	HCT490X+Z	1650	GALVANIZED (Zn coated)	232
EN 10346:2015	HCT590X+Z	1660	GALVANIZED (Zn coated)	232
EN 10346:2015	HCT780X+Z	1680	GALVANIZED (Zn coated)	232
Erdemir-04	1718	1718	HOT	42
Erdemir-04	1722	1722	HOT	42
Erdemir-04	1726	1726	HOT	42

Steel Grades

Standard	Grade	Erdemir Steel Grade	Product Group	Pages No.
Erdemir-18	1821	1821	HOT	42
Erdemir-04	1822	1822	HOT	42
Erdemir-04	1825	1825	HOT	42
Erdemir-04	1828	1828	HOT	42
Erdemir-04	1832	1832	HOT	42
Erdemir-04	1835	1835	HOT	42
EN 10202:2001	TS245	2004	TINPLATE (Sn coated)	42
EN 10202:2001	TS275	2005	TINPLATE (Sn coated)	46
EN 10202:2001	TS415	2006	TINPLATE (Sn coated)	46
EN 10202:2001	TS415	2007	TINPLATE (Sn coated)	46
Erdemir-01	2008	2008	HOT	46
ASTM A53-20	A	2009	HOT	46
EN 10202:2001	TS230	2023	TINPLATE (Sn coated)	271
EN 10202:2001	TS260	2026	TINPLATE (Sn coated)	271
EN 10202:2001	TS245	2104	TINPLATE (Cr coated)	267
EN 10202:2001	TS275	2105	TINPLATE (Cr coated)	267
EN 10202:2001	TS415	2106	TINPLATE (Cr coated)	267
EN 10202:2001	TS230	2123	TINPLATE (Cr coated)	268
EN 10202:2001	TS260	2126	TINPLATE (Cr coated)	268
EN 10202:2001	TH230	2223	TINPLATE (Sn coated)	268
EN 10202:2001	TH245	2225	TINPLATE (Sn coated)	268
EN 10202:2001	TH260	2226	TINPLATE (Sn coated)	268
EN 10202:2001	TH275	2228	TINPLATE (Sn coated)	268
EN 10202:2001	TH415	2240	TINPLATE (Sn coated)	268
EN 10202:2001	TH415	2242	TINPLATE (Sn coated)	270
EN 10202:2001	TH435	2244	TINPLATE (Sn coated)	270
Erdemir-20	TH460	2246	TINPLATE (CA, DR, Sn coated)	271
EN 10202:2001	TH520	2252	TINPLATE (CA, DR, Sn coated)	270
Erdemir-21	Tinform8	2254	TINPLATE (CA, DR, Sn coated)	272
EN 10202:2001	TH550	2255	TINPLATE (CA, DR, Sn coated)	270
Erdemir-21	DR8 Mod	2256	TINPLATE (CA, DR, Sn coated)	271
EN 10202:2001	TH580	2258	TINPLATE (CA, DR, Sn coated)	270
EN 10202:2001	TH620	2260	TINPLATE (CA, DR , Sn coated)	269
EN 10202:2001	TH620	2262	TINPLATE (CA, DR, Sn coated)	269
EN 10202:2001	TH230	2323	TINPLATE (Cr coated)	269
EN 10202:2001	TH245	2325	TINPLATE (Cr coated)	269
EN 10202:2001	TH260	2326	TINPLATE (Cr coated)	269
EN 10202:2001	TH275	2328	TINPLATE (Cr coated)	269
EN 10202:2001	TH415	2340	TINPLATE (Cr coated)	269
EN 10202:2001	TH415	2342	TINPLATE (Cr coated)	101
EN 10202:2001	TH435	2344	TINPLATE (Cr coated)	101
EN 10202:2001	TH520	2352	TINPLATE (CA, DR , Cr coated)	13
EN 10202:2001	TH550	2355	TINPLATE (CA, DR , Cr coated)	13
EN 10202:2001	TH580	2358	TINPLATE (CA, DR , Cr coated)	272
EN 10202:2001	TH620	2360	TINPLATE (CA, DR , Cr coated)	272
EN 10202:2001	TH620	2362	TINPLATE (CA, DR , Cr coated)	272
JIS G 3303:2017	T-2,5	2726	BLACK PLATE	192
JIS G 3303:2017	T-3	2728	BLACK PLATE	192
JIS G 3303:2017	T-4	2742	BLACK PLATE	192
SAE J403-2014 / ASTM A1011-15/ ASTM A1018-18	1008 / CS Type B	3008	HOT	101
SAE J403-2014	1010	3010	HOT	101
SAE J403-2014	1012	3012	HOT	101
SAE J403-2014	1015	3015	HOT	101
ASTM A283-13	C	3018	HOT	47
SAE J403-2014	1020	3020	HOT	101
SAE J403-2014	1021 Mod	3021	HOT	102
SAE J403-2014	1026(Mod)/25Mn5	3026	HOT	101
SAE J403-2014	1030	3030	HOT	101
EN 10083-2:2006	28Mn6	3031	HOT	104
EN 10083-2:2006	28Mn6 Mod	3032	HOT	105
Erdemir-20	28Mn6	3033	HOT	105
SAE J403-2014	1018 Mod	3037	HOT	104
EN 10025-2:2019	S355JR+N	3052	HOT	54
EN 10025-2:2019	S235JR+AR	3137	HOT	54
EN 10025-2:2019	S355JR+AR Mod	3152	HOT	52
EN 10111:2008	DD11	3222	HOT	44
CSA G40.21-13 / ASTM A36-19	300W / A36	3230	HOT	51
EN 10025-2:2019	S235JR+AR Mod	3235	HOT	52
EN 10025-2:2019	S235JR+AR	3237	HOT	52
ASTM A36-19	A36	3241	HOT	48

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Standard	Grade	Erdemir Steel Grade	Product Group	Pages No.
EN 10025-2:2019	S275JR+AR Mod CTB	3243[2]	HOT	55
EN 10025-2:2019	S275JR+AR	3244	HOT	52
CSA G40.21-13	300W	3245	HOT	48
CSA G40.21-13 / ASTM A572-18	300W / 350W - Gr50Type2	3246	HOT	50
CSA G40.21-13	300W / 350W	3249	HOT	51
EN 10025-2:2019	E295	3250	HOT	61
EN 10025-2:2019	S355JR+AR	3252	HOT	52
EN 10025-2:2019	E335	3260	HOT	61
EN 10025-2:2019	S235JR+AR CTB (Cu)	3281	HOT	52
EN 10217-1:2002+A1:2005	P235TR1	3285	HOT	92
ASTM A1011-18	SS 30	3330	HOT	57
ASTM A1011-18	SS 33	3333	HOT	57
ASTM A1011-18	SS 36 Type1	3336	HOT	57
EN 10217-1:2002+A1:2005	P235TR1	3337	HOT	92
ASTM A1011-18	SS 40	3340	HOT	57
ASTM A1011-18	SS 45 Type 1	3345	HOT	57
ASTM A1011-18	SS 50	3350	HOT	57
ASTM A1011-18	Grade 55 Class 1	3355[3]	HOT	57
ASTM A1011-18	Grade 65 Class 1	3365[3]	HOT	57
ASTM A1018-18	SS 30	3430	HOT	58
ASTM A1018-18	SS 33	3433	HOT	58
ASTM A1018-18	SS 36 Type1	3436	HOT	58
ASTM A1018-18	SS 40	3440	HOT	61
ASTM A1018 HSLAS	Grade 55 Class1	3455[3]	HOT	61
ASTM A1018 HSLAS	Grade 65 Class 1	3465[3]	HOT	58
ASTM A1011 HSLAS	Grade 50 Class 1	3550	HOT	58
ASTM A1018 HSLAS-18	Grade 50 Class 1	3551	HOT	59
ASTM A1018 HSLAS	Grade 50 Class 1	3552[3]	HOT	61
MW GL-012/JMW	2661-01/MW06	3660[3]	HOT	75
ABS-P2-21	A	3701	HOT	82
ABS-P2-21	B	3702	HOT	82
ABS-P2-21	AH32	3732	HOT	83
ABS-P2-21	AH36	3736	HOT	84
ASTM A36-19/ABS-P2-21	A36-Gr.A	3741	HOT	49
JMW	MW01	3901	HOT	75
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MW GL-012	1932-01	3922	HOT	75
EN 10111:2008	DD13 Mod	3923	HOT	77
EN 10025-2:2019	S235J2	3936	HOT	78
MW GL-040	1932-11A	3937	HOT	76
MW GL-040	1953-14A	3938	HOT	76
MW/HL3 MS-03	1937-02	3940	HOT	75
MW GL-040	1937-11A	3944	HOT	76
EN 10025-2:2019	S275J2	3945	HOT	78
MW GL-012	1937-03	3946	HOT	75
MW GL-012/040	1953-02/11A	3949	HOT	75
EN 10149-2:2013	S355MC	3955	HOT	81
MW GL-012/040	2242-03/11A	3957	HOT	75
MW GL-012/040	6000-03/11A	3960	HOT	75
Erdemir-01	3995	3995	HOT	104
ASTM A53-20	A	4009	HOT	46
EN 10025-2:2019	S275JRC+AR Mod CTA	4044	HOT	59
EN 10025-2:2019	S355J2C+N CTA	4052	HOT	59
SAE J403-2014	1012	4112	COLD	59
DIN 1623:2009	S215G	4137	COLD	189
Erdemir-18	S325G Mod	4138	COLD	189
EN 10111:2008	DD11	4222	HOT	44
EN 10025-2:2019	S235JR+AR CTA	4237	HOT	52
EN 10025-2:2019	S235JR+AR Mod	4238	HOT	55
EN 10025-2:2019	S235J2/S235J2+N CTA	4239	HOT	52
AS NZS 1594:2002	HA 250 Özel	4240	HOT	55
EN 10025-2:2019	S275JR+AR CTA	4244	HOT	52
EN 10025-2:2019	S275J2 CTA	4246	HOT	52
AS NZS 1594:2002	HA 350 Özel	4249	HOT	55
EN 10025-2:2019	S355JR+AR CTA	4250	HOT	52
CSA G40.21-13	350W	4251	HOT	48
EN 10025-2:2019	S355J2 CTA	4252	HOT	52
EN 10025-2:2019	S355J2 Mod CTA	4255	HOT	52

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EN 10025-2:2019	S235JR+AR Mod	4260	HOT	52
EN 10025-2:2019	S235JR+AR Mod CTA	4275	HOT	52
EN 10025-2:2019	S235JR+AR CTA	4437	HOT	52
SAE J2340-1999	340XF	4634	HOT	75
SAE J2340-1999	420XF	4642	HOT	75
ABS-P2-21	DH32	4732	HOT	83
EN 10149-2:2013	S355MC (CT A)	4937	HOT	69
ABS-P2-21	DH36	4736	HOT	84
EN 10025-4:2019	S275M	4828[1]	HOT	72
EN 10025-4:2019	S355M	4836[1]	HOT	72
EN 10025-4:2019	S420M	4842[1]	HOT	72
EN 10025-4:2019	S460M	4846	HOT	72
EN 10149-2:2013	S315MC	4932	HOT	69
KB01	MC300	4933	HOT	79
EN 10149-2:2013	S355MC	4936	HOT	69
EN 10149-2:2013	S355MC (CT A)	4937	HOT	6 9
EN 10149-2:2013	S420MC	4942	HOT	69
EN 10149-2:2013	S420MC (CT A)	4943	HOT	69
EN 10149-2:2013	S460MC	4946	HOT	69
EN 10149-2:2013	S460MC (CT A)	4947	HOT	69
EN 10149-2:2013	S500MC	4950	HOT	69
EN 10149-2:2013	S550MC	4955	HOT	69
EN 10149-2:2013	S600MC	4960	HOT	69
EN 10149-2:2013	S650MC	4965	HOT	69
EN 10149-2:2013	S700MC	4970	HOT	69
SAE J403-2014	1035	5035	HOT	101
SAE J403-2014	1040	5040	HOT	101
SAE J403-2014	1045	5045	HOT	101
SAE J403-2014	1050	5050	HOT	101
EN 10025-2:2019	S355J0+N Mod	5051	HOT	54
EN 10025-2:2019	S355J0+N	5052	HOT	54
SAE J403-2014	1060	5060	HOT	101
SAE J403-2014	1070	5070	HOT	101
SAE J403-2014	1080	5080	HOT	101
Erdemir-05	5105	5130	COLD	190
SAE J403-2014	1030	5131	COLD	190
SAE J403-2014	1030 Mod	5140	COLD	190
SAE J403-2014	1040	5145	COLD	190
SAE J403-2014	1045	5152	HOT	54
Erdemir-01	5155	5155	HOT	68
ASTM A709-21	345F Type 2	5246	HOT	52
EN 10025-2:2019	S355J0	5252	HOT	61
EN 10025-2:2019	E360	5270	HOT	102
ASTM A829-17	1345	5345	HOT	102
ASTM A829-17	5160	5360	HOT	102
DIN 17350:1980	75Cr1	5375	HOT	102
EN 10132-4:2000	80CrV2	5380	HOT	52
EN 10025-2:2019	S235JR+AR CTB	5437	HOT	43
Erdemir-09	5536	5536	HOT	43
Erdemir-07	5541	5541	HOT	43
Erdemir-09	5542	5542	HOT	43
Erdemir-07	5548	5548	HOT	43
Erdemir-07	5549	5549	HOT	43
Erdemir-07	5554	5554	HOT	43
Erdemir-07	5555	5555	HOT	43
Erdemir-07	5561	5561	HOT	43
Erdemir-07	5562	5562	HOT	43
Erdemir-07	5571	5571	HOT	43
Erdemir-07	5572	5572	HOT	43
Erdemir-07	5581	5581	HOT	43
Erdemir-07	5582	5582	HOT	43
Erdemir-13	5592	5592	HOT	103
EN 10083-3:2006	20MnB5 Mod	5620	HOT	103
Erdemir-15	22MnB5	5622	HOT	103
Erdemir-15	26MnB5	5626	HOT	103
Erdemir-19	28MnB5	5628	HOT	103
EN 10083-3:2006	30MnB5 Mod	5630	HOT	103
EN 10083-3:2006	30MnB5 Mod1	5631	HOT	83
ABS-P2-21	EH32	5732	HOT	84
ABS-P2-21	EH36	5736	HOT	84

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SAE J403-2014 / ASTM A1011-15 / ASTM A1018-18	1006 / CS Type B	6006	HOT	101
SAE J403-2014	1006 Mod	6007	HOT	41
SAE J403-2014	1006 Mod1	6009	HOT	41
SAE J403-2014	1018	6018	HOT	101
ASTM A1011-18	SS 36 Type 2	6035	HOT	57
ASTM A1018-18	SS 36 Type 2	6036	HOT	58
EN 10025-2:2019	S235J2C+N / S235J2+N	6037	HOT	59
ASTM A500-18	B	6040	HOT	46
ASTM A500-18	C	6042	HOT	46
EN 10025-2:2019	S275J2C+N / S275J2+N	6044	HOT	59
EN 10025-2:2019	S355J2C+N Mod	6050	HOT	59
EN 10025-2:2019	S355J2+N Mod	6051	HOT	54
EN 10025-2:2019	S355J2C+N / S355J2+N	6052	HOT	59
EN 10025-2:2019	S355J2C+N Mod 1	6053	HOT	59
SAE J403-2014 / ASTM A1008-20	1006 / CS Type B	6106	COLD	59
SAE J403-2014 / ASTM A1008-20	1008 / CS Type B	6108	COLD	188
Erdemir-01	6109	6109	COLD	188
SAE J403-2014	1010	6110	COLD	190
JIS G 3141:2011	SPCCT	6111	COLD	172
EN 10130:2006	DC01	6112	COLD	172
EN 10130:2006	DC03	6113	COLD	172
EN 10130:2006	DC04	6114	COLD	172
EN 10130:2006	DC05	6115	COLD	188
SAE J403-2014	1018 Mod	6118	COLD	187
DIN 1623:2009	S215G	6137	COLD	45
DIN 1623:2009	S215G Mod	6138	COLD	44
EN 10130:2006	DC01 (Cu)	6182	COLD	44
JIS G3131:2018	SPHC	6211	HOT	44
EN 10111:2008	DD11	6222	HOT	52
EN 10111:2008	DD12	6223	HOT	52
EN 10111:2008	DD13	6224	HOT	52
EN 10025-2:2019	S235J2 CTB	6237	HOT	52
EN 10025-2:2019	S275J2 CTB	6244	HOT	43
EN 10025-2:2019	S355J2	6252	HOT	52
EN 10025-2:2019	S355J2 Mod	6258	HOT	40
EN 10111:2008	DD11 (Cu)	6282	HOT	40
EN 10025-2:2019	S355J2 (Cu)	6284	HOT	93
Erdemir-04	6314	6314	HOT	86
Erdemir-04	6315	6315	HOT	93
EN 10028-2:2017	P235GH	6335	HOT	94
EN 10207:2005	P275SL	6340	HOT	93
EN 10028-2:2017	P265GH	6341	HOT	90
EN 10028-2:2017	16Mo3	6345	HOT	93
EN 10028-2:2017	P295GH	6347	HOT	91
Erdemir-14	6350	6350	HOT	91
EN 10028-2:2017	P355GH	6352	HOT	91
EN 10028-3:2017	P355NH	6353	HOT	41
EN 10028-3:2017	P355NL1	6355	HOT	41
EN 10028-3:2017	P355NH/P355NL1	6356	HOT	41
SAE J403-2014	1006 Mod3	6404	HOT	41
Erdemir-2021	6405	6405(3)	HOT	41
SAE J403-2014 / ASTM A1011-15	1006 / CS Type B	6406	HOT	41
SAE J403-2014	1006 Mod2	6407	HOT	41
SAE J403-2014 / ASTM A1011-15	1008 / CS Type B	6408	HOT	41
DIN 1614-1:1986	St22	6412	HOT	41
DIN 1614-1:1986	RRSt 23	6413	HOT	41
DIN 1614-1:1986	St22	6422	HOT	41
DIN 1614-1:1986	RRSt 23	6423	HOT	41
DIN 1614-1:1986	St24	6424	HOT	180
DIN 1614-1:1986	St 22 Mod	6425	HOT	180
EN 10209:2013	DC01EK	6512	COLD	43
EN 10209:2013	DC04EK	6513	COLD	43
Erdemir-01	6523	6523	HOT	43

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Erdemir-20	6524	6524	HOT	43
DIN 1614-1:1986	DD13	6624	HOT	41
ABS-P2-21	D	6704	HOT	41
ABS-P2-21	E	6705	HOT	82
ABS-P2-21	FH32	6732	HOT	82
ABS-P2-21	FH36	6736	HOT	83
JIS G 3101:2010	SS 400	6741	HOT	84
EN 10120:2017	P245NB	6837	HOT	56
ASTM A285-17	C	6838	HOT	85
EN 10120:2017	P265NB	6842	HOT	87
EN 10120:2017	P310NB	6847	HOT	85
EN 10120:2017	P310NB Mod	6848	HOT	85
LR-P2-13	490 FG	6850	HOT	85
EN 10120:2017	P355NB	6852	HOT	88
ASTM A516-17	55	6855	HOT	85
ASTM A516-17	60	6860	HOT	89
ASTM A516-17	65	6865	HOT	89
ASTM A516-17	70	6870	HOT	89
EN 10268:2006+A1:2013	HC220Y	7022	COLD	89
EN 10268:2006+A1:2013	HC260Y	7026	COLD	182
EN 10130:2006	DC01 Mod	7109	COLD	176
EN 10130:2006	DC01 Mod	7110	COLD	174
EN 10130:2006/ERDEMİR-15	DC01 / ERDEMIR-DC02	7112	COLD	177
ASTM A1008-2015	DS Type B	7113	COLD	174
EN 10130:2006	DC04	7114	COLD	177
EN 10130:2006	DC05	7115	COLD	177
EN 10130:2006	DC06	7116	COLD	177
EN 10130:2006	DC01	7122	COLD	177
EN 10130:2006	DC03	7123	COLD	177
EN 10130:2006	DC04	7124	COLD	178
EN 10268:2006+A1:2013	HC260 LA	7125	COLD	184
EN 10268:2006+A1:2013	HC300 LA	7128	COLD	184
EN 10268:2006+A1:2013	HC340 LA	7132	COLD	184
EN 10268:2006+A1:2013	HC380 LA	7136	COLD	184
EN 10268:2006+A1:2013	HC420 LA	7140	COLD	184
EN 10268:2006+A1:2013	HC460 LA	7146	COLD	184
EN 10111:2008	DD11	7222	HOT	44
EN 10111:2008	DD14	7224	HOT	44
EN 10025-2:2019	S355K2+N	7252	HOT	52
EN 10130:2006	DC03	7313	COLD	174
EN 10130:2006	DC04	7314	COLD	40
EN 10130:2006	DC05	7315	COLD	178
EN 10130:2006	DC06	7316	COLD	40
Erdemir-04	7414	7414	HOT	40
Erdemir-04	7416	7416	HOT	40
EN 10209:2013	DC01EK	7512	COLD	180
EN 10209:2013	DC04EK	7513	COLD	180
EN 10209:2013	DC04ED	7514	COLD	180
EN 10209:2013	DC06ED	7516	COLD	180
Erdemir-01	7524	7524	HOT	43
SAE J403-2014	10B08	7608	COLD	188
EN 10130:2006	DC01	7612	COLD	172
EN 10338:2015	HCT490X	7650	COLD	183
E DIN EN 10338:2013-04	HCT590X	7660	COLD	183
EN 10338:2015	HCT780X	7680	COLD	188
EN 10268:2006+A1:2013	HC220B	7722	COLD	181
EN 10268:2006+A1:2013	HC260B	7726	COLD	181
EN 10083-3:2006	51 CrV 4	8412	HOT	103
EN 10269:2013	21 CrMoV 5-7	8414	HOT	103

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Standard	Grade	Erdemir Steel Grade	Product Group	Pages No.
Erdemir-04	8416	8416	HOT	103
DIN - 1.7263	30 CrMo 5-2	8430	HOT	103
EN 10083-3:2006	34 CrMo 4	8434	HOT	103
EN 10083-2:2006	C45E Mod	8440	HOT	103
EN 10083-3	46Cr2 Mod	8451	HOT	103
EN 10083-3	8613	8613	HOT	103
Erdemir-03	L210 / A	9030	HOT	95
API 5L-18 / EN ISO 3183 PSL1	L245 / B	9035	HOT	95
API 5L-18 / EN ISO 3183 PSL1	L245N / BN	9036	HOT	95
API 5L-18 / EN ISO 3183 PSL2	L290 / X42	9042	HOT	95
API 5L-18 / EN ISO 3183 PSL1	L290N / X42N	9043	HOT	95
API 5L-18 / EN ISO 3183 PSL2	L320 / X46	9046	HOT	95
API 5L-18 / EN ISO 3183 PSL2	L320N / X46N	9047	HOT	95
API 5L-18 / EN ISO 3183 PSL1	L360 / X52	9052	HOT	95
API 5L-18 / EN ISO 3183 PSL2	L360M / X52M	9053	HOT	95
API 5L-18 / EN ISO 3183 PSL2	L390 / X56	9056	HOT	95
API 5L-18 / EN ISO 3183 PSL1	L390M / X56M	9057	HOT	95
API 5L-18 / EN ISO 3183 PSL2	L415 / X60	9060	HOT	95
API 5L-18 / EN ISO 3183 PSL1	L415M / X60M	9061	HOT	95
API 5L-18 / EN ISO 3183 PSL2	L450 / X65	9065	HOT	95
API 5L-18 / EN ISO 3183 PSL1	L450M / X65M	9066	HOT	95
API 5L-18 / EN ISO 3183 PSL2	L485 / X70	9070	HOT	95
API 5L-18 / EN ISO 3183 PSL1	L485M / X70M	9071	HOT	95
API 5L-18 / EN ISO 3183 PSL2	L555M / X80M	9080	HOT	95
API 5L-18 / EN ISO 3183 PSL2	SPA - C	9160	COLD	99
API 5CT-18 PSL1	H40	9240	HOT	97
EN ISO 3183:2019 Annex A PSL2	L245ME	9245	HOT	97
EN ISO 3183:2019 Annex A PSL2	L245NE	9246	HOT	99
API 5CT-18 PSL1	J55	9255	HOT	99
API 5CT-18 PSL1	J55 (Mod 1)	9256	HOT	99
API 5CT-18 PSL1	J55 (Mod 2)	9257	HOT	99
API 5CT-18 PSL1	J55 (Mod 3)	9258	HOT	99
API 5CT-18 PSL1	N80 Mod	9275	HOT	99
API 5CT-18 PSL1	N80 Type1	9280	HOT	97
EN ISO 3183:2019 Annex A PSL2	L290ME	9290	HOT	97
EN ISO 3183:2019 Annex A PSL2	L290NE	9291	HOT	62
ASTM A572-18	42 Type2	9329	HOT	62
ASTM A572-18	50 Type2	9335	HOT	62
ASTM A572-18	55 Type2	9338	HOT	62
ASTM A572-18	60 Type3	9342	HOT	54
EN 10025-2:2019	S355J2 Mod	9352	HOT	63
EN 10025-3:2019	S355N	9355	HOT	63
EN 10025-3:2019	S355NL	9356	HOT	97
EN ISO 3183:2019 Annex A PSL2	L360ME	9360	HOT	97
EN ISO 3183:2019 Annex A PSL2	L360NE	9361	HOT	97
EN ISO 3183:2019 Annex A PSL2	L415ME	9415	HOT	97
EN ISO 3183:2019 Annex A PSL2	L415NE	9416	HOT	63
EN 10025-3:2019	S420N	9420	HOT	64
ASTM A656-18	50 Type3	9435	HOT	64
ASTM A656-18	60 Type8	9442	HOT	64
ASTM A656-18	70 Type8	9449	HOT	97
EN ISO 3183:2012 Annex M PSL2	L450ME	9450	HOT	64
ASTM A656-18	80 Type8	9455	HOT	63
EN 10025-3:2019	S460N	9460	HOT	97
EN ISO 3183:2019 Annex A PSL2	L485ME	9485	HOT	100
ASTM A606	Type4 Mod	9951	HOT	67
Erdemir-05	9500	9500	HOT	66
EN 10025-5:2019/ASTM A709-21	S355J2W / 50 WF (345WF)	9952	HOT	67
JIS G 3125:2021	SPA-H	9960	HOT	67

Hot Rolled Flat Steel Products

Hot Rolled Flat
Steel Products

Hot Rolled Flat Steel Products

Coils, having a thickness range of 1.40-25.00 mm, can be supplied coiled or cut to various lengths. Heavy plates can be supplied with thicknesses 6 mm to 200.00 mm and widths of 1.000 to 3.600 mm.

General Application Areas

We provide our hot rolled steel grades application areas in a wide range, in order to meet the variety of demands and expectations of our customers.

Micro alloyed high strength steel grades with high deep drawing quality deliver excellent performance in bending and cold forming applications. Wheel or frame steels, one of the main components of the automotive industry, are used in the manufacture of wheel or frame parts due to their high strength and formability quality.

General structural steels with ductility and toughness properties, and that are suitable for conventional welding processeses are mainly used in the production of construction machinery, caterpillars, heavy plates for general construction, land and railway vehicles, storage tanks and containers.

Hot rolled pipe grades are used for the production of pipes with high tensile strength, excellent toughness and weldability properties and that are used for the transport of gases/petroleum or fluid substances such as water or oil.

High-pressure and temperature boiler steels are used in the manufacture of pressure vessels and boilers, pipes subjected to pressure and steam, industrial thermal vessels and heat exchangers, due to their excellent forming and weldability properties.

Tube steels are used in the manufacture of LPG tubes, as they have a very good formability quality and excellent weldability and toughness properties.

Medium and high tensile strength steels for shipbuilding with superior weldability and relevant toughness properties can be used for building ship interiors and keels.

General Information on Hot Rolled Flat Steel Products;

Products:

We can supply our hot rolled products in following physical conditions:

- As coils or cut as plates (thick plates, surfaces sandblasted or dyed plates)
- As trimmed or mill edge, hot rolled or oxide layer on surface rinsed off with acid
- Tempered (skin-pass) or untempered (re-coiled) through the coil preparation process.
- Normalized (coil plates, plates and dyed products),
- Raised drop patterns on surface

Dimensions:

- Width and length sizes to be considered as nominal, unless otherwise specified
- Inner diameter of coil products with mill edges: 762 mm (+/- % 7)
- Inner diameter of coil products with triimed edges: 762 mm (+/- % 3)
- Inner diameter of pickled coil products with mill edges: 610 mm (+/- % 7)
- Inner diameter of pickled coil products with trimmed edges: 610 mm (+/- % 3)
- Max outer diameter of coils made of 12 meter slabs: 2150 mm
- Max outer diameter of coils made of 6 meter slabs: 1750 mm

Surface Protection:

- Oiling: Surfaces of pickled products will not be coated with protective oil, unless otherwise specified.
- It is Erdemir's recommendation to apply a surface protection at a minimum of "medium level", in order to lower the risk of corrosion. Erdemir bear no responsibility for corrosion occurring on product's surfaces that were requested to be delivered as "unoiled" or "lightly oiled".
- The warranty period for corrosion of pickled and oiled products having a surface protection of at least a "normal" level is 3 months from the production date onwards.
- Erdemir does not recommend hot rolled products with unoiled or lightly oiled surfaces. In the eventof orders of such products Erdemir will not be responsible for any corrosion occurrences on surfaces.

Surface Quality:

- EN 10163-2 (Class B Subclass 3) standards are ensured for surface quality of hot rolled products

Weldability:

For instructions about weldability of hot rolled steels, the literature's commonly used formulation of carbon equivalent value (CE_IIW) is applied, of which results of can be interpreted as below. But in order to determine steels' real weldabilities, the C and CE values have to be assessed together.

- % CE ≤ 0,30: Weldability very high, can be welded without any extra intervention.
- 0,30 < % CE < 0,55: Can be welded with suitable welding equipment and feasible temperature conditions.
- % CE ≥ 0,55: Can just be welded with special welding practices.

Applicability for Surface Coating:

Steel grades produced with S235JR, S275JR, S355JR notions within the scope of EN 10025-2:2004 standards are designated to be suitable for hot dip galvanising as Class1 or Class 3. Any further information in this regard is given in the grade tables in the 'hot rolled products' subsection.
Products requested with applicability for galvanized coating to be mentioned in purchase order.

Marking:

All plates produced in the rolling plant can be furnished with information such as plate number, grade, dimension etc. by paint or markers.
The same information can be provided by die stamping (up to 100mm thickness) upon request.

Mechanical Test:

Tensile test is carried out according to EN ISO 6892-1" Metallic Materials - Tensile Test - Part 1: Tests Performed at Room Temperature " The test certificate containing the mechanical test and chemical analysis results sent to the customer is an inspection document and is prepared according to the standard EN 10204 "Metallic products - Types of Inspection Documents". In case an analysis / test report is requested by our customers within the scope of TS EN ISO / IEC 17025 "General Conditions for the Competence of Testing and Calibration Laboratories", the report can be requested from the sales unit with a request letter.

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Scope of Application And Main Properties	Corresponding		Erdemir Steel Grade
	Standard	Grade	
Low-carbon unalloyed mild steels for cold reducing with the obligation of batch annealing	SAE J403-14	1006 Mod3	6404
	Erdemir-2021	6405	6405[3]
	SAE J403-2014/ASTM A1011-15	1006 / CS Type B	6406
	SAE J403-2014	1006 Mod2	6407
	SAE J403-2014	1006 Mod	6007
	SAE J403-2014	1006 Mod1	6009
	SAE J403-2014/ASTM A1011-15	1008 / CS Type B	6408
	DIN 1614-1:1986	St 22	6421[3]
	DIN 1614-1:86	St22	6422
	DIN 1614-1:1986	St22 Mod	6624
	DIN 1614-1:86	RRSt 23	6423
	DIN 1614-1:86	St24	6424
	DIN 1614-1:1986	St 22 Mod	6425
Hot rolled low strength steels suitable for continuous annealing after cold reducing	DIN 1614-1:86	St 22	6412
	DIN 1614-1:86	RRSt 23	6413
Hot rolled ultra low carbon steels suitable for continuous annealing after cold reducing	Erdemir-04	6314	6314
	Erdemir-04	6315	6315
	Erdemir-04	7414	7414
	Erdemir-04	7416	7416
Hot rolled steels for manufacturing hot-dip galvanised bake-hardening steels provided that continuously annealed after cold reducing	Erdemir-04	1718	1718
	Erdemir-04	1722	1722
	Erdemir-04	1726	1726
Hot rolled steels suitable for production of hot-dip galvanised structural steels provided that continuously annealed after cold reducing	Erdemir-18	1821	1821
	Erdemir-04	1822	1822
	Erdemir-04	1825	1825
	Erdemir-04	1828	1828
	Erdemir-04	1832	1832
	Erdemir-04	1835	1835
Hot rolled steels for manufacturing cold reduced non-oriented electrical steels	Erdemir-09	5536	5536
	Erdemir-07	5541	5541
	Erdemir-09	5542	5542
	Erdemir-07	5548	5548
	Erdemir-07	5549	5549
	Erdemir-07	5554	5554
	Erdemir-07	5555	5555
	Erdemir-07	5561	5561
	Erdemir-07	5562	5562
	Erdemir-07	5571	5571
	Erdemir-07	5572	5572
	Erdemir-07	5581	5581
	Erdemir-07	5582	5582
	Erdemir-13	5592	5592
Hot rolled steels for cold forming	11-04-013	HES-HC	700
	EN 10111:2008	DD11	3222
	JIS G3131:2010	SPHC	6211
	EN 10111:2008	DD11	4222
	EN 10111:2008	DD11	6222
	JIS G3131:2018	SPHC	6211
	EN 10111:2008	DD11	7222
Hot rolled steels for deep-drawing and cold forming	EN 10111:2008	DD12	6223
	EN 10111:2008	DD13	6224
	400.240.003.C	DD13	712
	400.040.101	VAW HRC1/HRC3	713
Non ageing extra deep-drawing steel	EN 10111:2008	DD14	7224
Hot rolled low-carbon steels for vitreous enamelling after cold reducing	Erdemir-01	6523	6523
	Erdemir-20	6524	6524
	Erdemir-01	7524	7524

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1.0332	DIN 1614-P2 StW22		ASTM A1011 CS Type B	JIS G3131 SPHC	44
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1.0332	DIN 1614-P2 StW22		ASTM A1011 CS Type B	JIS G3131 SPHC	45
1.0332	DIN 1614-P2 StW22		ASTM A1011 CS Type B	JIS G3131 SPHC	44
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1.0332	DIN 1614-P2 StW22			JIS G3131 SPHC	44
1.0398	DIN 1614-P2 RRStW23		ASTM A 1011 DS Type A	JIS G3131 SPHD	44
1.0335	DIN 1614-P2 StW24		ASTM A 1011 DS Type B	JIS G3131 SPHD	45
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Low and medium strength carbon steels (automotive industry, pipe and machine parts production)	SAE J403-2014/ASTM A1011-15 /ASTM A1018-18	1006 / CS Type B	6006				ASTM A1011 CS Type A		101
	SAE J403-2014/ASTM A1011-15/ASTM A1018-18	1008 / CS Type B	3008				ASTM A1011 CS Type D		101
	SAE J403-2014	1010	3010						101
	SAE J403-2014	1012	3012						101
	SAE J403-2014	1015	3015						101
Unalloyed carbon steels with intermediate-strength for pipe and tube production	ASTM A53-20	2008	2008						46
	ASTM A53-20	A	2009						46
	ASTM A500-18	A	4009						46
	ASTM A500-18	B	6040						46
	EN 10025-4:2019	C	6042						46
Thermomechanically hot rolled weldable fine-grained structural steels	EN 10025-4:2019	S275M	4828	1.8818					72
	EN 10025-4:2019	S355M	4836	1.8823					72
	EN 10025-4:2019	S420M	4842	1.8825					72
	EN 10025-4:2019	S460M	4846	1.8827					72
Medium and high strength low alloyed steels suitable for cold forming for manufacture of chassis, cranes, trailers and railings in particular	EN 10149-2:2013	S315MC	4932	1.0972			ASTM A1011 HSLAS Gr.45 Class 2		69
	EN 10149-2:2013	S355MC (CT A)	4937						69
	EN 10149-2:2013	S355MC	4936	1.0976			ASTM A1011 HSLAS Gr.50 Class 2		69
	EN 10149-2:2013	S420MC	4942	1.0980			ASTM A1011 HSLAS Gr.60 Class 2		69
	EN 10149-2:2013	S420MC (CT A)	4943[3]						69
	EN 10149-2:2013	S460MC	4946	1.0982			ASTM A1011 HSLAS Gr.65 Class 2		69
	EN 10149-2:2013	S460MC (CT A)	4947[3]						69
	EN 10149-2:2013	S500MC	4950	1.0984			ASTM A1011 HSLAS Gr.70 Class 2		69
	EN 10149-2:2013	S550MC	4955	1.0986			ASTM A1011 HSLAS - F Gr.80		69
	EN 10149-2:2013	S600MC	4960	1.8969					69
	EN 10149-2:2013	S650MC	4965	1.8976					69
	EN 10149-2:2013	S700MC	4970	1.8974					69
	EN 10149-2:2013 / 11-04-002	S315MC / HE-320 D / HE-320 DR	800	1.0972					73
	WSS-M1 A346	A3 Gr.300	801			S315MC			73
	EN 10149-2:2013 / 11-04-002	S355MC / HE-360 D / HE-360 DR	810	1.0976					73
	WSB-M1 A 215-E1	Gr.350	811			S355MC			73
	WSS-M1 A346	A4 Gr.350	812			S355MC			73
	52812	FEE 340	813			S315MC			73
	WSB-M1 A 215-E1	Gr.400	820			S420MC			73
	E116088 / EN10149-2	HR-500Y550T / S500MC Özel	835						73
	11-04-002	HE 450M	845[3]						73
	CES 002	1.0986	855			S550MC			73
	KB01	MC300	4933						79
Hot rolled high yield strength steels suitable for cold forming	FG52806	FEP13	714						73
	MS.50002 / 52812	LAH420Y480T / FEE420	842			S420MC			70
	EN 10149-2:2013	S460MC	846						70
	MS.50002	LAH500Y560T	850			S500MC			70
Hot rolled fine-grained low alloyed steels suitable for cold forming	DBL 4041	M590 MC	859[3]						71
	MS.50002	MCH600Y650T	860			S600MC			71
Hot rolled dual phases steels based on customer specification	WSS-M1A368	HRDP600	890[3]						72
Hot rolled high yield strength low-alloy steels for automotive industry	SAE J2340-1999	340XF	4634			S355MC			75
	SAE J2340-1999	420XF	4642			S420MC			75
High-strength low-alloy steels with improved bending for production of construction equipment	ASTM A656-18	50 Type3	9435						64
	ASTM A656-18	60 Type8	9442						64
	ASTM A656-18	70 Type8	9449						64
	ASTM A656-18	80 Type8	9455						64
Hot rolled intermediate strength steel suitable for usage under low pressure and temperature	EN 10207:2005	P275SL	6340	1.1100					86
Steels for welded gas cylinders (LPG tubes)	EN 10120:2017	P245NB	6837	1.0111				JIS G3116 SG255	85
	EN 10120:2017	P265NB	6842	1.0423				JIS G3116 SG295	85
	EN 10120:2017	P310NB	6847	1.0437				JIS G3116 SG325	85
	EN 10120:2017	P310NB Mod	6848						85
	EN 10120:2017	P355NB	6852	1.0557				JIS G3116 SG365	85
Hot rolled carbon steels for pressure purposes at moderate and lower temperature services	ASTM A516-17	55	6855						89
	ASTM A516-17	60	6860						89
	ASTM A516-17	65	6865						89
	ASTM A516-17	70	6870						89
Hot rolled steels for pressure purposes (boilers, steam boiler plants, pressure vessels, etc.) at elevated temperatures	EN 10028-2:2017	P235GH	6335	1.0345	DIN 17155 H I				93
	EN 10028-2:2017	P265GH	6341	1.0425	DIN 17155 H II				93
	EN 10028-2:2017	16Mo3	6345	1.5415					94
	EN 10028-2:2017	P295GH	6347	1.0481	DIN 17155 17Mn4				93
	EN 10028-2:2017	P355GH	6352	1.0473	DIN 17155 19Mn6				93
Hot rolled steels for pipe production	Erdemir-14	6350	6350						90
Hot rolled normalized fine grained steels suitable for pressure purposes	EN 10028-3:2017	P355NH	6353	1.0565	DIN 17102 WStE355				91
	EN 10028-3:2017	P355NL1	6355	1.0566	DIN 17102 EStE355				91
Dual certified hot rolled normalized fine grained steel suitable for pressure purposes	EN 10028-3:2017	P355NH/P355NL1	6356						91

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Steels for manufacturing of welded pipes for pressure purposes	EN 10217-1:2002+A1:2005	P235TR1	3285	1.0254					92
	EN 10217-1:2002+A1:2005	P235TR1	3337	1.0254					92
Medium-strength steels for shipbuilding	ABS-P2-21	A	3701				ASTM A131 Gr.A		82
	ABS-P2-21	B	3702				ASTM A131 Gr.B		82
	ABS-P2-21	D	6704				ASTM A131 Gr.D		82
	ABS-P2-21	E	6705				ASTM A131 Gr.E		82
High-strength steels for shipbuilding	ABS-P2-21	AH32	3732						83
	ABS-P2-21	AH36	3736						84
	ABS-P2-21	DH32	4732						83
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	ABS-P2-21	EH36	5736						84
	ABS-P2-21	FH32	6732						83
	ABS-P2-21	FH36	6736						84
High-strength structural steels for manufacture of any kind of machines and machine parts, general construction, road and railway vehicles	SAE J403-2014 / B105-10	1022 Mod	735						65
	EN 10025-2:2019	S355JR+AR	3252	1.0045	DIN 17100 St52-3		ASTM A1011 SS Gr.50		52
	EN 10025-2:2019	S355JR+N	3052	~1.0045					54
	EN 10025-2:2019	S355JR+AR CTA	4250	1.0045	DIN 17100 St52-3		ASTM A1011 SS Gr.50		52
	EN 10025-2:2019	S355J2 CTA	4252	1.0577	DIN 17100 St52-3		ASTM A1011 SS Gr.50		52
	EN 10025-2:2019	S355J2 Özel CTA	4255	1.0577					52
	EN 10025-2:2019	S355J2	6252	1.0577	DIN 17100 St52-3		ASTM A1011 SS Gr.50		52
	EN 10025-2:2019	S355J2 Özel	6258	~1.0577					52
	EN 10025-2:2019	S355J2C+N Özel	6050	~1.0577					59
	EN 10025-2:2019	S355J2C+N Özel1	6053	~1.0577	DIN 17100 St 52-3		ASTM A1011 SS Gr.50		59
	EN 10025-2:2019	S355J0+AR	5252	1.0553	DIN 17100 St52-3		ASTM A1011 SS Gr.50		57
	EN 10025-2:2019	S355J0+N	5052	1.0553					52
	EN 10025-2:2019	S355K2+N	7252	1.0596	DIN 17100 St52-3		ASTM A1011 SS Gr.50		61
Hot rolled unalloyed high carbon structural steels	EN 10025-2:2019	E295	3250	1.0050	DIN 17100 St50-2				61
	EN 10025-2:2019	E335	3260	1.0060	DIN 17100 St60-2				61
	EN 10025-2:2019	E360	5270	1.0070	DIN 17100 St70-2				56
Hot rolled unalloyed structural steels for manufacture of construction equipment, machines and various machine parts, general construction plates, road and railway vehicles	DBL 4050	StW24H	720			S235JR			52
	EN 10025-2:2019	S235JR+AR	3137	1.0038	DIN 17100 St37-2		ASTM A1011 SS Gr.36 Type 1		52
	EN 10025-2:2019	S235JR+AR Mod	3235[3]	1.0038	DIN 17100 St37-2		ASTM A 1011 SS Gr.36 Type1		52
	EN 10025-2:2019	S235JR+AR	3237	1.0038	DIN 17100 St37-2		ASTM A1011 SS Gr.36 Type 1		48
	ASTM A36-19	A36	3241						48
	CSA G40.21-13	300W	3245						48
	CSA G40.21-13	350W	4251						55
	EN 10025-2:2019	S235JR+AR Mod CTA	4238						55
	AS NZS 1594:2002	HA 250 Mod	4240[3]						55
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	EN 10025-2:2019	S235JR+AR CTA	4237	1.0038	DIN 17100 St37-2		ASTM A1011 SS Gr.33		52
	EN 10025-2:2019	S235JR+AR Mod	4260	1.0038	DIN 17100 St37-2		ASTM A1011 SS Gr.33		52
	EN 10025-2:2019	S235JR+AR Mod CTA	4275						52
	EN 10025-2:2019	S235JR+AR CTA	4437	1.0038	DIN 17100 St37-2		ASTM A1011 SS Gr.33		52
	EN 10025-2:2019	S235JR+AR CTB	5437	1.0038	DIN 17100 St37-2		ASTM A1011 SS Gr.33		52
	EN 10025-2:2019	S235J2 CTB	6237	1.0117	DIN 17100 St37-3				52
	EN 10025-2:2019	S235J2/S235J2+N CTA	4239						55
	EN 10025-2:2019	S235JR+AR Mod CTB	3243[3]						52
	EN 10025-2:2019	S275JR+AR	3244	1.0044	DIN 17100 St44-2		ASTM A1011 SS Gr.40		52
	EN 10025-2:2019	S275JR+AR CTA	4244	1.0044	DIN 17100 St44-2		ASTM A1011 SS Gr.40		52
	EN 10025-2:2019	S275J2 CTB	6244	1.0145	DIN 17100 St44-3				52
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	ASTM A283-13	C	3018						101
	SAE J403-2014	1018	6018						101
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Hot rolled unalloyed structural steels for manufacture of construction equipment, machines and various machine parts, general construction plates, road and railway vehicles	SAE J403-2014	1035	5035
	SAE J403-2014	1040	5040
	SAE J403-2014	1045	5045
	JIS G 3101:2010	SS 400	6741
	400.240.004.D	18Mn5	721
Dual certified unalloyed steel suitable for general construction and shipbuilding	ASTM A36-19/ABS-P2-21	A36-Gr.A	3741
Hot rolled structural steel with improved atmospheric corrosion resistance	ASTM A606	Type4 Mod	9951
	EN 10025-5:2019 / ASTM A709-21	S355J2W / 50 WF (345WF)	9952
Dual certified weldable fine-grained structural steel	CSA G40.21-13	300W / 350W	3249
Triple certified weldable fine-grained structural steel	CSA G40.21-13 / ASTM A572-18	300W/350W-Gr50Type2	3246
Hot rolled steels for wheel manufacturing based on customer specification	JMW	MW01	3901
	JMW	MW05	3905
	MW/HL3 MS-03	1932-01	3922
	MW GL-040	1932-11A	3937
	MW GL-040	1953-14A	3938
	MW/HL3 MS-03	1937-02	3940
	MW GL-040	1937-11A	3944
	MW GL-012	1937-03	3946
	MW GL-012/040	1953-02/11A	3949
	MW GL-012/040	2242-03/11A	3957
	MW GL-012/JMW	2661-01/MW06	3660[3]
	MW GL-012/040	6000-03/11A	3960
Medium, low strength steels for automotive industry, mostly for wheel rims	EN 10111:2008	DD13 Mod	3923
High, medium strength steels for automotive industry, mostly for discs	EN 10025-2:2019	S235J2	3936
	EN 10025-2:2019	S275J2	3945
	EN 10149-2:2013	S355MC	3955
Structural steel for bridge construction	ASTM A709-21	345F Type2	5246
Hot rolled weldable fine-grained structural steels	ASTM A572-18	42 Type2	9329
	ASTM A572-18	50 Type2	9335
	ASTM A572-18	55 Type2	9338
	ASTM A572-18	60 Type3	9342
Hot rolled weldable fine-grained normalized structural steels	EN 10025-3:2019	S355N	9355
	EN 10025-3:2019	S355NL	9356
	EN 10025-3:2019	S420N	9420
	EN 10025-3:2019	S460N	9460
Hot rolled high strength structural steel for casing	Erdemir-05	9500	9500
Hot rolled structural steels with improved formability	ASTM A1011-18	SS 30	3330
	ASTM A1011-18	SS 33	3333
	ASTM A1011-18	SS 36 Type1	3336
	ASTM A1011-18	SS 36 Type2	6035
	ASTM A1011-18	SS 40	3340
	ASTM A1011-18	SS 45 Type1	3345
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	ASTM A1018 HSLAS-18	Grade 50 Class 1	3551
	ASTM A1018 HSLAS	Grade 50 Class 1	3552[3]
	ASTM A1018-18	SS 30	3430
	ASTM A1018-18	SS 33	3433
	ASTM A1018-18	SS 36 Type1	3436
	ASTM A1018 HSLAS	Grade 55 Class1	3455[3]
	ASTM A1018 HSLAS	Grade 65 Class 1	3465[3]
	ASTM A1011 HSLAS	Grade 50 Class 1	3550[3]
	ASTM A1018-18	SS 40	3440
	EN 10025-2:2019	S275JRC+AR Mod CTA	4044
	EN 10025-2:2019	S355J2C+N CTA	4052
	EN 10025-2:2019	S235J2C+N	6037
	EN 10025-2:2019	S275J2C+N	6044
	EN 10025-2:2019	S355J2C+N	6052
Carbon Steel with Intermediate Tensile Strengthfor Pressure Vessels	ASTM A285-17	C	6838
High strength steel for manufacture of boilers, pressure vessels and dam penstocks	LR-P2-13	490 FG	6850
Medium strength casting slab	Erdemir-01	3995	3995

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		EN 10149-2/EN 10025-2 S355MC/S355J2			75
		EN 10149-2 /S420MC			75
					75
		EN 10149-2 /S460MC			75
1.0335		EN 10149-2 /S460MC			77
1.0117	DIN 17100 St 37-3				78
1.0145	DIN 17100 St 44-3				78
1.0976					81
			ASTM A572 Gr.50 Type 2		68
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			ASTM A709 Gr.345F Type 2		62
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1.0545	DIN EN 10113-2 S355N		ASTM A1011 HSLAS Gr.50 Class 1		63
1.0546	DIN EN 10113-2 S355NL		ASTM A1011 HSLAS Gr.50 Class 1		63
1.8902	DIN EN 10113-2 S420N		ASTM A1011 HSLAS Gr.60 Class 1		63
1.8901	DIN EN 10113-2 S460N		ASTM A1011 HSLAS Gr.65 Class 1		63
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1.0119	DIN 17100 QSt37-3N				59
1.0142	DIN 17100 QSt44-3N				59
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Application Areas and Brand Correspondence of Hot Rolled Products

Scope of Application And Main Properties	Corresponding		Erdemir Steel Grade
	Standard	Grade	
Low and intermediate strength, atmospheric corrosion resistant structural steels	EN 10025-2:2019	S235JR+AR CTB (Cu)	3281
	EN 10111:2008	DD11 (Cu)	6282
	EN 10025-2:2019	S355J2 (Cu)	6284
	JIS G 3125:2021	SPA-H	9960
Alloyed structural steels	ASTM A829-17	1345	5345
	ASTM A829-17	5160	5360
Tool steel	DIN 17350:1980	75Cr1	5375
	EN 10132-4:2000	80CrV2	5380
Unaloyed high carbon steels for manufacturing machine parts and agriculture tools,etc.	SAE J403-2014	1050	5050
	SAE J403-2014	1060	5060
	SAE J403-2014	1070	5070
	SAE J403-2014	1080	5080
Silicon killed valve steel suitable for surface hardening	SAE J403-2014	1018 Mod	3037
Hot Rolled Carbon Steel For Strap Production After Cold Rolling And Heat Treatment	EN 10083-2:2006	28Mn6	3031
	EN 10083-2:2006	28Mn6 Mod	3032
	Erdemir-20	28Mn6	3033
Hot rolled boron alloyed steels for manufacturing of agricultural equipment by quenching and tempering	EN 10083-3:2006	20MnB5 Mod	5620
	Erdemir-15	22MnB5	5622
	Erdemir-15	26MnB5	5626
	Erdemir-19	28MnB5	5628
	EN 10083-3:2006	30MnB5 Mod	5630
	EN 10083-3:2006	30MnB5 Mod	5631
Hot rolled low alloy steels for quenching and tempering	EN 10083-3:2006	51CrV4	8412
	EN 10269:2013	21CrMoV5-7	8414
	DIN - 1.7263	30CrMo5-2	8430
	EN 10083-3:2006	34CrMo4	8434
	EN 10083-2:2006	C45E Mod	8440
Hot rolled steels for defense industry	Erdemir-04	8416	8416
	Erdemir-03	8613	8613
Intermediate and high strength steels for casing and tubing in the crude oil and natural gas industry	API 5CT-18 PSL1	H40	9240
	API 5CT-18 PSL1	J55	9255
	API 5CT-18 PSL1	J55 Mod 1	9256
	API 5CT-18 PSL1	J55 Mod 2	9257
	API 5CT-18 PSL1	J55 Mod 3	9258
	API 5CT-18 PSL1	N80 Mod	9275
	API 5CT-18 PSL1	N80 Type1	9280
Hot rolled steels for manufacturing line pipes of crude oil and natural gas	API 5L-18 / EN IS0 3183:2019 PSL1	L210 / A	9030
	API 5L-18 / EN IS0 3183:2019 PSL1	L245 / B	9035
	API 5L-18 / EN IS0 3183:2019 PSL2	L245N / BN	9036
	API 5L-18 / EN IS0 3183:2019 PSL1	L290 / X42	9042
	API 5L-18 / EN IS0 3183:2019 PSL2	L290N / X42N	9043
	API 5L-18 / EN IS0 3183:2019 PSL2	L290M / X42M	9044
	API 5L-18 / EN IS0 3183:2019 PSL1	L320 / X46	9046
	API 5L-18 / EN IS0 3183:2019 PSL2	L320N / X46N	9047
	API 5L-18 / EN IS0 3183:2019 PSL2	L320M / X46M	9048
	API 5L-18 / EN IS0 3183:2019 PSL1	L360 / X52	9052
	API 5L-18 / EN IS0 3183:2019 PSL2	L360M / X52M	9053
	API 5L-18 / EN IS0 3183:2019 PSL1	L390 / X56	9056
	API 5L-18 / EN IS0 3183:2019 PSL2	L390M / X56M	9057
	API 5L-18 / EN IS0 3183:2019 PSL1	L415 / X60	9060
	API 5L-18 / EN IS0 3183:2019 PSL2	L415M / X60M	9061
	API 5L-18 / EN IS0 3183:2019 PSL1	L450 / X65	9065
	API 5L-18 / EN IS0 3183:2019 PSL2	L450M / X65M	9066
	API 5L-18 / EN IS0 3183:2019 PSL1	L485 / X70	9070
	API 5L-18 / EN IS0 3183:2019 PSL2	L485M / X70M	9071
	API 5L-18 / EN IS0 3183:2019 PSL2	L555M / X80M	9080[5]
Hot rolled steels for manufacturing of line pipes for European onshore natural gas transmission	EN ISO 3183:2019 Annex A PSL2	L245ME	9245
	EN ISO 3183:2019 Annex A PSL2	L245NE	9246
	EN ISO 3183:2019 Annex A PSL2	L290ME	9290
	EN ISO 3183:2019 Annex A PSL2	L290NE	9291
	EN ISO 3183:2019 Annex A PSL2	L360ME	9360
	EN ISO 3183:2019 Annex A PSL2	L360NE	9361
	EN ISO 3183:2019 Annex A PSL2	L415ME	9415
	EN ISO 3183:2019 Annex A PSL2	L415NE	9416
	EN ISO 3183:2019 Annex A PSL2	L450ME	9450
	EN ISO 3183:2019 Annex A PSL2	L485ME	9485

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1.0038	DIN 17100 St37-2 (Cu)				52
1.0332	DIN 1614-P2 StW22 (Cu)		ASTM A1011 CS Type B		43
1.0570	DIN 17100 St52-3 (Cu)				52
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1.7709					103
					103
1.7220					103
					103
					103
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		API 5L-18 PSL2 L245N/BN			97
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		API 5L-18 PSL2 L290N/X42N			97
		API 5L-18 PSL2 L360M/X52M			97
					97
		API 5L-18 PSL2 L415M/X60M			97
					97
		API 5L-18 PSL2 L415M/X60M			97
		API 5L-12 PSL2 L485M/X70M			97

1) The “Equivalent Standards” may correspond to the exact same material or similar materials. We therefore cannot guarantee conformity of our material to relevant equivalent standards. A 100% conformity of the product to its application field according to relevant standards can only be ascertained after trial production.

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Application Areas and Brand Correspondence of Plate Products

Scope of Application And Main Properties	Corresponding		Erdemir Steel Grade
	Standard	Grade	
Hot rolled steels for deep-drawing and cold forming	EN 10111:2008	DD13	6224
	EN 10111:2008	DD13 (B)	6624
Non ageing extra deep-drawing steel	EN 10111:2008	DD14	7224
Low and medium strength carbon steels (automotive industry, pipe and machine parts production)	SAE J403-2014/ASTM A 1011-15 /ASTM A 1018-16	1006 / CS Type B	6006
	SAE J403-2014/ASTM A 1011-15 /ASTM A 1018-16	1008 / CS Type B	3008
	SAE J403-2014	1010	3010
	SAE J403-2014	1012	3012
	SAE J403-2014	1015	3015
High-strength low-alloy steels with improved bending for production of construction equipment	ASTM A656-13	50 Type 3	9435
	ASTM A656-13	60 Type 8	9442
	ASTM A656-13	70 Type 8	9449
	ASTM A656-13	80 Type 8	9455
Hot rolled carbon steels for pressure purposes at moderate and lower temperature services	ASTM A516-10	55	6855
	ASTM A516-10	60	6860
	ASTM A516-10	65	6865
	ASTM A516-10	70	6870
Hot rolled steels for pressure purposes (boilers, steam boiler plants, pressure vessels, etc.) at elevated temperatures	EN 10028-2:2009	P235GH	6335
	EN 10028-2:2009	P265GH	6341
	EN 10028-2:2009	16Mo3	6345
	EN 10028-2:2009	P295GH	6347
	EN 10028-2:2009	P355GH	6352
Hot rolled normalized fine grained steels suitable for pressure purposes	EN 10028-3:2009	P355NH	6353
	EN 10028-3:2009	P355NL1	6355
Dual certified hot rolled normalized fine grained steel suitable for pressure purposes	EN 10028-3:2009	P355NH/P355NL1	6356
Medium strength steels for shipbuilding	ABS-P2-21	A	3701
	ABS-P2-21	B	3702
	ABS-P2-21	D	6704
	ABS-P2-21	E	6705
High strength steels for shipbuilding	ABS-P2-21	AH32	3732
	ABS-P2-21	AH36	3736
	ABS-P2-21	DH32	4732
	ABS-P2-21	DH36	4736
	ABS-P2-21	EH32	5732
	ABS-P2-20	EH36	5736
	ABS-P2-21	FH32	6732
	ABS-P2-21	FH36	6736
High-strength structural steels for manufacture of any kind of machines and machine parts, general construction, road and railway vehicles	EN 10025-2:2019	S355JR+N	3052
	EN 10025-2:2019	S355JR+AR Mod	5051
	EN 10025-2:2019	S355JR+AR	3052
	EN 10025-2:2019	S355J0+N Mod	6252
	EN 10025-2:2019	S355J0+N	5152
	EN 10025-2:2019	S355J0+AR Mod	5252
	EN 10025-2:2019	S355J0+AR	6051
	EN 10025-2:2019	S355J2+N Mod	5052
	EN 10025-2:2019	S355J2	7252
	EN 10025-2:2019	S355K2+N	3152
	EN 10025-2:2019	S355J2 Mod	9352

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1.0335	DIN 1614-P2 StW24		ASTM A1011 DS Type B	JIS G3131 SPHD	44
1.0335	DIN 1614-P2 StW24			JIS G3131 SPHD	41
1.0398				JIS G3131 SPHE	44
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			ASTM A1011 CS Type D		101
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1.0473	DIN 17155 19Mn6				93
1.0565	DIN 17102 WStE355				91
1.0566	DIN 17102 EStE355				91
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1.0045	DIN 17100 St52-3		ASTM A1011 SS Gr.50		54
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1.0577	DIN 17100 St52-3		ASTM A1011 SS Gr.50		52
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1.0553					54
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Application Areas and Brand Correspondence of Plate Products

Scope of Application And Main Properties	Corresponding		Erdemir Steel Grade
	Standard	Grade	
Hot rolled unalloyed high carbon structural steels	EN 10025-2:2019	E295	3250
	EN 10025-2:2019	E335	3260
	EN 10025-2:2019	E360	5270
Hot rolled unalloyed structural steels for manufacture of construction equipment, machines and various machine parts, general construction plates, road and railway vehicles	EN 10025-2:2019	S235JR+AR	3237
	ASTM A36-19	A36	3241
	CSA G40.21-13	300W	3245
	EN 10025-2:2019	S235J2 CTB	6237
	EN 10025-2:2019	S275JR+AR	3244
	EN 10025-2:2019	S275J2 CTB	6244
	ASTM A 283-13	C	3018
	SAE J403-2014	1018	6018
	SAE J403-2014	1020	3020
	SAE J403-2014	1030	3030
	SAE J403-2014	1035	5035
	SAE J403-2014	1040	5040
	SAE J403-2014	1045	5045
	JIS G 3101:2010	SS 400	6741
Dual certified unalloyed steel suitable for general construction and shipbuilding	ASTM A36-19/ABS2-P2-21	A36-Gr.A	3741
Hot rolled structural steel with improved atmospheric corrosion resistance	EN 10025-5:2019 ASTM A709-21	S355J2W/ 50 WF (345WF)	9952
Dual certified weldable fine-grained structural steel	CSA G40.21-13	300W / 350W	3249
	CSA G40.21-13 / ASTM A36-19	300W / A36	3230
Triple certified weldable fine-grained structural steel	EN 10025-5:2019 ASTM A709-21	300W/350W-Gr50Type2	3246
Structural steel for bridge construction	ASTM A709-21	345F Type 2	5246
Hot rolled weldable fine-grained structural steels	ASTM A 572-18	42 Type 2	9329
	ASTM A 572-18	50 Type 2	9335
	ASTM A 572-18	55 Type 2	9338
	ASTM A 572-18	60 Type 3	9342
Hot rolled weldable fine-grained normalized structural steels	EN 10025-3:2019	S355N	9355
	EN 10025-3:2019	S355NL	9356
Hot rolled structural steels with improved formability	ASTM A1018-16	SS 36 Type 2	6036
	EN 10025-2:2019	S235J2C+N (d ≤ 25) S235J2+N (d > 25)	6037
	EN 10025-2:2019	S275J2C+N (d ≤ 25) S275J2+N (d > 25)	6044
	EN 10025-2:2019	S355J2C+N (d ≤ 25) S355J2+N (d > 25)	6052
Hot rolled intermediate tensile strength steel for pressure vessel	ASTM A 285-17	C	6838

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1.0070	DIN 17100 St70-2				61
1.0038	DIN 17100 St37-2		ASTM A1011 SS Gr.36 Type 1		52
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1.0117	DIN 17100 St37-3				52
1.0044	DIN 17100 St44-2		ASTM A1011 SS Gr.40		52
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			ASTM A36		56
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			ASTM A572 Gr.50 Type 2		68
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			ASTM A709 Gr.345F Type 2		62
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1.0545	DIN EN 10113-2 S355N		ASTM A1011 HSLAS Gr.50 Class 1		63
1.0546	DIN EN 10113-2 S355NL		ASTM A1011 HSLAS Gr.50 Class 1		63
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1.0119	DIN 17100 QSt37-3N				59
1.0142	DIN 17100 QSt44-3N				59
1.0579	DIN 17100 QSt52-3N				59
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Application Areas and Brand Correspondence of Plate Products

Scope of Application And Main Properties	Corresponding		Erdemir Steel Grade
	Standard	Grade	
High strength steels for manufacture of boilers, pressure vessels and dam penstocks	LR-P2-13	490 FG	6850
Medium strength casting slab (merely as casting slab)	Erdemir-01	3995	3995
Low and intermediate strength, atmospheric corrosion resistant structural steels	EN 10025-2:2019	S355J2 (Cu)	6284
	JIS G 3125:2021	SPA-H	9960
Alloyed structural steels	ASTM A829-14	1345	5345
	ASTM A829-14	5160	5360
Tool Steel	DIN 17350:1980	75Cr1	5375
	EN 10132-4:2000	80CrV2	5380
Unalloyed high carbon steels for manufacturing machine parts and agriculture tools,etc.	SAE J403-2014	1050	5050
	SAE J403-2014	1060	5060
	SAE J403-2014	1070	5070
	SAE J403-2014	1080	5080
Hot rolled boron alloyed steels for manufacturing of agricultural equipment by quenching and tempering	EN 10083-3:2006	20MnB5 Mod	5620
	Erdemir-15	22MnB5	5622
	Erdemir-15	26MnB5	5626
	EN 10083-3:2006	30MnB5 Mod	5630
	EN 10083-3:2006	30MnB5 Mod	5631
Hot rolled low alloy steels for quenching and tempering	EN 10083-3:2006	51CrV4	8412
	EN 10269:2013	21CrMoV5-7	8414
	DIN - 1.7263	30CrMo5-2	8430
	EN 10083-3:2006	34CrMo4	8434
	EN 10083-2:2006	C45E Mod	8440
	EN 10083-3	46Cr2 Özel	8451
Hot rolled Steels for defense industry	Erdemir-04	8416	8416
	Erdemir-03	8613	8613

1) The “Equivalent Standards” may correspond to the exact same material or similar materials. We therefore cannot guarantee conformity of our material to relevant equivalent standards.

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1.5531					103
					103
1.8159					103
1.7709					103
					103
1.7220					103
					103
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A 100% conformity of the product to its application field according to relevant standards can only be ascertained after trial production.

Steel Grade

Hot Rolled Ultra Low Carbon Steels Suitable for Continuous Annealing after Cold Reducing

Standard: Erdemir

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Mn max.	P max.	S max.	Si max.	Al min.	N max.	Ti	Nb max.
Standard	Grade										
Erdemir-2004	6314	6314[(1)(2)(4)(5)]	0.006	0.25	0.015	0.015	0.030	0.020	60	0.01-0.09	0.030 max.
Erdemir-2004	6315	6315[(1)(2)(4)]	0.005	0.20	0.015	0.015	0.030	0.020	60	0.01-0.09	0.030 max.
Erdemir-2004	7414	7414[(1)(3)(5)]	0.006	0.25	0.025	0.020	0.035	0.020	60	0.04-0.09	0.005 max.
Erdemir-2004	7416	7416[(1) (3)]	0.004	0.25	0.020	0.020	0.030	0.020	50	0.30 max.	0.005 max.

Notes

1) Mechanical test is not carried out.
2) Suitable for galvanizing after cold rolling and continuous annealing.
3) Suitable for continous annealing after cold rolling.
4) Cr+Ni+Cu+Mo ≤ 0.16 dir
5) For Fully Killed grades, if Al(tot) value is lower than 0.020%, Al/N shall not be lower than 2/1

Steel Grade

Hot Rolled Steels Suitable For Cold Reducing

Standard: DIN 1614-1:1986

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Mn max.	P max.	S max.	Si max.	N[(1)] max.	Al min.
Standard	Grade								
DIN 1614-1	St 22	6422[(2)(3)(5)]	0.08	0.40	0.025	0.025	0.030	0.007	0.020[(7)]
DIN 1614-1	St 22 Mod	6624[(2)(3)(5)(8)]	0.08	0.40	0.025	0.025	0.030	0.007	0.020[(7)]
DIN 1614-1	RRSt 23	6423[(2)(3)(5)(6)]	0.06	0.35	0.020	0.020	0.030	-	0.020
DIN 1614-1	St 24	6424[(2)(3)(5)(6)]	0.06	0.30	0.020	0.020	0.030	-	0.020
DIN 1614-1	St 22	6412[(2)(4)(5)]	0.08	0.40	0.025	0.025	0.030	0.007	0.020[(7)]
DIN 1614-1	RRSt 23	6413[(2)(4)(5)(6)]	0.06	0.35	0.020	0.020	0.030	-	0.020

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P max.	S max.	Si max.	N[(1)]	Al	Ni max.	Cr max.	Mo max.	V max.	Nb max.	Ti max.	B max.	Cu max.
Standard	Grade																
DIN 1614-1	St 22	6421[(2)(3)(5)]	0.03-0.06	0.18-0.35	0.020	0.015	0.05	0.004-0.008	0.020-0.070	(5)	(5)	(5)	-	-	-	-	(5)
DIN 1614-1	St 22 Mod	6425(2)(3)	0.04-0.09	0.18-0.50	0.025	0.025	0.03	100	0.010 - 0.080	0.10	0.06	0.012	0.010	0.008	0.010	0.003	0.10

Notes

1) If the content of metallic aluminium ≥ 0.020, the maximum limit of nitrogen does not apply.
2) Mechanical test is not carried out.
3) Suitable for batch annealing after cold reducing.
4) Suitable for continuous annealing after cold reducing.
5) Cr+Ni+Cu+Mo ≤ 0.25 %
6) This is the aimed value.
7) The chemical analysis which contains 10-40 ppm boron, is composed according to the customer's request.

Standard: Miscellaneous

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Mn max.	P max.	S max.	Si max.	N max.	Al	Ni max.	Cr max.	Mo max.	V max.	Nb max.	Ti max.	B max.	Cu max.
Standard	Grade																
SAE J403-14	1006 Mod3	6404[(2)(3)(10)]	0.06	0.30	0.020	0.018	0.030	0.012	0.015 - 0.080	0.08	0.06	0.02	0.010	0.005	0.010	0.0010	0.080
Erdemir- 2021	6405	6405[(11)(12)]	0.04-0.08	0.35-0.65	0.20	0.20	0.030	0.008	0.020-0.080	0.08	0.06		0.010	0.010	0.010	0.0010	0.10
SAE J403-14/ ASTM A1011-15	1006 / CS Type B	6406[(2)(3)(5)(6)(9)]	0.02-0.08	0.45	0.025	0.025	0.040	-	0.020 min.	0.20	0.15	0.06	0.008	0.008	0.025		
SAE J403-14	1006 Mod2	6407[(2)(3)(5)(7)(8)(9)]	0.02-0.08	0.15-0.45	0.010-0.025	0.025	0.040	-	0.020 min.	-	-	-	-	0.0015-0.015	-		
SAE J403-14/ ASTM A1011-15	1008 / CS Type B	6408[(2)(3)(5)(9)]	0.02-0.10	0.50	0.030	0.035	0.10	-	-	0.20	0.15	0.06	0.008	0.008	0.025		
SAE J403-14	1006 Mod	6007[(1)(2)(3)(9)]	0.08	0.45	0.030	0.035	0.13	0.007[(4)]	0.005 max[(4)]	-	-	-	-	-	-		
SAE J403-14	1006 Mod1	6009[(1)(2)(3)(9)]	0.05	0.30-0.50[(4)]	0.025	0.015	0.15-0.35	0.007 [(4)]	0.005 max[(4)]	-	-	-	-	-	-	-	-

Notes

1) (Cu+Cr+Ni) ≤ 0.16 %.
2) Mechanical test is not carried out.
3) Suitable for batch annealing after cold reducing.
4) Added according to customer requests.
5) Deoxidation methods of these products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.
6) Cr+Ni+Cu+Mo ≤ 0.21 %
7) Mn, P and Nb values are requested as aiming.
8) For the thickness of 2.80 mm, crown value is aimed between 30-40 micron.
9) The limitation requests for the residual elements (Cu, Ni, Cr, Mo) which are not mentioned on the table are subjected to negotitation for special application purposes.
10) (Cu+Cr+Ni) ≤ 0.18 %.
11) (Cu+Cr+Ni+Mo) ≤ 0.26 %.
12) These grades are produced in İsdemir facilities

Steel Grade

Hot Rolled Steels Suitable For Cold Reducing

Standard : Miscellaneous

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e [1)2)] N/mm² (kg/mm²) min.	A_{50} [1)2)] min.	Hardness[1] (HRC) max.
Standard	Grade				
SAE J403-14/ASTM A1011-15	1006 / CS Type B	6406	205-340 (20.90 - 34.65)	25	75
SAE J403-14/ASTM A1011-15	1008 / CS Type B	6408	205-340 (20.90 - 34.65)	25	75

Notes

1) Yield strenght and elongation are measured in the longitudinal direction in accordance with A 370 Test Methods and Definitions.
2) Specified values are referanced values and mechanic test is carried out only when specified at the time of enquiry and order.

Hot Rolled Steels Suitable for Manufacturing Electrolytic or Hot-dip Galvanized Bake-hardening Steels Provided that Continuously Annealed after Cold Reducing

Standard: Erdemir

Chemical Composition (%)

Corresponding		Erdemir Steel Grade [1]	C max.	Mn max.	P max.	S max.	Si max.	Al max.	N max.	Ti max.	Nb max.
Standard	Grade										
Erdemir-2004	1718	1718	0.0060	0.70	0.060	0.025	0.50	0.10	0.0060	0.12	0.09
Erdemir-2004	1722	1722	0.0060	0.70	0.080	0.025	0.50	0.10	0.0060	0.12	0.09
Erdemir-2004	1726	1726	0.0065	0.80	0.10	0.025	0.50	0.10	0.0060	0.12	0.09

Notes

1) Mechanical test is not carried out.

Hot Rolled Steels Suitable for Manufacturing Electrolytic or Hot-dip Galvanized Structural Steels Provided that Continuously Annealed after Cold Reducing

Standard: Erdemir

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Mn max.	P max.	S max.	Si max.	N max.	V max.	Nb max.	Ti max.
Standard	Grade										
Erdemir-2018	1821	1821[2)(3)]	0.07-0.14	0.40-0.60	0.025	0.025	0.03	0.0120	0.010	0.008	0.01
Erdemir-2004	1822	1822	0.13	0.90	0.025	0.025	0.040	0.0120	0.10	0.008	0.04
Erdemir-2004	1825	1825	0.18	1.00	0.025	0.025	0.040	0.0120	0.10	0.008	0.04
Erdemir-2004	1828	1828	0.20	1.20	0.025	0.025	0.040	0.0120	0.10	0.008	0.04
Erdemir-2004	1832	1832	0.20	1.50	0.025	0.025	0.040	0.0120	0.10	0.008	0.04
Erdemir-2004	1835	1835	0.20	1.70	0.025	0.025	0.040	0.0120	0.10	0.008	0.04

Notes

1) Mechanical test is not carried out.
2) Chemical Analysis aim Al %0.015-0.050.
3) Grade specified on table, is produced within the framework of agreements with customers

Steel Grade

Hot Rolled Steel For Manufacturing Cold Reduced Non-Oriented Electrical Steels

Standard: Erdemir

Chemical Composition (%)

Corresponding		Erdemir Steel Grade [1]	Intended Final Product Grade	C max.	Mn	Si	P max.	S max.	Al	N max.
Standard	Grade									
ERDEMİR-2009	5536	5536	M350-50A	0.040	max. 0.70	2.10	0.015 - 0.10	0.025	0.15 - 0.90	0.0090
ERDEMİR-2007	5541	5541	M400-50A	0.040	max. 0.60	1.50	0.015 - 0.10	0.025	0.15 - 0.70	0.0090
ERDEMİR-2009	5542	5542	M400-65A	0.040	max. 0.60	2.30	0.015 - 0.10	0.025	0.40 - 0.55	0.0090
ERDEMİR-2007	5548	5548	M470-50A	0.050	max. 0.70	0.90	0.015 - 0.10	0.025	0.15 - 0.70	0.0090
ERDEMİR-2007	5549	5549	M470-65A	0.040	max. 0.60	1.50	0.03 - 0.15	0.025	0.15 - 0.80	0.0090
ERDEMİR-2007	5554	5554	M530-50A	0.050	max. 0.70	0.70	0.02 - 0.15	0.025	0.10 - 0.60	0.0090
ERDEMİR-2007	5555	5555	M530-65A	0.040	max. 0.70	1.30	0.015 - 0.10	0.025	0.15 - 0.70	0.0090
ERDEMİR-2007	5561	5561	M600-50A	0.050	max. 0.70	0.60	0.06 - 0.20	0.025	0.05 - 0.50	0.0090
ERDEMİR-2007	5562	5562	M600-65A	0.040	0.20 - 0.90	0.90	0.05 - 0.20	0.025	0.10 - 0.50	0.0090
ERDEMİR-2007	5571	5571	M700-50A	0.050	0.20 - 0.90	0.40	0.02 - 0.15	0.025	0.05 - 0.50	0.0090
ERDEMİR-2007	5572	5572	M700-65A	0.040	0.20 - 1.00	0.80	0.02 - 0.20	0.025	0.03 - 0.40	0.0090
ERDEMİR-2007	5581	5581	M800-50A	0.050	0.20 - 0.90	0.30	0.05 - 0.20	0.025	0.05 - 0.50	0.0090
ERDEMİR-2007	5582	5582	M800-65A	0.040	0.20 - 1.00	0.60	0.06 - 0.25	0.025	0.05 - 0.40	0.0090
ERDEMİR-2013	5592	5592	-	0.040	0.20 - 1.00	0.30	0.06 - 0.20	0.025	0.03 - 0.40	0.0090

Notes

1) Mechanical test is not carried out.

Hot Rolled Low-Carbon Steels For Vitreous Enamelling After Cold Reducing

Standard: Erdemir

Chemical Composition (%)

Corresponding		Erdemir Steel Grade [1]	C max.	Mn max.	P max.	S max.	Si max.	Al min.	B ppm	Ti max.
Standard	Grade									
Erdemir-2001	6523[1)2)4)5)]	6523	0.05	0.30	0.015	0.015	0.04	0.020	10-60	-
Erdemir-2020	6524[1)]	6524	0.05	0.45	0.025	0.015	0.040	0.02	5 - 35	-
Erdemir-2001	7524 [1) 3)]	7524	0.01	0.25	0.025	0.030	0.035	-	-	0.15

Notes

1) Mechanical test is not carried out.
2) Suitable for enamelling after batch annealing.
3) Suitable for enamelling after continuous annealing.
4) Cr+Ni+Cu+Mo ≤ 0.18 dir
5) For Fully Killed grades, if Al(tot) value is lower than 0.020%, Al/N shall not be lower than 2/1

Hot Rolled Steels for Deep-drawing and Cold Forming

Standard: EN 10111:2008

Chemical Composition (%)

Corresponding		Erdemir[1] Steel Grade	Method of deoxidation	C	Mn	P	S	Ti
Standard	Grade			max.	max.	max.	max.	min.
EN 10111	DD11	3222	-	0.12	0.60	0.045	0.045	-
EN 10111	DD11	4222	-	0.12	0.60	0.045	0.045	-
EN 10111	DD11	6222	-	0.11	0.50	0.035	0.035	-
EN 10111	DD11	6282[1]	-	0.12	0.60	0.045	0.045	-
EN 10111	DD11	7222	-	0.12	0.60	0.045	0.045	-
EN 10111	DD12	6223[3]	Fully killed	0.09	0.40	0.030	0.030	-
EN 10111	DD13	6224[2][3]	Fully killed	0.07	0.35	0.025	0.025	-
EN 10111	DD14	7224[3]	Fully killed	0.08	0.35	0.025	0.025	0.01

Notes

1) 0.20 ≤ Cu % ≤ 0.40

2) Max. 50 ppm of boron is added to improve the forming property.

3) Deoxidation methods of these products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)		R_m[1] N/mm² (kg/mm²)	A (%)			Guarantee[3] Period
						A_{80}		A_5	
Standard	Grade		1.5 ≤ d < 2	2 ≤ d ≤ 11	max.	1.5 ≤ d < 2 min.	2 ≤ d < 3 min.	3 ≤ d ≤ 11 min.	
EN 10111	DD11	3222[2]	170 - 360 (17.3-36.7)	170 - 340 (17.3-34.7)	440 (44.9)	23	24	28	-
EN 10111	DD11	4222[2]	170 - 360 (17.3-36.7)	170 - 340 (17.3-34.7)	440 (44.9)	23	24	28	-
EN 10111	DD11	6222[2]	170 - 360 (17.3-36.7)	170 - 340 (17.3-34.7)	440 (44.9)	23	24	28	-
EN 10111	DD11	6282[2]	170 - 360 (17.3-36.7)	170 - 340 (17.3-34.7)	440 (44.9)	23	24	28	-
EN 10111	DD11	7222[2]	170 - 360 (17.3-36.7)	170 - 340 (17.3-34.7)	440 (44.9)	23	24	28	-
EN 10111	DD12	6223	170 - 340 (17.3-34.7)	170 - 320 (17.3-32.6)	420 (42.8)	25	26	30	6 month
EN 10111	DD13	6224	170 - 330 (17.3-33.7)	170 - 310 (17.3-31.6)	400 (40.8)	28	29	33	6 month
EN 10111	DD14	7224	170 - 310 (17.3-31.6)	170 - 290 (17.3-29.6)	380 (38.8)	31	32	36	6 month

Notes

1) Tensile test values apply to “transverse” test pieces.

2) Recommended for use within 6 weeks from the date being made ready for pick-up.

3) Guarantee periods specified in the table begin on the date on which products are made available.

Low Carbon Hot Rolled Steels for Cold Forming

Standart: VALEO 400.040.101

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Mn	P max.	S max.
Standard	Grade					
400.040.101	VAW HRC1/HRC3	713	0.02-0.08	0.15 - 0.50	0.030	0.030

Notes

1) The ratio of Al% + Si% is between 0.01-0.11

2) Grade specified on table, is produced within the framework of agreements with customers

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²) min.	R_m[1] N/mm² (kg/mm²)	Elongation (%)			
					A_{80}			A_5
Standard	Grade				1.2≤t<1.5	1.5≤t<2.0	2.0≤t<3.0	Lo= 5.65√So 3≤t≤6
					min.	min.	min.	min.
400.040.101	VAW HRC1/HRC3	713	170 (17.3)	270 - 400 (27.6-40.7)	27	28	29	33

Notes

1) Tensile test values apply to “transverse” test pieces

Hot Rolled Steels for Deep-drawing and Cold Forming

Standart: VALEO 400.240.003.C

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Mn	P max.	S max.	Si max.	Al max.
Standard	Grade							
400.240.003.C	DD13	712	0.10	0.15 - 0.60	0.025	0.025	0.40	0.015

Notes

1) % Si+Mn ≥ 0.30

2) Grade specified on table, is produced within the framework of agreements with customers

Mechanical Properties

Corresponding		ERDEMİR Steel Grade	$Rp_{0.2}$ N/mm² (kg/mm²)		R_m[1] N/mm² (kg/mm²)	Elongation (%) t (thickness, mm)	
						A_{80}	A_5
Standard	Grade		1.5≤t≤2	2<t≤5	max.	1.5<t<3	3≤t≤5
						min.	min.
400.240.003.C	DD13	712	170 - 330 (17.4 - 33.6)	170 - 310 (17.4 - 31.6)	400 (40.7)	29	33

Notes

1) Tensile test values apply to “transverse” test pieces

Hot Rolled Steels for Deep-drawing and Cold Forming

Standart: JIS G3131

Chemical Composition (%)

Corresponding		ERDEMİR Steel Grade	C max.	Mn	P max.	S max.
Standard	Grade					
JIS G3131:2018	SPHC	6211	0.12	0.60	0.045	0.035

Mechanical Properties

Corresponding		ERDEMİR Steel Grade	R_m[1] N/mm² (kg/mm²)	Elongation (t: thickness mm) A_{50} min			Bend (Transverse) t: thickness mm 180°	
Standard	Grade			t <1.6	1.6≤t<3.2	≥ 3.2	t <3.2	t ≥3.2
			min.					
JIS G3131:2018	SPHC	6211	270 (27.5)	27	29	31	0 t	0.5 t

Hot Rolled Low-Carbon Steel Suitable For Cold Forming

Standard: 11-04-013

Chemical Composition (%)

Corresponding			Erdemir Steel Grade	C	Mn	P	S	Si	Al	CE (1) (%)
Standard	Applied Grade	Similar Standard /Grade		max.	max.	max.	max.	max.	min.	max.
11-04-013	HES-HC	EN 10111 / DD13	700[1)2)]	0.07	0.40	0.024	0.020	0.030	0.020	0.16

Notes
1) Calculated according to “CE” % = C % + (Mn+Si) % / 6.
2) Grades specified on table, are produced within the framework of agreements with customers.

Mechanical Properties

Corresponding			Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A (%)	
Standard	Applied Grade	Similar Standard /Grade				A_{80} d<3 min.	A_5 3 ≤ d ≤ 11 min.
11-04-013	HES-HC	EN 10111 / DD13	700[2)3)]	220 - 280 (22.4 - 28.6)	320-390 (32.7 - 39.8)	31	37

Notes
1) Tensile test values apply to “transverse” test pieces.
2) Re / Rm ≤ 0.86.
3) The mechanical properties are valid for a period of 6 months from the date on which the products are made available.

Unalloyed Carbon Steels with Intermediate- Strength for Pipe and Tube Production

Standard: Miscellaneous

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Si	Cu[1]	Ni[1]	Cr[1]	Mo[1]	V[1]
Standard	Grade				max.	max.		max.	max.	max.	max.	max.
Erdemir - 2001	2008	2008	0.06-0.12	0.35-0.60	0.025	0.020	0.15-0.30	0.15	0.15	0.12	0.05	0.02
ASTM A53	A	2009[3)]	0.25 max.	0.95 max.	0.050	0.045	-	0.40	0.40	0.40	0.15	0.08
ASTM A53	A	4009[3)]	0.25 max.	0.95 max.	0.050	0.045	-	0.40	0.40	0.40	0.15	0.08
ASTM A500	B	6040[2)4)]	0.26 max.	1.35 max.	0.035	0.035	-	-	-	-	-	-
ASTM A500	C	6042[2)4)]	0.23 max.	1.35 max.	0.035	0.035	-	-	-	-	-	-

Notes
1) The sum of elements Cu+Ni+Cr+Mo+V should not exceed 1.00 % for grades 2009 and 4009.
2) For each reduction of 0.01 percentage point below the specified max C an increase of 0.06 percentage point above the specified max for Mn is permitted for grade 6040 up to a max of 1.50% by heat analysis.
3) For each reduction of 0.01 percentage point below the specified max C an increase of 0.06 percentage point above the specified max for Mn is permitted for grades 2009 and 4009 up to a max of 1.35% by heat analysis
4) Copper content shall be minimum 0.20 %, if copper-containing steel is specified in the purchase order.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{50} (%)
Standard	Grade		min.	min.	min.
Erdemir - 2001	2008	2008	205 (20.9)	330 (33.7)	31
ASTM A53	A	2009	205 (20.9)	330 (33.7)	[2)]
ASTM A53	A	4009	205 (20.9)	330 (33.7)	[2)]
ASTM A500	B	6040	315 (32.2)	400 (40.8)	23[5)]
ASTM A500	C	6042	345 (35.2)	425 (43.4)	21[4)]

Notes

1) Tensile test values apply to “longitudinal” test pieces.
2) A_{50} (%) = 1940 $S_0^{0.2}$ / $U^{0.9}$ (S_0: Cross-sectional area of the specimen, mm² ; U: Specified minimum tensile strength, N/mm²).
3) Specified elongation value applies to thickness ≥ 4.57 mm . For thickness < 4.57 mm, the minimum elongation value is calculated by the formula : Elongation% = 2.40 d+12”
4) Specified elongation value applies to thickness ≥ 3.05 mm . For thickness < 3.05 mm, the minimum elongation value is subjected to negotiation.

Hot Rolled Unalloyed Structural Steel

Standard : ASTM A283-2013

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Si[1]
Standard	Grade		max.	max.	max.	max.	
ASTM A283	C	3018[3)]	0.24	0.90	0.030	0.030	0.15-0.40

Notes
1) For thicknesses ≤40 mm the minimum Si value of 0.15% does not apply.
2) Copper content shall be minimum 0.20 %, if copper-containing steel is specified in the purchase order.
3) Deoxidation method of these products is fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A (%)	
Standard	Grade		min.		A_{50} min.	A_{200} min.
ASTM A283	C	3018	205 (20.9)	380 - 515 (38.8 - 52.5)	25	22

Notes
1) Tensile test values apply to “transverse” test pieces.

Hot Rolled Unalloyed Structural Steel

Standard : ASTM A36-19

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C(2)		Mn(1)(2)	P	S	Si(4)
Standard	Grade		d ≤ 40 mm max.	40 < d ≤ 60mm. max.		max.	max.	max.
ASTM A36	A 36	3241(3)(5)	0.25	0.26	0.80-1.20	0.030	0.030	0.40

Notes
1) There is no requirement for manganese content in thicknesses thinner than 20mm.
2) For each reduction of 0.01 percentage point below the specified carbon maximum, an increase of 0.06 percentage point manganese above the specified maximum will be permitted up to the maximum of 1.35 % for grade 3241.
3) Copper content shall be min 0,20% when Cu steel is specified.
4) For thicknesses >40 mm of 3241 grade, the min limit of silicon content is 0.15 %.
5) Deoxidation method of these products is fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m(1) N/mm² (kg/mm²)	A (%)	
Standard	Grade		min.		A_{50} min.	A_{200} min.
ASTM A36	A 36	3241	250 (25.5)	400-550 (40.8-56.1)	21	18

Notes
1) Tensile test values apply to “transverse” test pieces.

Standard : CSA G40.21-13

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Mn	P max.	S max.	Si(2) max.	Al(2) min.	Cu min.
Standard	Grade								
CSA G40.21-13	300W	3245(2)	0.22	0.50-1.50	0.040	0.050	0.40(1)	-	0.20
CSA G40.21-13	350W(4)	4251(4)(5)	0.23	0.50-1.50	0.040	0.050	0.040	0.020	0.20

Notes
1) Silicon content shall be 0.15-0.40 % for thickness greater than 40 mm.
2) The lower limit of ‘Si’ does not apply in case the chemical composition of ‘Al’ in the steel is min 0.020% and the amount of ‘Si’ can not be above the upper limit indicated in the table.
3) Copper content shall be min 0.20% when Cu steel is specified.
4) Maximum order thickness is 16 mm. Orders with thickness greater than 8 mm are subjected to negotiation.
5) This grade is suitable for galvanizing.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)			R_m(1) N/mm² (kg/mm²)	A (%)	
Standard	Grade		d ≤ 16 min.	16 < d ≤ 65 min.	65 < d ≤ 100 min.	d ≤ 100	A_{50} min.	A_{200} min.
CSA G40.21-13	300W	3245	300 (30.6)	300 (30.6)	280 (28.6)	440-620 (44.9-63.2)	21	18
CSA G40.21-13	350W	4251	350 (35.7)	-	-	450-650 (45.9-66.3)	20(2)	17(2)

Notes
1) Tensile test values apply to “transverse” test pieces
2) Below 8 mm thickness, according to the item 8.3.1.1 of standart CSA G40.20, elongation value shall differ from the values given above the table

Unalloyed Steel Suitable for General Construction and Shipbuilding

Standard : ASTM A36-19/ABS2-P2-21

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C(1) max.	Mn(1)	P max.	S max.	Si(2) max.
Standard	Grade						
ASTM A36-ABS	A36/Gr.A	3741(3)	0.21	0.80-1.20	0.030	0.030	0.40

Notes
1) C+(Mn/6) ≤ % 0.40
2) The min limit of silicon content is 0.15 % for thickness greater than 40mm.
3) Deoxidation method of these products is fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m(1) N/mm² (kg/mm²)	A_{200}(2) % d (thickness mm.)	Impact	
Standard	Grade		min.		min.	Temp. °C	KV_c min. J
						50<d<=60	
ASTM A36-ABS	A36-Gr.A	3741(3)	250 (25.5)	400-520 (40.8-53.0)	22	20	34

Notes
1) Tensile test values apply to “transverse” test pieces
2) % Elongation value specified in the table is valid for plate products in thickness range 40.01<d(thickness)≤60 mm and coil products
The % elengation values for plate products less than or equal to 40 mm are given below.
min 21% for 30<d≤40 mm thickness range.
min 20% for 25<d≤30 mm thickness range.
min 19% for 20<d≤25 mm thickness range.
min 18% for d≤20 mm

Steel Grade

Hot Rolled Triple Certified Weldable Fine-Grained Structural Steel

Standard : CSA G40.21-13 / ASTM A572-18

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C[3] max.	Mn[3]	P max.	S max.	Si[1] max.	Al[2] min.	V max.	Cu[4] min.
Standard	Grade									
CSA G40.21-ASTM A572	300W/350W-Gr50Type2	3246[5]	0.22	0.80-1.35	0.03	0.03	0.40	–	0.01-0.15	0.2

Notes
1) Silicon content shall be 0.15-0.40 % for thickness greater than 40 mm.
2) The lower limit of 'Si' does not apply in case the content of 'Al' in the steel is min 0.020%.
3) For each reduction of 0.01 percentage point below the specified carbon maximum, an increase of 0.06 percentage point manganese above the specified maximum will be permitted up to the maximum of 1.50 %.
4) Copper content shall be min 0.20% when Cu steel is specified.
5) Deoxidation method of these products is fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding		Erdemir Steel Grade	Re[1] N/mm² (kg/mm²)		Rm N/mm² (kg/mm²)	A (%)		Impact[2] (longitudinal)	
Standard	Grade		d ≤ 65 mm min.	65 < d ≤ 100 mm. min.		A_{50} min.	A_{200} min.	Temp. °C	KVc Joule min.
CSA G40.21-ASTM A572	300W/350W-Gr50Type2	3246[3]	350	345	450-620	21	18	+20	27

Notes
1) Tensile test values apply to "transverse" test pieces.
2) The impact test is carried out only when specified at the time of enquiry and order. Impact test is not carried out for thickness thinner than 6 mm.
3) Below 8 mm thickness, according to the item 8.3.1.1 of standart CSA G40.20, elongation value shall differ from the values given above the table.

Steel Grade

Hot Rolled Dual Certified Weldable Fine-Grained Structural Steel

Standard : CSA G40.21-13

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Mn	P max.	S max.	Si[1][2] max.	Cu[3] min.
Standard	Grade							
CSA G40.21-13	300W / 350W	3249	0.22	0.50-1.50	0.04	0.05	0.40	0.20

Notes
1) Silicon content shall be 0.15-0.40 % for thickness greater than 40 mm.
2) The lower limit of 'Si' does not apply in case the content of 'Al' in the steel is min 0.020%.
3) Copper content shall be min 0.20% when Cu steel is specified.

Mechanical Properties

Corresponding		Erdemir Steel Grade	Re(1) N/mm² (kg/mm²)	Rm N/mm² (kg/mm²)	A (%)	
Standard	Grade				A_{50} min.	A_{200} min.
CSA G40.21	300W / 350W	3249	350 (35,7)	450-620 (45,9-63,3)	21	18

Notes
1) Tensile test values apply to "transverse" test pieces.
2) Below 8 mm thickness, according to the item 8.3.1.1 of standart CSA G40.20, elongation value shall differ from the values given above the table.

Hot Rolled Dual Certified Weldable Fine-Grained Structural Steel

Standart : CSA G40.21-13 / ASTM A36-19

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Mn[1]	P max.	S max.	Si[2] max.	Cu[3] min.
Standart	Grade							
CSA G40.21 / ASTM A36	300W / A36	3230[4]	0.22	0.80-1.35	0.03	0.03	0.40	0.20

Notes
1) Manganese content shall be 0.50-1.50 % for thickness lower than and equal to 20mm.
2) The lower limit of 'Si' does not apply in case the content of 'Al' in the steel is min 0.020%.
3) Copper content shall be min 0.20% when Cu steel is specified.
4) Deoxidation method of these products is fully-killed. Minimum aluminium to nitrogen ratio is 2:1.
5 Produced as Plate Product

Mechanical Properties

Corresponding		Erdemir Steel Grade	Re[1] N/mm² (kg/mm²) min	R_m N/mm² (kg/mm²)	A (%)[2]	
Standart	Grade				A_{50} min	A_{200} min
CSA G40.21 / ASTM A36	300W / A36	3230	300 (30,6)	440-550 (44,9-56,1)	21	18

Notes
1) Tensile test values apply to "transverse" test pieces.
2) Below 8 mm thickness, according to the item 8.3.1.1 of standart CSA G40.20, elongation value shall differ from the values given above the table.

Steel Grade

Hot Rolled Unalloyed Structural Steels

Standard : EN 10025-2:2019

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C d(thickness, mm)			Mn	P	S	Si	Cu	N[1]	CE(IIW)[4] max. (%) d (mm)		
			≤16	16<d≤40	40<d≤100									
Standard	Grade		max.	max.	max.	max.	max.	max.	max.	max.	max.	≤30	30<d≤40	40<d≤100
EN 10025-2	S235JR+AR	3237	0.17	0.17	0.20	1.40	0.035	0.035	0.40	0.55	0.012	0.35	0.35	0.38
EN 10025-2	S235JR+AR	3137[14]	0.17	0.17	0.20	1.40	0.035	0.035	0.40	0.55	0.012	0.35	0.35	0.38
EN 10025-2	S235JR+AR CTB (Cu)	3281[6][8]	0.17	0.17	0.20	1.40	0.035	0.035	0.14-0.25	0.55	0.012	0.35	0.35	0.38
EN 10025-2	S235JR+ARCTA	4237[7]	0.17	0.17	0.20	1.20	0.025	0.035	0.03	0.55	0.012	0.35	0.35	0.38
EN 10025-3	S235JR+ARÖzel CTA	4238[7][11][15]	0.06-0.17	-	-	1.20	0.025	0.025	0.03	0.55	0.012	0.35	-	-
EN 10025-2	S235JR+ARÖzel	4260[11][12][15]	0.050-0.095	-	-	0.30-0.45	0.015	0.025	0.05	0.55	0.012	0.35	-	-
EN 10025-2	S235JR+ARCTA	4437[7][15]	0.17	-	-	1.40	0.035	0,035	0.03	0.55	0.012	0.35	0.35	0.38
EN 10025-2	S235JR+ARCTB	5437(8)	0.17	0.17	0.20	1.40	0.035	0.035	0.14-0.25	0.55	0.012	0.35	0.35	0.38
EN 10025-2	S235J2 CTB	6237[2][8]	0.17	0.17	0.17	1.40	0.025	0.025	0.14-0.25	0.55	-	0.35	0.35	0.38
EN 10025-2	S275JR+AR	3244[5]	0.21	0.21	0.22	1.50	0.030	0.030	0.40	0.55	0.012	0.40	0.40	0.42
EN 10025-2	S275JR+AR CTA	4244[5][7]	0.20	0.21	0.22	1.40	0.025	0.025	0.03	0.55	0.012	0.40	0.40	0.42
EN 10025-2	S275J2 CTB	6244[2][5][8]	0.18	0.18	0.18	1.50	0.025	0.025	0.14-0.25	0.55	-	0.40	0.40	0.42
EN 10025-2	S355JR+AR	3252[5]	0.24	0.24	0.24	1.60	0.035	0.035	0.55	0.55	0.012	0.45	0.47	0.47
EN 10025-2	S355JR+ARCTA	4250[5][7][15]	0.24	0.24	0.24	1.60	0.030	0.035	0.03	0.55	0.012	0.45	-	-
EN 10025-2	S355J0+AR	5252[3][5]	0.20	0.20	0.22	1.60	0.030	0.030	0.55	0.55	0.012	0.45	0.47	0.47
EN 10025-2	S355J2	6252[2][3][5]	0.20	0.20	0.22	1.60	0.025	0.025	0.55	0.55	-	0.45	0.47	0.47
EN 10025-2	S355J2 CTA	4252[2][3][5][7][16]	0.20	-	-	1.60	0.025	0.025	0.03	0.55	-	0.45	0.47	0.47
EN 10025-2	S355J2 Özel CTA	4255[2][3][5][7][11][12]	0.15	-	-	1.60	0.025	0.025	0.03	0.15	-	0.40	-	-
EN 10025-2	S355J2 Özel	6258[2][3][10]	0.18-0.22	0.18-0.22	-	1.40-1.60	0.025	0.025	0.40-0.55	0.55	-	0.55	-	-
EN 10025-2	S355J2 (Cu)	6284[2][3][5][6]	0.20	0.20	0.22	1.60	0.025	0.025	0.55	0.55	-	0.45	0.47	0.47
EN 10025-2	S355J2 Mod	6258[5][12][13][14]	0.18-0.22	0.18-0.22	-	1.40-1.60	0.025	0.025	0.40-0.55	0.55	-	0.55	-	-
EN 10025-2	S355J2	6284[2][3][7][12]	0.20	0.20	0.22	1.60	0.025	0.025	0.55	0.55	-	0.45	0.47	0.47

Notes

1) The max. value for nitrogen does not apply if the chemical composition shows a min. total Al content of 0.020 %.
2) Deoxidation methods of these products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.
3) C = 0.22 % max. for thickness greater than 30 mm,
4) Carbon equivalent, CEV (IIW) % = C + Mn / 6 + (Cr + Mo + V) / 5 + (Ni + Cu) / 15
5) Max carbon equivalent (CE) is increased by 0.01 % for Si ≤ 0.25 %, and 0.02 % for Si ≤ 0.030 %
6) If Cu %: 0.25-0.40, max carbon equivalent (CEV) is increased 0.02 % within the framework of agreements with customers.
7) Suitable for galvanizing as “Category A”. Category A contains Si ≤ 0.030% and Si+2.5P ≤ 0.090%.
8) Suitable for galvanizing as “Category B”. Category B contains Si 0.14≤ Si ≤0.25%.
9) Category A contains Si ≤ 0.030% ve Si+2.5P ≤ 0.090%, Category B contains Si 0.14≤ Si ≤0.25%, Category D contains Si 0.25< Si ≤0.35%.
10) These qualities are produced as “Mod” within the framework of the agreements made with the customer and may differ from the relevant standard conditions depending on the customer demand
11) These qualities are produced as “Mod” within the framework of the agreements made with the customer
12) Nb %: 0.015-0.050
13) Titanium may be added depending on the results of production.
14) Only for pipe production orders and available for thickness < 8 mm.
15) Only available for thickness < 8 mm.
16) Only available for thickness < 16 mm.

Hot Rolled Flat Steel Products

Steel Grade

Hot Rolled Unalloyed Structural Steels

Standard: EN 10025-2:2004

Mechanical Properties

Corresponding		Erdemir Steel Grade	Re (min) N/mm² (kg/mm²) d(thickness, mm)					Rm[1] N/mm² (kg/mm²) d(thickness, mm)		A (%) min. d(thickness, mm)							Impact[3] (long.)	
										A_{80}				A_5				
			≤ 16	> 16	> 40	> 63	> 80	< 3	≥ 3	>1	>1.5	> 2	>2.5	≥ 3	>40	>63	Temp.	KV_C
Standard	Grade[6]			≤ 40	≤ 63	≤ 80	≤ 100		≤ 100	≤1.5	≤ 2	≤ 2.5	<3	≤ 40	≤ 63	≤100	°C	J (min.)
EN 10025-2	S235JR+AR	3237	235 (24.0)	225 (23.0)	215 (21.9)	215 (21.9)	215 (21.9)	360-510 (36.7-52.0)	360-510 (36.7-52.0)	16	17	18	19	24	23	22	+20	27[2]
EN 10025-2	S235JR+AR	3137	235 (24.0)	- -	- -	- -	- -	360-510 (36.7-52.0)	360-510 (36.7-52.0)	16	17	18	19	24	-	-	+20	27[2]
EN 10025-2	S235JR+AR CTB (Cu)	3281	235 (24.0)	225 (23.0)	- -	- -	- -	360-510 (36.7-52.0)	360-510 (36.7-52.0)	16	17	18	19	24	-	-	+20	27[2]
EN 10025-2	S235JR+AR CTA	4237	235 (24.0)	225 (23.0)	- -	- -	- -	360-510 (36.7-52.0)	360-510 (36.7-52.0)	16	17	18	19	24	-	-	+20	27[2]
EN 10025-2	S235JR+AR Özel CTA	4238	235 (24.0)	225 (23.0)	- -	- -	- -	360-510 (36.7-52.0)	360-510 (36.7-52.0)	16	17	18	19	24	-	-	+20	27[2]
EN 10025-2	S235JR+AR Özel	4260[5]	260-360 (26.5-36.7)	- -	- -	- -	- -	370 - 460 (37.7-46.9)	370-460 (37.7-46.9)	32	32	32	32	24	-	-	+20	27[2]
EN 10025-2	S235JR+AR CTA	4437	235 (24.0)	- -	- -	- -	- -	360-510 (36,7-52,0)	360-510 (36.7-52.0)	16	17	18	19	24	-	-	+20	27[2]
EN 10025-2	S235JR+AR CTB	5437	235 (24.0)	225 (23.0)	215 (21.9)	215 (21.9)	215 (21.9)	360-510 (36,7-52,0)	360-510 (36.7-52.0)	16	17	18	19	24	23	22	+20	27[2]
EN 10025-2	S235J2 CTB	6237	235 (24.0)	225 (23.0)	215 (21.9)	215 (21.9)	215 (21.9)	360-510 (36,7-52,0)	360-510 (36.7-52.0)	16	17	18	19	24	23	22	-20	27
EN 10025-2	S275JR+AR	3244	275 (28.1)	265 (27.0)	255 (26.0)	245 (25.0)	235 (24.0)	430-580 (43.9-59.2)	410-560 (41.8-57.1)	14	15	16	17	21	20	19	+20	27[2]
EN 10025-2	S275JR+AR CTA	4244	275 (28.1)	265 (27.0)	- -	- -	- -	430-580 (43.9-59.2)	410-560 (41.8-57.1)	14	15	16	17	21	20	19	+20	27[2]
EN 10025-2	S275J2 CTB	6244	275 (28.1)	265 (27.0)	255 (26.0)	245 (25.0)	235 (24.0)	430-580 (43.9-59.2)	410-560 (41.8-57.1)	14	15	16	17	21	20	19	-20	27
EN 10025-2	S355JR+AR	3252	355 (36.2)	345 (35.2)	335 (34.2)	325 (33.2)	315 (32.2)	510-680 (52.0-69.3)	470-630 (47.9-64.2)	13	14	15	16	20	19	18	+20	27[2]
EN 10025-2	S355JR+AR CTA	4250	355 (36.2)	345 (35.2)	- -	- -	- -	510-680 (52.0-69.3)	470-630 (47.9-64.2)	13	14	15	16	20	-	-	+20	27[2]
EN 10025-2	S355J0+AR	5252	355 (36.2)	345 (35.2)	335 (34.2)	325 (33.2)	315 (32.2)	510-680 (52-69.3)	470-630 (48.0-64.2)	13	14	15	16	20	19	18	0	27
EN 10025-2	S355J2	6252	355 (36.2)	345 (35.2)	335 (34.2)	325 (33.2)	315 (32.2)	510-680 (52.0-69.3)	470-630 (47.9-64.2)	13	14	15	16	20	19	18	-20	27
EN 10025-2	S355J2 CTA	4252	355 (36.2)	- -	- -	- -	- -	510-680 (52.0-69.3)	470-630 (47.9-64.2)	13	14	15	16	20	-	-	-20	27
EN 10025-2	S355J2 Özel CTA	4255	355 (36.2)	- -	- -	- -	- -	510-680 (52.0-69.3)	470-630 (47.9-64.2)	14	14	15	16	20	-	-	-20	27
EN 10025-2	S355J2 Özel	6258[5]	355 (36.2)	345 (35.2)	- -	- -	- -	510 (52.0)	470 (47.9)	13	14	15	16	20	-	-	-20	27
EN 10025-2	S355J2 (Cu)	6284	355 (36.2)	345 (35.2)	335 (34.2)	325 (33.2)	315 (32.2)	510-680 (52.0-69.3)	470-630 (47.9-64.2)	13	14	15	16	20	19	18	-20	27

Notes

1) Tensile test values apply to “transverse” test pieces
2) Impact test is carried out only when specified at the time of enquiry and order
3) Impact test is not carried out for thickness thinner than 6 mm.
4) Grades including J2 notations could be normalized or equivalent to normalized rolling ,
5) Grades specified on table, are produced within the framework of agreements with customers.
6) Upper limit of tensile test values will not be applied according to customer request.

Hot Rolled Unalloyed Structural Steels

Standard : EN 10025-2:2019

Chemical Composition (%)

Corresponding		Erdemir Grade No	C d (thickness, mm)			Mn	P	S	Si	Cu	N[3]	CE(IIW) max. (%)[2]
			d ≤ 16	16<d≤40	40<d≤60							
Standard	Grade		max.	max.	max.	max.	max.	max.	max.	max.	max.	
EN 10025-2	S355J2+AR Mod	3152	0.24	0.24	0.24	1.60	0.035	0.035	0.55	0.55	0.012	0.43
EN 10025-2	S355J0+AR Mod	5152[5]	0.20	0.20	0.22	1.60	0.030	0.030	0.55	0.55	0.012	0.45
EN 10025-2	S355J0+N Mod	5051[5]	0.20	0.20	0.22	1.60	0.030	0.030	0.55	0.55	0.012	0.45
EN 10025-2	S355J2+N Mod	6051[4][5]	0.20	0.20	0.22	1.60	0.025	0.025	0.55	0.55	0.012	0.45
EN 10025-2	S355J2 Mod	9352[4][5]	0.20	0.20	0.22	1.60	0.025	0.025	0.55	0.55	0.012	0.43

Notes
1) Produced as Plate Product
2) These grades are produced as “Mod” with a carbon equivalent limit. Carbon equivalent, CEV (IIW) % = C + Mn / 6 + (Cr + Mo + V) / 5 + (Ni + Cu) / 15
3) The max. value for nitrogen does not apply if the chemical composition shows a minimum total Al content of 0,020 %
4) Deoxidation methods of these products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.
5) C = 0.22 % max. for thickness greater than 30 mm,

Mechanical Properties

Corresponding		Erdemir Grade No	R_e N/mm² (kg/mm²)			R_m[1] N/mm² (kg/mm²)	A (%) min. d (kalınlık, mm)		Impact (long.)	
							A_5		Sic.	KV_c
Standard	Grade		d≤16	16<d≤40	40<d≤60		8≤t≤ 40	40<t≤ 60	°C	J (min.)
			min.	min.	min.					
EN 10025-2	S355JR+AR Mod	3152[2]	355 (36.2)	345 (35.2)	335 (34.2)	470 - 630 (48.0-64.2)	20	19	+20	27
EN 10025-2	S355J0+AR Mod	5152	355 (36.2)	345 (35.2)	335 (34.2)	470 - 630 (48.0-64.2)	20	19	0	27
EN 10025-2	S355J0+N Özel	5051	355 (36.2)	345 (35.2)	335 (34.2)	470 - 630 (48.0-64.2)	20	19	0	27
EN 10025-2	S355J2+N Özel	6051	355 (36.2)	345 (35.2)	335 (34.2)	470 - 630 (48.0-64.2)	20	19	-20	27
EN 10025-2	S355J2 Özel	9352	355 (36.2)	345 (35.2)	335 (34.2)	470 - 630 (48.0-64.2)	20	19	-20	27

Notes
1) Tensile test values apply to “transverse” test pieces
2) Impact test is carried out only when specified at the time of enquiry and order
3) Grades including J2 notations could be normalized or equivalent to normalized rolling, the grades specified with “+ N” notation areproduced by normalizing or rolling equivalent to normalizing, and mechanical values after normalizing are guaranteed.

Standard : EN 10025-2:2019

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C d (thickness, mm)			Mn	P	S	Si	Cu	N[1]	CEV(IIW) [4][5] max. (%) d (thickness, mm)		
			≤ 16	16<d≤40	40<d≤100							≤ 30	30<d≤40	40<d≤60
Standard	Grade		max.	max.	max.	max.	max.	max.	max.	max.	max.			
EN 10025-2	S355JR+N	3052[4]	0.24	0.24	0.24	1.60	0.035	0.035	0.55	0.55	0.012	0.45	0.47	0.47
EN 10025-2	S355J0+N	5052[2][4]	0.20	0.20	0.22	1.60	0.030	0.030	0.55	0.55	0.012	0.45	0.47	0.47

Notes
1) The max. value for nitrogen does not apply if the chemical composition shows a min. total Al content of 0.020 %.
2) C = 0.22 % max. for thickness greater than 30 mm,
3) Carbon equivalent, CEV (IIW) % = C + Mn / 6 + (Cr + Mo + V) / 5 + (Ni + Cu) / 15
4) Max carbon equivalent (CE) is increased by 0.01 % for Si ≤ 0.25 %, and 0.02 % for Si ≤ 0.030 %

Classes for the suitability for hot-dip zinc coating based on the ladle analysis (for guidance)

Classes	Elementles (%)		
	Si	Si+2.5P	P
Class 1	≤ 0.030	≤ 0.090	-
Class 3	0.14≤ Si ≤0.25	-	≤ 0.030

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e (min.) N/mm² (kg/mm²) d (thickness, mm)					R_m[2] N/mm² (kg/mm²) d (thickness, mm)		A (%) (min.) d (thickness, mm) A_{80}				A_5			Impact (Long) Temp.	Impact (Long) KV_c min.
Standard	Grade		≤16	>16 ≤40	>40 ≤63	>63 ≤80	>80 ≤100	<3	≥3 ≤100	>1 ≤1.5	>1.5 ≤ 2	>2 ≤2,5	>2,5 ≤3	≥3 ≤40	>40 ≤63	>63 ≤100	°C	J
EN 10025-2	S355JR+N	3052[2]	355 (36.2)	345 (35.2)	335 (34.2)	325 (33.2)	315 (32.2)	510-680 (52.0-69.3)	470-630 (47.9-64.2)	13	14	15	16	20	19	18	+20	27
EN 10025-2	S355J0+N	5052	355 (36.2)	345 (35.2)	335 (34.2)	325 (33.2)	315 (32.2)	510-680 (52.0-69.3)	470-630 (48.0-64.2)	13	14	15	16	20	19	18	0	27

Notes
1) Tensile test values apply to “transverse” test pieces
2) Impact test is carried out only when specified at the time of enquiry and order
3) Impact test is not carried out for thickness thinner than 6 mm.
4) The grades specified with “+ N” notation are produced by normalizing or rolling equivalent to normalizing, and mechanical values after normalizing are guaranteed.

Hot Rolled Unalloyed Structural Steels

Standard : EN 10025-2:2019

Chemical Composition (%)

Corresponding		ERDEMİR Grade No	C max.	Mn max.	P max.	S max.	Si max.	Cu max.	N max.	CE(IIW) max. (%)
Standard	Grade									
EN 10025-2	S235JR+AR Özel	3235[2]	0.17	1.40	0.035	0.035	0.40	0.55	0.012	0.35
EN 10025-2	S275JR+AR Özel CTB	3243[3][7][9]	0.14-0.20	1.00 - 1.35	0.025	0.025	0.15 - 0.25	0.55	0.012	0.40
EN 10025-2	S235JR+AR CTA	4275[8][11]	0.17	1.20	0.025	0.035	0.03	0.55	0.012	0.35
EN 10025-2	S235J2/S235J2+N CTA	4239[5][8]	0.17	1.40	0.025	0.025	0.03	0.55	-	0.35
EN 10025-2	S275J2	4246[5][7]	0.18	1.50	0.025	0.025	-	0.55	-	0.40

Notes
1) These grades are produced at İsdemir.
2) This grade is produced in Isdemir facilities as any coil break defects will not to be occur.
3) Mechanical test is not carried out.
4) The max. value for nitrogen does not apply if the chemical composition shows a min. total Al content of 0.020 %.
5) Deoxidation methods of these products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.
6) Carbon equivalent, CEV (IIW) % = C + Mn / 6 + (Cr + Mo + V) / 5 + (Ni + Cu) / 15
7) Max carbon equivalent (CE) is increased by 0.01 % for Si ≤ 0.25 %, and 0.02 % for Si ≤ 0.030 %
8) Suitable for galvanizing as “Category A”. Category A contains Si ≤ 0.030% and Si+2.5P ≤ 0.090%.
9) Suitable for galvanizing as “Category B”. Category B contains Si 0.14≤ Si ≤0.25%.
10) Category A contains Si ≤ 0.030% ve Si+2.5P ≤ 0.090%, Category B contains Si 0.14≤ Si ≤0.25%, Category D contains Si 0.25< Si ≤0.35%.
11) Only available for thickness < 8 mm.

Mechanical Properties

Corresponding		Erdemir Grade No	R_e min. N/mm² (kg/mm²) (thickness, mm)		R_m[1] N/mm² (kg/mm²) (thickness, mm)		A (%) min. d(thickness, mm) A_{80}				A_5	Impact[3] (Long.)	
			≤16	>16 ≤40	<3	≥3 ≤25	>1 ≤1.5	>1.5 ≤ 2	>2 ≤ 2.5	>2.5 <3	≥ 3 ≤ 40	Sic °C	KV_c J(min.)
EN 10025-2	S235JR+AR Özel	3235[2]	235 (24.0)	-	360-510 (36.7-52.0)	360-510 (36.7-52.0)	16	17	18	19	24	+20	27
EN 10025-2	S275JR+AR Özel	3243[2][4]	275 (28.1)	265 (27.0)	430-580 (43.9-59.2)	410-560 (41.8-57.1)	14	15	16	17	21	+20	27
EN 10025-2	S235JR+AR Özel CTB	4238[2]	235 (24.0)	225 (23.0)	360-510 (36.7-52.0)	360-510 (36.7-52.0)	16	17	18	19	24	+20	27
EN 10025-2	S235JR+AR CTA	4275[2]	235 (24.0)	225 (23.0)	360-510 (36.7-52.0)	360-510 (36.7-52.0)	16	17	18	19	24	+20	27
EN 10025-2	S235J2 / S235J2+N CTA	4239	235 (24.0)	225 (23.0)	360-510 (36.7-52.0)	360-510 (36.7-52.0)	16	17	18	19	24	-20	27
EN 10025-2	S275J2	4246	235 (24.0)	265 (27.0)	430-580 (43.9-59.2)	410-560 (41.8-57.1)	14	15	16	17	21	-20	27

Notes
1) Tensile test values apply to “transverse” test pieces
2) Impact test is carried out only when specified at the time of enquiry and order
3) Impact test is not carried out for thickness thinner than 6 mm.
4) Mechanical test is not carried out. Mechanical test is carried out only when specified at the time of enquiry and order

Standard : AS NZS 1594 :2002

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Mn max.	P max.	S max.	Si max.	Cu max.	Cr max.	Ni max.	Al	Ti max.	V max.	Mo max.	Ceq[1] max.
Standard	Grade														
AS NZS 1594:2002	HA250 Mod	4240[1]	0.20	1.20	0.040	0.030	0.03	0.25	0.25	0.25	0.015 - 0.100	0.040	-	0.05	0.39
AS NZS 1594:2002	HA350 Mod	4249[2]	0.20	1.60	0.040	0.030	0.03	0.25	0.25	0.25	0.015 - 0.100	-	0.10	0.05	0.44

Notes
1) Cu+Ni+Mo max %0.60 and Nb+V max %0.03
2) Cu+Ni+Mo max %0.60 and Nb+V+Ti max %0.15
3) CEV (IIW) % = C + Mn / 6 + (Cr + Mo + V) / 5 + (Ni + Cu) / 15
4) These grades are produced at Isdemir.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	Elongation (t: thickness) (%) t ≤ 3			t > 3			Bend (transverse, mrb) 180°	
Standard	Grade		min.	min.	A_{50} min	A_{80} min	A_{200} min	A_{50} min	A_{80} min	A_{200} min	t ≤ 5	> 5
AS NZS 1594:2002	HA 250 Mod	4240	250 (25.5)	350 (35.7)	22	20	16	26	24	17	t	2 t
AS NZS 1594:2002	HA 350 Mod	4249	350 (35.7)	430 (43.9	18	16	14	22	20	15	2 t	3 t

Notes

1) Tensile test values apply to” longituonal” test pieces
2) A50 is shown on the test certificate within the framework of agreements with customers

Hot Rolled Unalloyed Structural Steel

Standard : DBL 4050

Chemical Composition (%)

Corresponding			Erdemir Steel Grade	C max.	Mn max.	P max.	S max.	Si max.	Al min.
Standard	Grade	Similar Standard / Grade							
DBL 4050	StW24H	EN 10025-2 / S235JR	720[1]	0.12	0.70	0.020	0.020	0.040	0.020

Notes

1) Grade specified on table, is produced within the framework of agreements with customers.

Mechanical Properties

Corresponding			Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A (%)		Bend[2] Trans, 180°
						A_{80} 1.5≤d<3 min.	A_5 3≤d≤ 8 min.	
Standard	Grade	Similar Standard / Grade						mrb
DBL 4050	StW24H	EN 10025-2 / S235JR	720[3]	260-340 (26.5-34.7)	370-450 (37.7-45.9)	25	30	3 d

Notes

1) Tensile test values apply to “transverse” test pieces.
2) The bend test is carried out only when specified at the time of enquiry and order.
3) Only available for thickness ≤ 8 mm.

Hot Rolled Structural Steels For Otomotıv Industry

Standard: VALEO 400.240.004.D

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P max.	S max.	Si max.
Standard	Grade						
400.240.004.D	18Mn5	721	0.15-020	1.20-1.50	0.025	0.025	0.40

Notes

1) Grade specified on table, is produced within the framework of agreements with customers.

Mechanical Properties

Corresponding		Erdemir Steel Grade	$Rp_{0.2}$ N/mm² (kg/mm²) min.	R_m N/mm² (kg/mm²)	Elongation	
					t<3	t≥3
Standard	Grade				A_{80}	A_5
					min.	
400.240.004.D	18Mn5	721	355 (36,2)	470 - 620 (48.0 - 63.2)	20	

Açıklamalar

1) Tensile test values apply to “Transverse” test pieces

Hot Rolled Structural Steels For General Purposes

Standard : JIS G 3101:2010

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Mn max.	P max.	S max.	Si max.
Standard	Grade						
JIS G 3101:2010	SS 400	6741	-	-	0.050	0.050	-

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)			R_m[1] N/mm² (kg/mm²)	A (%, min.)				Bend mrb
			d≤16 min.	16<d≤40 min.	40<d≤100 min.		A_{50} ≤5	A_{200} 5<d≤16	A_{200} 16<d≤50	A_{50} 50<d≤100	d: thickness
Standard	Grade										
JIS G 3101:2010	SS400	6741	245 (25.0)	235 (24.0)	215 (21.9)	400-510 (40.8-52.0)	21	17	21	23	1.5d

Notes

1) Tensile test values apply to “longitudinal” test pieces
2) Only available for thickness ≤ 50 mm.

Hot Rolled Steels With Improved Formability

Standard : ASTM A1011-18

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C[1] max.	Mn[1] max.	P max.	S max.	Cu[2] max.	Ni max.	Cr max.	Mo max.	V max.	Nb max.	Ti[3] max.
Standard	Grade												
ASTM A1011	SS30	3330[4]	0.25	0.90	0.035	0.040	0.20	0.20	0.15	0.06	0.008	0.008	0.025
ASTM A1011	SS33	3333[4]	0.25	0.90	0.035	0.040	0.20	0.20	0.15	0.06	0.008	0.008	0.025
ASTM A1011	SS36 Type 1	3336[4]	0.25	0.90	0.035	0.040	0.20	0.20	0.15	0.06	0.008	0.008	0.025
ASTM A1011	SS36 Type 2	6035[1] [4]	0.25	1.35	0.035	0.040	0.20	0.20	0.15	0.06	0.008	0.008	0.025
ASTM A1011	SS40	3340[4]	0.25	0.90	0.035	0.040	0.20	0.20	0.15	0.06	0.008	0.008	0.025
ASTM A1011	SS45 Type 1	3345[1] [4]	0.25	1.35	0.035	0.040	0.20	0.20	0.15	0.06	0.008	0.008	0.025
ASTM A1011	SS50	3350[1] [4]	0.25	1.35	0.035	0.040	0.20	0.20	0.15	0.06	0.008	0.008	0.025
ASTM A1011	Grade 55 Class 1	3355[5][6]	0.25	1.35	0.040	0.040	0.20	0.20	0.15	0.06	0.005	0.005	0.005
ASTM A1011	Grade 65 Class 1	3365[5][6]	0.26	1.50	0.040	0.040	0.20	0.20	0.15	0.06	0.005	0.005	0.005

Notes

1) For each reduction of 0.01 percentage point below the specified carbon maximum an increase of 0.06 percentage point manganese above the specified maximum will be permitted up to the maximum of 1.50%.
2) When copper is specified, a minimum of 0.20 % is required. When copper steel is not specified, the copper limit is a maximum requirement.
3) Titanium is permitted at the producer’s option, to the lesser of 3.4N + 1.5S or 0.025 %.
4) Deoxidation methods of all products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.
5) One of V,Ti, Nb elements or different combination of these elements can be added according to above table.
6) These grades are produced in İsdemir facilities.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²) min.	R_m[1] N/mm² (kg/mm²)	A (%)			Bend[2] (Trans, 180°) mrb (d: thickness)
					A_{50} d (mm)		A_{200} d (mm)	
Standard	Grade				1.6<d≤2.5 min.	2.5<d≤6.0 min.	d≤6.0 min.	
ASTM A1011	SS30	3330	205 (20.9)	340 min. (34.7)	24	25	19	1 d
ASTM A1011	SS33	3333	230 (23.5)	360 min. (36.7)	22	23	18	1 d
ASTM A1011	SS36 Type 1	3336	250 (25.5)	365 min. (37.3)	21	22	17	1.5 d
ASTM A1011	SS36 Type 2	6035	250 (25.5)	400-550 (40.8-56.0)	20	21	16	2 d
ASTM A1011	SS40	3340	275 (28.1)	380 min. (38.8)	20	21	16	2 d
ASTM A1011	SS45 Type 1	3345	310 (31.6)	410 min. (41.8)	18	19	14	2 d
ASTM A1011	SS50	3350	340 (34.7)	450 min. (45.9)	16	17	12	2.5 d
ASTM A1011	Grade 55 Class 1	3355	380	480 min.	18	20	-	2 d
ASTM A1011	Grade 65 Class 1	3365	450	550 min.	16	14	-	2 d

Notes

1) Tensile test values apply to “longtidunal” test pieces.
2) The bend test is carried out only when specified at the time of enquiry and order.

Hot Rolled Structural Steels with Improved Formability

Standard : ASTM A1018-18

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C[3]	Mn[3]	P	S	Cu[1]	Ni	Cr	Mo	V	Nb	Ti[2]	N
Standard	Grade		max.	max.	max.	max.	max.	max.	max.	max.	max.	max.	max.	max.
ASTM A1018	SS30	3430[4]	0.25	1.50	0.035	0.040	0.20	0.20	0.15	0.06	0.008	0.008	0.025	0.014
ASTM A1018	SS33	3433[4]	0.25	1.50	0.035	0.040	0.20	0.20	0.15	0.06	0.008	0.008	0.025	0.014
ASTM A1018	SS36 Type 1	3436[4]	0.25	1.50	0.035	0.040	0.20	0.20	0.15	0.06	0.008	0.008	0.025	0.014
ASTM A1018	SS36 Type 2	6036[4]	0.25	[3]	0.035	0.040	0.20	0.20	0.15	0.06	0.008	0.008	0.025	0.014
ASTM A1018	SS40	3440[4]	0.25	1.50	0.035	0.040	0.20	0.20	0.15	0.06	0.008	0.008	0.025	0.014

Notes
1) When copper bearing steel is specified, the minimum limit for copper is 0.20 %. When copper bearing steel is not specified, the maximum limit for copper is as shown in the table.
2) Titanium is permitted at the producer's option, to the lesser of 3.4N + 1.5S or 0.025 %.
3) For thickness ≥ 20 mm, the "Mn" content is from 0.80 to 1.20 % max. For each reduction of 0.01% below "Mn" above the specified maximum will be permitted up to a maximum of 1.35%. the specified "C" maximum, an increase of 0.06%
4) Deoxidation methods of all products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding		Erdemir [3] Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A (%)		Impact[2] (Long.)		Bend[2] (Trans,180°)
					A_{50} d (mm)	A_{200} d (mm)	Temp.	KV_c	mrb
Standard	Grade		min.		min.	min.	°C	J (min.)	(d: thickness)
ASTM A1018	SS30	3430	205 (20.9)	340 min. (34.7)	22	17	+20	40	1 d
ASTM A1018	SS33	3433	230 (23.5)	360 min. (36.7)	22	16	+20	40	1 d
ASTM A1018	SS36 Type 1	3436	250 (25.5)	365 min. (37.2)	21	15	+20	40	1.5 d
ASTM A1018	SS36 Type 2	6036	250 (25.5)	400-550 (40.8-56.1)	21	18	+20	40	2 d
ASTM A1018	SS40	3440	275 (28.1)	380 min. (38.8)	19	14	+20	40	2 d

Notes
1) Tensile test values apply to "transverse" test pieces.
2) The bend test and impact test are carried out only when specified at the time of enquiry and order.
3) Only available for thickness 6 ≤ d ≤ 25 mm.

Standard : ASTM A1011 HSLAS

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn[1]	P	S	Al	Nb[3]	Ti[3]	V[3]	Mo	Cu[2]	Cr	Ni
Standard	Grade		max.	max.	max.	max.	min.	min.	min.	min.	max.	max.	max.	max.
ASTM A1011 HSLAS	Gr.50 Class 1	3550	0.23	1.35	0.040	0.040	0.015	0.005	0.005	0.005	0.060	0.20	0.15	0.20

Notes
1) For each reduction of 0.01 percentage point below the specified carbon maximum an increase of 0.06 percentage point manganese above the specified maximum will be permitted up to the maximum of 1.50%.
2) When copper is requested in the chemical compositon, value specified in the table will be evaluated as minimum value. When copper is not specified, the copper limit is a maximum requirement.
3) V,Nb or Ti elements can be added either individually or any combinations specified in the table.

Mechanical Properties

Corresponding		Erdemir [3] Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A (%)		Bend (Transverse)
					A_{50} min.	A_{50} min.	180°
Standard	Grade		min.		t ≤ 2.5	t > 2.5	(d: thickness)
ASTM A1011 HSLAS	Gr.50 Class 1	3550	340 (34.7)	450 (45.9)	20	22	2 d

Notes
1- Tensile test values apply to "longtidunal" test pieces
2- The bend test is carried out only when specified at the time of enquiry and order
3- This grade will be produced in İsdemir facilities.

Hot Rolled Unalloyed Structural Steels with Improved Formability

Standard : EN 10025-2:2019

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C d (thickness, mm)			Mn	P	S	Si	Cu	N[1]	CEV(IIW) [2][3] max. (%) d (thickness, mm)		
			≤ 16	16<d≤40	40<d≤60									
Standard	Grade		max.	max.	max.	max.	max.	max.	max.	max.	max.	≤ 30	30<d≤40	40<d≤60
EN 10025-2	S275JRC+AR ÖZEL CTA	4044 [4][5][8][10][11]	0.21	-	-	1.50	0.035	0.035	0.03	0.55	0.012	0.40	0.40	0.42
EN 10025-2	S355J2C+N CTA	4052 [2][4][5][7][12]	0.20	0.20	-	1.60	0.025	0.025	0.03	0.55	-	0.45	0.47	0.47
EN 10025-2	S235J2C+N	6037 [2]	0.17	0.17	0.17	1.40	0.025	0.025	-	0.55	-	0.35	0.35	0.38
EN 10025-2	S275J2C+N	6044 [2][4]	0.18	0.18	0.18	1.50	0.025	0.025	-	0.55	-	0.40	0.40	0.42
EN 10025-2	S355J2C+N	6052 [2][4][7]	0.20	0.20	0.22	1.60	0.025	0.025	0.55	0.55	-	0.45	0.47	0.47
EN 10025-2	S355J2C+N Özel	6050 [2][4][7][9][13]	0.14-0.20		-	1.20-1.60	0.025	0.020	0.10-0.30	0.55	-	0.49	-	-
EN 10025-2	S355J2C+N Özel 1	6053 [2][4][7][9][13]	0.15-0.21		-	1.20-1.60	0.025	0.020	0.10-0.30	0.55	-	0.49	-	-
EN 10025-2	S355K2+N	7252[2][4][7]	0.20	0.20	0.22	1.60	0.025	0.025	0.55	0.55	-	0.45	0.47	0.47
EN 10025-2	S355J2C+N	6052 [2][5][6]	0.20	0.20	0.22	1.60	0.025	0.025	0.55	0.55	-	0.45	0.47	0.47

Notes
1) The maximum value for nitrogen does not apply if the chemical composition shows a minimum total aluminium content of 0.020%.
2) Deoxidation methods of these products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.
3) Carbon equivalent, CEV (IIW) % = C + Mn / 6 + (Cr + Mo + V) / 5 + (Ni + Cu) / 15
4) Max carbon equivalent (CE) is increased by 0.01 % for Si ≤ 0.25%, and 0.02 % for Si ≤ 0.030 %
5) Suitable for galvanizing as "Category A". Category A contains Si ≤ 0.030% and Si+2.5P ≤ 0.090%.
6) Category A contains Si ≤ 0.030% ve Si+2.5P ≤ 0.090%, Category B contains Si 0.14≤ Si ≤0.25%, Category D contains Si 0.25< Si ≤0.35%.
7) C = 0.22 % max. for thickness greater than 30 mm,
8) Boron content is limited to maximum 8 ppm for customer request.
9) These qualities are produced as "Mod" within the framework of the agreements made with the customer and may differ from the relevant standard conditions depending on the customer demand
10) These qualities are produced as "Mod" within the framework of the agreements made with the customer
11) Only available for thickness < 8 mm.
12) Only available for thickness < 20 mm.
13) Only available for thickness < 16 mm.

Mechanical Properties

Corresponding		ERDEMİR Steel Grade	R_e (min.) N/mm² (kg/mm²) d (thickness, mm)					R_m[1] N/mm² (kg/mm²) d (thickness, mm)		A (%) min. d (thickness, mm)							Impact[3] (Long.)	
										A_{80}				A_5				
										>1	>1.5	>2	>2.5	≥3	>40	> 63 ≤ 100	Temp.	KV_c
Standard	Grade[2][6]		≤16	16<d≤40	40<d≤60	63<d≤80	80<d≤100	< 3	3≤d≤100	≤1.5	≤2	≤2.5	<3	≤40	≤63		°C	J(min.)
EN 10025-2	S275JRC+AR ÖZEL CTA	4044[2][6]	280-400 (28.6-40.8)	- -	- -	- -	- -	430-520 (43.9-53.0)	420-520 (42.9-53.0)	23-37				23-37	-	-	+20	27
EN 10025-2	S355J2+N CTA	4052	355 (36.2)	345 (35.2)	- -	- -	- -	510-680 (52.0-69.3)	470-630 (47.9-64.2)	13	14	15	16	20	-	-	-20	27
EN 10025-2	S235J2C+N	6037[5]	235 (24.0)	225 (23.0)	215 (21.9)	215 (21.9)	215 (21.9)	360-510 (36.7-52.0)	360-510 (36.7-52.0)	16	17	18	19	24	23	22	-20	27
EN 10025-2	S275J2C+N	6044[5]	275 (28.1)	265 (27.0)	255 (26.0)	245 (25.0)	235 (24.0)	430-580 (43.9-59.2)	410-560 (41.8-57.1)	14	15	16	17	21	20	19	-20	27
EN 10025-2	S355J2C+N	6052[5]	355 (36.2)	345 (35.2)	335 (34.2)	325 (33.2)	315 (32.2)	510-680 (52.0-69.3)	470-630 (47.9-64.2)	13	14	15	16	20	19	18	-20	27
EN 10025-2	S355J2C+N Özel	6050[5]	355 (36.2)	- -	- -	- -	- -	510-680 (52.0-69.3)	470-630 (48.0-64.2)	13	14	15	16	20	-	-	-20	27
EN 10025-2	S355J2C+N Özel 1	6053[5]	355 (36.2)	- -	- -	- -	- -	510-680 (52.0-69.3)	470-630 (48.0-64.2)	13	14	15	16	20	-	-	-20	27
EN 10025-2	S355K2+N	7252	355 (36.2)	345 (35.2)	335 (34.2)	325 (33.2)	315 (32.2)	510-680 (52.0-69.3)	470-630 (48.0-64.2)	13	14	15	16	20	19	18	-20	40

Notes
1) Tensile test values apply to "transverse" test pieces
2) Impact test is carried out only when specified at the time of enquiry and order
3) Impact test is not carried out for thickness thinner than 6 mm.
4) The grades specified with "+ N" notation are produced by normalizing or rolling equivalent to normalizing, and mechanical values after normalizing are guaranteed.
5) Up to 25mm in thickness is produced with "J2C+N" notation , over 25mm in thickness is produced with "J2+N" notation.

Bending Test

Corresponding		Erdemir Steel Grade	Bend (Transverse, mrb)[1] d (mm)														
			>1	>1.5	>2.5	>3	>4	>5	>6	>7	>8	>10	>12	>14	>16	>18	>20
Standard	Grade		≤1.5	≤2.5	≤3	≤4	≤5	≤6	≤7	≤8	≤10	≤12	≤14	≤16	≤18	≤20	≤25
EN 10025-2	S275JRC	4044	2	3	4	5	8	10	12	16	-	-	-	-	-	-	-
EN 10025-2	S355J2+N	4052	2.5	4	5	6	8	10	12	16	20	25	32	36	45	50	-
EN 10025-2	S235J2C+N	6037	1.6	2.5	3	5	6	8	10	12	16	20	25	28	36	40	50
EN 10025-2	S275J2C+N	6044	2	3	4	5	8	10	12	16	20	25	28	32	40	45	55
EN 10025-2	S355J2C+N	6052	2.5	4	5	6	8	10	12	16	20	25	32	36	45	50	65
EN 10025-2	S355J2C+N Özel	6050	2.5	4	5	6	8	10	12	16	20	25	32	36	-	-	-
EN 10025-2	S355J2C+N Özel 1	6053	2.5	4	5	6	8	10	12	16	20	25	32	36	-	-	-

Notes
1) The values are applicable for bend angles ≤90°.v

Hot Rolled Unalloyed Structural Steels

Standard : EN 10025-2:2019

Chemical Composition (%)

Corresponding		ERDEMİR Kalite No	C	Mn	P	S	Si	Cu	N[6]	CE(IIW)[8] max. (%)
Standard	Grade		max.	max.	max.	max.	max.	max.	max.	
EN 10025-2	S235JR+AR Özel	3235[2]	0.17	1.40	0.035	0.035	0.40	0.55	0.012	0.35
EN 10025-2	S275JR+AR Özel CTB	3243[3][7][9]	0.14-0.20	1.00 - 1.35	0.025	0.025	0.15 - 0.25	0.55	0.012	0.40
EN 10025-2	S235JR+AR CTA	4275[8][11]	0.17	1.20	0.025	0.035	0.03	0.55	0.012	0.35
EN 10025-2	S235J2/S235J2+N CTA	4239[5][8]	0.17	1.40	0.025	0.025	0.03	0.55	-	0.35
EN 10025-2	S275J2	4246[5][7]	0.18	1.50	0.025	0.025	-	0.55	-	0.40

Notes
1) These grades are produced at İsdemir.
2) This grade is produced in Isdemir facilities as any coil break defects will not to be occur.
3) Mechanical test is not carried out.
4) The max. value for nitrogen does not apply if the chemical composition shows a min. total Al content of 0.020 %.
5) Deoxidation methods of these products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.
6) Carbon equivalent, CEV (IIW) % = C + Mn / 6 + (Cr + Mo + V) / 5 + (Ni + Cu) / 15
7) Max carbon equivalent (CE) is increased by 0.01 % for Si ≤ 0.25 %, and 0.02 % for Si ≤ 0.030 %
8) Suitable for galvanizing as "Category A". Category A contains Si ≤ 0.030% and Si+2.5P ≤ 0.090%.
9) Suitable for galvanizing as "Category B". Category B contains Si 0.14≤ Si ≤0.25%.
10) Category A contains Si ≤ 0.030% ve Si+2.5P ≤ 0.090%, Category B contains Si 0.14≤ Si ≤0.25%, Category D contains Si 0.25< Si ≤0.35%.
11) Only available for thickness < 8 mm.

Mechanical Properties

Corresponding		ERDEMİR Steel Grade	R_e (min) N/mm² (kg/mm²) d(kalınlık, mm)		R_m[1] N/mm² (kg/mm²) d (thickness, mm)		A (%) min. thickness, mm)					Darbe[3] (Boyuna)	
							A_{80}				A_5		
Standard	Gdaoe[5]		≤16	>16 ≤40	<3	≥3 ≤25	>1 ≤1.5	>1.5 ≤2	>2 ≤2.5	>2.5 <3	≥3 ≤40	Sıc. °C	KV_c J(min.)
EN 10025-2	S235JR+AR Özel	3235[6]	235 (24.0)	-	360-510 (36.7-52.0)	360-510 (36.7-52.0)	16	17	18	19	24	+20	27
EN 10025-2	S275JR+AR Özel	3243[2][4]	275 (28.1)	265 (27.0)	430-580 (43.9-59.2)	410-560 (41.8-57.1)	14	15	16	17	21	+20	27
EN 10025-2	S235JR+AR Özel CTB	4238[2]	235 (24.0)	225 (23.0)	360-510 (36.7-52.0)	360-510 (36.7-52.0)	16	17	18	19	24	+20	27
EN 10025-2	S235JR+AR CTA	4275[2]	235 (24.0)	225 (23.0)	360-510 (36.7-52.0)	360-510 (36.7-52.0)	16	17	18	19	24	+20	27
EN 10025-2	S235J2 / S235J2+N CTA	4239	235 (24.0)	225 (23.0)	360-510 (36.7-52.0)	360-510 (36.7-52.0)	16	17	18	19	24	-20	27
EN 10025-2	S275J2	4246	275 (28.1)	265 (27.0)	430-580 (43.9-59.2)	410-560 (41.8-57.1)	14	15	16	17	21	-20	27

Açıklamalar
1) Çekme testi değerleri "Enine" test numunelerine uygulanır.
2) Darbe testi "İsteğe Bağlı" olarak yapılır.
3) Kalınlığı 6 mm nin altında olan ürünler için darbe testi yapılmaz.
4) Mekanik test yapılmaz, belirtilen değerler referans değerler olup, isteğe bağlı olarak yapılabilir.

Hot Rolled High-Carbon Unalloyed Structural Steels

Standard : EN 10025-2:2019

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	P	S	N[1]
Standard	Grade		max.	max.	max.
EN 10025-2	E295	3250	0.045	0.045	0.012
EN 10025-2	E335	3260	0.045	0.045	0.012
EN 10025-2	E360	5270	0.045	0.045	0.012

Notes
1) The maximum value for nitrogen does not apply if the chemical composition shows total aluminium content of 0.020% min.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e (min.) N/mm² (kg/mm²) d (thickness, mm)					R_m[1] N/mm² (kg/mm²) d (thickness, mm)		A (%) (min.) d (thickness, mm)							
										A_{80}				A_5			
Standard	Grade		≤16	>16 ≤40	>40 ≤63	>63 ≤80	>80 ≤100	<3	≥3 ≤100	>1 ≤1.5	>1.5 ≤2	>2 ≤2.5	>2.5 ≤3	>3 ≤40	>40 ≤63	>63 ≤100
EN 10025-2	E295	3250	295 (30.1)	285 (29.1)	275 (28.1)	265 (27.1)	255 (26.0)	490 - 660 (50.0 - 67.3)	470 - 610 (47.9 - 62.2)	11	12	13	14	18	17	16
EN 10025-2	E335	3260	335 (34.2)	325 (33.2)	315 (32.1)	305 (31.2)	295 (31.2)	590 - 770 (60.2 - 78.6)	570 - 710 (58.2 - 72.4)	7	8	9	10	14	13	12
EN 10025-2	E360	5270	360 (36.7)	355 (36.2)	345 (35.2)	335 (34.2)	325 (33.2)	690-900 (70.4-91.8)	670-830 (68.4-84.7)	4	5	6	7	10	9	8

Notes
1) Tensile test values apply to "transverse" test pieces

Hot Rolled Steels With Improved Formability

Standart : ASTM A1018 HSLAS-18

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn[1]	P	S	Al	Nb[2]	Ti[2]	V[2]	Mo	Cu[3]	Cr	Ni
Standard	Grade		max.	max.	max.	max.	min.	min.	min.	min.	max.	max.	max.	max.
ASTM A1018 HSLAS-18	Grade 50 Class 1	3551	0.23	1.50	0.040	0.040	0.005	0.005	0.005	0.005	0.060	0.20	0.15	0.20
ASTM A1018 HSLAS-18	Grade 55 Class 1	3455	0.25	1.50	0.040	0.040	0.005	0.005	0.005	0.005	0.060	0.20	0.15	0.20
ASTM A1018 HSLAS-18	Grade 65 Class 1	3465	0.26	1.50	0.040	0.040	0.005	0.005	0.005	0.005	0.060	0.20	0.15	0.20
ASTM A1018 HSLAS-18	Grade 50 Class 1	3552	0.23	1.50	0.040	0.040	0.005	0.005	0.005	0.005	0.060	0.20	0.15	0.20

Notes
1) No limit for Al, Si and N elements and their values will be written in certicifate.
2) V,Nb or Ti elements can be added either individually or any combinations specified in the table. The analysis which are indicated minimum value can be applied only for improving stress and strain
3) When copper is requested in the chemical compositon, value specified in the table will be evaluated as minimum value. When copper is not specified, the copper limit is a maximum requirement.
4) This grade will be produced in İsdemir facilities.

Mechanical Properties

Corresponding		Erdemir [3] Steel Grade	R_e N/mm² (kg/mm²) min.	R_m[1] N/mm² (kg/mm²)	Elongation (%)		Bend (Transverse)
					A_{50}	A_{200}	180°
Standard	Grade				min.	min.	(d: thickness)
ASTM A1018 HSLAS-18	Gr.50 Class 1	3551	340 (34.7)	450 (45.9)	20	16	2 d
ASTM A1018 HSLAS-18	Gr.55 Class 1	3455	380	480	18	15	2 d
ASTM A1018 HSLAS-18	Gr.65 Class 1	3465	450	220	14	22	2 d
ASTM A1018 HSLAS-18	Gr.50 Class 1	3552	340 (34.7)	450 (45.9)	20	16	2 d

Notes
1) Tensile test values apply to "transverse" to test pieces
2) The bending test is carried out only when specified at the time of enquiry and order

Steel Grade

Hot Rolled Weldable Fine-Grained Structural Steels

Standard : ASTM A572-18

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C[1) 2)] max.	Mn[1) 2)]	P max.	S max.	Si max.	Nb	V	Cu[3)] min.
Standard	Grade									
ASTM A572	42 Type2	9329[4) 6)]	0.21	0.80-1.35	0.03	0.03	0.40	-	0.01-0.15	0.20
ASTM A572	50 Type2	9335[4) 6)]	0.23	0.80-1.35	0.03	0.03	0.40	-	0.01-0.15	0.20
ASTM A572	55 Type2	9338[4) 6)]	0.25	0.80-1.35	0.03	0.03	0.40	-	0.01-0.15	0.20
ASTM A572	60 Type3	9342[5) 6)]	0.26	0.80-1.35	0.03	0.03	0.40	0.005-0.050	0.01-0.15	0.20

Notes

1) For each reduction of 0.01 percentage point below the specified carbon maximum, an increase of 0.06 percentage point manganese above the specified maximum is permitted, up to a maximum of 1.60%.
2) Minimum manganese content is 0.50% for thickness ≤ 10,00 mm. The manganese to carbon ratio shall not be less than 2 to 1.
3) Copper when specified shall have a minimum content of 0.20% by heat analysis.
4) Silicon content is ≥ 0.15% for grade 9329, 9335, 9338 of thickness greater than 40 mm.
5) For grade 9342, 0.02 ≤ Nb+V ≤ 0.15 % by heat analysis.
6) Deoxidation methods of all products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²) (min.)	R_m[1)] N/mm² (kg/mm²) (min.)	A (%)	
Standard	Grade				A_{50} (min.)	A_{200} (min.)
ASTM A572	42 Type 2	9329	290 (29.6)	415 (42.3)	22	18
ASTM A572	50 Type 2	9335	345 (35.2)	450 (45.9)	19	16
ASTM A572	55 Type 2	9338[4)]	380 (38.8)	485 (49.5)	18	15
ASTM A572	60 Type 3	9342[4)]	415 (42.3)	520 (53.1)	15	13

Notes

1) Tensile test values apply to “transverse” test pieces.
2) Max thickness of grades 9338 and 9342 are 50mm and 32mm respectively.

Steel Grade

Hot Rolled Weldable Fine Grain Structural Steels in Normalized Condition

Standard : EN 10025-3:2019

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Si max.	Mn	P max.	S max.	Al[2)] (min.)	Cr[3)] max.	Cu max.	Mo[3)] max.	Nb[3)] max.	Ni max.	Ti[3)] max.	V[3)] max.	N max.	CE(IIW)[4)(5)] max. (%)
Standard	Grade																
EN 10025-3	S355N	9355[4)]	0.20	0.50	0.90-1.65	0.030	0.025	0.02	0.30	0.55	0.10	0.05	0.50	0.05	0.12	0.015	0.43
EN 10025-3	S355NL	9356[4)]	0.18	0.50	0.90-1.65	0.025	0.020	0.02	0.30	0.55	0.10	0.05	0.50	0.05	0.12	0.015	0.43
EN 10025-3	S420N	9420[4)6)]	0.20	0.60	1.00-1.70	0.030	0.025	0.02	0.30	0.55	0.10	0.05	0.80	0.05	0.20	0.025	0.48
EN 10025-3	S460N	9460[4)5)6)]	0.20	0.60	1.00-1.70	0.030	0.025	0.02	0.30	0.55	0.10	0.05	0.80	0.05	0.20	0.025	0.53

Notes

1) These grades are produced normalized or equivalent to normalized rolling ,
2) If sufficient nitrogen-binding elements are present, the minimum total aluminium content does not apply.
3) Carbon equivalent, CEV (IIW) % = C + Mn / 6 + (Cr + Mo + V) / 5 + (Ni + Cu) / 15
4) Max carbon equivalent (CE) is increased by 0.01 % for Si ≤ 0.25%, and 0.02 % for Si ≤ 0.030 %
5) (V + Nb + Ti) ≤ 0.22 % and (Mo + Cr) ≤ 0.30 %.
6) Only available for thicknesses ≤ 20 mm.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)			R_m[1)] N/mm² (kg/mm²)	A_5 (%)	Impact[2)] (Long.)		Bend[3)(4)] (Trans, 180°)
			d≤16	16<d≤40	40<d≤60			Temp.	KV_c min.	mrb
Standard	Grade		min.	min.	min.		min.	°C	J	(d: thickness)
EN 10025-3	S355N	9355[4)]	355 (36.2)	345 (35.2)	335 (34.2)	470 - 630 (47.9 - 64.3)	22	-20	40	2 d
EN 10025-3	S355NL	9356[4)]	355 (36.2)	345 (35.2)	335 (34.2)	470 - 630 (47.9 - 64.3)	22	-50	27	2 d
EN 10025-3	S420N	9420[4)6)]	420 (42.9)	400 (40.8)	-	520 - 680 (53.0 - 69.3)	19	-20	40	4 d
EN 10025-3	S460N	9460[4)5)6)]	460 (46.9)	440 (44.9)	-	540 - 720 (55.1 - 73.4)	17	-20	40	4 d

Notes

1- These grades are produced normalized or equivalent to normalized rolling,
2- If sufficient nitrogen-binding elements are present, the minimum total aluminium content does not apply.
3- Carbon equivalent, CEV (IIW) % = C + Mn / 6 + (Cr + Mo + V) / 5 + (Ni + Cu) / 15
4- Max carbon equivalent (CE) is increased by 0.01 % for Si ≤ 0.25%, and 0.02 % for Si ≤ 0.030 %
5- (V + Nb + Ti) ≤ 0.22 % and (Mo + Cr) ≤ 0.30 %.
6- Only available for thicknesses ≤ 20 mm.

High-Strength Low-Alloy Steels with Improved Formability

Standard : ASTM A656-18

Chemical Composition (%)

Corresponding		Erdemir	C[1]	Mn [1]	P	S	Al	Si	V[2]	N	Nb[2]	Ti[2]
Standard	Grade	Steel Grade	max.	max.	max.	max.	min.	max.	max.	max.		max.
ASTM A656	50 Type 3	9435	0.18	1.65	0.025	0.030	0.020	0.60	0.08	0.030	0.008-0.100	-
ASTM A656	60 Type 8	9442	0.18	1.65	0.025	0.030	0.020	0.60	0.15	0.030	0.10 Max.	0.15
ASTM A656	70 Type 8	9449	0.18	1.65	0.025	0.030	0.020	0.60	0.15	0.030	0.10 Max.	0.15
ASTM A656	80 Type 8	9455	0.18	1.65	0.025	0.030	0.020	0.60	0.15	0.030	0.10 Max.	0.15

Notes

1) For each reduction of 0.01 percentage point below the specified maximum for carbon, an increase of 0.06 percentage point above the specified maximum for manganese is permitted, up to a maximum of 1.75% for grades 9435,9442 and 9449; and up to a maximum of 1.90% for grade 9455.
2) 'Nb + V + Ti' shall be between 0.008 and 0.20 % for type 8 grades.

Mechanical Properties

Corresponding		Erdemir	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A (%)		Bend[2] (Trans,180°) mrb
Standard	Grade[3]	Steel Grade	(min.)	(min.)	A_{50} (min.)	A_{200} (min.)	(d: thickness)
ASTM A656	50 Type 3	9435	345 (35.2)	415 (42.3)	21	18	1,5 d
ASTM A656	60 Type 8	9442	415 (42.3)	485 (49.5)	17	14	1,5 d
ASTM A656	70 Type 8	9449	485 (49.5)	550 (56.1)	14	11	1,5 d
ASTM A656	80 Type 8	9455	550 (56.1)	620 (63.3)	12	9	1,75 d

Notes

1) Tensile test values apply to "transverse" test pieces.
2) Bend test is carried out only when specified at the time of enquiry and order.
3) Max thickness is 50 mm for grade 9435, 40 mm for grade 9442, 25 mm for grades 9449 and 9455 respectively.

Hot Rolled Structural Steel With High Strength

Standard: SAE J403-2014 / B105-10 Erdemir EE01

Chemical Composition (%)

Corresponding		Erdemir	C	Si	Mn	P	S	Al	V
Standard	Grade	Steel Grade		max.	max.	max.	max.		max.
SAEJ403 / B105-10	1022 Mod	735[1] [2]	0.17-0.22	0.55	1.60	0.030	0.035	0.02-0.05	0.010

Notes

1) Grade specified in this table, is produced within the framework of agreements with customers
2) The limitation requests for the residual elements (Cu, Ni, Cr, Mo) which are not mentioned on the table are subjected to negotitation for special application purposes.

Mechanical Properties

Corresponding		Erdemir	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_5 (%)	Impact[2][3] (Long)		Bend[4] (Trans, 180°) mrb
Standard	Grade	Steel Grade	min.	min.	min.	Temparature °C	KV_c min. J	(d: thickness)
SAEJ403 / B105-10	1022 Mod	735[5]	345 (35.2)	517 (52.7)	20	-20	27	2 d

Notes

1) Grade specified in this table, is produced within the framework of agreements with customers
2) The limitation requests for the residual elements (Cu, Ni, Cr, Mo) which are not mentioned on the table are subjected to negotitation for special application purposes.
3) Impact test is not carried out for thickness thinner than 6 mm.
4) Bend test is carried out only when specified at the time of enquiry and order
5) Only available for thickness ≤ 16 mm.

Steel Grade

Hot Rolled Structural Steel with Improved Atmospheric Corrosion Resistance

Standard : EN 10025-5:2019/ ASTM A709-21

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Si	N	Al	Cr	Cu	Ni	V
Standard	Grade		max.		max.	max.			min.			max.	
EN 10025-5	S355J2W[1)2)3)]	9952	0.16	0.50-1.50	0.030	0.030	0.50 max	[4)]	0.020	0.40-0.80	0.25-0.55	0.65	[1)]
ASTM A709	50WF (345WF) Type B[6)]		0.20[5)]	0.75-1.35[5)]	0.030	0.030	0.15-0.50	-	-	0.40-0.70	0.20-0.40	0.50	0.01-0.10

Notes

1) The steels shall contain at least one of the following elements: Al total ≥ 0,020%, Nb: 0,015-0,060%, V:0,02-0,12%, Ti:0,02-0,10%. If these elements are used in combination, at least one of them shall be present with the minimum content indicated for the grade S355J2W.
2) Grade S355J2W can contain 0.30% max “Mo” and 0.15% max “Zr“.
3) C eq (IIW) = C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15 formula is applied for S355J2W according to ladle analysis. “C eq “ value shall be 0.52 % max for all thicknesses.
4) If “Al” content > 0.020 % then Maximum “N” value does not apply.
5) For grade 50WF(345WF): Against each reduction by 0.01 % of the max “C” specified in the standard, the max “Mn” value specified in the table can be increased by 0.06 %, as long as the “Mn” value does not exceed 1.50 %.
6) 50WF(345WF) Type B is equivalent to Specification A588/A588M grade B.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e (min.) N/mm² (kg/mm²) d (thickness, mm)					R_m[2)] N/mm² (kg/mm²) d (thickness, mm)		A (%) (min.) d (thickness, mm) A_{80}			A_5		Impact (Long) Temp.	Impact (Long) KV_c min.
Standard	Grade		≤16	>16 ≤40	>40 ≤63	>63 ≤ 80	>80 ≤100	<3	≥3 ≤100	>2 ≤2,5	>2,5 ≤3	≥3 ≤40	>40 ≤63	>63 ≤100	°C	J
EN 10025-5	S355J2W[1)2)]	9952[4)5)]	355 (36.2)	345 (35.2)	335 (34.2)	325 (33.2)	315 (32.2)	510-680 (52-69.3)	470-630 (48.0-64.2)	15	16	20	19	18	-20	27
ASTM A709	50WF(345WF) TypeB[2)]		345 (35.2)					485 min. (49.5) min		A_{50} 19			A_{200} 16		-12	34[3)]

Notes

1) Bending test only made upon request. If a bending test is specified in the purchase order the test will be conducted on all material with thicknesses 6≤d≤20 mm at a bending angle of ≤ 90°. Recommended bending diameters are given below.
2) Tensile test values apply to “transverse” test pieces.
3) Minimum impact value is 41 joule for thickness greater than 50mm.
4) Only available for thickness ≥ 8 mm.
5) Can be produced as “AR” or “+N”.

Grade	Bending Direction	Recommended Bending Diameter For Nominal Thicknesses[1)] d (thickness, mm) =6	>6 ≤7	>7 ≤8	>8 ≤10	>10 ≤12	>12 ≤14	>14 ≤16	>16 ≤18	>18 ≤20
S355J2W	Transverse	10	12	16	20	25	32	36	45	50
	Longitudinal	12	16	20	25	32	36	40	50	63

Hot Rolled Flat Steel Products

Steel Grade

Structural Steel With Improved Atmospheric Corrosion Resistance

Standard : JIS G 3125:2021

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Si	Mn[1)]	P	S	Cu	Cr	Ni
Standard	Grade		max.		max.		max.			max.
JIS G 3125	SPA-H	9960	0.12	0.20-0.75	0.60	0.070-0.150	0.035	0.25-0.55	0.30-1.25	0.65

Notes

1) “Mn” upper limit may be set at 1.00 % or less by agreement between the purchaser and the supplier.

Mechanical Properties

Corresponding		Erdemir Steel Grade	Product thickness (d)	R_e N/mm² (kg/mm²) min.	R_m[1)] N/mm² (kg/mm²) min.	A (%) A_{50} min.	A (%) A_{200} min.	Bend (Long., 180°) mrb (d: thcikness)
Standard	Grade							
JIS G 3125	SPA-H	9960	d ≤6.0	355 (36.2)	490 (50.0)	22	-	0.5 d
			6.0 < d ≤ 16.0	355 (36.2)	490 (50.0)	-	15	1.5 d

Notes

1) Tensile test values apply to “longitudinal” test pieces.

Hot Rolled Structural Steel with Improved Atmospheric Corrosion Resistance

Standard : ASTM A606-18

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Si	Cu	Ni	CEV (IIW)[2)3)]
Standard	Grade		max.			max.	max.	min.		max. (%)
ASTM A606	Type4 Mod	9951	0.22	0.60-0.90	0.08-0.15	0.04	0.40	0.50	0.40-0.75	0.50

Notes

1) For each reduction of 0.01 percentage point below the specified carbon maximum, an increase of 0.06 percentage point manganese above the specified maximum is permitted, up to a maximum of 1.10%
2) Grade specified in this table is produced within the framework of agreements with customers
3) Carbon equivalent, CEV (IIW) % = C + Mn / 6 + (Cr + Mo + V) / 5 + (Ni + Cu) / 15

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² min.	R_m[1)] N/mm² (kg/mm²) min.	A (%) A_{50} min.
Standard	Grade				
ASTM A606	Type4 Mod	9951	345 (35,2)	485 (49,5)	22

Notes

1) Tensile test values apply to “longitudinal” test pieces
2) Only available for thickness below 20 mm

Steel Grade

Structural Steel For Bridges

Standard : ASTM A709-17

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C[1]	Mn[1][2]	P	S	Si[4]	V
Standard	Grade		max.		max.	max.		
ASTM A709	345F Type2	5246[3][5]	0.23	0.80-1.35	0.04	0.05	0.15-0.40	0.01-0.15

Notes

1) Against each reduction by 0.01 % of the max “C” specified in the standard, the max “Mn” value specified in the table can be increased by 0.06 %, as long as the Mn value does not exceed 1.50 %.
2) The min limit of manganese content is 0.50 % for thickness ≤ 10mm.
3) When copper is specified, a minimum of 0.20 % is required.
4) There is no limit for minimum % value of silicon less than or equal to 40mm in thickness.
5) Deoxidation method of these products is fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e (min.) N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A (%)		Impact (Long.)[2][3]				
							Minimum Test Value		Minimum avarage energy (J) Temperature		
Standard	Grade		min.	min.	A_{50} min.	A_{200} min.	Temp. °C	Energy KV_c min. J	21°C	4°C	-12°C
ASTM A709	345F Type2	5246	345 (35.2)	450 (45.9)	19	16	-30	27	34	34	34

Notes

1) Tensile test values apply to “transverse” test pieces.
2) Impact tests are not required for thickness thinner than 6 mm.
3) Minimum impact value is 33 joule for thickness ≥ 50mm.

Steel Grade

Hot Rolled High Yield Strength Steels for Cold Forming

Standard : EN 10149-2:2013

Chemical Composition (%)

Corresponding		Erdemir Steel Grade[1]	C	Mn	P	S	Si	Al	Nb[2]	Ti[2]	V[2]	Mo	B
Standard	Grade		max.	max.	max.	max.	max.	min.	max.	max.	max.	max.	max.
EN 10149-2	S315MC	4932	0.12	1.30	0.025	0.020	0.50	0.020	0.09	0.15	0.20	-	-
EN 10149-2	S355MC	4936	0.12	1.50	0.025	0.020	0.50	0.015	0.09	0.15	0.20	-	-
EN 10149-2	S355MC (CT A)	4937[3]	0.12	1.50	0.024	0.020	0.03	0.015	0.09	0.15	0.20		
EN 10149-2	S420MC	4942	0.12	1.60	0.025	0.015	0.50	0.020	0.09	0.15	0.20	-	-
EN 10149-3	S420MC (CT A)	4943	0.12	1.60	0.024	0.015	0.30	0.020	0.09	0.15	0.20	-	-
EN 10149-2	S460MC	4946	0.12	1.60	0.025	0.015	0.50	0.015	0.09	0.15	0.20	-	-
EN 10149-3	S460MC (CT A)	4947[3]	0.12	1.60	0.024	0.015	0.30	0.015	0.09	0.15	0.20	-	-
EN 10149-2	S500MC	4950	0.12	1.70	0.025	0.015	0.50	0.015	0.09	0.15	0.20	-	-
EN 10149-2	S550MC	4955	0.12	1.80	0.025	0.015	0.50	0.015	0.09	0.15	0.20	-	-
EN 10149-2	S600MC	4960	0.12	1.90	0.025	0.015	0.50	0.015	0.09	0.22	0.20	0.50	0.005
EN 10149-2	S650MC	4965[3]	0.12	2.00	0.025	0.015	0.60	0.015	0.09	0.22	0.20	0.50	0.005
EN 10149-2	S700MC	4970[3]	0.12	2.10	0.025	0.015	0.60	0.015	0.09	0.22	0.20	0.50	0.005

Notes

1) The products are supplied in “thermomechanically” rolled condition.
2) The sum of Nb, V and Ti shall be 0.22 % max.
3) These grades are in development progress in İsdemir facilities.
4) Categori A qualities are produced as Si ≤0,03 and Si+2,5P≤0,09%

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A (%)		Impact[2] KV_c (Long.)	Bend (Trans. 180°) mdb
					d<3 A_{80}	d≥3 A_5	Temp. = -20°C	(d: thickness)
Standard	Grade		min.		min.	min.	min.	
EN 10149-2	S315MC	4932	315 (32.1)	390 - 510 (39.8 - 52.0)	20	24	40	0
EN 10149-2	S355MC	4936	355 (36.2)	430 - 550 (43.9 - 56.1)	19	23	40	0.5 d
EN 10149-2	S420MC	4937	355 (36.2)	430 - 550 (43.9 - 56.1)	19	23	40	0.5 d
EN 10149-2	S420MC (CT A)	4942	420 (42.9)	480 - 620 (49.0 - 63.2)	16	19	40	0.5 d
EN 10149-2	S460MC	4943	420 (42.9)	480 - 620 (49.0 - 63.2)	16	19	40	0.5 d
EN 10149-2	S460MC (CT A)	4946	460 (46.9)	520 - 670 (53.1 - 68.4)	14	17	40	1 d
EN 10149-2	S500MC	4947	460 (46.9)	520 - 670 (53.1 - 68.4)	14	17	40	1 d
EN 10149-2	S550MC	4950	550 (56.1)	550 - 700 (56.1 - 71.4)	12	14	40	1 d
EN 10149-2	S600MC	4955	550 (56.1)	600 - 760 (61.20 - 77.5)	12	14	40	1.5 d
EN 10149-2	S650MC	4960	600 (61.2)	700 - 880 (71.4 - 89.7)	11	13	40	1.5 d
EN 10149-2	S700MC	4965[3]	650 (66.3)	700 - 880 (71.4 - 89.7)	10	12	40	2.0 d
EN 10149-2	S650MC	4970[3]	700 (71.4)	750 - 950 (76.5 - 96.9)	10	12	40	2.0 d

Notes

1) Tensile test values apply to “longitudinal” test pieces
2) The impact test is carried out only when specified at the time of enquiry and order and is not carried out for thickness thinner than 6 mm.
3) For thicknesses 8 mm the minimum yield strength can be 20 N/mm2 lower.

Steel Grade

Hot Rolled High Yield Strength Steels Suitable For Cold Forming

Standard : Miscellaneous

Chemical Composition (%)

Corresponding		Erdemir Steel Grade[2]	C max.	Mn max.	P max.	S max.	Si max.	Al min.	Nb	Ti max.
Standard	Grade									
MS.50002 / 52812	LAH420Y480T / FEE420	842[1]	0.12	1.60	0.030	0.025	0.50	0.015	0.015-0.040	0.15
MS.50002	LAH500Y560T	850[1]	0.12	1.70	0.030	0.025	0.60	0.015	0.09	0.15

Notes

1) 0.01 ≤ % Nb+Ti+V ≤ 0.22

2) Grades specified on table, are produced within the framework of agreements with customers.

Mechanical Properties

Corresponding		Erdemir Steel Grade[1]	$Rp_{0.2}$ N/mm² (kg/mm²)		R_m N/mm² (kg/mm²)	A_{80}	A_{50}	$n_{\%10-\%20}$
Standard	Grade		min.	max.	min.	(%) min.	(%) min.	min.
MS.50002 / 52812	LAH420Y480T / FEE420	842[2]	420 (42.9)	520 (53.0)	480 (49.0)	20	22	0.11
MS.50002	LAH500Y560T	850[2]	500 (51.0)	600 (61.1)	560 (57.0)	18	20	0.09

Notes

1) Tensile test values apply to “longitudinal” test pieces

2) “n” value measurement is carried out only for the products whose surfaces are cleaned with acid up to 6 mm thickness.

Hot Rolled High Yield Strength Steels Suitable For Cold Forming Based On Customer Specification

Standart : EN 10149-2:2013

Chemical Composition (%)

Corresponding		Erdemir Steel Grade [1] [2]	C max.	Mn	P max.	S max.	Si max.	Al	Nb[3] max.	Ti[3] max.	V[3] max.	Mo max.	B max.	Cu max.	Cr max.	Ni max.	N max.	Ca	Ceq max.
Standard	Grade																		
EN 10149-2	S460MC	846[4]	0.12	1.00 - 1.60	0.025	0.010	0.30	0.015-0.060	0.060	0.030	0.030	0.030	0.001	0.12	0.20	0.10	0.009	0.002-0.006	0.36

Notes

1) Grades specified on table, are produced within the framework of agreements with customers.

2) The products are supplied in “thermomechanically” rolled condition.

3) Nb + Ti + V ≤ % 0,22

4) This grade will be produced in İsdemir facilities.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e[1] N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	Elongation (%)		Impact[2] (Long)		Hardness	Bending (Trans)
					A_{80} (%) min.	A_5 (%) min.	Temp.	KVC	HV10	kmç : 180°
Standard	Grade	min.	min.		t < 3	t ≥ 3	°C	J (min.)	max.	d: thcikness
EN 10149-2	S460MC	846	470 (47.9)	520-720 (53.1-73.4)	14	17	-20	40	275	2 d

Notes

1) Tensile test values apply to “longitudinal” test pieces

2) Impact test is not carried out for thickness thinner than 6 mm.

Steel Grade

Standard : Miscellaneous

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Mn max.	P max.	S max.
Standard	Grade					
FG52806	FEP13	714	0.08	0.40	0.030	0.030

Notes

1) Chemical composition is based on DD13 grade stated in EN 10111 as referred by customer.

Mechanical Properties

Corresponding		Erdemir Steel Grade	Rp0.2 N/mm² (kg/mm2)		Rm N/mm² (kg/mm²)		A_{80} (%) min.	A_5 (%) min.	n_{90}
Standard	Grade		min.	max.	min.	max.	1.5 ≤ d < 3	3 ≤ d ≤ 8	min.
FG52806	FEP13	714	170 (17.3)	310 (31.6)	270 (27.6)	410 (41.8)	33	35	0.18

Notes

1) Tensile test values apply to “transverse” test pieces.

2) “n_{90}” value measurement is carried out only for the products whose surfaces are cleaned with acid up to 5 mm thickness.

3) The mechanical properties are valid for a period of 6 months from the date on which the products are made available.

Hot Rolled High Yield Strength Steels Suitable For Cold Forming

Standard : Miscellaneous

Chemical Composition (%)

Corresponding		Corresponding Similar Standards / Grades	Erdemir Steel Grade (1) (2) (3)	C	Mn	P Max.	S Max	Si Max	Al Min.	Nb Max.	Ti Max.	V Max.	B Max.	Mo Max.
Standard	Grade													
DBL 4041	M590 MC	EN 10149-2 S600MC	859	0.04-0.09	1.30-1.65	0.025	0.006	0.50	0.015	0.09	0.08	0.06	0.005	0.2

Notes

1) Grades specified on table, are produced within the framework of agreements with customers.

2) The products are supplied in “thermomechanically” rolled condition.

3) This grade will be produced in İsdemir facilities.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m N/mm² (kg/mm²)	Elongation % A5 min	Hardness HV10	Bend (Long) mdb: 180°
Standard	Grade		min.	min.	t ≥ 2	max.	d:thcikness
DBL 4041	M590 MC	859	590 - 690 (60.2) - (70.4)	670 - 760 (68.4) -(77.5)	18	245	2d

Notes

1- Tensile test values apply to “longitudinal” test pieces

Chemical Composition (%)

Corresponding		Erdemir Steel Grade[2]	C max.	Mn max.	P max.	S max.	Si max.	Al min.	Nb max.	Ti max.
Standard	Grade									
MS.50002	MCH600Y650T	860	0.12	1.90	0.030	0.025	0.50	0.015	0.10	0.22

Notes

1) Grades specified on table, are produced within the framework of agreements with customers.

Mechanical Properties

Corresponding		Erdemir SteelGrade[1]	$Rp_{0.2}$ N/mm² (kg/mm²)		R_m N/mm² (kg/mm²)	A_{80}	A_{50}
Standard	Grade		min.	max.	min.	(%) min.	(%) min.
MS.50002	MCH600Y650T	860	600 (61.1)	720 (73.4)	650 - 820 (66.2-83.6)	11	12

Notes

1) Tensile test values apply to “longitudinal” test pieces.

Steel Grade

Hot Rolled Dual Phases Steels Based On Customer Specification

Standard : Miscellaneous

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn[3]	P	S	Si	Ai	B	Cu	Ti+Nb	Cr+Mo
Standard	Grade		max.	max.	max.	max.	max.	max.	max.	max.	max.	max.
WSS-M1A368	HRDP600	890	0.14	2.20	0.06	0.01	1.0	0.015 - 1.0	0.01	0.20	0.15	1.0

Notes
1) This grade is produced in Isdemir facility

Mechanical Properties

Corresponding		Erdemir Grade No	R_e N/mm² (kg/mm²) min.	R_e N/mm² (kg/mm²)		A80 (%)	$n_{\%10-\%20}$	Bending (Transverse) 180°	BHI N/mm²
Standard	Grade			t ≤ 3	t > 3	min	min	(d: thickness)	min.
WSS-M1A368	HRDP600	890	330-450 (33.6-45.9)	580-680 (59.1-68.3)		19	0.13	1.0a	30

Notes
1) Tensile test values apply to “longitudinal” test pieces
2) “n” value measurement is carried out only for the products whose surfaces are cleaned with acid up to 6 mm thickness.
3) The impact test is carried out only when specified at the time of enquiry and order and is not carried out for thickness thinner than 6 mm.
4) The grade is produced up to 5 mm thickness
5) The product is supplied in “thermomechanically” rolled condition.
6) BH value is acquired by 170oC in 20 minutes.

Hot Rolled High Yield Structural Steels

Standart : EN 10025-4:2019

Chemical Composition (%)

Corresponding		Erdemir Steel Grade[1)(2)]	C max.	Mn max.	P max.	S max.	Si max.	Al[3] min.	Cr max.	Cu max.	Mo max.	Ni max.	Nb max.	Ti max.	V max.	N max.	CEV(IIW) [4)(5)] max.	
Standard	Grade																d (thickness, mm)	
																	d ≤ 16	d>16
EN 10025-4	S275M	4828[5)6)]	0.13	1.50	0.030	0.025	0.50	0.020	0.30	0.55	0.10	0.30	0.05	0.05	0.08	0.015	0.34	
	S355M	4836[5)6)]	0.14	1.60	0.030	0.025	0.50	0.020	0.30	0.55	0.10	0.50	0.05	0.05	0.10	0.015	0.39	
	S420M	4842[5)6)]	0.16	1.70	0.030	0.025	0.50	0.020	0.30	0.55	0.20	0.80	0.05	0.05	0.12	0.025	0.43	0.45
	S460M	4846[5)]	0.16	1.70	0.030	0.025	0.60	0.020	0.30	0.55	0.20	0.80	0.05	0.05	0.20	0.025	0.45	0.46

Notes
1) The products are supplied in “thermomechanically” rolled condition.
2) Only available for thickness ≤ 16 mm.
3) If sufficient nitrogen-binding elements are present, the minimum total aluminium content does not apply.
4) Carbon equivalent, CEV (IIW) % = C + Mn / 6 + (Cr + Mo + V) / 5 + (Ni + Cu) / 15
5) Max carbon equivalent (CE) is increased by 0.01 % for Si ≤ 0.25%, and 0.02 % for Si ≤ 0.030 %
6) These grades are in progress and orders are subjected to negotiation.

Mechanical Properties

Corresponding		Erdemir Steel Grade[1)]	R_e N/mm² (kg/mm²)		R_m N/mm² (kg/mm²)	A_5 (%)	Impact[2)] (Long.)		Bend[3)4)] (Trans., 180°)
			d≤16	16 < d ≤ 20			Temp.	KV_c min.	mdb
Standard	Grade		min.	min.		min.	°C	J	(d : thickness)
EN 10025-4	S275M	4828	275	265	370 - 530	24	-20	40	2 d
			(28.1)	(27.0)	(37.7 - 54.1)				
	S355M	4836	355	345	470 - 630	22	-20	40	2 d
			(36.2)	(35.2)	(47.9 - 64.3)				
	S420M	4842	420	400	520 - 680	19	-20	40	4 d
			(42.9)	(40.8)	(53.0 - 69.3)				
	S460M	4846	460	440	540 - 720	17	-20	40	4 d
			(46.9)	(44.9)	(55.1 - 73.4)				

Notes
1) Tensile test values apply to “transverse” test pieces
2) Impact test is not carried out for thickness thinner than 6 mm.
3) Bend test is not carried out for thickness greater than 12 mm.
4) Bend test is carried out only when specified at the time of enquiry and order

Steel Grade

Hot Rolled High Yield Strength Steels Suitable for Cold Forming

Standard: Miscellaneous

Chemical Composition (%)

Corresponding			Erdemir[5)] Steel Grade	C	Mn	P	S	Si	Al	Nb	Ti	V
Standard	Grade	Similar Standard / Grade				max.	max.	max.			max.	max.
EN 10149-2:2013 / 11-04-002	S315MC / HE-320 D / HE-320 DR	-	800	0.10 max.	1.10 max.	0.024	0.025	0.030	0.015-0.080	0.10 max.	0.10	0.10
WSS-M1 A346	A3 Gr.300	EN 10149-2 / S315MC	801[1)]	0.10 max.	0.60 max.	0.020	0.010	0.12	0.020-0.070	0.04 max.	0.05 max.	0.05
EN 10149-2:2013 / 11-04-002	S355MC / HE-360 D / HE-360 DR	-	810	0.11 max.	1.40 max.	0.024	0.025	0.030	0.015-0.080	0.10 max.	0.10	0.10
WSB-M1 A 215-E1	Gr.350	EN 10149-2 / S355MC	811	0.11 max.	1.30 max.	0.020	0.015	0.12	0.020-0.070	0.05 max.	0.04 max.	0.06
WSS-M1 A346	A4 Gr.350	EN 10149-2 / S355MC	812	0.09 max.	0.90 max.	0.020	0.015	0.12	0.020-0.070	0.05 max.	0.05 max.	0.02
52812	FEE 340	EN 10149-2 / S315MC	813[3)]	0.12 max.	1.50 max.	0.030	0.030	0.50	0.015 min.	0.015-0.040	-	-
WSB-M1 A 215-E1	Gr.400	EN 10149-2 / S420MC	820	0.12 max.	1.60 max.	0.020	0.015	0.12	0.020-0.070	0.07 max.	0.05 max.	0.07
E116088 / EN10149-2	HR-500Y550T / S500MC Mod	EN 10149-2 / S500MC	835[1)4)5)]	0.03-0.12	1.70 max.	0.025	0.008	0.50	-	0.10 max.	0.15 max.	0.20
11-04-002	HE 450M	-	845[6)7)]	0.17 max.	1.60 max.	0.050	0.025	0.40	0.015-0.080	0.60 max.	0.60 max.	0.60 max.
CES 002	1.0986	EN 10149-2 / S550MC	855[2)4)]	0.04-0.10	0.60-1.80	0.020	0.008	0.50	0.015-0.070	0.10 max.	0.15 max.	0.20

Notes
1) Only available for thickness ≤ 8 mm
2) N % ≤ 0.010 ; Cu % ≤ 0.25 ; Cr % ≤ 0.15 ; Ni % ≤ 0.15 ; Mo % ≤ 0.10
3) % Nb+Ti+V ≤ 0.20
4) % Nb+Ti+V ≤ 0.22
5) Cu ≤ % 0.25
6) (Nb+Ti+V) % ≤ 0.070
7) CEV (IIW) % = C + Mn / 6 + (Cr + Mo + V) / 5 + (Ni + Cu) / 15 and Ceq max 0.44%
8) Grades specified on table, are produced within the framework of agreements with customers

Soğuk Şekillendirmeye Uygun, Yüksek Akma Dayanımlı, Sıcak Haddelenmiş Çelikler

Kimyasal Bileşim (%)

Corresponding		Erdemir Steel Grade	C max.	Mn max.	P max.	S max.	Si max.	Al max.	Nb max.	Ti max.	V max.
Standard	Grade										
KB01	MC300	4933	0.12	1.20	0.025	0.020	0.50	0.02	0.09	0.15	0.20

Notes
1) The products are supplied in “thermomechanically rolled” condition
2) Nb + Ti + V ≤ % 0,22
3) Grades specified on table, are produced within the framework of agreements with customers

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²) min.	R_m N/mm² (kg/mm²) min.	Ekıngation (%) min. A_{80} min	Bend (Longitudinal, 180°) mdb
Standard	Grade		min.	min.	d (thickness, mm)	d (thickness, mm)
KB01	MC300	4933	300	390	26	0

Notes
1) Tensile test values apply to “longitudinal” test pieces
2) Grades specified on table, are produced within the framework of agreements with customers

Hot Rolled High Yield Strength Steels Suitable for Cold Forming

Standard: Miscellaneous

Mechanical Properties

Corresponding			Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{50} (%)	A_{80} (%)	A_5 (%)	Impact[3] KV_5(Long.) Temp. = -20°C	Bend[7] (Trans.,180°) D/a (mdb)	n_{90}[8]
Standard	Grade	Similar Standard / Grade				min.	min. (t<3)	min. (t≥3)	min.	min.	min.
EN 10149-2:2013 /11-04-002	S315MC / HE-320 D / HE-320 DR	-	800[2)(4)]	320-390 (32.7-39.7)	410-480 (41.8-49.0)	-	24	28	40 J	0	0.14 (d<3)
WSS-M1 A346	A3 Gr.300	EN 10149-2 / S315MC	801	300-350 (30.6-35.7)	400 min. (40.8)	28	-	-	-	-	-
EN 10149-2:2013 / 11-04-002	S355MC / HE-360 D / HE-360 DR	-	810[2)(4)]	360-440 (36.7-44.8)	445-520 (45.4-53.1)	-	23	27	40 J	0.5	0.13 (d<3)
WSB-M1 A 215-E1	Gr.350	EN 10149-2 / S355MC	811	350-450 (35.7-45.9)	430 min. (43.9)	25	-	-	-	-	-
WSS-M1 A346	A4 Gr.350	EN 10149-2 / S355MC	812	350-400 (35.7-40.8)	430 min. (43.9)	25	-	-	-	-	-
52812	FEE 340	EN 10149 / S315MC	813	340-420 (34.7-42.8)	410 min. (41.8)	-	23	23	-	0.5	-
WSB-M1 A 215-E1	Gr.400	EN 10149-2 / S420MC	820	400-500 (40.8-51.0)	460 min. (46.9)	22	-	-	-	-	-
E116088 / EN10149-2	HR-500Y550T / S500MC Mod	EN 10149-2 / S500MC	835	500 min (51.0)	550-670 (56.1-68.4)	-	16	20	-	1.0	-
11-04-002	HE 450M	-	845[1)(9)(10)]	450 - 540 (45.9-55.1)	560 - 640 (57.0-65.2)	-	17	22	40 J	1.5	-
CES 002	1.0986	EN 10149-2 / S550MC	855[4)(6)]	550 min. (56.1)	600-720 (61.2-73.3)	-	14	20	40 J	1.5	-

Notes
1) Tensile test values apply to “longitudinal” test pieces.
2) Re / Rm is ≤ 0.88.
3) Impact test only made for material thicknesses of min 6mm, upon request.
4) The mechanical properties are valid for a period of 6 months from the date on which the products are made available.
5) Ag ≥ 9
6) Ag ≥ 7
7) The bending test is carried out only when specified at the time of enquiry and order
8) “n” value measurement is carried out only when specified at the time of enquiry and order and for the products whose surfaces are cleaned with acid up to 5 mm thickness.
9) “n” value measurement is carried out only when specified at the time of enquiry and order and for the products whose surfaces are cleaned with acid up to 3 mm thickness and min 0.11.
10) $Rt_{0,5}/Rm \leq 0.90$

Hot Rolled High Yield Strength Low Alloy Steels for Automotive Industry

Standard : SAE J2340-1999

Chemical Composition (%)

Corresponding			Erdemir Steel Grade	C max.	P max.	S max.	Cu max.	Ni max.	Cr max.	Mo max.	V[2)] min.	Nb[2)] min.	Ti[2)] min.
Standard	Grade	Similar Standard / Grade											
SAE J2340	340XF	EN 10149-2 / S355MC	4634	0.02-0.13	0.06	0.015	0.20	0.20	0.15	0.06	0.005	0.005	0.005
SAE J2340	420XF	EN 10149-2 / S420MC	4642	0.02-0.13	0.06	0.015	0.20	0.20	0.15	0.06	0.005	0.005	0.005

Notes
1) % Cu + Ni + Cr + Mo ≤ 0.50
2) V, Nb, Ti can be added seperately or in various combinations as indicated in the table.

Mechanical Properties

Corresponding			Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m [1] N/mm² (kg/mm²)	A_{50} (%) min.	
Standard	Grade	Similar Standard / Grade				t<2.50	t≥2.50
SAE J2340	340XF	EN 10149-2 / S355MC	4634	340-440	410	23	25
SAE J2340	420XF	EN 10149-2 / S420MC	4642	420-520	490	20	22

Notes
1) Tensile test values apply to “longitudinal” test pieces

Hot rolled steels for wheel manufacturing based on customer specification

Standard : Miscellaneous

Chemical Composition (%)

Corresponding			Erdemir Steel Grade	C max.	Mn max.	P max.	S max.	Si max.	Al	N max.	Nb max.	Cu+Cr+Ni max.
Standard Material Quality	Grade	Similar Standart/Grade										
JMW	MW01	Unalloyed Structural Steel	3901	0.025-0.130	0.150-0.575	0.020	0.020	0.05	max. 0.05	-	-	-
JMW	MW05	EN 10149-2 / S420MC	3905	0.10	1.40	0.025	0.015	0.12	max 0.06	-	0.065	-
MW GL-012	1932-01	Unalloyed Structural Steel	3922[1)(2)(4)]	0.14	0.70	0.020	0.012	0.10	0.020-0.070	0.009	0.09	0.30
MW GL-040	1932-11A	EN 10025-2 / S235JR	3937[1)(2)]	"0.03-0.09(t<8mm) 0.17(t≥8mm)"	0.20-0.85	0.020	0.012	0.15	0.015-0.070	0.011	-	0.45
MW GL-040	1953-14A	EN 10025-2 / S355J2	3938[1)(3)(7)]	0.21	1.60	0.025	0.015	0.17	0.015-0.070	0.012	0.025	0.45
MW/HL3 MS-03	1937-02	Unalloyed Structural Steel	3940[6)]	0.10	0.80	0.020	0.015	0.05	0.015-0.070	0.009	0.09	0.30
MW GL-040	1937-11A	EN 10025-2 / S275JR	3944[1)(2)]	0.10-0.20	1.30	0.020	0.012	0.15	0.015-0.070	0.011	-	0.45
MW GL-012	1937-03	EN 10025-2 / S275JR	3946[1)(2)(4)]	0.19	1.25	0.020	0.015	0.10	0.020-0.070	0.009	0.09	0.30
MW GL-012/040	1953-02/11A	EN 10149-2/EN 10025-2 S355MC/ S355J2"	3949[1)(2)(4)]	0.10-0.19	0.80-1.60	0.025	0.010	0.30	0.020-0.070	0.009	0.04	0.30
MW GL-012/040	2242-03/11A	EN 10149-2 / S420MC	3957[1)(2)(5)]	0.12	1.60	0.025	0.010	0.10	0.015-0.060	0.008	0.03-0.09	0.45
MW GL-012/ JMW	2661-01/MW06	DP600/MW06 (Dual faz ferrit-martenzit)	3660[8)]	0.10	1.40	0.085	0.008	0.30	0.020-0.060	0.009	0.09	1.30
MW GL-012/040	6000-03/11A	EN 10149-2 / S460MC	3960[1)(2)(5)]	0.10	1.60	0.020	0.008	0.15	0.020-0.060	0.009	0.09	0.45

Notes
1) Sn max % 0.02
2) Cu max % 0.15
3) Cu max % 0.20
4) Ti max % 0.15 and the sum of Nb + Ti + V shall be % 0.22 max.
5) Ti max %0.10 and V max 0.12. The sum of Nb + Ti + V shall be % 0.22 max.
6) Sn max % 0.02 and Ti max % 0.22. The sum of Nb + Ti + V shall be % 0.22 max.
7) The ratio of Mn/Si shall be 5-25.
8) This grade will be produced in İsdemir facilities.
9) Grades specified in this table are produced within the conditions in the table as suitable for chemical and mechanical properties which are mentioned according to only relevant standard specification.

Hot rolled steels for wheel manufacturing based on customer specification

Standard : Miscellaneous

Mechanical Properties

Corresponding		Steel Grade	Tensile test[7] pieces direction	R_e N/mm² (kg/mm²)	Rm N/mm² (kg/mm²)		Elongation (%)		Bend (trans. 180°) mdb (d : thickness)	Impact (long.)		
					t ≤ 3	t ≤ 3	A5 min.			Temp °C	KVc min. J	
Standard	Grade											
JMW	MW01	3901[1][7]	Transverse	240 - 340 (24.5 - 34.6)	360-470 (36.7 - 47.9)	340-470 (34.7 - 47.9)	A_{80} min 26(t ≤ 3)	A_5 min 28 (t > 3)	-	+20	27	
JMW	MW05	3905[1][4]	Transverse	420-530 (42.8-54.1)	470-600 (47.3-61.2)		A_{80} min 18 (t ≤ 3)	A_5 min 22 (t > 3)	-	-20	27	
MW GL-012	1932-01	3922	Transverse	235-320 (24.0-32.6)	350-430 (35.7-43.8)		35			0.5a	-	-
MW GL-040	1932-11A	3937	Transverse	min 235 (24.0)	350-510 (35.7-51.0)		25			0.5a	-	-
MW GL-040	1953-14A	3938	Transverse	min 300 (30.6)	430-570 (43.9-57.1)		21			0.5a	-	-
MW/HL3 MS-03	1937-02	3940[2]	Transverse	280-350 (28.6-35.7)	390-460 (39.8-46.9)		28			0.5a	-	-
MW GL-040	1937-11A	3944	Transverse	min 275 (28.1)	410-560 (41.8-57.1)		21			0.5a	-	-
MW GL-012	1937-03	3946[3]	Transverse	290-420 (29.6-42.8)	420-500 (42.9-51.0)		29			0.5a	-	-
MW GL-012/040	1953-02/11A	3949	Transverse	330-410 (33.7-49.9)	480-570 (49.0-58.2		25			2.0a	-	-
MW GL-012/040	2242-03/11A	3957[6]	Longitudinal	420 min. (42.9)	480-600 (49.0-61.2)		24			0.5a	-	-
MW GL-012/JMW	2661-01/MW06	3660[1][2][6]	Longitudinal	300-470 (30.6-47.9)	580-670 (59.2-68.4)		24			1.0a	-20	40
MW GL-012/040	6000-03/11A	3960(6)	Longitudinal	450-550 (45.9-56.1)	550-650 (56.1-66.3)		22			0.5a	-	-

Notes

1) The impact test is carried out only when specified at the time of enquiry and order and is not carried out for thickness thinner than 6 mm.
2) Only available for thickness ≤ 5 mm.
3) Only available for thickness ≤ 8 mm.
4) Only available for thickness < 4 mm.
5) Only available for thickness < 6 mm.
6) The grades are supplied in “thermomechanically rolled” condition
7) Values specified in this table are guaranteed on the tests made in the specified direction of the sample.

Wheel Steels With Low Strength

Standard: EN 10111:2008

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C[2] max.	Mn[2] max.	P[2] max.	S max.	Si[2] max.	Al[2] min.	Nb[2] max.	Cu[1][2] max.	Sn[1][2] max.	Pb[1][2] max.	Zn[1][2] max.	Ni[1][2] max.	Cr[1][2] max.
Standard	Grade														
EN 10111	DD13 Mod	3923[2]	0.10	0.45	0.035	0.030	0.30	0.020	0.004	0.20	0.03	0.01	0.02	0.10	0.10

Notes

1) Values specified in table is valid for orders with thickness equal and lower than 8 mm.
2) Grade specified on table, is produced within the framework of agreements with customers

Mechanical Properties

Corresponding		Erdemir Steel Grade	Re N/mm² (kg/mm²) min.	Rm[1] N/mm² (kg/mm²)	A (%) min.		Hardness HRB max
Standard	Grade				A_{80} t<3 mm	A_5 t≥3 mm	
EN 10111	DD13 Mod	3923[2]	210 (21.4)	300 - 410 (30.6 - 41.8)	38	38	66

Notes

1) Tensile test values apply to “transverse” test pieces.
2) Mechanical properties specified on the table are guaranteed for 6 months beginning from the date which products are made available.

Hot Rolled Flat
Steel Products

Steel Grade

Steel Grade

High, Medium Strength Steels for Automotive Industry, Mostly for Discs

Standard : EN 10025-2:2019

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C d (thickness, mm)		Mn	P	S	Si	Cu	N[1]	CEV (IIW)[3] max. (%)
Standard	Grade		≤ 16 max.	16<d≤25 max.	max.	max.	max.		max.	max.	d (thickness, mm) ≤ 25
EN 10025-2	S235J2	3936[3]	0.17	0.17	1.40	0.025	0.025	-	0.55	-	0.35
EN 10025-2	S275J2	3945[3][4]	0.18	0.18	1.50	0.025	0.025	-	0.55	-	0.40

Notes

1) The maximum value for nitrogen does not apply if the chemical composition shows a minimum total aluminium content of 0.020%. Minimum aluminium to nitrogen ratio is 2:1.
2) Carbon equivalent, CEV (IIW) % = C + Mn / 6 + (Cr + Mo + V) / 5 + (Ni + Cu) / 15
3) If Cu %: 0.25-0.40, max carbon equivalent (CEV) is increased 0.02 % within the framework of agreements with customers.
4) Max carbon equivalent (CE) is increased by 0.01 % for Si ≤ 0.25%, and 0.02 % for Si ≤ 0.030 %

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)		R_m[1] N/mm² (kg/mm²)		A (%, min.) d (thickness, mm)					Impact[2][3] Long.	
							A_{80}				A_5	Temp.	KV_c min.
Standard	Grade		d≤16 min.	16<d≤25 min.	d<3	3≤d≤25	>1 ≤1.5	>1.5 ≤2	>2 ≤2.5	>2.5 <3	≥3 ≤40	°C	J
EN 10025-2	S235J2	3936	235 (24.0)	225 (23.0)	360 - 510 (36.7 - 52.0)	360 - 510 (36.7 - 52.0)	16	17	18	19	24	-20	27
EN 10025-2	S275J2	3945	275 (28.1)	265 (27.0)	430 - 580 (43.9 - 59.2)	410 - 560 (41.8 - 57.1)	14	15	16	17	21	+20	27

Notes

1) Tensile test values apply to “transverse” test pieces
2) Impact test is carried out only when specified at the time of enquiry and order
3) Impact test is not carried out for thickness thinner than 6 mm.
4) Grades including J2 notations could be normalized or equivalent to normalized rolling ,
5) Grades specified on table, are produced within the framework of agreements with customers.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	N/mm² (kg/mm²)	Ekıngation (%)	Bend
					A_{80} min	(Longitudinal, 180°) mdb
Standard	Grade		min.		(d: thickness)	(d: thickness)
KB01	MC300	4933	300	390	26	0

Notes

1) Tensile test values apply to “longitudinal” test pieces
2) Grades specified on table, are produced within the framework of agreements with customers

Wheel Steels with High Strength

Standard : EN 10149-2:2013

Chemical Composition (%)

Corresponding		Erdemir Steel Grade[1]	C	Si	Mn	P	S	Al	Nb[2]	Ti[2]	V[2]
Standard	Grade		max.	max.	max.	max.	max.	min.	max.	max.	max.
EN 10149-2	S355MC	3955	0.12	0.50	1.50	0.025	0.020	0.015	0.09	0.15	0.20

Notes

1) The products are supplied in “thermomechanically” rolled condition.
2) ‘Ni + V + Ti’ : ≤ 0.22 %.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A (%)		Impact[2][3] (Long.)		Bend (Trans., 180°)
Standard	Grade		min.		d<3 A_{80} min.	d≥3 A_5 min.	Temp. °C	KV_c min. J	mdb (d: thickness)
EN 10149-2	S355MC	3955	355 (36.2)	430 - 550 (43.9 - 56.1)	19	23	-20	40	0.5 d

Notes

1) Tensile test values apply to “longitudinal” test pieces.
2) Impact test is carried out only when specified at the time of enquiry and order.
3) Impact test is not required for thickness thinner than 6 mm.

Steel Grade

Ordinary-strength Hull Structural Steels for Shipbuilding

Standard : ABS-Part 2-2021

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Si	Al
Standard	Grade		max.	min.	max.	max.	max.	min.
ABS - P2	A	3701[1)4)]	0.21	2.5 x C	0.035	0.035	0.50	-
ABS - P2	B	3702[1)2)4)]	0.21	0.80	0.035	0.035	0.35	-
ABS - P2	D	6704[1)3)]	0.21	0.60	0.035	0.035	0.10-0.35	0.020
ABS - P2	E	6705[1)]	0.18	0.70	0.035	0.035	0.10-0.35	0.020

Notes

1) C + (Mn/6) ≤ 0.40 %.
2) When impact test is carried out, the minimum manganese content may be reduced to 0.60 %.
3) Where the content of soluble aluminum is not less than 0.015%, the minimum required silicon content does not apply.
4) Deoxidation methods of these products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1)] N/mm² (kg/mm²)	A_{200}[2)] (%)
Standard	Grade		min.		min.
ABS - P2	A	3701	235 (24.0)	400 - 520 (40.8 - 53.0)	22
ABS - P2	B	3702	235 (24.0)	400 - 520 (40.8 - 53.0)	22
ABS - P2	D	6704	235 (24.0)	400 - 520 (40.8 - 53.0)	22
ABS - P2	E	6705	235 (24.0)	400 - 520 (40.8 - 53.0)	22

Notes

1) Tensile test values apply to “transverse” test pieces.
2) Elongation % values specified in this table are applicable for thickness “40 < d ≤ 50” mm. Elongation % is 21 for thickness “30 < d ≤ 40” mm., 20 for “25 < d ≤ 30” mm., 19 for “20 < d ≤ 25” mm., 18 for “15 < d ≤ 20”mm., 17 for “10 < d ≤ 15”mm., 16 for “5 < d ≤ 10”mm., 14 for “d ≤ 5” mm.

Impact (Longitudinal)[1)2)] KV_c (J) Min.				
Grade	Erdemir Steel Grade	Temperature (°C)	d(mm)≤50	50<d(mm)≤60
A	3701	20	-	34
B	3702[3)]	0	27	34
D	6704	-20	27	34
E	6705	-40	27	34

1) Impact energy values for “full size” (10 X 10 mm) test specimens for thinner products, impact energy values decreases depending on the thickness.
2) Impact test is not required for thickness thinner than 6 mm.
3) Impact test is not carried out for thickness thinner than 25,01 mm

Steel Grade

High-Strength Hull Structural Steels For Shipbuilding

Standard : ABS-Part2-2021

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Si	Mn	P	S	Al[1)]	Cr	Cu	Mo	Nb[1)]	Ni	Ti	V[1)]
Standard	Grade		max.	max.		max.	max.	min.	max.	max.	max.		max.	max.	
ABS - P2	AH32	3732	0.18	0.50	0.90-1.60	0.035	0.035	0.020	0.20	0.35	0.08	0.02 - 0.05	0.40	0.02	0.05 - 0.10
ABS - P2	DH32	4732	0.18	0.50	0.90-1.60	0.035	0.035	0.020	0.20	0.35	0.08	0.02 - 0.05	0.40	0.02	0.05 - 0.10
ABS - P2	EH32	5732	0.18	0.50	0.90-1.60	0.035	0.035	0.020	0.20	0.35	0.08	0.02 - 0.05	0.40	0.02	0.05 - 0.10
ABS - P2	FH32	6732[2)]	0.16	0.50	0.90-1.60	0.025	0.025	0.020	0.20	0.35	0.08	0.02 - 0.05	0.80	0.02	0.05 - 0.10

Notes

1) The indicated amount of aluminum, niobium and vanadium applies when any such element is used singly.
2) Nitrogen (N) content is 0.012 % max.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1)] N/mm² (kg/mm²)	A_{200}[2)] (%)
Standard	Grade		min.		min.
ABS - P2	AH32	3732	315 (32.2)	440-590 (44.9-60.1)	22
ABS - P2	DH32	4732	315 (32.2)	440-590 (44.9-60.1)	22
ABS - P2	EH32	5732	315 (32.2)	440-590 (44.9-60.1)	22
ABS - P2	FH32	6732	315 (32.2)	440-590 (44.9-60.1)	22

Notes

1) Tensile test values apply to “transverse” test pieces.
2) Elongation % values specified in this table are applicable for thickness “40 < d ≤ 50” mm. Elongation % is 21 for thickness “30 < d ≤ 40” mm., 20 for “25 < d ≤ 30” mm., 19 for “20 < d ≤ 25” mm., 18 for “15 < d ≤ 20”mm., 17 for “10 < d ≤ 15”mm., 16 for “5 < d ≤ 10”mm., 14 for “d ≤ 5” mm.

Impact (Longitudinal)[1)2)] KV_c (J) Min.				
Grade	Erdemir Steel Grade	Temperature (°C)	d(mm)≤50	50<d(mm)≤60
AH32	3732	0	31	38
DH32	4732	-20	31	38
EH32	5732	-40	31	38
FH32	6732	-60	31	38

1) Impact energy values for “full size” (10 X 10 mm) test specimens for thinner products, impact energy values decreases depend on the specimen sizes.
2) Impact tests are not required for thickness thinner than 6 mm.

High-Strength Hull Structural Steels

Standard : ABS-Part2-2020

Chemical Composition (%)

Corresponding		Erdemir	C	Si	Mn	P	S	Al[1]	Cr	Cu	Mo	Nb[1]	Ni	Ti	V[1]	Ca
Standard	Grade	Steel Grade	max.	max.		max.	max.	min.	max.	max.	max.		max.	max.		max.
ABS - P2	AH36	3736	0.18	0.50	0.90-1.60	0.035	0.035	0.020	0.20	0.35	0.08	0.02 - 0.05	0.40	0.02	0.05 - 0.10	0.005
ABS - P2	DH36	4736	0.18	0.50	0.90-1.60	0.035	0.035	0.020	0.20	0.35	0.08	0.02 - 0.05	0.40	0.02	0.05 - 0.10	0.005
ABS - P2	EH36	5736	0.18	0.50	0.90-1.60	0.035	0.035	0.020	0.20	0.35	0.08	0.02 - 0.05	0.40	0.02	0.05 - 0.10	0.005
ABS - P2	FH36	6736[2]	0.16	0.50	0.90-1.60	0.025	0.025	0.020	0.20	0.35	0.08	0.02 - 0.05	0.80	0.02	0.05 - 0.10	0.005

Notes

1) The specified values for aluminium, niobium and vanadium apply when any such element is used singular.
2) Nitrogen (N) content is 0.012 % max.

Mechanical Properties

Corresponding		Erdemir	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{200}[2] (%)
Standard	Grade	Steel Grade	min.		min.
ABS - P2	AH36	3736	355 (36.2)	490-620 (50.0-63.2)	21
ABS - P2	DH36	4736	355 (36.2)	490-620 (50.0-63.2)	21
ABS - P2	EH36	5736	355 (36.2)	490-620 (50.0-63.2)	21
ABS - P2	FH36	6736	355 (36.2)	490-620 (50.0-63.2)	21

Notes

1) Tensile test values apply to “transverse” test pieces.
2) Elongation % values specified on the table are applicable for thickness “40 < d ≤ 50” mm. Elongation % is 20 for thickness “30 < d ≤ 40” mm., 19 for “25 < d ≤ 30” mm., 18 for “20 < d ≤ 25” mm., 17 for “15 < d ≤ 20”mm., 16 for “10 < d ≤ 15”mm., 15 for “5 < d ≤ 10”mm., 13 for “d ≤ 5” mm.

Impact (Long.)[1][2] KV_c (J) Min.				
Grade	Erdemir Steel Grade	Temperature (°C)	d(mm)≤50	50<d(mm)≤60
AH36	3736	0	34	41
DH36	4736	-20	34	41
EH36	5736	-40	34	41
FH36	6736	-60	34	41

1) Impact energy values for “full size” (10 X 10 mm) test specimens for thinner products, impact energy values decreases depend on the specimen sizes.
2) Impact tests are not required for thickness thinner than 6 mm.

Hot Rolled Steel For Welded Gas Cylinders (LPG Tubes)

Standard :EN 10120:2017

Chemical Composition (%)

Corresponding		Erdemir	C	Si	Mn	P	S	Al	N[2]	Nb	Ti
Standard[1]	Grade	Steel Grade	max.	max.	min.	max.	max.	min.	max.	max.	max.
EN 10120	P245NB	6837	0.16	0.25	0.30	0.025	0.015	0.020	0.009	0.050	0.03
EN 10120	P265NB	6842	0.19	0.25	0.40	0.025	0.015	0.020	0.009	0.050	0.03
EN 10120	P310NB	6847	0.20	0.50	0.70	0.025	0.015	0.020	0.009	0.050	0.03
EN 10120	P310NB Mod	6848[3]	0.20	0.50	0.70	0.025	0.015	0.020	0.009	0.050	0.03
EN 10120	P355NB	6852	0.20	0.50	0.70	0.025	0.015	0.020	0.009	0.050	0.03

Notes

1) This standard is equivalent to the ‘NF EN 10120’ standard that substitutes BS1, BS2, BS3, BS4 grades.
2) If (Al / N) % ≥ 2.2 or if Nb and/or Ti additions are applied, the nitrogen content may be 0.012 % max .
3) Unit Cracking Sensivitiy (UCS) max. 0,30. (UCS = 230C* + 190%S + 75%P + 45%Nb - 12,3Si - 5,4%Mn - 1)
   For C* value; if %C≥0,08 then C is 0,08%

Mechanical Properties

Corresponding		Erdemir	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A (%)	
Standard	Grade	Steel Grade	min.		d<3 A_{80} min.	3≥d≥5 A_5 min.
EN 10120	P245NB	6837	245 (25.0)	360 - 450 (36.7 - 45.9)	26	34
EN 10120	P265NB	6842	265 (27.0)	410 - 500 (41.8 - 51.0)	24	32
EN 10120	P310NB	6847	310 (31.6)	460 - 550 (46.9 - 56.1)	21	28
EN 10120	P310NB MOD	6848	310 (31.6)	460 - 550 (46.9 - 56.1)	21	-
EN 10120	P355NB	6852	355 (36.2)	510 - 620 (52.0 - 63.2)	19	24

Notes

1) Tensile test values apply to “transverse” test pieces.

Steel Grade

Steel Suitable For Usage Under Low Pressure

Standard: EN 10207:2005

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Si	Mn	P	S	Al[1]
Standard	Grade		max.	max.		max.	max.	min.
EN 10207	P275SL	6340	0.16	0.40	0.50-1.50	0.025	0.020	0.020

Notes

1) If chemical composition includes Nb, Ti or V, the minimum total aluminium content does not apply.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)			R_m[1] N/mm² (kg/mm²)	A_{80} (%)		A_5 (%)	Impact[3] (Long.)		$R_{p0.2}$[1][2] N/mm² (kg/mm²)
			d≤16	16<d≤40	40<d≤60		2<d≤2.5	2.5<d<3	3≤d≤60	Temp.	KV_c	Temp = 300°C
Standard	Grade		min.	min.	min.		min.	min.	min.	°C	J	d≤60 min.
EN 10207	P275SL	6340[4]	275 (28.1)	265 (27.0)	255 (26.0)	390 - 510 (39.8 - 52.0)	17	18	22	-50	28	132 (13.5)

Notes

1) Tensile test values apply to “transverse” test pieces.
2) The tensile test for proof strength at elevated temperature is carried out on request.
3) Impact test is not required for thickness thinner than 6 mm.
4) Only available for thickness ≤ 8 mm.

Steel Grade

Carbon Steel with Intermediate Tensile Strength for Pressure Vessels

Standard : ASTM A285-2017

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S
Standard	Grade		max.	max.	max.	max.
ASTM A285	C	6838	0.28	0.90	0.025	0.025

Mechanical Properties

Corresponading		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A (%)	
Standard	Grade		min.		A_{50} min.	A_{200} min.
ASTM A285	C	6838	205 (20.9)	380-515 (38.8-52.5)	27	23

Notes

1) Tensile test values apply to “transverse” test pieces.

Steel Grade

Steel For Pressure Vessels

Standard : LR-2-2008 (Lloyd's Register of Shipping)

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C[2]	Si	Mn	P	S	Al[3]	Cr[1]	Cu[1]	Mo[1]	Ni[1]
Standard	Grade		max.			max.	max.	min.	max.	max.	max.	max.
LR - P2	490FG	6850	0.20	0.10-0.50	0.90-1.60	0.035	0.035	0.018	0.25	0.30	0.10	0.30

Notes

1) 'Cr + Cu + Mo + Ni' : ≤ 0.70 %
2) Carbon content is 0,22% max for thicknesses grater than 30mm.
3) Nb, V or other suitable grain refining elements may be used either in place of or in addition to aluminium.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)		R_m[1] N/mm² (kg/mm²)	A_5 (%)	$R_{p0.2}$[2] N/mm² (kg/mm²)
			3<d≤40	40<d≤50			Temp. =300°C
Standard	Grade		min.	min.		min.	min.
LR-P2	490FG	6850	315 (32.1)	305 (31.1)	490-610 (50.0-62.2)	21	192 (19.6)

Notes

1) Tensile test values apply to "transverse" test pieces.
2) The tensile test for proof strength at elevated temperature is carried out on request.

Steel Grade

Hot Rolled Carbon Steels for Pressure Purposes at Moderate and Lower Temperature Services

Standard : ASTM A516-17

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C[1]			Mn[1][5]		P	S	Si	Cu	Ni	Cr	Mo	V	Nb	Ti
			d≤12.5	12.5<d≤50	50<d≤100	d≤12.5	d>12.5										
Standard	Grade		max.	max.	max.	max.	max.	max.	max.		max.	max.	max.	max.	max.	max.	max.
ASTM A516	55	6855[3]	0.18	0.20	0.22	0.60-0.90	0.60-1.20	0.025	0.025	0.15-0.40	0.40	0.40	0.30	0.12	0.03	0.02	0.03
ASTM A516	60	6860[3]	0.21	0.23	0.25	0.60-0.90	0.85-1.20	0.025	0.025	0.15-0.40	0.40	0.40	0.30	0.12	0.03	0.02	0.03
ASTM A516	65	6865[3]	0.24	0.26	0.28	0.85-1.20	0.85-1.20	0.025	0.025	0.15-0.40	0.40	0.40	0.30	0.12	0.03	0.02	0.03
ASTM A516	70	6870[3]	0.27	0.28	0.30	0.85-1.20	0.85-1.20	0.025	0.025	0.15-0.40	0.40	0.40	0.30	0.12	0.03	0.02	0.03

Notes

1) For each reduction of 0.01 percentage point below the specified maximum for carbon, an increase of 0.06 percentage point above the specified maximum for manganese is permitted up to a maximum of 1.50% by heat analysis and 1.60% by product analysis.
2) Grade 6860 products 12.5mm and under in thickness may have 0.85-1.20 % manganese on heat analysis and 0.79-1.30 % manganese on product analysis.
3) Deoxidation methods of all products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding		Erdemir[2] Steel Grade	R_e N/mm² (kg/mm²) min.	R_m[1] N/mm² (kg/mm²)	A (%)	
					A_{50}	A_{200}
Standard	Grade				min.	min.
ASTM A516	55	6855	205 (20.9)	380-515 (38.8-52.6)	27	23
ASTM A516	60	6860	220 (22.4)	415-550 (42.3-56.1)	25	21
ASTM A516	65	6865	240 (24.5)	450-585 (45.9-59.7)	23	19
ASTM A516	70	6870	260 (26.5)	485-620 (49.5-63.3)	21	17

Notes

1) Tensile test values apply to "transverse" test pieces.
2) Plates with thicknesses over 40 mm are "normalized". Material with thicknesses less than 40 mm that are requested to recieve impact tests will be "normalized", unless otherwise specified by the customer.

Impact (Longitudinal)[1][2]							
Grade	Erdemir Steel Grade	Temp. (°C)	KVc (J) Min.	Temp. (°C)	KVc (J) Min.	Temp. (°C)	KVc (J) Min.
		d(mm) ≤ 25		25< d(mm) ≤ 50		50< d(mm) ≤ 60	
55	6855	-51	18	-51	18	-46	18
60	6860	-51	18	-46	18	-46	18
65	6865	-51	18	-46	18	-40	18
70	6870	-46	20	-40	20	-35	20

Notes

1) Impact energy values for "full size" (10 X 10 mm) test specimens for thinner products, impact energy values decreases depending on the thickness.
2) Impact test is carried out only when specified at the time of enquiry and order

Steel Grade

Hot Rolled Steels for Pipe Production

Standard : Erdemir-14

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Si	Mn	P	S	Al
Standard	Grade			max.		max.	max.	min.
Erdemir-14	6350	6350	0.19-0.25	0.18-0.32	1.10-1.60	0.025	0.020	0.020

Mechanical Properties (Intended)

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²) min.	R_m[1] N/mm² (kg/mm²)	A_5 (%) min.
Standard	Grade		d (mm) ≤ 16		
Erdemir-14	6350	6350	350 (35.7)	510-650 (52.0-66.3)	20

Notes

1) Tensile test values apply to “transverse” test pieces.

Hot Rolled Flat
Steel Products

Steel Grade

Normalized Fine Grained Steels Suitable for Pressure Purposes

Standard: EN 10028-3:2017

Chemical Composition (%)

Corresponding		Erdemir Steel Grade[6]	C	Mn	P	S	Si	Al[1][4]	N	Cr[2]	Cu[2]	Mo[2]	Nb[3]	Ni	Ti[3]	V[3]
Standard	Grade		max.		max.	max.	max.	min.	max.	max.	max.	max.	max.	max.	max.	max.
EN 10028-3	P355NH	6353	0.18	1.10-1.70	0.025	0.010	0.50	0.020	0.012	0.30	0.30	0.08	0.050	0.50	0.03	0.10
EN 10028-3	P355NL1	6355	0.18	1.10-1.70	0.025	0.008	0.50	0.020	0.012	0.30	0.30	0.08	0.050	0.50	0.03	0.10
EN 10028-3	P355NH/P355NL1	6356[5]	0.18	1.10-1.70	0.025	0.008	0.50	0.020	0.012	0.30	0.30	0.08	0.050	0.50	0.03	0.10

Notes

1) Minimum value for aluminium does not apply if the chemical composition includes additionally Nb, Ti or V.
2) ‘Cu + Cr + Mo’ : ≤ 045 %
3) ‘Nb + V + Ti’ : ≤ 0.12 %
4) If only aluminium is used for nitrogen binding, a ratio N/Al ≥ 2 shall apply.
5) Suitable for dual certification.
6) Depending on agreement, Cu + 6Sn ≤ 0,33 %

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²) d (mm)			R_m[1] N/mm² (kg/mm²)	A_5 (%)	Impact[3] (Trans.)		$R_{p0.2}$[1][2] N/mm² (kg/mm²) Temperature= 300°C		
			d≤16	16<d≤40	40<d≤60			Temp.	KV_c min.	d≤16	16<d≤40	40<d≤60
Standard	Grade		min.	min.	min.		min.	°C	J	min.	min.	min.
EN 10028-3	P355NH	6353	355 (36.2)	345 (35.2)	335 (34.2)	490 - 630 (50.0 - 64.3)	22	-20	30	232 (23.7)	225 (22.9)	219 (22.3)
EN 10028-3	P355NL1	6355	355 (36.2)	345 (35.2)	335 (34.2)	490 - 630 (50.0 - 64.3)	22	-40	27	-	-	-
EN 10028-3	P355NH / P355NL1	6356	355 (36.2)	345 (35.2)	335 (34.2)	490 - 630 (50.0 - 64.3)	22	-40	27	232 (23.7)	225 (22.9)	219 (22.3)

Notes

1) Tensile test values apply to “transverse” test pieces.
2) The tensile test for proof strength at elevated temperature is carried out on request.
3) Impact test is not required for thickness thinner than 6 mm.

Steel Grade

Steel for Manufacturing of Welded Pipes for Pressure Purposes

Standard: EN 10217-1:2002+A1:2005

Chemical Composition (%)[1]

Corresponding		Erdemir Steel Grade	C	Mn	Si	P	S	Cu
Standard	Grade		max.	max.	max.	max.	max.	max.
EN 10217-1	P235TR1	3285[1)2)4)]	0.16	1.20	0.35	0.025	0.020	0.30
EN 10217-1	P235TR1	3337[3)4)]	0.16	1.20	0.040	0.025	0.020	0.12

Notes
1) 'Cr + Cu + Mo + Ni' : ≤ 0.70 %
2) Copper alloyed steel.
3) Suitable for galvanizing with low silicon content.
4) Deoxidation method of these products is fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties[2]

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)		R_m[1] N/mm² (kg/mm²)	A_5 (%)
			1.50≤d≤16	16.0<d≤40		
Standard	Grade		min.	min.		min.
EN 10217-1	P235TR1	3285	235 (24.0)	225 (23.0)	360-500 (36.7-50.9)	23
EN 10217-1	P235TR1	3337[3)]	235 (24.0)	225 (23.0)	360-500 (36.7-50.9)	23

Notes
1) Tensile test values apply to "transverse" test pieces.
2) Mechanical properties are guaranteed on hot rolled band.
3) Available for thickness ≤ 25 mm.

Steel Grade

Unalloyed Steels for Pressure Purposes at Elevated Temperatures

Standard : EN 10028-3:2017

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Si	Mn	P	S	Al	N[3)]	Cr[1)]	Cu[1)]	Mo[1)]	Nb	Ni[1)]	Ti	V
Standard	Grade			max.		max.	max.	min.	max.	max.	max.	max.	max.	max.	max.	max.
EN 10028-2	P235GH	6335[2)]	0.16 max.	0.35	0.60-1.20	0.025	0.010	0.020	0.012	0.30	0.30	0.08	0.020	0.30	0.03	0.02
EN 10028-2	P265GH	6341[2)]	0.20 max.	0.40	0.80-1.40	0.025	0.010	0.020	0.012	0.30	0.30	0.08	0.020	0.30	0.03	0.02
EN 10028-2	P295GH	6347[2)]	0.08 - 0.20	0.40	0.90-1.50	0.025	0.010	0.020	0.012	0.30	0.30	0.08	0.020	0.30	0.03	0.02
EN 10028-2	P355GH	6352	0.10 - 0.22	0.60	1.10-1.70	0.025	0.010	0.020	0.012	0.30	0.30	0.08	0.040	0.30	0.03	0.02

Notes
1) 'Cr + Cu + Mo + Ni' : ≤ 0.70 %
2) For product thicknesses < 6 mm, a minimum manganese content of 0.20 % lower than specified is permitted.
3) A ratio N/Al ≥ 2 shall apply.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)			R_m[1] N/mm² (kg/mm²)	A_5 (%)	Impact[3)4)] (Trans.)		$R_{p0.2}$[1)2)] N/mm² (kg/mm²) Temp.= 300°C		
			d≤16	16<d≤40	40<d≤50			Temp.	KV_c			
Standard	Grade		min.	min.	min.		min.	°C	min. J	d≤16 min.	16<d≤40 min.	40<d≤50 min.
EN 10028-2	P235GH	6335	235 (24.0)	225 (22.9)	215 (21.9)	360 - 480 (36.7 - 49.0)	24	-20	27	153 (15.6)	147 (15.0)	140 (14.3)
EN 10028-2	P265GH	6341	265 (27.0)	255 (26.0)	245 (25.0)	410 - 530 (41.8 - 54.1)	22	-20	27	173 (17.6)	166 (16.9)	160 (16.3)
EN 10028-2	P295GH	6347	295 (30.1)	290 (29.6)	285 (29.1)	460 - 580 (46.9 - 59.2)	21	-20	27	192 (19.6)	189 (19.3)	186 (19.0)
EN 10028-2	P355GH	6352	355 (36.2)	345 (35.2)	335 (34.2)	510 - 650 (52.0 - 66.3)	20	-20	27	232 (23.7)	225 (22.9)	219 (22.3)

Notes
1) Tensile test values apply to "transverse" test pieces.
2) The tensile test for proof strength at elevated temperature is carried out on request.
3) Impact test is not required for thickness thinner than 6 mm.
4) Depending on agreement the minimum impact energy can be specified as 40J in the purchase order.

Alloyed Steel for Pressure Purposes at Elevated Temperatures

Standard : EN 10028-2:2017

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Si	N	Cr	Cu	Mo	Ni
Standard	Grade				max.	max.	max.	max.	max.	max.		max.
EN 10028-2	16Mo3	6345	0.12-0.20	0.40-0.90	0.025	0.010	0.35	0.012	0.30	0.30	0.25-0.35	0.30

Notes

1) Deoxidation method of these products is fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)			R_m[1] N/mm² (kg/mm²)	A_5 (%)	Impact[3][4] (Trans.)		$R_{p0.2}$[1][2] N/mm² (kg/mm²) Temperature= 300°C		
			d≤16	16<d≤40	40<d≤60			Temp.	KV_c min.	d≤16	16<d≤40	40<d≤60
Standard	Grade		min.	min.	min.		min.	°C	J	min.	min.	min.
EN 10028-2	16Mo3	6345	275 (28.1)	270 (27.6)	260 (26.5)	440 - 590 (44.9 - 60.2)	22	20	31	194 (19.8)	190 (19.4)	183 (18.7)

Notes

1) Tensile test values apply to “transverse” test pieces.
2) The tensile test for proof strength at elevated temperature is carried out on request.
3) Impact test is not required for thickness thinner than 6 mm.
4) Depending on agreement the minimum impact energy can be specified as 40J in the purchase order.

Hot Rolled Steels for Manufacturing Line Pipes of Crude Oil and Natural Gas

Standard : API 5L 46th Edition-2018/ EN ISO 3183:2019

Chemical Composition (%)

Corresponding			Erdemir Steel Grade	C[2] max.	Si max	Mn[2] max.	P max.	S max.	V max.	Nb max.	Ti max.	Others	Carbon[1] Equivalent (%)	
Standard	Specification Level[11]	Grade											CE_{IIW} max.	CE_{pcm} max.
API 5L / EN ISO 3183	PSL1	L210 / A	9030	0.22	-	0.90	0.030	0.030	-	-	-	(9)(10)	-	-
API 5L / EN ISO 3183	PSL1	L245 / B	9035	0.26	-	1.20	0.030	0.030	(3)(8)	(3)(8)	(3)	(9)(10)	-	-
API 5L / EN ISO 3183	PSL2	L245N / BN	9036[12]	0.24	0.40	1.20	0.025	0.015	(8)	(8)	0.040	(5) (9)	0.43	0.25
API 5L / EN ISO 3183	PSL1	L290 / X42	9042	0.26	-	1.30	0.030	0.030	(3)	(3)	(3)	(9)(10)	-	-
API 5L / EN ISO 3183	PSL2	L290N / X42N	9043[12]	0.24	0.40	1.20	0.025	0.015	0.06	0.05	0.040	(5) (9)	0.43	0.25
API 5L / EN ISO 3183	PSL2	L290M / X42M	9044[12]	0.22	0.45	1.30	0.025	0.015	0.05	0.05	0.040	(5) (9)	0.43	0.25
API 5L / EN ISO 3183	PSL1	L320 / X46	9046	0.26	-	1.40	0.030	0.030	(3)	(3)	(3)	(9)(10)	-	-
API 5L / EN ISO 3183	PSL2	L320N / X46N	9047[12]	0.24	0.40	1.40	0.025	0.015	0.07	0.05	0.040	(3) (5) (9)	0.43	0.25
API 5L / EN ISO 3183	PSL1	L360 / X52	9052	0.26	-	1.40	0.030	0.030	(3)	(3)	(3)	(9)(10)	-	-
API 5L / EN ISO 3183	PSL2	L360M / X52M	9053[12]	0.22	0.45	1.40	0.025	0.015	(3)	(3)	(3)	(5) (9)	0.43	0.25
API 5L / EN ISO 3183	PSL1	L390 / X56	9056	0.26	-	1.40	0.030	0.030	(3)	(3)	(3)	(9)(10)	-	-
API 5L / EN ISO 3183	PSL2	L390M / X56M	9057[12]	0.22	0.45	1.40	0.025	0.015	(3)	(3)	(3)	(5) (9)	0.43	0.25
API 5L / EN ISO 3183	PSL1	L415 / X60	9060	0.26[7]	-	1.40[7]	0.030	0.030	(4)	(4)	(4)	(9)(10)	-	-
API 5L / EN ISO 3183	PSL2	L415M / X60M	9061[12]	0.12[7]	0.45[7]	1.60[7]	0.025	0.015	(4)	(4)	(4)	(6) (9)	0.43	0.25
API 5L / EN ISO 3183	PSL1	L450 / X65	9065	0.26[7]	-	1.45[7]	0.030	0.030	(4)	(4)	(4)	(9)(10)	-	-
API 5L / EN ISO 3183	PSL2	L450M / X65M	9066[12]	0.12[7]	0.45[7]	1.60[7]	0.025	0.015	(4)	(4)	(4)	(6) (9)	0.43	0.25
API 5L / EN ISO 3183	PSL1	L485 / X70	9070	0.26[7]	-	1.65[7]	0.030	0.030	(4)	(4)	(4)	(9)(10)	-	-
API 5L / EN ISO 3183	PSL2	L485M / X70M	9071[12]	0.12[7]	0.45[7]	1.70[7]	0.025	0.015	(4)	(4)	(4)	(6) (9)	0.43	0.25
API 5L / EN ISO 3183	PSL2	L555M / X70M	9080[12][13]	0.12[7]	0.45[7]	1.85[7]	0.025	0.015	(4)	(4)	(4)	(6) (9)	0.43[7]	0.25

Notes

1) For product analysis if C % ≤ 0.12 then C equivalent formula, CE pcm % = C+(Si/30)+(Mn/20)+(Cu/20)+(Ni/60)+(Cr/20)+(Mo/15)+(V/10)+5B is applied.
   If B % < 0.0005 then B value shall not be taken into account in the formula given above and shall be accepted 0 (zero).
   For product analysis if C % > 0.12 then C equivalent formula, CE_{IIW} % = C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15 is applied.
   Carbon equivalent related to heat analysis is indicated in test certificate and also it is guaranteed in product analysis as an Erdemir practice (PSL2)
2) For each reduction of per 0.01% below the specified maximum carbon content, an increase of 0.05% above the specified maximum manganese content is permissible
   -Up to a maximum of 1.65% for grades 9030, 9031, 9035, 9036, 9042, 9043, 9046, 9047, 9052, 9053,
   -Up to a maximum of 1.75% for grades 9056, 9057, 9060, 9061, 9065, 9066
   -Up to 2.00% for grade 9070, 9071, 9080 (PSL1)(PSL2)
   -Up to 2.00% for grade 9070, 9071, 9080 (PSL1)(PSL2)
3) (Nb + V + Ti) ≤ 0.15 % (PSL1)(PSL2)
4) Unless otherwise specified; (Nb + V + Ti) ≤ 0.15 % is applied. (PSL1)(PSL2)
5) Unless otherwise specified, Cu ≤ 0.50 %, Ni ≤ 0.30 %, Cr ≤ 0.30 %, Mo ≤ 0.15 % shall be applied for grades 9036, 9043, 9047, 9053 and 9057. (PSL2)
6) Unless otherwise specified, Cu ≤ 0.50 %, Ni ≤ 0.50 %,Cr ≤ 0.50 %,Mo ≤ 0.50 % shall be applied for grades 9061,9066,9071,9080 and in addition for grade 9080 Ni ≤ 1.00%(PSL2)
7) Unless otherwise specified, these values are valid. (PSL1)(PSL2)
8) Unless otherwise specified, (Nb + V) ≤ 0.06 % is applied. (PSL1)(PSL2)
9) Unless otherwise specified, B is not added and B ≤ 0,001% is applied. (PSL1)(PSL2)
10) Cu ≤ 0.50 %; Ni ≤ 0.50 %; Cr ≤ 0.50 % and Mo ≤ 0.15 %. (PSL1)
11) Orders over 14.00mm thickness is subjected to negotiaton for PSL2 Grades.(PSL2)
12) Deoxidation methods of these products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.
13) This grade is produced at İsdemir.

Hot Rolled Steels for Manufacturing Line Pipes of Crude Oil and Natural Gas

Standard : API 5L 46th Edition-2018/ EN ISO 3183:2019

Mechanical Properties

Corresponding			Erdemir Steel Grade[6]	R_e N/mm² (kg/mm²)		R_m[1] N/mm² (kg/mm²)		Yield/Tensile $R_{t0.5}/R_m$	A_{50}[2] (%)	Impact[3][4]	
										Temp.	KVC min.
Standard	Specification Level[5]	Grade		min.	max.	min.	max.	max.	min.	°C	J
API 5L / EN ISO 3183	PSL1	L210 / A	9030	210 (21.5)	- -	335 (34.2)	- -	-	36	-	-
API 5L / EN ISO 3183	PSL1	L245 / B	9035	245 (25.0)	- -	415 (42.3)	- -	-	30	-	-
API 5L / EN ISO 3183	PSL2	L245N / BN	9036	245 (25.0)	450 (45.9)	415 (42.3)	655 (66.7)	0.93	30	0	40
API 5L / EN ISO 3183	PSL1	L290 / X42	9042	290 (29.6)	- -	415 (42.3)	- -	-	30	-	-
API 5L / EN ISO 3183	PSL2	L290N / X42N	9043	290 (29.6)	495 (50.6)	415 (42.3)	655 (66.7)	0.93	30	0	40
API 5L / EN ISO 3183	PSL2	L290M / X42M	9044	290 (29.6)	495 (50.6)	415 (42.3)	655 (66.7)	0,93	30	-	40
API 5L / EN ISO 3183	PSL1	L320 / X46	9046	320 (32.6)	- -	435 (44.4)	- -	-	28	-	-
API 5L / EN ISO 3183	PSL2	L320N / X46N	9047	320 (32.6)	525 (53.6)	435 (44.4)	655 (66.7)	0.93	28	0	40
API 5L / EN ISO 3183	PSL2	L320M / X46M	9048	320 (32.6)	525 (53.6)	435 (44.4)	655 (66.7)	0,93	28	-	40
API 5L / EN ISO 3183	PSL1	L360 / X52	9052	360 (36.7)	- -	460 (46.9)	- -	-	27	-	-
API 5L / EN ISO 3183	PSL2	L360M / X52M	9053	360 (36.7)	530 (54.1)	460 (46.9)	760 (77.5)	0.93	27	0	40
API 5L / EN ISO 3183	PSL1	L390 / X56	9056	390 (39.8)	- -	490 (50.0)	- -	-	25	-	-
API 5L / EN ISO 3183	PSL2	L390M / X56M	9057	390 (39.8)	545 (55.6)	490 (50.0)	760 (77.5)	0.93	25	0	40
API 5L / EN ISO 3183	PSL1	L415 / X60	9060	415 (42.3)	- -	520 (53.1)	- -	-	24	-	-
API 5L / EN ISO 3183	PSL2	L415M / X60M	9061	415 (42.3)	565 (57.6)	520 (53.1)	760 (77.5)	0.93	24	0	40
API 5L / EN ISO 3183	PSL1	L450 / X65	9065	450 (45.9)	- -	535 (54.6)	- -	-	24	-	-
API 5L / EN ISO 3183	PSL2	L450M / X65M	9066	450 (45.9)	600 (61.2)	535 (54.6)	760 (77.5)	0.93	24	0	54
API 5L / EN ISO 3183	PSL1	L485 / X70	9070	485 (49.5)	- -	570 (58.2)	- -	-	22	-	-
API 5L / EN ISO 3183	PSL2	L485M / X70M	9071	485 (49.5)	635 (64.8)	570 (58.2)	760 (77.5)	0.93	22	0	68
API 5L / EN ISO 3183	PSL2	L555M / X70M	9080	555 (56.7)	705 (72.0)	625 (63.8)	825 (84.2)	0.93	22	0	68

Notes

1) In Erdemir practice, test values apply to transverse specimens taken from the coil, although these test values apply to transverse specimens taken from the pipe body. (PSL1)(PSL2)
2) Elongation percentage values given on the table are valid for thickness ≥ 12,7mm. For thinner thicknesses (<12,7mm);A50 (%) = 1940 Axc0.2 / U0.9 (Axc: cross-sectional area of specimen, mm²; U: minimum tensile strength, N/mm²) formulation is applied. (PSL1)(PSL2)
3) Impact test is not carried out under 6.00 mm thickness for grades ordered as PSL2.
   For thicknesses in the range of T ≥ 6.00
   - For grades 9036, 9043, 9044, 9047, 9048, 9053 CVN impact energy values are guaranteed as specifed in standart without applying CVN impact test, however, CVN impact test may be performed “optionally” to meet CVN absorbed energy requirements of customer in case of negotiation
   - For other grades 9057, 9061, 9066, 9071, 9080 impact test is carried out.
   % Shear fracture area is not measured under 6.00mm thicknesses. For thicknesses equal or over 6.00mm, calculation of average shear fracture area is done “optionally” for pipes with diameter (D) ≤ 508mm. If pipe diameter (D) > 508mm or not specified calculation of average shear fracture area is not performed.(PSL2)
4) % Shear fracture are values are guaranteed subject to negotiation with performing DWTT providing % shear fracture area is equal or greater than 85% at 0° celcius for grades ordered as PSL2 in all thickness, results are released as separated from test report. (PSL2)
5) There are some discrepansies (increase or decrease) between the test results, according to taken specimens from coil or pipe depending on diameter, type and direction of test taken from pipe. Therefore we advise our customers to consider this issue and determine the most suitable grade for their intended production accordingly. Mechanical properties which are specified in the above table for hot rolled bands are only guaranteed on the sample taken perpendicular to the rolling direction. (PSL1) (PSL2)

Hot Rolled Steels for Manufacturing of Line Pipes for European Onshore Natural Gas Transmission

Standard : EN ISO 3183:2019 Annex A

Chemical Composition (%)

Corresponding			Erdemir Steel Grade (2)(5)(9)(10)	C[1]	Mn[1]	P	S	Si	Nb	V	Ti	CEV[6] max.	
Standard	Specification Level	Grade		max.	max.	max.	max.	max.	max.	max.	max.	CE_{Pcm}	CE_{IIW}
EN ISO 3183	PSL2	L245ME	9245	0.18	1.20	0.025	0.015	0.45	0.05	0.05	-	0.25	0.40
EN ISO 3183	PSL2	L245NE	9246	0.18	1.20	0.025	0.015	0.40	-	-	-	0.25	0.42
EN ISO 3183	PSL2	L290ME	9290	0.18	1.30	0.025	0.015	0.45	0.05	0.05	-	0.25	0.40
EN ISO 3183	PSL2	L290NE	9291	0.19	1.20	0.025	0.015	0.40	0.05	0.06	0.04	0.25	0.42
EN ISO 3183	PSL2	L360ME	9360	0.18	1.40	0.025	0.015	0.45	0.06	0.06	0.05	0.25	0.41
EN ISO 3183	PSL2	L360NE[3]	9361	0.22	1.40	0.025	0.015	0.45	0.05	0.10	0.04	0.25	0.43
EN ISO 3183	PSL2	L415ME[3][4][7]	9415	0.12[8]	1.60	0.025	0.015	0.45	0.06	0.09	0.07	0.25	0.42
EN ISO 3183	PSL2	L415NE[3][4]	9416	0.23	1.40[8]	0.025	0.015	0.45[8]	0.05[8]	0.10[8]	0.04[8]	as agreed	as agreed
EN ISO 3183	PSL2	L450ME[3][4][7]	9450	0.12[8]	1.60	0.025	0.015	0.45	0.06	0.09	0.07	0.25	0.43
EN ISO 3183	PSL2	L485ME[3][4][7]	9485	0.12[8]	1.70	0.025	0.015	0.45	0.07	0.11	0.07	0.25[8]	0.43[8]

Notes

1) For each reduction of 0.01% below the maximum carbon content an increase of 0.05% manganese above the specified maximum value is permitted with a maximum increase of 0.2%.
2) 0.015% ≤ Al(tot) < 0.060%; N≤ 0.012%; Al/N≥ 2; Cu≤ 0.25%; Ni≤ 0.30%; Cr≤ 0.30%; Mo≤ 0.10%
3) (Nb + V + Ti) ≤ 0.15%
4) For these steel grades, a molybdenum content up to 0.35% may be agreed.
5) Elements not mentioned in this table shall not be added intentionally without purchaser’s approval except for elements which may be added for deoxidation and finishing of the heat. In Erdemir practice for this grade max 60ppm Ca is added in order to inclusion modification.
6) For product analysis if C % ≤ 0.12 then C equivalent formula,
   CE pcm % = C+(Si/30)+(Mn/20)+(Cu/20)+(Ni/60)+(Cr/20)+(Mo/15)+(V/10)+5B is applied.
   If B % < 0.0005 then B value shall not be taken into account in the formula given above and shall be accepted 0 (zero).
   For product analysis if C % > 0.12 then C equivalent formula, CE_{IIW} % = C+(Mn/6)+(Cr+Mo+V)/5+(Ni+Cu)/15 is applied.
   Carbon equivalent related to heat analysis is indicated in test certificate and also it is guaranteed in product analysis as an Erdemir practice.
7) If agreed, for pipe with wall thickness ≥ 16.00mm, Cu≤0,50%, Ni≤0,50%; V+ Nb+ Ti≤0,15 restrictions and also individual restrictions for V, Nb, and Ti is not applied
8) Unless otherwise stated, these values are valid.
9) Unless otherwise specified, B is not added and B ≤ 0,001% is applied.
10) These grades except 9360, 9415 and 9485 are in development progress and orders are subjected to negotiation.

Hot Rolled Steels for Manufacturing of Line Pipes for European Onshore Natural Gas Transmission

Standard : EN ISO 3183:2019 Annex A

Mechanical Properties

Corresponding			Erdemir Steel Grade [5][7]	$R_{t0.5}$ [1] N/mm² kg/mm²	Rm[1] N/mm² kg/mm²	$R_{t0.5}/R_m$ [2] max.	A_s [1] (%) min.	Impact [1][4][6] (0 °C) KVc (Joule)		Bend Test (mdb) d : thickness
Standard	Specification Level	Grade[3][8]						min.single	min.average	
EN ISO 3183	PSL2	L245ME	9245	245-440 (25.0-44.8)	415-760 (42.3-77.5)	0.85	22	30	40	3d
EN ISO 3183	PSL2	L245NE	9246	245-440 (25.0-44.8)	415-760 (42.3-77.5)	0.80	22	30	40	3d
EN ISO 3183	PSL2	L290ME	9290	290-440 (29.6-44.8)	415-760 (42.3-77.5)	0.85	21	31	42	3d
EN ISO 3183	PSL2	L290NE	9291	290-440 (29.6-44.8)	415-760 (42.3-77.5)	0.85	21	31	42	3d
EN ISO 3183	PSL2	L360ME	9360	360-510 (36.7-52.0)	460-760 (46.9-77.5)	0.85	20	31	42	4d
EN ISO 3183	PSL2	L360NE	9361	360-510 (36.7-52.0)	460-760 (46.9-77.5)	0.85	20	31	42	4d
EN ISO 3183	PSL2	L415ME	9415	415-565 (42.3-57.6)	520-760 (53.0-77.5)	0.85	18	31	42	5d
EN ISO 3183	PSL2	L415NE	9416	415-565 (42.3-57.6)	520-760 (53.0-77.5)	0.85	18	31	42	5d
EN ISO 3183	PSL2	L450ME	9450	450-570 (45.9-58.1)	535-760 (54.5-77.5)	0.87	18	35	47	6d
EN ISO 3183	PSL2	L485ME	9485	485-605 (49.5-61.7)	570-760 (58.1-77.5)	0.90	18	46	63	6d

Notes

1) In Erdemir practice, test values apply to transverse specimens taken from the coil, although these test values apply to transverse specimens taken from the pipe body.
2) Aimed on hot band.
3) These grades are produced up to 12 mm thickness and subjected to negotation for thickness>12 mm.
4) For impact test values are based on Table G.1 from related standart.
5) Impact test is not carried out under 6.00mm thickness.
   For thicknesses in the range of T ≥ 6.00:
   - For grades 9245, 9246, 9290, 9291, 9360, 9361 CVN impact energy values are guaranteed as specifed in standart without applying CVN impact test, however, CVN impact test may be performed “optionally” to meet CVN absorbed energy requirements of customer in case of negotiation
   - For other grades 9415, 9416, 9450, 9485 impact test is carried out.
6) % Shear fracture are values are guaranteed subject to negotiation with performing DWTT providing % shear fracture area is equal or greater than 85% at 0° celcius for grades ordered as PSL2 in all thickness, results are released as separated from test report.(PSL2) in all thickness, results are released as separated from test report.(PSL2)
7) There are some discrepansies (increase or decrease) between the test results, according to taken specimens from coil or pipe depending on diameter, type and direction of test taken from pipe. Therefore we advise our customers to consider this issue and determine the most suitable grade for their intended production accordingly. Mechanical properties which are specified in the above table for hot rolled bands are only guaranteed on the sample taken perpendicular to the rolling direction.

Steels For Casing And Tubing

Standart : API 5CT-18 PSL1

Chemical Composition (%)

Corresponding			Erdemir Steel Grade	C	Mn	P max.	S max.	Si[1] max.	Al[1]	Nb[1] max.	Cr[1] max.	V[1] max.	Ti[1]	B[1]
Standard	Specification Level	Grade												
API 5CT	PSL1	H40	9240	-	-	0.030	0.030	-	-	-	-	-	-	-
API 5CT	PSL1	J55	9255	-	-	0.030	0.030	-	-	-	-	-	-	0.0007 max.
API 5CT	PSL1	J55 (Mod 1)	9256	0.23-0.28[1]	1.60 max.[1]	0.025[1]	0.020[1]	0.50	0.015-0.080	0.040	0.30	-	-	0.0007 max.
API 5CT	PSL1	J55 (Mod 2)	9257	0.25-0.30[1]	1.60 max.[1]	0.025[1]	0.020[1]	0.15-0.35	0.015-0.060	0.020 max.	0.12 max.	-	0.020-0.035	0.0008-0.0025
API 5CT	PSL1	J55 (Mod 3) (upgradeable)	9258[1][2][3][4][5]	0.24-0.29[1]	1.20-1.50[1]	0.025[1]	0.012[1]	0.40	0.015-0.060	0.020	0.12	-	0.020-0.035	0.0008-0.0030
API 5CT	PSL1	N80 Mod	9275[1]	0.15 max.[1]	1.80 max.[1]	0.025[1]	0.010[1]	0.50	0.060 max.	0.06-0.10	0.30-0.40	0.20	0.05 max.	-
API 5CT	PSL1	N80 Type1	9280(5)	-	-	0.030	0.030	-	-	-	-	-	-	-

Notes

1) Specified limit values are determined within the framework of agreements with customers.
2) Only available for thickness ≤ 18 mm.
3) A ratio Ti/B ≥ 14 shall apply.
4) A ratio Mn/Si ≥ 5 shall apply.
5) Calcium (Ca) content 0.0010 - 0.0060% shall apply.
6) Only available for thickness ≤ 10 mm.

Mechanical Properties

Corresponding			Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m N/mm² (kg/mm²) min.	A_{50} (%) min.	Impact[6]		
Standard	Specification Level	Grade					Temp. (°C)	KVC J min.	Shear Area % min.
API 5CT	PSL1	H40	9240[1][8]	276-552 (28.2-56.3)	414 (42.2)	(5)	0	20	-
API 5CT	PSL1	J55	9255[2][8]	379-552 (38.7-56.3)	517 (52.8)	(5)	21	27	-
API 5CT	PSL1	J55 (Mod 1)	9256[1]	400-570 (40.8-58.1)	550 (56.0)	28	0	27	-
API 5CT	PSL1	J55 (Mod 2)	9257[1]	400-570 (40.8-58.1)	550 (56.0)	28	0	27	-
API 5CT	PSL1	J55 (Mod 3) (upgradeable)	9258[4][7][8]	380-550 (38.8-56.1)	530 (54.1)	27	0	27	-
API 5CT	PSL1	N80 Special	9275[3][7]	550 (56.1)	660 (67.3)	14	-	-	-
API 5CT	PSL1	N80 Type1	9280[1][8][9]	552-758 (56.3-77.3)	689 (70.25)	(5)	0	27	75

Notes

1) Tensile and impact test values apply to “longitudinal” test pieces
2) Tensile and impact test values apply to “transverse” test pieces
3) Tensile test values apply to “transverse” test pieces
4) Tensile test values apply to “longitudinal” test pieces
5) A50 (%) = 1944 S00.2 / U0.9 (S0: cross)sectional area of the specimen, mm²; U: specified tensile strength, N/mm²)
6) Impact test is not carried out for thickness thinner than 6 mm.
7) Grade specified on table, is produced within the framework of agreements with customers.
8) Impact test is carried out only when specified at the time of enquiry and order.
9) Measurement of shear area is subjected to negotiation but not guaranteed.

Hot Rolled High Strength Structural Steel for Casing

Standard: Erdemir

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Si	Mn	P	S	Al	Cr	Cu	Mo	Nb	Ni	Ti
Standard	Grade		max.	max.		max.	max.	min.	max.	max.	max.	max.	max.	max.
Erdemir-2005	9500	9500	0.16	0.50	1.50-2.00	0.020	0.010	0.02	0.20	0.20	0.25	0.10	0.30	0.05

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²) min.	R_m[1] N/mm² (kg/mm²) min.	A_5 (%) min.	Impact[2][3] (Long.) Temp. °C	Impact[2][3] (Long.) KV_c J min.	Bend[3] (Trans., 180°) mrb (d: thickness)
Standard	Grade							
Erdemir-2005	9500	9500[4]	500 (51.0)	690 (70.4)	18	-20	30	4 d

Notes
1) Tensile test values apply to “transverse” test pieces.
2) Impact test is not required for thickness thinner than 6 mm.
3) Impact test and bend test are carried out only when specified at the time of enquiry and order.
4) Only available for thickness ≤ 20 mm.

Alloy Structural Steel Plates

Standard : Miscellaneous

Chemical Composition (%)

Corresponding		Erdemir[1] Steel Grade	C	Mn	P max.	S max.	Si[2]	Ni max.	Cr max.	Mo max.	V max.	Nb max.	Ti max.
Standard	Grade												
SAE J403-14/ASTM A1011-15/ ASTM A1018-18	1006 / CS Type B	6006[5]	0.02 - 0.08	0.45 max.	0.025	0.025	0.04 max.	0.20	0.15	0.06	0.008	0.008	0.025
SAE J403-14/ASTM A1011-15/ ASTM A1018-18	1008 / CS Type B	3008[5]	0.02 - 0.10	0.50 max.	0.030	0.035	0.10 max.	0.20	0.15	0.06	0.008	0.008	0.025
SAE J403	1010	3010[1][5]	0.08 - 0.13	0.30 - 0.60	0.030	0.035	0.10 max.	-	-	-	-	-	-
SAE J403	1012	3012[1][5]	0.10 - 0.15	0.30 - 0.60	0.030	0.035	0.10 max.	-	-	-	-	-	-
SAE J403	1015	3015[1][5]	0.13 - 0.18	0.30 - 0.60	0.030	0.035	0.10 max.	-	-	-	-	-	-
SAE J403	1018	6018[1][5]	0.15 - 0.20	0.60 - 0.90	0.030	0.035	0.10 max.	-	-	-	-	-	-
SAE J403	1020	3020[1][5]	0.18 - 0.23	0.30 - 0.60	0.030	0.035	0.15 - 0.35	-	-	-	-	-	-
SAE J403	1026Mod/25Mn5	3026[1][5]	0.22 - 0.28	1.10 - 1.50[3]	0.025	0.015	0.15 - 0.35	-	-	-	-	-	-
SAE J403	1030	3030[1][5]	0.28 - 0.34	0.60 - 0.90	0.030	0.035	0.15 - 0.35	-	-	-	-	-	-
SAE J403	1035	5035[1][5]	0.32 - 0.38	0.60 - 0.90	0.030	0.035	0.15 - 0.35	-	-	-	-	-	-
SAE J403	1040	5040[1][5]	0.37 - 0.44	0.60 - 0.90	0.030	0.035	0.15 - 0.35	-	-	-	-	-	-
SAE J403	1045	5045[1][5]	0.43 - 0.50	0.60 - 0.90	0.030	0.035	0.15 - 0.35	-	-	-	-	-	-
SAE J403	1050	5050[1][5]	0.48 - 0.55	0.60 - 0.90	0.030	0.035	0.15 - 0.35	-	-	-	-	-	-
SAE J403	1060	5060[1][5]	0.55 - 0.65	0.60 - 0.90	0.030	0.035	0.15 - 0.35	-	-	-	-	-	-
SAE J403	1070	5070[1][5]	0.65 - 0.75	0.60 - 0.90	0.030	0.035	0.15 - 0.35	-	-	-	-	-	-
SAE J403	1080	5080[1][5]	0.75 - 0.88	0.60 - 0.90	0.030	0.035	0.15 - 0.35	-	-	-	-	-	-

Notes
1) Mechanical test is not carried out.
2) When Silicon ranges or limits are required, the following ranges are commonly used 0,10 % max; 0,10 to 0,20 %; 0,15 to 0,35 %; 0,20 to 0,40 %; or 0,30 to 0,60 %. Erdemir normally applies the above silicon ranges but they can be also produced in the other silicon ranges.
3) Added according to customer requests.
4) Deoxidation method of these products is fully-killed. Minimum aluminium to nitrogen ratio is 2:1.
5) The limitation requests for the residual elements (Cu, Ni, Cr, Mo) which are not mentioned on the table are subjected to negotitation for special application purposes.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e[1][2] N/mm² (kg/mm²) min.	A_{50}[1][2] (%) min.	Hardness[2] (HRB) max.
Standard	Grade				
SAE J403-14/ASTM A1011-15/ASTM A1018-18	1006 / CS Type B	6006	205-340 (20.90 - 34.65)	25	75
SAE J403-14/ASTM A1011-15/ASTM A1018-18	1008 / CS Type B	3008	205-340 (20.90 - 34.65)	25	75

Notes
1) Tensile test values apply to “transverse” test pieces.
2) Specified values are referanced values and mechanic test is carried out only when specified at the time of enquiry and order.

Hot Rolled Carbon Structural Steels With Specific Chemical Composition

Standard : Miscellaneous

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	Si	P	S
Standard	Grade		max.	max.	max.	max.	max.
SAE J403-2014	1021 Mod	3021	0.18-0.23	1.35	0.04	0.020	0.015

Notes
1) Grade specified on table, is produced within the framework of agreements with customers
2) Deoxidation method of these products is fully-killed. Minimum aluminium to nitrogen ratio is 2:1.
3) 1021 Mod is similar to ASTM A500 / A500M grade B
4) The limitation requests for the residual elements (Cu, Ni, Cr, Mo) which are not mentioned on the table are subjected to negotitation for special application purposes.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e[1] N/mm² (kg/mm²) min.	Rm[1] N/mm² (kg/mm²)	A_{50} % min.
Standard	Grade				
SAE J403-2014	1021 Mod	3021	310 (31.7)	450-585 (45.88 - 59.62)	28

Notes
1) Tensile test values apply to “longitudinal” test pieces

Alloyed Structural Steel Plates

Standard : ASTM A829-17

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Si	Cr
Standard	Grade				max.	max.		
ASTM A829	1345	5345[1][2]	0.43 - 0.48	1.60-1.90	0.030	0.040	0.15-0.35	-
ASTM A829	5160	5360[1][3]	0.56 - 0.64	0.75-1.00	0.030	0.040	0.15-0.35	0.70-0.90

Notes
1) Mechanical test is not carried out.
2) Corresponds to “SAE J404-95 Gr. 1345” grade.
3) Corresponds to “SAE J404 Gr.5160” grade.

Tool Steel

Standard: DIN 17350:1980

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Si	Cr	Ni	V	Mo
Standard	Grade				max.	max.			max.		max.
DIN 17350	75Cr1	5375 [1]	0.70 - 0.80	0.60 - 0.80	0.030	0.030	0.25 -0.50	0.30 - 0.40	-	-	-
EN 10132-4	80CrV2	5380[1][2][3]	0.75 - 0.85	0.30 - 0.50	0.025	0.025	0.15 - 0.35	0.40 - 0.60	0.40	0.15 - 0.25	0.10

Notes
1) Mechanical test is not carried out.
2) Produced as hot rolled according to chemical analysis specified in EN 10132-4.
3) Deoxidation method of these products is fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Hot Rolled Boron Alloyed Steels Suitable For Heat Treatment

Standard: EN EN 10083-3:2006 / Erdemir

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Si	Cr	Ti	B
Standard	Grade				max.	max.	max.			
EN 10083-3	20MnB5 Mod	5620[1][2][8]	0.17 - 0.23	1.10 - 1.40	0.025	0.035	0.40	0.05 - 0.30[3]	0.015 - 0.060[3]	0.0008-0.0050
Erdemir-15	22MnB5	5622[1][2][4]	0.19-0.25	1.10-1.40	0.025	0.015	0.40	0.10-0.30	0.015-0.060	0.0008-0.0050
Erdemir-15	26MnB5	5626[1][2][4][5]	0.23-0.29	1.05-1.40	0.025	0.020	0.18-0.32	0.10-0.20	0.015-0.035	0.0020-0.0045
Erdemir-19	28MnB5	5628[4][6][7][8][9]	0.26-0.31	1.10 - 1.40	0.020	0.010	0.20-0.35	0.10-0.25	0.03-0.06	0.0020-0.0045
EN 10083-3	30MnB5 Mod	5630[1][2][8]	0.27 - 0.33	1.15 - 1.45	0.025	0.035	0.40	0.05 - 0.30[3]	0.015 - 0.060[3]	0.0008-0.0050
EN 10083-3	30MnB5 Mod	5631[1][2][8]	0.27 - 0.33	1.15 - 1.45	0.025	0.035	0.40	0.20 - 0.60[3]	0.015 - 0.060[3]	0.0008-0.0050

Notes
1) Mechanical test is not carried out.
2) 20-60 ppm Ca is included.
3) Added according to customer requests.
4) Grade specified on the table, is produced within the framework of agreements with customers.
5) Al ≤ 0.080.
6) Deoxidation methods of these products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.
7) N ≤ 0.008
8) 0.02 ≤ Al ≤ 0.05
9) Minimum titanium to nitrogen ratio is 3,5

Hot Rolled Steels for Defense Industry

Standard: Erdemir

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Si	Al	Cu	Cr	Mo	Vi	Ni
Standard	Grade				max.	max.			max.				max.
Erdemir-2004	8416	8416[1]	0.27 - 033	0.45-0.65	0.025	0.020	0.55-0.75	0.030 min.	0.35	1.00-1.50	0.40-0.60	0.20-0.30	0.25
Erdemir-2003	8613	8613[1]	0.11-0.15	0.60-0.90	0.025	0.015	0.30-0.50	0.02-0.07	0.20	0.20 max.	-	-	0.60-0.90

Notes
1) Mechanical test is not carried out.

Hot Rolled Low Alloy Steels for Quenching and Tempering in Untreated Condition

Standard: Miscellaneous

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Al	Si	Cr	Ni	V	Mo
Standard	Grade				max.	max.	max.			max.		
EN 10083-3	51CrV4	8412[1][5]	0.47 - 0.55	0.70-1.10	0.025	0.025	-	0.40 max.	0.90-1.20	-	0.10 - 0.25	-
EN 10269	21CrMoV5-7	8414[1]	0.17 - 0.25	0.40-0.80	0.025	0.030	0.030	0.40 max.	1.20-1.50	0.60	0.20 - 0.35	0.55-0.80
DIN - 1.7263	30CrMo5-2	8430[1]	0.27 - 0.32	0.50-0.80	0.010	0.010	0.050	0.10-0.40	1.00-1.50	-	-	0.10-0.30
EN 10083-3	34CrMo4	8434[1][3][5]	0.30 - 0.37	0.60-0.90	0.025	0.035		0.40 max.	0.90-1.20	-	-	0.15-0.30
EN 10083-2	C45E (Mod)	8440[1][2][5]	0.42 - 0.48	0.95-1.30[4]	0.030	0.030	-	0.40 max.	0.20-0.40	0.20	-	0.05 max.
EN 10083-3	46Cr2 Özel	8451[1][6][7]	0.45 - 0.55	0.90-1.40	0.030	0.030	0.060	0.12-0.30	0.30-0.50	-	-	-

Notes
1) Mechanical test is not carried out.
2) ‘Cr + Mo + Ni’ : ≤ 0.63 %
3) ‘P + S’ : ≤ 0.020 %
4) Added according to customer requests.
5) Deoxidation methods of these products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.
6) It is accepted on condition that the normalizing of the products is carried out in the normalizing furnace.
7) Grade specified on table, is produced within the framework of agreements with customers.

Steel Produced As Casting Slab

Standard: Erdemir

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Mn max.	P max.	S max.	Si max.	Ti max.	Nb max.	Cr max.	V max.	N max.
Standard	Grade											
Erdemir-2001	3995	3995[1)2)]	0.25	2.00	0.040	0.040	0.60	0.05	0.10	0.50	0.20	0.022

Notes

1) Only available as “casting slab”.
2) Mechanical test is not carried out.

Silicon Killed Valve Steel Suitable For Surface Hardening

Standard: SAE J403-2014

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C [1]	Mn	Al max.	P [1] max.	S [1] max.	Si min.
Standard	Grade							
SAE J403	1018 Mod	3037	0.14-0.21	0.60-0.90	0.009	0.040	0.050	0.10

Notes

1) Added according to customer requests.
2) The limitation requests for the residual elements (Cu, Ni, Cr, Mo) which are not mentioned on the table are subjected to negotitation for special application purposes.

Mechanical Properties (Intended)

Corresponding		Erdemir Steel Grade	R_m[1] Psi / (N/mm^2) (kg/mm^2)	Sertlik (HRB)
Standard	Grade			
SAE J403	1018 Mod	3037[2)]	58000-65000 / (400-448) (40.8-45.7)	65-80

Notes

1) Tensile test values apply to “transverse” test pieces.
2) Intended austenite grain size (ASTM E112) 2 ≤ austenite grain size ≤ 8

Hot Rolled Carbon Steel For Strap Production After Cold Rolling And Heat Treatment

Standard: EN 10083-2:2006

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P max.	S max.	Si	Al	N max.
Standard	Grade								
EN 10083-2	28Mn6	3031	0.26-0.32	1.30-1.60	0.030	0.020[3)]	0.25-0.40	0.020-0.080	0.010

Notes

1) Mechanical test is not carried out.
2) ‘Cr+Mo+Ni’ : ≤ 0.63%
3) Specified limit value is determined within the framework of agreements with customers.

Hot Rolled Carbon Steel For Strap Production After Cold Rolling And Heat Treatment

Standart : EN 10083-2:2006

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P max.	S max.	Si	Nb	N max.
Standard	Grade								
EN 10083-2	28Mn6 Mod	3032[3)]	0.28-0.32	1.50-1.65	0.030	0.035	0.25-0.40	0.015-0.030	0.010
EN 10083-2	28Mn6 Mod1	3033	0.29-0.34	1.40-1.70	0.030	0.035	0.25-0.35	-	-

Notes

1) Mechanical test is not carried out.
2) Specified limit value is determined within the framework of agreements with customers.
3) Deoxidation methods of these products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.
4) This grade will be produced in İsdemir facilities. Production in Erdemir facilities is subjected to negotiation.

Production Limits

* Production limits will be re-evaluated prior to order according to plant production capabilities.

Hot Rolled Products

Product Symbol	Product Description	Page Number
RKK	Hot rolled coil with mill edge	107
IKRKK	Hot rolled thin thin thicknes coil with mill edge	108
KRKK	Hot rolled heavy-thickness coil with mill edge	109
BRKK	Hot rolled coil with mill edge processed in recoiling line	110
HCKK	Hot Rolled coil with mill edge for cold rolling	112
BCKK	Hot Rolled coil with mill edge processed in recoiling line for cold rolling	113
TCKK	Hot rolled coil with mill edge skin-passed in recoiling line for cold rolling	113
RKKM	Hot rolled, patterned coil with mill edge	114
R	Hot rolled coil with trimmed edge	115
TR	Hot rolled skin-passed coil with trimmed edge	116
TRKK	Hot rolled skin-passed coil with mill edge	116
HRU	Hot rolled sheet cut from coil with trimmed edge	117
HRUKK	Hot rolled sheet cut from coil with mill edge	118
FHRUK	Hot rolled sheet directly cut from coil with mill edge	119
THRU	Hot rolled, skin-passed sheet cut from coil with trimmed edge	121
HRP	Hot rolled, pickled sheet cut from coil with trimmed edge	122
HRPKK	Hot rolled, pickled sheet cut from coil with mill edge	122
THRP	Hot rolled, skin-passed and pickled sheet cut from coil with trimmed edge	123
THRPK	Hot rolled, skin-passed and pickled sheet cut from coil with mill edge	123
RP	Hot rolled, pickled coil with trimmed edge	124
BRP	Hot rolled, pickled coil with trimmed edge processed in recoiling line	125
RPKK	Hot rolled, pickled coil with mill edge	126
BRPKK	Hot rolled, pickled coil with mill edge processed in recoiling line	128
TRP	Hot rolled, skin-passed, pickled coil with trimmed edge	129
TRPKK	Hot rolled, skin-passed, pickled coil with mill edge	130
LP	Hot rolled, pickled plate cut from coil with trimmed edge	132
LPKK	Hot rolled, pickled plate cut from coil with mill edge	133
TLP	Hot rolled, skin-passed and pickled sheet cut from coil with trimmed edge	134
TLPKK	Hot rolled, skin-passed and pickled sheet cut from coil with mill edge	134
LR	Hot rolled plate cut from coil with trimmed edge	135
LRKK	Hot rolled plate cut from coil with mill edge	136
FLRKK	Hot rolled plate directly cut from coil with mill edge	137
L	Heavy plate with trimmed edge	138-140
LKK	Heavy plate with mill edge	138-140
DS	Casted slab (extra heavy plate with mill edge)	142
PLR	Painted, shot blasted hot rolled plate cut from coil with trimmed edge	143
PLRKK	Painted, shot blasted hot rolled plate cut from coil with milled edge	143
PL	Painted, shot blasted heavy plate with trimmed edge	144-146
PLKK	Painted, shot blasted heavy plate with milled edge	144-146
RKK & KRKK	Hot rolled Pipe Steels For Crude Oil And Natural Gas Industry (API 5L & EN 10208)	148
RD (*)	Hot rolled, slitted coil	-
RPD (*)	Hot rolled, pickled, slitted coil	-
TRPD (*)	Hot rolled, skin-passed, pickled, slitted coil	-

* Please contact our sales department for these products

Production Limits

RKK

Hot Rolled, Mill Edge - Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
1,40 - 1,49	1325	1325	1250	1250		
1,50 - 1,79	1400	1400	1280	1280	1200	1200
1,80 - 1,99	1550	1550	1400	1400	1350	1350
2,00 - 2,09	1610	1610	1500	1500	1400	1400
2,10 - 2,29	1750	1750	1550	1550	1430	1430
2,30 - 2,49	1800	1800	1600	1600	1500	1500
2.50 - 2.79	1850	1850	1650	1650	1565	1565
2.80 - 2.99	1950	1950	1750	1750	1655	1655
3,00 - 3,19	2000	2000	1800	1800	1710	1710
3,20 - 3,49	2050	2050	1850	1850	1765	1765
3,50 - 3,59	2050	2050	1900	1900	1850	1850
3,60 - 3,99	2050	2050	1925	1925	1865	1865
4,00 - 4,19	2050	2050	2000	2000	1915	1915
4,20 - 4,49	2050	2050	2050	2050	1945	1945
4,50 - 4,99	2050	2050	2050	2050	1985	1985
5,00 - 10,00	2050	2050	2050	2050	2050	2050

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 720, 3008, 3137, 3222, 3235, 3237, 3281, 3333, 3337, 3901, 3922, 3923, 4009, 4222, 4237, 4238, 4240, 4437, 5437, 6006, 6037, 6211, 6222, 6223, 6224, 6282, 6837, 7222
2	2008, 2009, 3010, 3012, 3015, 3018, 3285, 3330, 3430, 3433, 3936, 3937, 4260, 4275
3	3020, 3037, 3241, 3244, 3336, 3340, 3345, 3436, 3440, 3701, 3702, 3741, 3940, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842, 9240, 9329, 3938
4	3021, 3945, 3946, 6847, 6852, 9255, 9256, 9960
5	800, 801, 810, 811, 812, 813, 846, 3246, 3249, 3355, 3365, 3455, 3465,3552, 3955, 4255, 4634, 4932, 4933, 4936, 4937
6	721, 735, 820, 835, 842, 845, 850, 855, 859, 860, 890, 3026, 3030, 3031, 3032, 3033, 3052, 3245, 3250, 3252, 3260, 3350, 3550, 3551, 3660, 3732, 3736, 3905, 3949, 3957, 3960, 4052, 4249, 4250, 4251, 4252, 4642, 4732, 4736, 4846, 4942, 4943, 4946, 4947, 4950, 4955, 4960, 4970, 5035, 5040, 5045, 5050, 5052, 5060, 5246, 5252, 5270, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6052, 6053, 6252, 6258 , 6284, 6345, 6347, 6350, 6352, 6353, 6355, 6356, 6704, 6850, 6855, 6860, 6865, 6870, 7252, 9257, 9275, 9280, 9335, 9338, 9342, 9355, 9356, 9360, 9420, 9435, 9442, 9449, 9455, 9460, 9951, 9952

Notes

1) Production limits will be re-evaluated prior to order according to plant production capabilities and other current orders.
2) Orders for hot charging compulsory grades, 3260, 5045, 5050, 5060, 5270, 5622, 5626, 5628, 5630, 5631, 9280 are subjected to negotiation.
3) Small or big coil orders are accepted for thicknesses between 1,40-1,79 mm and maximum big coil weight is 25 tons.
4) Claims about coil break are not accepted for 1st and 2nd group grades for thicknesses less than or equal to 6.50 mm . If coil break is not tolerable for these grades, orders for thicknesses less than or e qual to 6.50 mm have to be TRKK product type.
5) Coil break claim are not accepted for 1st and 2nd group grade coil orders in case of customer applications such as slitting, cut to length, pickling and pipe manufacturing e.t.c. over 6.50 mm thickness. For mentioned application if coil break is not tolerable, customer must order as cut to length product or one of a 3 rd. group grade
6) For the grades which are suitable for wheel manufacturing such as 3901, 3905, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955, 3957, 3960 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.
7) Small coil orders given with 50 % thickness tolerance (t≤5 mm) are only accepted for the BRKK product type up to 1525 mm width, instead of the RKK product type.
8) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections
9) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length products.

Grade	Thickness of Order
3938, 3940, 3945, 3946, 6837, 6842, 6848, 6852	Max. 5,00 mm
3330, 3333, 3336, 3340, 3345, 3355, 3350, 3365, 6035	Max. 6,00 mm
720, 801, 835, 3137, 3337, 4044, 6340, 9952	Max. 8,00 mm
3430, 3433, 3436, 3440, 6036	Min. 6,01 mm
3660, 890	Max. 6,00 mm (Subjected to negotiation)

Production Limits

IKRKK

Hot Rolled, M,ll Edge, Thin- Coil

Dimensions

Thickness (mm)	Maksimum Genişlik (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
4,00 - 4,99	1300	1300	1300			
5,00 - 5,99	1400	1400	1400			
6,00 - 6,49	1525	1525	1525	1300	1300	
6,50 - 6,99	1525	1525	1525	1300	1300	

Steel Grades

Group No	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009, 6006, 6211, 6222, 6223, 6224, 6282
2	720, 2008, 2009, 3010, 3012, 3015, 3235, 3237, 3281, 3337, 3430, 3433, 3936, 3937, 4237, 4238, 4240, 4437, 5437, 6037
3	801, 3018, 3020, 3021, 3037, 3241, 3244, 3436, 3440, 3701, 3702, 3732, 3741, 4044, 4244, 4732, 6018, 6036, 6040, 6042, 6044, 6237, 6244
	6335, 6340, 6341, 6741, 6838, 9329
4	721, 735, 3026, 3030, 3031, 3032, 3033, 3245, 3250, 3252, 3260, 3550, 3551, 3955, 3957, 3960,4052, 4252, 4249, 5035
	5040, 5045, 5050, 5270, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6053, 6284, 6345, 6347, 6350, 6352, 6353, 6355, 6356, 6704
	6850, 9056, 9258, 9335, 9338, 9435
5	5060, 5070, 5080, 5360, 5375, 5380 6855, 6860, 6865, 6870, 9342, 9356, 9442

Notlar

1) Only domestic order are accepted for IKRKK product.
2) 6335 , 6341 , 6345 , 6352 , 6353 , 6355 , 6356 grades are produced as untreated or normalizing rolled.
3) Orders given with 50 % thickness tolerance (t≤5 mm) are not accepted. This type of orders can be accepted for RKK product as big coil or for BRKK product as small coil.
4) Claims about coil break are not accepted for 1st and 2nd group grades for thickness less than or equal to 6.50 mm have to be TRKK product type.
5) Fort the grades which are suitable for wheel manufacturing such as 3901, 3905, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955, 3957, 3960 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.
6) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length products.
7) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections.

Production Limits

KRKK

Hot Rolled, Mill Edge, Heavy Thickness - Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
7,00 - 7,99	2050	2050	2050	2050	2050	2050
8,00 - 10,00	2050	2050	2050	2050	2050	2050
10,01 - 12,99	2050	2050	2050	2050	1625	1625
13,00 - 14,00	2050	2050	2050	2050	1625	1625
14,01 - 15,00	2050	2050	2050	2050	1625	1625
15,01 - 16,00	2050	2050	2000	1850	1625	1625
16,01 - 18,00	2050	2050	2000	1525	1525	1525
18,01 - 20,00	2050	2050	2000	1525	1525	1525
20,01 - 22,00	2050	2050	1525	1525	1525	1525
22,01 - 25,00	1525	1525	1525	1500	1500	1500
25,01 - 25,04	1525	1525	1525	1500	1500	1500

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 720, 3008, 3137, 3222, 3235, 3237, 3281, 3337, 3901, 3922, 3923, 4009, 4222, 4237, 4437, 5437, 6006, 6037,6211, 6222, 6223, 6224, 6282
2	2008, 2009, 3010, 3012, 3015, 3018, 3285, 3430, 3433, 3936, 3937, 4238, 4240, 4260, 4275
3	3020, 3021, 3037, 3241, 3244, 3436, 3440, 3701, 3702, 3741, 3940, 3944, 4044, 4239, 4244, 4246, 6018, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341 6741, 6838, 9240, 9329
4	9255, 9256, 9960
5	800, 801, 810, 811, 812, 813, 846, 3246, 3249, 3552, 3955, 4255, 4634, 4932, 4933, 4936, 4937
6	721, 735, 820, 835, 842, 845, 850, 855, 859, 860, 3026, 3030, 3031, 3032, 3033, 3052, 3245, 3250, 3252, 3260, 3550, 3551, 3732, 3736, 3905, 3949, 3957, 3960, 4052, 4249, 4250, 4251, 4252, 4642, 4732, 4736, 4846, 4942, 4943, 4946, 4947, 4950, 4955, 4960, 4970, 5035, 5040, 5045, 5050, 5052, 5060, 5070, 5080, 5246, 5252, 5270, 5375, 5380, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6052, 6053, 6252, 6258, 6284, 6345, 6347, 6350, 6352, 6353, 6355, 6356, 6704, 6850, 6855, 6860, 6865, 6870, 7252, 9257, 9258, 9275, 9335, 9338, 9342, 9355, 9356, 9360, 9420, 9435, 9442, 9449, 9485, 9460, 9951, 9952, 9960

Notes

1) Production limits will be re-evaluated prior to order according to plant production capabilities and other current orders.
2) Orders for hot charging compulsory grades, 3260, 5050, 5622, 5626, 5628, 5630, 5631 are subjected to negotiation.
3) Orders are not accepted for 6335, 6341, 6345, 6347, 6352, 6353, 6355 due to hot tensile test request.
4) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections
5) Coil break claim are not accepted for 1st and 2nd group grade coil orders in case of customer applications.
6) For mentioned application if coil break is not tolerable, customer must order as cut to length product or one of a 3 rd. group grade
7) Claims related with wave defect will not be accepted upto 15 mm thickness if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length products.
8) For the grades which are suitable for wheel manufacturing such as 3901, 3905, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955, 3957, 3960 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed bygrinding the surface, are not accepted.

Grade	Thickness of Order
720, 801, 835, 3337, 4044, 6340	Max. 8,00 mm
9257	Min. 8,01 mm
4950, 4955	Max. 12,00 mm
4960, 4970	Max. 10,00 mm
9275	Max. 10,00 mm
3552	Max. 20,00 mm
Group 4, 5 and 6	22,01-25,00 mm (Subjected to negotiation)

BRKK

Hot Rolled, Mill Edge, Processed in Coil Preparation Line - Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
1,50 - 1,79	1137	1037				
1,80 - 1,99	1237	1137	837			
2,00 - 2,09	1237	1237	1037	937		937
2,10 - 2,19	1337	1237	1037	937	837	937
2,20 - 2,29	1337	1237	1037	937	837	937
2,30 - 2,39	1437	1337	1137	1037	937	1037
2,40 - 2,49	1437	1337	1137	1037	937	1037
2.50 - 2.59	1537	1437	1237	1137	1037	1137
2.60 - 2.69	1537	1437	1237	1137	1037	1137
2.70 - 2.79	1537	1537	1237	1137	1037	1137
2,80 - 2,94	1537	1537	1337	1237	1037	1237
2,95 - 2,99	1537	1537	1337	1237	1037	1237
3,00 - 3,19	1537	1537	1437	1337	1137	1237
3,20 - 3,29	1537	1537	1437	1337	1137	1337
3,30 - 3,49	1537	1537	1437	1337	1137	1337
3,50 - 3,59	1537	1537	1537	1437	1237	1337
3,60 - 3,89	1537	1537	1537	1437	1237	1437
3,90 - 3,99	1537	1537	1537	1437	1237	1437
4,00 - 4,19	1537	1537	1537	1537	1337	1537
4,20 - 4,49	1537	1537	1537	1537	1337	1537
4,50 - 4,99	1537	1537	1537	1537	1437	1537
5,00 - 6,50	1537	1537	1537	1537	1537	1537

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009, 6006, 6211, 6222, 6223, 6224, 6282, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3137, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3430, 3433, 3701, 3702, 3937 3938, 3940, 4237, 4260, 4275, 4437, 4238, 4240, 5437, 6037, 6837, 6842(t≤2,50), 9030
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3436, 3440, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842 (t>2,50), 9035, 9042, 9046, 9240
4	3945, 3946, 3955, 4634,6345, 6847, 6848, 9056, 9329, 9960
5	721, 735, 835, 842, 846, 850, 855, 860, 890, 3030, 3031, 3032, 3033, 3052, 3245, 3250, 3252, 3350, 3550, 3551, 3660, 3732, 3736, 3905, 3949, 3957, 3960, 4052, 4249, 4250, 4251, 4252, 4642, 4732, 4736, 4846, 4946, 4947, 5035, 5052, 5246, 5252, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6052, 6053, 6252, 6258, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6704, 6850, 6852, 6855, 6860, 6865, 6870, 7252, 9052, 9255, 9256, 9257, 9335, 9338, 9342, 9355, 9356, 9420, 9435, 9442
6	800, 801, 810, 811, 812, 813, 820, 859, 4255, 4932, 4933, 4936, 4937, 4942, 4943

Hot Rolled Flat Steel Products

Production Limits

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for hot charging compulsory grades, 5622, 5626, 5628, 5630, 5631 are subjected to negotiation.
3) Orders for special grades, 700, 720, 735, 800, 801, 810, 811, 812, 813, 820, 835 are subjected to negotiation.
4) Claims about coil break are not accepted for 1. group grades. If coil break is not desired for these grades, orders have to be product type of TRKK
5) 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
6) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections.
7) For the grades which are suitable for wheel manufacturing such as 3901, 3905, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955, 3957, 3960 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.
8) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should begiven as cut to length products.

Grade	Thickness of Order
890, 3660	Max. 6,00 mm (Subjected To Negotiation)
3938, 3940, 3945, 3946, 6837, 6842, 6847, 6848, 6852	Max. 5,00 mm
3330, 3333, 3336, 3340, 3345, 3350, 6035	Max. 6,00 mm
3430, 3433, 3436, 3440, 6036	Min. 6,01 mm

Production Limits

HCKK

Hot Rolled For Cold Rolling With Mill Edge - Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 8
1,40 - 1,49	1325	1325	1250			
1,50 - 1,79	1400	1400	1280		1200	
1,80 - 1,99	1550	1550	1400		1350	
2,00 - 2,09	1610	1610	1500	937	1400	
2,10 - 2,19	1750	1750	1550	937	1430	
2,20 - 2,29	1750	1750	1550	1037	1430	
2,30 - 2,39	1800	1800	1600	1137	1500	
2,40 - 2,49	1800	1800	1600	1137	1500	937
2,50 - 2,59	1850	1850	1650	1137	1565	1037
2,60 - 2,69	1850	1850	1650	1137	1565	1037
2.70 - 2.79	1850	1850	1650	1137	1565	1137
2,80 - 2,94	1950	1950	1750	1237	1655	1237
2,95 - 2,99	1950	1950	1750	1237	1655	1237
3,00 - 3,19	2000	2000	1800	1237	1710	1237
3,20 - 3,29	2050	2050	1850	1337	1765	1337
3,30 - 3,49	2050	2050	1850	1337	1765	1337
3,50 - 3,59	2050	2050	1900	1437	1850	1337
3,60 - 3,99	2050	2050	1925	1437	1865	1437
4,00 - 4,19	2050	2050	2000	1537	1915	1537
4,20 - 4,49	2050	2050	2050	1537	1945	1537
4,50 - 4,99	2050	2050	2050	1537	1985	1537
5,00 - 6,00	2050	2050	2050	1537	2050	1537

Steel Grades

Group No.	Grades
1	6007, 6009, 6406, 6407, 6408, 6412, 6413, 6421, 6422, 6423, 6424, 6425, 6523, 6624
2	1821, 1822, 1825
3	1828, 3243
4	5536, 5541, 5542, 5548, 5549, 5554, 5555, 5561, 5562, 5571, 5572, 5581, 5582, 5592
5	1832, 1835
8	1718, 1722, 1726, 6314, 6315, 7414, 7416

Notes

1) Production limits will be re-evaluated prior to order according to plant production capabilities and other current orders.
2) Orders for 6007 are subjected to negotiation.
3) The suitability for enamelling is not guaranteed for the cold rolled products produced from steel grades of the product type HCKK .
4) Mechanical test is not carried out.
5) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections
6) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length products.
7) Coil break claims are not accepted for non skin-passed products.

Hot Rolled Flat Steel Products

Production Limits

TCKK

Hot Rolled For Cold Rolling With Mill Edge, Skin Passed, Processed in Coil Preparation Line Coil

BCKK

Hot Rolled For Cold Rolling With Mill Edge, Processed in Coil Preparation Line Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 8
1,50 - 1,79	1137	1037				
1,80 - 1,99	1237	1137	837			
2,00 - 2,09	1237	1237	1037	937		
2,10 - 2,29	1337	1237	1037	937	837	
2,30 - 2,39	1437	1337	1137	1037	937	
2,40 - 2,49	1437	1337	1137	1037	937	937
2.50 - 2.69	1537	1437	1237	1137	1037	1037
2.70 - 2.79	1537	1537	1237	1137	1037	1137
2,80 - 2,99	1537	1537	1337	1237	1037	1237
3,00 - 3,19	1537	1537	1437	1337	1137	1237
3,20 - 3,49	1537	1537	1437	1337	1137	1337
3,50 - 3,59	1537	1537	1537	1437	1237	1337
3,60 - 3,89	1537	1537	1537	1437	1237	1437
3,90 - 3,99	1537	1537	1537	1437	1237	1537
4,00 - 4,49	1537	1537	1537	1537	1337	1537
4,50 - 4,99	1537	1537	1537	1537	1437	1537
5,00 - 6,50	1537	1537	1537	1537	1537	1537

Steel Grades

Group No.	Grades
1	6007, 6009, 6406, 6407, 6408, 6412, 6413, 6421, 6422, 6423, 6424, 6425, 6523, 6624
2	1821, 1822, 1825
3	1828, 1832, 3243
4	5536, 5541, 5542, 5548, 5549, 5554, 5555, 5561, 5562, 5571, 5572, 5581, 5582, 5592
5	1835
8	1718, 1722, 1726, 6314, 6315, 7414, 7416

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for grade 6007 is subjected to negotiation.
3) Orders for high silicon grade, 5536, 5541, 5542, 5548, 5549, 5554, 5555, 5561, 5562, 5571, 5572, 5581, 5582, 5592 are subjected to negotiation.
4) The suitability for enamelling is not guaranteed for the cold rolled products produced from steel grades of the product types TCKK, BCKK.
5) Mechanical test is not carried out.
6) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections,
7) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length products.
8) Coil break claims are not accepted for non skin-passed products.(for the type of product BCKK.)

Production Limits

RKKM

Hot Rolled, Patterned, Mill Edge - Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
4,00 - 4,99		1225	1225			
5,00 - 5,99		1325	1325			
6,00 - 10,00		1425	1425			

Steel Grades

Group No.	Grades
2	3237, 4237, 4275
3	3241, 3244, 4239, 4244, 4246, 6237, 6244

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for the grades other than grades in the table stated above are subjected to negotiation.
3) Orders for this group is subjected to negotiation.
4) Orders for "big coil" is not accepted

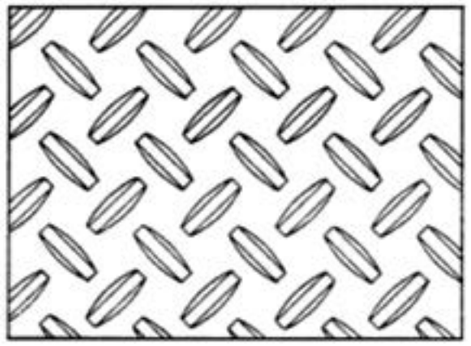
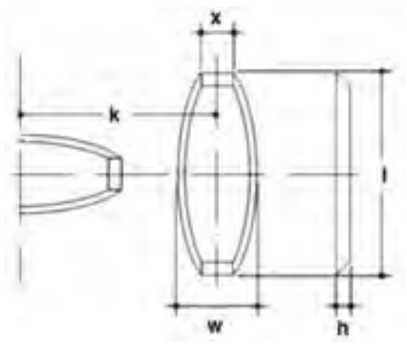


Figure 1 : Surface pattern designed in Erdemir



h (Pattern height) » 1 - 2 mm
l (Pattern length) » 17- 27 mm
w (Pattern width) » 8-10,5 mm
x (Pattern upper width) » 3-5 mm
k (Distance between the center of 2 parpendicular patterns.) » 25± 2,5 mm

Figure 2 : Pattern dimensions (Referance values)

Production Limits

R

Hot Rolled, Trimmed Edge - Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
1,50 - 1,79	1100	1000				
1,80 - 1,99	1200	1100	800			
2,00 - 2,09	1200	1200	1000	900		900
2,10 - 2,29	1300	1200	1000	900	800	900
2,30 - 2,49	1400	1300	1100	1000	900	1000
2,50 - 2,69	1500	1400	1200	1100	1000	1100
2,70 - 2,79	1500	1500	1200	1100	1000	1100
2,80 - 2,99	1500	1500	1300	1200	1000	1200
3,00 - 3,19	1500	1500	1400	1300	1100	1200
3,20 - 3,49	1500	1500	1400	1300	1100	1300
3,50 - 3,59	1500	1500	1500	1400	1200	1300
3,60 - 3,99	1500	1500	1500	1400	1200	1400
4,00 - 4,49	1500	1500	1500	1500	1300	1500
4,50 - 4,99	1500	1500	1500	1500	1400	1500
5,00 - 6,50	1500	1500	1500	1500	1500	1500

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009, 6006, 6211, 6222, 6223, 6224, 6282, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3137, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3430, 3433, 3701, 3702, 3937 3938, 3940, 4237, 4238, 4240, 4260, 4275, 4437, 5437, 6037, 6837, 6842(t≤2,50), 9030
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3436, 3440, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842 (t>2,50), 9035, 9042, 9046, 9240
4	3550, 3945, 3946, 3955, 4249, 4634, 6345, 6847, 9329
5	842, 846, 850, 859, 860, 3031,3032 3033, 3052, 3245, 3252, 3550, 3551, 3905, 3949, 4052, 4250, 4251, 4252, 4642, 5052, 5252, 6050, 6052, 6053, 6252, 6258, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6852, 9355, 9356
6	800, 801, 810, 811, 812, 813, 4255, 4932, 4933, 4936, 4937

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for special grades, 700, 720, 800, 801, 810, 811, 812, 813 are subjected to negotiation.
3) Claims about coil break are not accepted for 1. group grades. If coil break is not desired for these grades, orders have to be product type of TR.
4) 6335, 6341, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
5) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections,
6) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length products.

Grade	Thickness of Order
3938, 3940, 3945, 3946, 6837, 6842, 6847, 6852	Max. 5,00 mm
3330, 3333, 3336, 3340, 3345, 6035	Max. 6,00 mm
3430, 3433, 3436, 3440, 6036	Min. 6,01 mm

Production Limits

TR

Hot Rolled, Skin Passed, Trimmed Edge - Coil

TRKK

Hot Rolled, Skin Passed, Mill Edge - Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)						
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 8
1,50 - 1,79	1125	1025					
1,80 - 1,99	1225	1125	825				
2,00 - 2,09	1225	1225	1025	925		925	
2,10 - 2,29	1325	1225	1025	925	825	925	
2,30 - 2,39	1425	1325	1125	1025	925	1025	
2,40 - 2,49	1425	1325	1125	1025	925	1025	925
2,50 - 2,69	1525	1425	1225	1125	1025	1125	1025
2,70 - 2,79	1525	1525	1225	1125	1025	1125	1125
2,80 - 2,99	1525	1525	1325	1225	1025	1225	1225
3,00 - 3,19	1525	1525	1425	1325	1125	1225	1225
3,20 - 3,49	1525	1525	1425	1325	1125	1325	1325
3,50 - 3,59	1525	1525	1525	1425	1225	1325	1325
3,60 - 3,89	1525	1525	1525	1425	1225	1425	1425
3,90 - 3,99	1525	1525	1525	1425	1225	1425	1525
4,00 - 4,49	1525	1525	1525	1525	1325	1525	1525
4,50 - 4,99	1525	1525	1525	1525	1425	1525	1525
5,00 - 6,50	1525	1525	1525	1525	1525	1525	1525

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009, 6006, 6211, 6222, 6223, 6224, 6282, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3137, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3430, 3433, 3701, 3702, 3937, 3938, 3940, 4237, 4238, 4240, 4260, 4275, 4437, 5437, 6037, 6837, 6842 (t≤2,50), 9030
3	3020, 3037, 3241, 3244, 3285, 3345, 3436, 3440, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842 (t>2,50), 9035, 9042, 9046, 9240
4	3945, 3946, 3955, 4634, 6345, 6847, 6848, 9329
5	842, 846, 850, 859, 860, 3245, 3252, 3550, 3551, 3905, 3949, 3957, 4052, 4249, 4250, 4251, 4252, 4642, 4947, 5035, 5252, 6050, 6052, 6053, 6252, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6852, 9355, 9356, 9420
6	800, 801, 810, 811, 812, 813, 820, 4255, 4932, 4933, 4936, 4937, 4942, 4943
8	7224, 7524

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for special grades, 700, 720, 800, 801, 810, 811, 812, 813, 820 are subjected to negotiation.
3) The upper limits of width for product type TR are determined by subtracting 25 mm from the upper limits of widths specified for each individual range of thickness.
4) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections.
5) 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
6) For the grades which are suitable for wheel manufacturing such as 3905, 3901, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the regionof 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.
7) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as "THRU" product type up to 4,99 mm in thickness and other cut to length products between 5,00-6,50 mm thickness range.

Grade	Thickness of Order
3938, 3940, 3945, 3946, 6837, 6842, 6847, 6852	Max. 5,00 mm
3330, 3333, 3336, 3340, 3345, 6035	Max. 6,00 mm
3430, 3433, 3436, 3440, 6036	Min. 6,01 mm

Hot Rolled Flat Steel Products

Production Limits

HRU

Hot Rolled, Trimmed Edge - Sheet From Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
1,50 - 1,79	1100	1000				
1,80 - 1,99	1200	1100	800			
2,00 - 2,09	1200	1200	1000	900		900
2,10 - 2,29	1300	1200	1000	900	800	900
2,30 - 2,49	1400	1300	1100	1000	900	1000
2.50 - 2.69	1500	1400	1200	1100	1000	1100
2.70 - 2.79	1500	1500	1200	1100	1000	1100
2,80 - 2,99	1500	1500	1300	1200	1000	1200
3,00 - 3,19	1500	1500	1400	1300	1100	1200
3,20 - 3,49	1500	1500	1400	1300	1100	1300
3,50 - 3,59	1500	1500	1500	1400	1200	1300
3,60 - 3,99	1500	1500	1500	1400	1200	1400
4,00 - 4,49	1500	1500	1500	1500	1300	1500
4,50 - 4,99	1500	1500	1500	1500	1400	1500

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009, 6006, 6211,6222, 6223, 6224, 6282, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3701, 3702, 3937, 3938, 3940, 4237, 4275, 4437, 4238, 4240, 5437, 6037, 4437, 5437, 6037, 6842 (≤ 2,5)
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6837, 6838, 6842 (> 2,5), 9035, 9042, 9046, 9240
4	3945, 3946, 3955, 4634, 6345, 6847, 6848, 9329, 9960
5	721, 735, 835, 842, 845, 846, 850, 855, 859, 860, 890, 3030, 3031, 3032, 3033, 3052, 3245, 3250, 3252, 3260, 3350, 3550, 3551, 3660, 3732, 3736, 3905, 3949, 3957, 3960, 4052, 4249, 4250, 4251, 4252, 4642, 4732, 4736, 4946, 4947, 4950, 4955, 4960, 4965, 4970, 5035, 5040, 5045, 5050, 5052, 5060, 5246, 5252, 5270, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6052, 6053, 6252, 6258, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6704, 6850, 6852, 6855, 6860, 6865, 6870, 7252, 8412, 8414, 8416, 8430, 8434, 8440, 8613, 9052, 9255, 9256, 9257, 9335, 9338, 9342, 9355, 9356, 9435, 9442, 9449, 9455, 9420, 9460
6	800, 801, 810, 811, 812, 813, 820, 4255, 4932, 4933, 4936, 4937, 4942, 4943

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for hot charging compulsory grades, 3260, 5045, 5050, 5060, 5270, 5622, 5626, 5628, 5630, 5631 are subjected to negotiation.
3) Orders for special grades, 700, 720, 735, 800, 801, 810, 811, 812, 813, 820, 835 are subjected to negotiation.
4) Claims about coil break are not accepted for 1. group of grades. If coil break is not desired for these grade, orders have to be product type of THRU
5) a) For thicknesses ≤ 4.00 mm, the nominal lengths are between 1500 mm and 6000 mm.
   b) For thicknesses > 4.00 mm, the nominal lengths are between 1500 mm and 15000 mm.
6) a) For the nominal length ≤ 4000 mm, maximum bundle weight is 7 mtons.
   b) For the nominal length > 4000 mm, no limitation for bundle weight.
7) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections,
8) 6335, 6341, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
9) For the grades which are suitable for wheel manufacturing such as 3901, 3905, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955, 3957, 3960 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.

Production Limits

HRUKK

Hot Rolled, Mill Edge - Sheet From Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
1,40 - 1,49	1325	1325	1250	1250		
1,50 - 1,79	1400	1400	1280	1280	1200	1200
1,80 - 1,99	1550	1550	1400	1400	1350	1350
2,00 - 2,09	1610	1610	1500	1500	1400	1400
2,10 - 2,29	1750	1750	1550	1550	1430	1430
2,30 - 2,49	1800	1800	1600	1600	1500	1500
2.50 - 2.79	1850	1850	1650	1650	1565	1565
2,80 - 2,99	1950	1950	1750	1750	1655	1655
3,00 - 3,19	2000	2000	1800	1800	1710	1710
3,20 - 3,49	2050	2050	1850	1850	1765	1765
3,50 - 3,59	2050	2050	1900	1900	1850	1850
3,60 - 3,99	2050	2050	1925	1925	1865	1865
4,00 - 4,19	2050	2050	2000	2000	1915	1915
4,20 - 4,49	2050	2050	2050	2050	1945	1945
4,50 - 4,99	2050	2050	2050	2050	1985	1985

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 720, 3008, 3137, 3222, 3235, 3237, 3281, 3333, 3337, 3901, 3922, 3923, 4009, 4222, 4237, 4437, 5437, 6006, 6037, 6211, 6222, 6223, 6224, 6282, 6837, 7222
2	2008, 2009, 3010, 3012, 3015, 3018, 3285, 3330, 3936, 3937, 4238, 4240, 4260, 4275
3	3020, 3021, 3037, 3241, 3244, 3336, 3340, 3345, 3436, 3440, 3701, 3702, 3741, 3940, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842, 9240, 9329, 3938
4	3945, 3946, 6847, 6848, 6852, 9255, 9256, 9960
5	800, 801, 810, 811, 812, 813, 3955, 4634, 4932, 4933, 4936, 4937
6	721, 735, 820, 835, 842, 845, 846, 850, 855, 859, 860, 890, 3026, 3030, 3031, 3052, 3245, 3250, 3252, 3260, 3350, 3550, 3551, 3660, 3732, 3736, 3901, 3905, 3949, 3957, 3960, 4052, 4249, 4250, 4251, 4252, 4255, 4642, 4732, 4736, 4846, 4942, 4343, 4933, 4946, 4947, 4950, 4955, 4960, 4970, 5035, 5040, 5045, 5050, 5052, 5060, 5246, 5252, 5270, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6052, 6053, 6252, 6258, 6284, 6345, 6347, 6350, 6352, 6353, 6355, 6356, 6704, 6850, 6855, 6860, 6865, 6870, 8412, 8414, 8416, 8130, 8434, 8440, 8613, 7252, 9257, 9335, 9338, 9342, 9355, 9356, 9360, 9420, 9435, 9442, 9449, 9455, 9460

Notes

1) Production limits will be re-evaluated prior to order according to plant production capabilities and other current orders.
2) Orders for hot charging compulsory grades, 3260, 5045, 5050, 5060, 5270, 5622, 5626, 5628, 5630, 5631, 8412, 8414, 8416, 8430, 8434, 8440, 8613 are subjected to negotiation.
3) Orders for 890, 3660 and 9360 are subjected to negotiation.
4) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections
5) For the grades which are suitable for wheel manufacturing such as 3901, 3905, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955, 3957, 3960 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.
6) 6335, 6341, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
7) Bundle weight and minimum sheet length depend on thickness and width.

Hot Rolled Flat Steel Products

Production Limits

FHRUK

Hot Rolled Sheet Directly Cut From Coil With Mill Edge - Sheet From Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
1,50 - 1,79	1137	1037				
1,80 - 1,99	1237	1137	837			
2,00 - 2,09	1237	1237	1037	937		937
2,10 - 2,29	1337	1237	1037	937	837	937
2,30 - 2,49	1437	1337	1137	1037	937	1037
2.50 - 2.69	1537	1437	1237	1137	1037	1137
2.70 - 2.79	1537	1537	1237	1137	1037	1137
2,80 - 2,99	1537	1537	1337	1237	1037	1237
3,00 - 3,19	1537	1537	1437	1337	1137	1237
3,20 - 3,49	1537	1537	1437	1337	1137	1337
3,50 - 3,59	1537	1537	1537	1437	1237	1337
3,60 - 3,99	1537	1537	1537	1437	1237	1437
4,00 - 4,49	1537	1537	1537	1537	1337	1537
4,50 - 4,99	1537	1537	1537	1537	1437	1537

Steel Grades

Group No.	
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 6006, 6211, 6222, 6223, 6224, 6282, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3701, 3702, 3936, 3937, 3938, 3940, 4009, 4237, 4238, 4240, 4275, 4437, 5437, 6037
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3944, 4044, 4239, 4244, 4246, 4947, 6018, 6035, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6837, 6838, 6842
4	3245, 3945, 3946, 3955, 4634, 6847, 6848, 6852, 9960
5	721, 735, 835, 842, 845, 846, 850, 859, 860, 890, 3030, 3031, 3052, 3245, 3250, 3252, 3260, 3350, 3550, 3551, 3660, 3732, 3736, 3949, 3957, 3960, 4052, 4249, 4250, 4251, 4252, 4642, 4732, 4736, 4946, 4947, 4950, 4955, 4960, 4965, 4970, 5035, 5040, 5045, 5050, 5052, 5060, 5246, 5252, 5270, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6052, 6053, 6258, 6252, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6704, 6850, 6852, 6855, 6860, 6865, 6870, 7252, 8412, 8414, 8416, 8430, 8434, 8440, 8613, 9052, 9255, 9256, 9257, 9335, 9338, 9342, 9355, 9356, 9435, 9442, 9449, 9455, 9420, 9460
6	455, 800, 801, 810, 811, 812, 813, 820, 4932, 4933, 4936, 4937, 4942, 4943

Production Limits

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for hot charging compulsory grades, 3260, 5045, 5050, 5060, 5270, 5622, 5626, 5628, 5630, 5631, 8412, 8414, 8416, 8430, 8434, 8440, 8613 are subject to negotiation.
3) Orders for the grade 890, 3660 is subjected to negotiations.
4) Orders for 1. group grade are accepted under the condition that claims about coil break will not be made. If coil breaks are not tolerable relevant orders can be considered as THRU product type.
5) a) For thicknesses ≤ 4.00 mm, the nominal lengths are between 1500 mm and 6000 mm.
   b) For thicknesses > 4.00 mm, the nominal lengths are between 1500 mm and 15000 mm.
6) a) For the nominal length ≤ 4000 mm, maximum bundle weight is 7 mtons.
   b) For the nominal length > 4000 mm, no limitation for bundle weight.
7) EN 10163-2 (Class B, Subclass 3) is guaranteed for surface imperfections.
8) For the grades which are suitable for wheel manufacturing up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which these type of imperfections may cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.
9) Only the head and the tail sections of the hot rolled coil are eliminated during cut to length process
10) This product code is not available for export sales.

Hot Rolled Flat Steel Products

Production Limits

THRU

Hot Rolled, Skin Passed, Trimmed Edge - Sheet From Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)						
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 8
1,50 - 1,79	1100	1000					
1,80 - 1,99	1200	1100	800				
2,00 - 2,09	1200	1200	1000	900		900	
2,10 - 2,29	1300	1200	1000	900	800	900	
2,30 - 2,39	1400	1300	1100	1000	900	1000	
2,40 - 2,49	1400	1300	1100	1000	900	1000	900
2.50 - 2.69	1500	1400	1200	1100	1000	1100	1000
2.70 - 2.79	1500	1500	1200	1100	1000	1100	1100
2,80 - 2,99	1500	1500	1300	1200	1000	1200	1200
3,00 - 3,19	1500	1500	1400	1300	1100	1200	1200
3,20 - 3,49	1500	1500	1400	1300	1100	1300	1300
3,50 - 3,59	1500	1500	1500	1400	1200	1300	1300
3,60 - 3,89	1500	1500	1500	1400	1200	1400	1400
3,90 - 3,99	1500	1500	1500	1400	1200	1400	1500
4,00 - 4,49	1500	1500	1500	1500	1300	1500	1500
4,50 - 4,99	1500	1500	1500	1500	1400	1500	1500

Steel Grades

Group No.	
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009, 6006, 6211, 6222, 6223, 6224, 6282, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3237, 3235, 3281, 3330, 3333, 3336, 3337, 3340, 3701, 3702, 3937, 3938, 3940, 4237, 4238, 4240, 4260, 4275, 4437, 5437, 6037, 6837, 6842(t≤2,50), 9030
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842(t>2,50), 9035, 9042, 9046, 9240
4	3945, 3946, 3955, 4634, 6345, 6847, 6848, 9329
5	842, 846, 850, 859, 860, 3031, 3032, 3033, 3052, 3245, 3550, 3252, 3551, 3905, 3949, 3957, 4052, 4249, 4250, 4251, 4252, 4642, 5035, 5052, 5252, 6050, 6052, 6053, 6252, 6258, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6852, 9355, 9356, 9420
6	800, 801, 810, 811, 812, 813, 820, 4255, 4932, 4933, 4936, 4937, 4942, 4943
8	7224, 7524

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for special grades, 700, 720, 800, 801, 810, 811, 812, 813, 820 are subjected to negotiation.
3) a) For thicknesses ≤ 4.00 mm, the nominal lengths are between 1500 mm and 6000 mm.
   b) For thicknesses > 4.00 mm, the nominal lengths are between 1500 mm and 15000 mm.
4) a) For the nominal length ≤ 4000 mm, maximum bundle weight is 7 t.
   b) For the nominal length > 4000 mm, no limitation for bundle weight.
5) No request is accepted for normalizing.
6) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections,
7) 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.

Production Limits

HRP
Hot Rolled, Pickled, Trimmed Edge - Sheet From Coil

HRPKK
Hot Rolled, Pickled, Mill Edge - Sheet From Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
1,50 - 1,79	1125	1025				
1,80 - 1,99	1225	1125	825			
2,00 - 2,09	1225	1225	1025	925		925
2,10 - 2,29	1325	1225	1025	925	825	925
2,30 - 2,49	1425	1325	1125	1025	925	1025
2.50 - 2.69	1525	1425	1225	1125	1025	1125
2.70 - 2.79	1525	1525	1225	1125	1025	1125
2,80 - 2,99	1525	1525	1325	1225	1025	1225
3,00 - 3,19	1525	1525	1425	1325	1125	1225
3,20 - 3,49	1525	1525	1425	1325	1125	1325
3,50 - 3,59	1525	1525	1525	1425	1225	1325
3,60 - 3,99	1525	1525	1525	1425	1225	1425
4,00 - 4,49	1525	1525	1525	1525	1325	1525
4,50 - 4,99	1525	1525	1525	1525	1425	1525

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009, 6006, 6211, 6222, 6223, 6224, 6282, 6523, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3701, 3702, 3937, 3938, 3940, 4237, 4238, 4240, 4260 4275, 4437, 5437, 6037, 6837, 6842 (t≤2,50), 9030
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842 (t>2,50) 9035, 9042, 9046, 9240
4	3945, 3946, 3955, 4634, 6345, 6847, 6848, 9329, 9960
5	721, 735, 835, 842, 845, 846, 850, 855, 859, 860, 890, 3030, 3031, 3032, 3033 3052, 5052, 3245, 3250, 3252, 3260, 3350, 3550, 3551, 3660, 3732, 3736, 3905, 3949, 3957, 3960, 4052, 4249, 4250, 4251, 4252, 4642, 4732, 4736, 4846, 4946, 4947, 4950, 5035, 5040, 5045, 5050, 5060, 5246, 5252, 5270, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6052, 6053, 6252, 6258, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6704, 6850, 6852, 6855, 6860, 6865, 6870, 7252, 9052, 9255, 9256, 9257, 9335, 9338, 9342, 9355, 9356, 9360, 9420, 9435, 9442, 9449, 9455, 9460
6	800, 801, 810, 811, 812, 813, 820, 4255, 4932, 4933, 4936, 4937, 4942, 4943

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for hot charging compulsory grades, 3260, 5045, 5050, 5060, 5270, 5622, 5626, 5628, 5630, 5631 are subjected to negotiation.
3) Orders for special grades, 700, 720, 735, 800, 801, 810, 811, 812, 813, 820, 835 are subjected to negotiation.
4) The upper limits of width for product type HRP are determined by subtracting 25 mm from the upper limits of widths specified for each individual range of thickness.
5) Claims about coil break are not accepted for 1. group of grades. If coil break is not desired for these grade, orders have to be product type of THRP and THRPK.
6) Claims about scratch and similar defects are not accepted for dry (unoiled) orders.
7) Length : min. 1500 mm, max. 6000 mm.
8) a) For the nominal length ≤ 4000 mm, maximum bundle weight is 7 t.
   b) For the nominal length > 4000 mm, no limitation for bundle weight.
9) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections,
10) 6335, 6341, 6345, 6347, 6350, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
11) For the grades which are suitable for wheel manufacturing such as 3901, 3905, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955, 3957, 3960 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding thesurface, are not accepted.

Production Limits

THRP
Hot Rolled, Skin Passed, Pickled, Trimmed Edge - Sheet From Coil

THRPK
Hot Rolled, Skin Passed, Pickled, Mill Edge - Sheet From Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)						
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 8
1,50 - 1,79	1125	1025					
1,80 - 1,99	1225	1125	825				
2,00 - 2,09	1225	1225	1025	925		925	
2,10 - 2,29	1325	1225	1025	925	825	925	
2,30 - 2,39	1425	1325	1125	1025	925	1025	
2,40 - 2,49	1425	1325	1125	1025	925	1025	925
2.50 - 2.69	1525	1425	1225	1125	1025	1125	1025
2.70 - 2.79	1525	1525	1225	1125	1025	1125	1125
2,80 - 2,99	1525	1525	1325	1225	1025	1225	1225
3,00 - 3,19	1525	1525	1425	1325	1125	1225	1225
3,20 - 3,49	1525	1525	1425	1325	1125	1325	1325
3,50 - 3,59	1525	1525	1525	1425	1225	1325	1325
3,60 - 3,89	1525	1525	1525	1425	1225	1425	1425
3,90 - 3,99	1525	1525	1525	1425	1225	1425	1525
4,00 - 4,49	1525	1525	1525	1525	1325	1525	1525
4,50 - 4,99	1525	1525	1525	1525	1425	1525	1525

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3922, 3923, 4009, 6006, 6211, 6222, 6223, 6224, 6282, 6523, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3701, 3702, 3937, 3938, 3940, 4237, 4238, 4240, 4260, 4275, 4437, 5437, 6037, 6837, 6842(t≤2,50), 9030
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6040, 6042, 6044, 6237, 6244, 6258, 6335, 6340, 6341, 6741, 6838, 6842(t>2,50), 9035, 9042, 9046, 9240
4	3945, 3946, 3955, 4634, 6345, 6847, 6848, 9329
5	842, 846, 850, 859, 860, 3032, 3033, 3052, 3245, 3252, 3550, 3551, 3905, 3949, 3957, 4052, 4249, 4250, 4251, 4252, 4642, 5035, 5052, 5252, 6050, 6052, 6053, 6252, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6852, 9355, 9356, 9420
6	800, 801, 810, 811, 812, 813, 820, 4255, 4932, 4933, 4936, 4937, 4942, 4943
8	7224, 7524

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for special grades, 700, 720, 800, 801, 810, 811, 812, 813, 820 are subjected to negotiation.
3) The upper limits of width for product type THRP are determined by subtracting 25 mm ‘from the upper limits of widths specified for each individual range of thickness.
4) Length : min. 1500 mm, max. 6000 mm.
5) a) For the nominal length ≤ 4000 mm, maximum bundle weight is 7 t.
   b) For the nominal length > 4000 mm, no limitation for bundle weight.
6) No request is accepted for normalizing.
7) Claims about scratch and similar defects are not accepted for dry (unoiled) orders.
8) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections,
9) 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
10) For the grades which are suitable for wheel manufacturing such as 3901, 3905, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.

Production Limits

RP

Hot Rolled, Pickled, Trimmed Edge - Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
1,50 - 1,79	1100	1000				
1,80 - 1,99	1200	1100	800			
2,00 - 2,09	1200	1200	1000	900		900
2,10 - 2,29	1300	1200	1000	900	800	900
2,30 - 2,49	1400	1300	1100	1000	900	1000
2.50 - 2.69	1500	1400	1200	1100	1000	1100
2.70 - 2.79	1500	1500	1200	1100	1000	1100
2,80 - 2,99	1500	1500	1300	1200	1000	1200
3,00 - 3,19	1500	1500	1400	1300	1100	1200
3,20 - 3,49	1500	1500	1400	1300	1100	1300
3,50 - 3,59	1500	1500	1500	1400	1200	1300
3,60 - 3,99	1500	1500	1500	1400	1200	1400
4,00 - 4,49	1500	1500	1500	1500	1300	1500
4,50 - 4,99	1500	1500	1500	1500	1400	1500
5,00 - 8,00	1500	1500	1500	1500	1500	1500

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009 (t≤8,00), 6006, 6211, 6222, 6223, 6224, 6282, 6523, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3430, 3433, 3701, 3702, 3937, 3938 3940, 4237, 4238, 4240, 4260, 4275, 4437, 5437, 6037, 6837, 6842 (t≤2,50), 9030 (t≤7,00)
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3436, 3440, 3741, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842 (t>2,50), 9030 (t>7,00), 9035, 9042, 9046, 9240
4	3945, 3946, 3955, 4634, 6345, 6847, 6848, 9329, 9960
5	721, 735, 835, 842, 845, 846, 850, 855, 859, 860, 890, 3030, 3031, 3032, 3033, 3052, 3245, 3246, 3249, 3250, 3252, 3260, 3350, 3550, 3551, 3660, 3732, 3736, 3905, 3949, 3957, 3960, 4052, 4249, 4250, 4251, 4252, 4642, 4732, 4736, 4846, 4946, 4947, 4950, 5035, 5040, 5045, 5050, 5052, 5246, 5252, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6052, 6053, 6252, 6258, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6704, 6850, 6852, 6855, 6860, 68656870, 7252, 9052, 9255, 9256, 9257, 9335, 9338, 9342, 9355, 9356, 9360, 9420, 9435, 9442, 9449, 9455, 9460
6	800, 801, 810, 811, 812, 813, 820, 4932, 4933, 4936, 4937, 4942, 4943

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for hot charging compulsory grades, 3260, 5045, 5050, 5622, 5626, 5628, 5630, 5631 are subjected to negotiation.
3) Orders for special grades, 700, 720, 735, 800, 801, 810, 811, 812,813, 820, 835 are subjected to negotiation.
4) Orders for limited coil weight are subjected to negotation.
5) Order for "SMALL COIL" is not accepted for the product of thickness greater than 7.51 mm.
6) Claims about coil break are not accepted for 1. group grades in thickness less than or equal to 6.50 mm . If coil break is not desired for these grades, orders for thickness less than or equal to 6.50 mm have to be product type of TRP.
7) 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
8) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections,
9) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length products.

Grade	Thickness of Order
3330, 3333, 3336, 3340, 3345, 3350, 6035	Max. 6,00 mm
3938, 3940, 3945, 3946, 6837, 6842, 6847, 6848, 6852	Max. 5,00 mm
3430, 3433, 3436, 3440, 6036	Min. 6,01 mm

Hot Rolled Flat Steel Products

Production Limits

BRP

Hot Rolled, Processed in Coil Preparation Line, Pickled, Trimmed Edge - Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
1,50 - 1,79	1100	1000				
1,80 - 1,99	1200	1100	800			
2,00 - 2,09	1200	1200	1000	900		900
2,10 - 2,29	1300	1200	1000	900	800	900
2,30 - 2,49	1400	1300	1100	1000	900	1000
2.50 - 2.69	1500	1400	1200	1100	1000	1100
2.70 - 2.79	1500	1500	1200	1100	1000	1100
2,80 - 2,99	1500	1500	1300	1200	1000	1200
3,00 - 3,19	1500	1500	1400	1300	1100	1200
3,20 - 3,49	1500	1500	1400	1300	1100	1300
3,50 - 3,59	1500	1500	1500	1400	1200	1300
3,60 - 3,99	1500	1500	1500	1400	1200	1400
4,00 - 4,49	1500	1500	1500	1500	1300	1500
4,50 - 4,99	1500	1500	1500	1500	1400	1500
5,00 - 6,50	1500	1500	1500	1500	1500	1500

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009, 6006, 6211, 6222, 6223, 6224, 6282, 6523, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3701, 3702, 3937, 3938, 3940, 4237, 4238, 4240, 4260, 4275, 4437, 5437, 6037, 6837, 6842 (≤ 2,5), 9030
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842 (>2,5), 9035, 9042, 9046, 9240
4	3945, 3946, 3955, 4634, 6345, 6847, 6848, 9329, 9960
5	721, 735, 835, 842, 846, 850, 855, 859, 860, 890, 3030, 3031, 3032, 3033, 3052, 3245, 3250, 3252, 3350, 3550, 3551, 3660, 3732, 3736, 3905, 3949, 3957, 3960, 4052, 4249, 4250, 4251, 4252, 4642, 4732, 4736, 4946, 4947, 5035, 5052, 5246, 5252, 5620, 5622, 5626, 5630, 5631, 6050, 6052, 6053, 6252, 6258, 6284, 6345, 6347, 6350, 6352, 6353, 6355, 6356, 6704, 6850, 6852, 6855, 6860, 6865, 6870, 7252, 9052, 9255, 7252, 9052, 9255, 9256, 9257, 9335, 9338, 9342, 9355, 9356, 9435, 9442
6	800, 801, 810, 811, 812, 813, 820, 4932, 4933, 4936, 4937, 4942, 4943

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for hot charging compulsory grades, 5622, 5626, 5628, 5630, 5631 are subjected to negotiation.
3) Orders for special grades, 700, 720, 735, 800, 801, 810, 811, 812, 813, 820, 835 are subjected to negotiation.
4) Orders for limited coil weight are subjected to negotation.
5) Claims about coil break are not accepted for 1. group grades. If coil break is not desired for these grades, orders have to be product type of TRP.
6) 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
7) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections,
8) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length products.

Grade	Thickness of Order
3330, 3333, 3336, 3340, 3345, 3350, 6035	Max. 6,00 mm
3938, 3940, 3945, 3946, 6837, 6842, 6847, 6848, 6852	Max. 5,00 mm

RPKK

Hot Rolled, Pickled, Mill Edge - Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
1,50 - 1,79	1125	1025				
1,80 - 1,99	1225	1125	825			
2,00 - 2,09	1225	1225	1025	925		925
2,10 - 2,29	1325	1225	1025	925	825	925
2,30 - 2,49	1425	1325	1125	1025	925	1025
2.50 - 2.69	1525	1425	1225	1125	1025	1125
2.70 - 2.79	1525	1525	1225	1125	1025	1125
2,80 - 2,99	1525	1525	1325	1225	1025	1225
3,00 - 3,19	1525	1525	1425	1325	1125	1225
3,20 - 3,49	1525	1525	1425	1325	1125	1325
3,50 - 3,59	1525	1525	1525	1425	1225	1325
3,60 - 3,99	1525	1525	1525	1425	1225	1425
4,00 - 4,49	1525	1525	1525	1525	1325	1525
4,50 - 4,99	1525	1525	1525	1525	1425	1525
5,00 - 10,00	1525	1525	1525	1525	1525	1525
10,01 - 16,00	1525	1525	1525	1525		

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009 (t≤8,00), 6006, 6211, 6222, 6223, 6224, 6282, 6523, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3430, 3433, 3701, 3702, 3937, 3938 3940, 4009(t>8,00), 4237, 4238, 4240, 4260, 4275, 4437, 5437, 6037, 6837, 6842(t≤2,50), 9030(t≤7,00)
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3436, 3440, 3741, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842(t>2,50), 9030(t>7,00), 9035, 9042, 9046, 9240
4	3945, 3946, 3955, 4634, 6345, 6847, 6848, 9329, 9960
5	735, 835, 842, 845, 846, 850, 859, 860, 890, 3030, 3031, 3032, 3033, 3052, 3245, 3246, 3249, 3250, 3252, 3260, 3350, 3550, 3551, 3660, 3732, 3736, 3905, 3949, 3957, 3960, 4052, 4249, 4250, 4251, 4252, 4642, 4732, 4736, 4846, 4946, 4947, 4950, 4955, 5035, 5040, 5045, 5050, 5052, 5060, 5246, 5252, 5270, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6052, 6053, 6252, 6258, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6704, 6850, 6852, 6855, 6860, 6865, 6870, 7252, 9052, 9255, 9256, 9257, 9335, 9338, 9342, 9355, 9356, 9360, 9420, 9435, 9442, 9449, 9455, 9460
6	800, 801, 810, 811, 812, 813, 820, 4255, 4932, 4933, 4936, 4937, 4942, 4943

Notes

1) The minimum width is 700 mm for thickness up to 10 mm . However, 700-899 mm width range is subjected to negotiation.
2) The minimum width is 800 mm for thickness greater than 10 mm. However 800-899 mm width range is subjected to negotiation.
3) Orders for hot charging compulsory grades, 3260, 5045, 5050, 5060, 5270, 5622, 5626, 5628, 5630, 5631 are subjected to negotiation.
4) Orders for special grades, 700, 720, 735, 800, 801, 810, 811, 812, 813, 820, 835 are subjected to negotiation.
5) Orders for limited coil weight are subjected to negotation.
6) Order for "SMALL COIL" is not accepted for the product of thickness greater than 7.51 mm.
7) Claims about coil break are not accepted for 1. group grades in thickness less than or equal to 6.50 mm . If coil break is not desired for these grades, orders for thickness less than or equal to 6.50 mm have to be product type of TRPKK.
8) 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
9) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections,
10) For the grades which are suitable for wheel manufacturing such as 3901, 3905, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955, 3957, 3960 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.
11) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length products.

Grade	Thickness of Order
3330, 3333, 3336, 3340, 3345, 3350, 6035	Max. 6,00 mm
3938, 3940, 3945, 3946, 6837, 6842, 6847, 6848, 6852	Max. 5,00 mm
720, 801, 835, 3337, 4044, 6340	Max. 8,00 mm
9035, 9042, 9046, 9052, 9255, 9256, 9960	Max. 10,00 mm
801	max 16mm (1525mm width)
3430, 3433, 3436, 3440, 6036	Min. 6,01 mm

Production Limits

BRPKK

Hot Rolled, Processed in Coil Preparation Line, Pickled, Mill Edge - Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
1,50 - 1,79	1125	1025				
1,80 - 1,99	1225	1125	825			
2,00 - 2,09	1225	1225	1025	925		925
2,10 - 2,29	1325	1225	1025	925	825	925
2,30 - 2,49	1425	1325	1125	1025	925	1025
2.50 - 2.69	1525	1425	1225	1125	1025	1125
2.70 - 2.79	1525	1525	1225	1125	1025	1125
2,80 - 2,99	1525	1525	1325	1225	1025	1225
3,00 - 3,19	1525	1525	1425	1325	1125	1225
3,20 - 3,49	1525	1525	1425	1325	1125	1325
3,50 - 3,59	1525	1525	1525	1425	1225	1325
3,60 - 3,99	1525	1525	1525	1425	1225	1425
4,00 - 4,49	1525	1525	1525	1525	1325	1525
4,50 - 4,99	1525	1525	1525	1525	1425	1525
5,00 - 6,50	1525	1525	1525	1525	1525	1525

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3922, 3923, 4009, 6006, 6211, 6222, 6223, 6224, 6282, 6523, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3701, 3702, 3937, 3938, 3940, 4237, 4238, 4240, 4260, 4275, 4437, 5437, 6037, 6837, 6842 (t≤2,50), 9030
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842 (t>2,50), 9035, 9042, 9046, 9240
4	3945, 3946, 3955, 4634, 6345, 6847, 6848, 9329, 9960
5	721, 735, 835, 842, 846, 850, 860, 855, 859, 890, 3030, 3031, 3032, 3033 3052, 3245, 3250, 3252, 3350, 3550, 3551, 3660, 3732, 3736, 3905, 3949, 3957, 3960, 4052, 4239, 4250, 4251, 4252, 4642, 4732, 4736, 4846, 4946, 4947, 5035, 5052, 5246, 5252, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6052, 6053, 6252, 6258, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6704, 6850, 6852, 6855, 6860, 6865, 6870, 7252, 9052, 9255, 9256, 9257, 9335, 9338, 9342, 9355, 9356, 9360, 9420, 9435, 9442
6	800, 801, 810, 811, 812, 813, 820, 4255, 4932, 4933, 4936, 4937, 4942, 4943

Notes

1) The minimum width is 700 mm for thickness up to 10 mm . However, 700-899 mm width range is subjected to negotiation.
2) Orders for hot charging compulsory grades, 5622, 5626, 5628, 5630, 5631 are subjected to negotiation.
3) Orders for special grades, 700, 720, 735, 800, 801, 810, 811, 812, 813, 820, 835 are subjected to negotiation.
4) Orders for limited coil weight are subjected to negotation.
5) Claims about coil break are not accepted for 1. group grades. If coil break is not desired for these grades, orders have to be product type of TRPKK.
6) 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
7) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections,
8) For the grades which are suitable for wheel manufacturing such as 3901, 3905, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955, 3957, 3960 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.
9) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length products.

Grade	Thickness of Order
3330, 3333, 3336, 3340, 3345, 3350, 6035	Max. 6,00 mm
3938, 3940, 3945, 3946, 6837, 6842, 6848, 6852	Max. 5,00 mm

Hot Rolled Flat Steel Products

Production Limits

TRP

Hot Rolled, Skin Passed, Pickled, Trimmed Edge - Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)						
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 8
1,50 - 1,79	1100	1000					
1,80 - 1,99	1200	1100	800				
2,00 - 2,09	1200	1200	1000	900		900	
2,10 - 2,29	1300	1200	1000	900	800	900	
2,30 - 2,39	1400	1300	1100	1000	900	1000	
2,40 - 2,49	1400	1300	1100	1000	900	1000	900
2.50 - 2.69	1500	1400	1200	1100	1000	1100	1000
2.70 - 2.79	1500	1500	1200	1100	1000	1100	1100
2,80 - 2,99	1500	1500	1300	1200	1000	1200	1200
3,00 - 3,19	1500	1500	1400	1300	1100	1200	1200
3,20 - 3,49	1500	1500	1400	1300	1100	1300	1300
3,50 - 3,59	1500	1500	1500	1400	1200	1300	1300
3,60 - 3,89	1500	1500	1500	1400	1200	1400	1400
3,90 - 3,99	1500	1500	1500	1400	1200	1400	1500
4,00 - 4,49	1500	1500	1500	1500	1300	1500	1500
4,50 - 4,99	1500	1500	1500	1500	1400	1500	1500
5,00 - 6,50	1500	1500	1500	1500	1500	1500	1500

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009, 6006, 6211, 6222, 6223, 6224, 6282, 6523, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3430, 3433, 3701, 3702, 3937, 3938, 3940, 4237, 4238, 4240, 4260, 4275 4437, 5437, 6037, 6837, 6842 (t≤2,50), 9030
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3436, 3440, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6741, 6837, 6838, 6842 (t>2,50) 9035, 9042, 9046, 9240
4	3945, 3946, 3955, 4634, 6345, 6847, 6848, 9329
5	842, 846, 850, 859, 860, 3032, 3033, 3052, 3245, 3252, 3550, 3551,3905, 3949, 3957, 4052, 4249, 4250, 4251, 4252, 4642, 5035, 5052, 5252, 6050, 6052, 6053, 6252, 6258, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6852, 9355, 9356, 9420
6	800, 801, 810, 811, 812, 813, 820, 4255, 4932, 4933, 4936, 4937, 4942, 4943
8	7224, 7524

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for special grades, 700, 720, 800, 801, 810, 811, 812, 813, 820 are subjected to negotiation.
3) Orders for limited coil weight are subjected to negotation.
4) 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
5) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections.
6) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as “THRP” product type up to 4,99 mm thickness and “TLP” product type between 5,00-6,50 mm thickness range.

Grade	Thickness of Order
3330, 3333, 3336, 3340, 3345, 6035	Max. 6,00 mm
3938, 3940, 3945, 3946, 6837, 6842, 6847, 6848, 6852	Max. 5,00 mm
3430, 3433, 3436, 3440, 6036	Min. 6,01 mm

Hot Rolled Flat Steel Products

Production Limits

Production Limits

TRPKK

Hot Rolled, Skin Passed, Pickled, Mill Edge - Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)						
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	
1,50 - 1,79	1125	1025					
1,80 - 1,99	1225	1125	825				
2,00 - 2,09	1225	1225	1025	925		925	
2,10 - 2,29	1325	1225	1025	925	825	925	
2,30 - 2,39	1425	1325	1125	1025	925	1025	
2,40 - 2,49	1425	1325	1125	1025	925	1025	925
2.50 - 2.69	1525	1425	1225	1125	1025	1125	1025
2.70 - 2.79	1525	1525	1225	1125	1025	1125	1125
2,80 - 2,99	1525	1525	1325	1225	1025	1225	1225
3,00 - 3,19	1525	1525	1425	1325	1125	1225	1225
3,20 - 3,49	1525	1525	1425	1325	1125	1325	1325
3,50 - 3,59	1525	1525	1525	1425	1225	1325	1325
3,60 - 3,89	1525	1525	1525	1425	1225	1425	1425
3,90 - 3,99	1525	1525	1525	1425	1225	1425	1525
4,00 - 4,49	1525	1525	1525	1525	1325	1525	1525
4,50 - 4,99	1525	1525	1525	1525	1425	1525	1525
5,00 - 6,50	1525	1525	1525	1525	1525	1525	1525

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009, 6006, 6211, 6222, 6223, 6224, 6282, 6523, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3430, 3433, 3701, 3702, 3937, 3938, 3940, 4237, 4238, 4240, 4260, 4275, 4437, 5437, 6037, 6837, 6842 (t≤2,50), 9030
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3436, 3440, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842 (t>2,50) 9035, 9042, 9046, 9240
4	3945, 3946, 3955, 4634, 6345, 6847, 6848, 9329
5	842, 846, 850, 859, 860, 3032, 3033, 3052, 3245, 3252, 3550, 3551, 3905, 3949, 3957, 4052, 4249, 4250, 4251, 4252, 4642, 5035, 5052, 5252, 6050, 6052, 6053, 6252, 6258, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6852, 9355, 9356, 9420
6	800, 801, 810, 811, 812, 813, 820, 4255, 4932, 4933, 4936, 4937, 4942, 4943
8	7224, 7524

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for special grades, 700, 720, 800, 801, 810, 811, 812, 813, 820 are subjected to negotiation.
3) Orders for limited coil weight are subjected to negotation.
4) 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
5) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections,
6) For the grades which are suitable for wheel manufacturing such as 3901, 3905, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.
7) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as "THRPK" product type up to 4,99 mm thickness and "TLPKK" product type between 5,00-6,50 mm thickness range.

Grade	Thickness of Order
3330, 3333, 3336, 3340, 3345, 6035	Max. 6,00 mm
3938, 3940, 3945, 3946, 6837, 6842, 6847, 6848, 6852	Max. 5,00 mm
3430, 3433, 3436, 3440, 6036	Min. 6,01 mm

Production Limits

LP

Hot Rolled, Pickled, Trimmed Edge - Plate From Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
5,00 - 10,00	1500	1500	1500	1500	1500	1500
10,01 - 15,00	1500	1500	1500	1500		

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009 (t≤8,00), 6006, 6211, 6222, 6223, 6224, 6282, 6523, 6624, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3430, 3433, 3701, 3702, 3937, 3938 3940, 4009(t>8,00), 4237, 4238, 4240, 4260, 4275, 4437, 5437, 6037, 6837, 9030(t≤7,00)
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3436, 3440, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842, 9030(t>7,00), 9035, 9042, 9046, 9240
4	3945, 3946, 3955, 4634, 6345, 6847, 6848, 9329, 9960
5	721, 735, 835, 842, 845, 846, 850, 855, 859, 860, 890, 3030, 3031, 3032, 3033, 3052, 3245, 3250, 3252, 3260, 3350, 3550, 3551, 3660, 3732, 3736, 3905, 3949, 3957, 3960, 4052, 4249, 4250, 4251, 4252, 4642, 4846, 4946, 4947, 4950, 5035, 5040, 5045, 5052, 5246, 5252, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6052, 6053, 6252, 6258, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6852, 6855, 6860, 6865, 6870, 7252, 9052, 9255, 9256, 9257, 9335, 9338, 9342, 9355, 9356, 9360, 9420, 9435, 9442, 9449, 9455, 9460
6	800, 801, 810, 811, 812, 813, 820, 4932, 4933, 4936, 4937, 4942, 4943

Notes

1) The minimum width is 700 mm for thickness up to 10 mm . However, 700-899 mm width range is subjected to negotiation.
2) The minimum width is 800 mm for thickness greater than 10 mm. However 800-899 mm width range is subjected to negotiation.
3) Orders for hot charging compulsory grades, 3260, 5045, 5622, 5626, 5628, 5630, 5631 are subjected to negotiation.
4) Orders for special grades, 700, 720, 735, 800, 801, 810, 811, 812, 813, 820, 835 are subjected to negotiation.
5) Impact test request is not accepted for grades 6855, 6860, 6865, 6870
6) 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
7) Claims about coil break are not accepted for 1. group grades in thickness less than or equal to 6.00 mm. If coil break is not desired for these grades, orders for thickness less than or equal to 6.00 mm have to be product type of TLP.
8) Claims about scratch and similar defects are not accepted for dry (unoiled) orders.
9) The order length is between min. 1500 mm and max. 12000 mm.
10) a) For the nominal length < = 4000 mm, maximum bundle weight is 7 t.
    b) For the nominal length > 4000 mm, no limitation for bundle weight.
11) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections,

Grade	Thickness of Order
801	max 16mm (1500mm width)
3330, 3333, 3336, 3340, 3345, 3350, 6035	Max. 6,00 mm
3938, 3940, 3945, 3946, 6837, 6842, 6847, 6848, 6852	Max. 5,00 mm
720, 801, 835, 3337, 4044, 6340	Max. 8,00 mm
3430, 3433, 3436, 3440, 6036	Min. 6,01 mm
9042, 9046, 9052, 9255, 9256, 9257, 9960	Max. 10,00 mm

Production Limits

LPKK

Hot Rolled, Pickled, Mill Edge - Plate From Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
5,00 - 10,00	1525	1525	1525	1525	1525	1525
10,01 - 15,00	1525	1525	1525	1525		

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009(t≤8,00), 6006, 6211, 6222, 6223, 6224, 6282, 6523, 6624, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3430, 3433, 3701, 3702, 3937, 3938 3940, 4009(t>8,00), 4237, 4238, 4240, 4260, 4275, 4437, 4238, 4240, 5437, 6037, 6837, 9030(t≤7,00)
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3436, 3440, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842, 9030(t>7,00), 9035, 9042, 9046, 9240
4	3945, 3946, 3955, 4634, 6345, 6847, 6848, 9329, 9960
5	721, 735, 835, 842, 845, 846, 850, 855, 859, 860, 890, 3030, 3031, 3032, 3033, 3245, 3250, 3252, 3260, 3350, 3550, 3551, 3660, 3732, 3736, 3905, 3949, 3957, 3960, 4052, 4249, 4250, 4251, 4252, 4642, 4846, 4946, 4947, 4950, 5035, 5040, 5052, 5045, 5246, 5252, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6052, 6053, 6252, 6258, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6852, 6855, 6860, 6865, 6870, 7252, 9052, 9255, 9256, 9257, 9335, 9338, 9342, 9355, 9356, 9360, 9420, 9435, 9442, 9449, 9455, 9460
6	800, 801, 810, 811, 812, 813, 820, 4255, 4932, 4933, 4936, 4942, 4943

Notes

1) The minimum width is 700 mm for thickness up to 10 mm . However, 700-899 mm width range is subjected to negotiation.
2) The minimum width is 800 mm for thickness greater than 10 mm. However 800-899 mm width range is subjected to negotiation.
3) Orders for hot charging compulsory grades, 3260, 5045, 5622, 5626, 5628, 5630, 5631 are subjected to negotiation.
4) Orders for special grades, 700, 720, 735, 800, 801, 810, 811, 812, 813, 820, 835 are subjected to negotiation.
5) Impact test request is not accepted for grades 6855, 6860, 6865, 6870
6) 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
7) Claims about coil break are not accepted for 1. group grades in thickness less than or equal to 6.50 mm . If coil break is not desired for these grades, orders for thickness less than or equal to 6.50 mm have to be product type of TLPKK.
8) Claims about scratch and similar defects are not accepted for dry (unoiled) orders.
9) The order length is between min. 1500 mm and max. 12000 mm.
10) a) For the nominal length ≤ 4000 mm, maximum bundle weight is 7 t.
    b) For the nominal length > 4000 mm, no limitation for bundle weight.
11) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections,
12) For the grades which are suitable for wheel manufacturing such as 3901, 3905, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955, 3957, 3960 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.

Grade	Thickness of Order
3330, 3333, 3336, 3340, 3345, 3350, 6035	Max. 6,00 mm
3938, 3940, 3945, 3946, 6837, 6842, 6847, 6848, 6852	Max. 5,00 mm
720, 801, 835, 3337, 4044, 6340	Max. 8,00 mm
9035, 9042, 9046, 9052, 9255, 9256, 9257, 9960	Max. 10,00 mm
801	max 16mm (1525mm width)
3430, 3433, 3436, 3440, 6036	Min. 6,01 mm

Production Limits

TLP

Hot Rolled, Skin Passed, Pickled, Trimmed Edge - Plate From Coil

TLPKK

Hot Rolled, Skin Passed, Pickled, Mill Edge - Plate From Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)						
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 8
5,00 - 6,50	1525	1525	1525	1525	1525	1525	1525

Steel Grades

Group No.	Grades
1	700, 712, 713, 3008, 3901, 3922, 3923, 4009, 6006, 6222, 6223, 6224, 6282, 6523, 6624, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3430, 3433, 3701, 3702, 3937, 3938, 3940, 4260, 4237, 4275, 4437, 5437, 6037, 6837, 9030
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3436, 3440, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 6842, 9035, 9042, 9046, 9240,
4	3945, 3946, 3955, 4634, 6345, 6847, 9329
5	842, 846, 850, 859, 860, 3032, 3033, 3052, 3245, 3252, 3550, 3551, 3905, 3949, 3957, 4052, 4250, 4251, 4252, 4642, 5035, 5052, 5252, 6050, 6052, 6053, 6252, 6258, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6852, 9355, 9356, 9420
6	800, 801, 810, 811, 812, 813, 820, 4255, 4932, 4933, 4936, 4937, 4942, 4933, 4943
8	7224, 7524

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Orders for special grades 700, 720, 800, 801, 810, 811, 812, 813 are subjected to negotiation.
3) Maximum width to be ordered for product type TLP is 1500 mm.
4) The order length is between min. 1500 mm and max. 12000 mm.
5) a) For the nominal length ≤ 4000 mm, maximum bundle weight is 7 t.
   b) For the nominal length > 4000 mm, no limitation for bundle weight.
6) Claims about scratch and similar defects are not accepted for dry (unoiled) orders.
7) 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
8) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections.
9) For the grades which are suitable for wheel manufacturing such as 3901, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.

Grade	Thickness of Order
3938, 3940, 3945, 3946, 6837, 6842, 6847, 6852	Max. 5,00 mm
3330, 3333, 3336, 3340, 3345, 6035, 7224, 7524	Max. 6,00 mm
3430, 3433, 3436, 3440, 6036	Min. 6,01 mm

Production Limits

LR

Hot Rolled, Trimmed Edge - Plate From Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
5,00 - 10,00	1500	1500	1500	1500	1500	1500
10,01 - 15,00	1500	1500	1500	1500	1500	1500

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009(t≤8,00), 6006, 6211, 6222, 6223, 6224, 6282, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3430, 3433, 3701, 3702, 3937, 3938, 3940, 4009, (t>8,00), 4237, 4238, 4240, 4260, 4275, 4437, 5437, 6037, 6837, 9030, (t≤7,00)
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3436, 3440, 3741, 3944, 4044, 4239, 4244, 4246, 6018, 6035, 6036, 6040, 6042, 6044, 6237, 62446335, 6340, 6341 6741, 6838, 6842, 9030, (t>7,00), 9035, 9042, 9046, 9240,
4	3945, 3946, 3955, 4634, 6345, 6847, 6848, 9329, 9960
5	721, 735, 835, 842, 845, 846, 850, 860, 855, 859, 3030, 3031, 3032, 3033, 3052, 3245, 3246, 3249, 3250, 3252, 3260, 3350, 3550, 3551, 3660, 3732, 3736, 3905, 3949, 3957, 3960, 4052, 4249, 4250, 4251, 4252, 4642, 4732, 4736, 4846, 4946, 4947, 4950, 5035, 5040, 5045, 5050, 5052, 5246, 5252, 5620, 5622, 5626, 5628, 5630, 5631, 5732, 5736, 6050, 6052, 6053, 6252, 6258, 6284, 6347, 6350, 6352, 6353, 6355, 6356, 6704, 6705, 6732, 6736, 6850, 6852, 6855, 6860, 6865, 6870, 7252, 9052, 9255, 9256, 9257, 9335, 9338, 9342, 9355, 9356, 9360, 9420, 9435, 9442, 9449, 9455, 9460, 9951, 9952
6	800, 801, 810, 811, 812, 813, 820, 4255, 4932, 4933, 4936, 4937, 4942, 4943

Notes

1) The minimum width is 700 mm for thickness up to 10 mm . However, 700-899 mm width range is subjected to negotiation.
2) The minimum width is 800 mm for thickness greater than 10 mm. However 800-899 mm width range is subjected to negotiation.
3) Orders for hot charging compulsory grades, 3260, 5045, 5050, 5622, 5626, 5628, 5630, 5631 are subjected to negotiation.
4) Orders for special grades, 700, 720, 735, 800, 801, 810, 811, 812, 813, 820, 835 are subjected to negotiation.
5) The order length is between min. 2000 mm and max. 15000 mm.
6) a) For the nominal length ≤ 4000 mm, maximum bundle weight is 7 t.
   b) For the nominal length > 4000 mm, no limitation for bundle weight.
7) Request for normalizing is accepted for the conditions given below :
   a) The minimum thickness of the product shall be 8 mm.
   b) The length of product shall be min. 4000 mm and max. 12000 mm.
   c) Orders for grades 4736, 5732, 5736, 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6704, 6705, 6732, 6736, 6850, 9952 of products of 8 mm or over in thickness are accepted on condition that the normalizing of the products is carried out in the normalizing furnace. These grades are produced as normalizing rolled below 8 mm.
   d) Orders for grades 6855, 6860, 6865, 6870 of products ordered with "impact test" special request are accepted on condition that the normalizing of products is carried out out in the normalizing furnace.
   e) For other grades, request for normalizing is accepted provided that the minimum thickness of the products is 11 mm.
8) Ultrasonic test is carried out acc. to ASTM A435 standard and is accepted for min. 12.50 mm thickness. If requested by the customer, in the range of 8.00-12.49mm thickness Ultrosonic test according to EN 10160 level S0 E0 can be guaranteed without testing.
9) EN 10163-2(class B, subclass 3) is guaranteed for surface imperfections,

Grade	Thickness of Order
3330, 3333, 3336, 3340, 3345, 3350, 6035	Max. 6,00 mm
3938, 3940, 3945, 3946, 6837, 6842, 6847, 6848, 6852	Max. 5,00 mm
720, 801, 835, 3337, 4044, 6340	Max. 8,00 mm
3430, 3433, 3436, 3440, 6036	Min. 6,01 mm
5732, 5736, 6705, 6732, 6736, 9952	Min. 8,00 mm

Production Limits

LRKK

Hot Rolled, Mill Edge - Plate From Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
5,00 - 10,00	2050	2050	2050	2050	2050	2050
10,01 - 12,99	2050	2050	2050	2050	1625	1625
13,00 - 14,00	2050	2050	2050	2050	1625	1625
14,01 - 15,00	2050	2050	2050	2050	1625	1625
15,01 - 16,00	2050	2050	2000	1850	1625	1625
16,01 - 20,00	2050	2050	2000	1525	1525	1525
20,01 - 22,00	2050	2050				

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 720, 3008, 3137, 3222, 3237, 3235, 3281, 3337, 3901, 3922, 3923, 4009, 4222, 4237, 4437, 5437, 6006, 6037, 6211, 6222, 6223, 6224, 6282
2	2008, 2009, 3010, 3012, 3015, 3018, 3285, 3430, 3433, 3936, 3937, 4238, 4240, 4260, 4275
3	3020, 3021, 3037, 3241, 3244, 3436, 3440, 3701, 3702, 3741, 3940, 3944, 4044, 4239, 4244, 4246, 6018, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341 6741, 6838, 9240, 9329
4	9255, 9256, 9960
5	800, 801, 810, 811, 812, 813, 3246, 3249, 3955, 4634, 4932, 4933, 4936, 4937, 4947
6	735, 820, 835, 845, 855, 3026, 3030, 3031, 3032, 3033, 3052, 3245, 3250, 3252, 3260, 3550, 3551, 3732, 3736, 3905, 3949, 3957, 3960, 4052, 4250, 4251, 4252, 4255, 4642, 4732, 4736, 4846, 4942, 4943, 4946, 4950, 4955, 4960, 4970, 5035, 5040, 5045, 5050, 5052, 5060, 5070, 5080, 5246, 5252, 5270, 5375, 5380, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6052, 6053, 6252, 6258, 6284, 6345, 6347, 6350, 6352, 6353, 6355, 6356, 6704, 6850, 6855, 6860, 6865, 6870, 7252, 9257, 9258, 9275, 9335, 9338, 9342, 9355, 9356, 9360, 9420, 9435, 9442, 9449, 9485, 9460, 9951, 9952, 9960

Notes

1) Production limits will be re-evaluated prior to order according to plant production capabilities and other current orders.
2) Orders for hot charging compulsory grades, 3260, 5045, 5050, 5060, 5270, 5622, 5626, 5628, 5630, 5631, 8412, 8414, 8416, 8430, 8434, 8440, 8613 are subjected to negotiation.
3) Orders' length should be minimum 2000 mm and maximum 15000 mm'dir.
4) Bundle weight and minimum sheet length depend on thickness and width.
5) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections
6) For the grades which are suitable for wheel manufacturing such as 3901, 3905, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955, 3957, 3960 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.
7) 5732, 5736, 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6704, 6705, 6732, 6736, 6850, 9952 are produced as normalizing rolled
8) Ultrasonic test is carried out acc. to ASTM A435 standard and is accepted for min. 12.50 mm thickness. If requested by the customer, in the range of 8.00-12.49mm thickness Ultrosonic test according to EN 10160 level S0 E0 can be guaranteed without testing.

Grade	Thickness of Order
4950, 4955	Max. 12,00 mm
3938, 3940, 3945, 3946, 6837, 6842, 6847, 6848, 6852	Max. 5,00 mm
3330, 3333, 3336, 3340, 3345, 3350, 6035	Max. 6,00 mm
720, 801, 835, 3337, 4044, 6340	Max. 8,00 mm
3430, 3433, 3436, 3440, 6036	Min. 6,01 mm
4960, 4970	Max. 10,00 mm

Hot Rolled Flat Steel Products

Production Limits

FLRKK

Hot Rolled Plate Directly Cut From Coil With Mill Edge - Plate From Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
5,00 - 10,00	2050	2050	2050	2050	2050	2050
10,01 - 12,99	2050	2050	2050	2050	1625	1625
13,00 - 14,00	2050	2050	2050	2050	1625	1625
14,01 - 15,00	2050	2050	2050	2050	1625	1625
15,01 - 16,00	2050	2050	2000	1850	1625	1625
16,01 - 20,00	2050	2050	2000	1525	1525	1525
20,01 - 22,00	2050	2050				

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 720, 3008, 3137, 3222, 3235, 3237, 3281, 3337, 3901, 3922, 3923, 4009, 4222, 4237, 4437, 5437, 6006, 6037, 6211, 6222, 6223, 6224, 6282
2	2008, 2009, 3010, 3012, 3015, 3018, 3285, 3430, 3433, 3936, 3937, 4240, 4260, 4275
3	3020, 3021, 3037, 3241, 3244, 3436, 3440, 3701, 3702, 3741, 3940, 3944, 4044, 4239, 4244, 4246, 6018, 6036, 6040, 6044, 6237, 6244, 6335, 6340, 6042, 6341 6741, 6838, 9240, 9329
4	9255, 9256, 9960
5	800, 801, 810, 811, 812, 813, 3955, 4634, 4932, 4933, 4936, 4937
6	735, 820, 835, 845, 855, 3026, 3030, 3031, 3032, 3033, 3052, 3245, 3250, 3252, 3260, 3550, 3551, 3732, 3736, 3905, 3949, 3957, 3960, 4052, 4249, 4250, 4251, 4252, 4255 4642, 4732, 4736, 4846, 4942, 4943, 4946, 4947, 4950, 4955, 4960, 4970, 5035, 5040, 5045, 5050, 5052, 5060, 5070, 5080, 5246, 5252, 5270, 5375, 5380, 5620, 5622, 5626, 5628, 5630, 5631, 6050, 6052, 6053, 6252, 6284, 6345, 6347, 6350, 6352, 6353, 6355, 6356, 6704, 6850, 6855, 6860, 6865, 6870, 7252, 9257, 9258, 9275, 9335, 9338, 9342, 9355, 9356, 9360, 9420, 9435, 9442, 9449, 9485, 9460, 9951, 9952, 9960

Notes

1) Only the head and the tail sections of the hot rolled coil are eliminated during cut to length process
2) Production limits will be re-evaluated prior to order according to plant production capabilities and other current orders.
3) Orders for hot charging compulsory grades, 3260, 5045, 5050, 5060, 5270, 5622, 5626, 5628, 5630, 5631, 8412, 8414, 8416, 8430, 8434, 8440, 8613 are subjected to negotiation.
4) Orders' length should be minimum 2000 mm and maximum 15000 mm'dir.
5) Bundle weight and minimum sheet length depend on thickness and width.
6) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections
7) For the grades which are suitable for wheel manufacturing such as 3901, 3905, 3922, 3923, 3936, 3937, 3938, 3940, 3944, 3945, 3946, 3949, 3955, 3957, 3960 up to 1510 mm widths, there may be casting or rolling process based imperfections such as thin scratches or shell on the coil surfaces in the region of 10 mm away from both sides. To avoid the problems which may these type of imperfections cause, orders should be given as trimmed edge product. In the situation of mill edge order, the claims about these type of imperfections which can be fixed by grinding the surface, are not accepted.
8) 5732, 5736, 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6704, 6705, 6732, 6736, 6850, 9952 are produced as normalizing rolled
9) "NORMALIZING" request is not accepted.
10) "ULTRASONIC TEST" request is not accepted

Grade	Thickness of Order
3938, 3940, 3945, 3946, 6837, 6842, 6847, 6848, 6852	Max. 5,00 mm
3330, 3333, 3336, 3340, 3345, 3350, 6035	Max. 6,00 mm
720, 801, 835, 3337, 4044, 6340	Max. 8,00 mm
3430, 3433, 3436, 3440, 6036	Min. 6,01 mm
6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356, 6704, 6850	Max. 7,99 mm
6855, 6860, 6865, 6870	Max. 7,99 mm (Impact Test request is not accepted)

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Production Limits

Production Limits For Grades Of As-Rolled Condition

L

Heavy Plate, Hot Rolled, Trimmed Edge - Plate

LKK

Heavy Plate, Hot Rolled, Mill Edge - Plate

Dimensions

Thickness (mm)	Maximum Widht (mm)				
	Group 1	Group 2	Group 3	Group 4	Group 5
7,90-10,00	1600 - 3050	1600 - 3050	1600 - 3050	1600 - 2600	1600 - 2000
10,01-12,00	1526 - 3200	1526 - 3200	1526 - 3200	1526 - 3050	1526 - 2600
12,01-15,00	1526 - 3600	1526 - 3600	1526 - 3600	1526 - 3200	1526- 3200
15,01-18,00	1000 - 3600	1000 - 3600	1000 - 3600	1000 - 3200	1000 - 3200
18,01 - 100,00	1000 - 3600	1000 - 3600	1000 - 3600	1000 - 3600	1000 - 3200

Dimensions

Thickness (mm)	Max. Length of plates in the range of 1000-3600 mm width															
	1000-1525	1526-1599	1600-1699	1700-1799	1800-1899	1900-2000	2001-2099	2100-2199	2200-2299	2300-2450	2451-2500	2501-2600	2601-2699	2700-3050	3051-3200	3201-3600
6,00 - 7,99			10	10	10	10	10	10	10	10						
8,00 - 9,99			12,25	12,25	12,25	12,25	12,25	12,25	12,25	12,25	12,25	12,25	12,25	12,25		
10,00 - 11,99		14	14	14	14	14	14	14	14	14	14	14	14	14	14	
12,00 - 15,00		14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
15,01 - 18,00	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
18,01 -22,00	14	14	14	14	14	14	14	14	14	14	14	14	14	12,5	12,5	12,5
22,01 - 25,00	14	14	14	14	14	14	14	14	14	14	14	14	12,75	11	11	11
25,01 - 27,00	14	14	14	14	14	14	14	14	14	14	14	12,5	11,75	10	10	10
27,01 - 30,00	14	14	14	14	14	14	14	14	14	12,25	12	11,25	10,5	9	9	9
30,01 - 35,00	14	14	14	14	14	14	13,5	12,25	11,75	10,5	10	9,25	8,75	7,5	7,5	7,5
35,01 - 40,00	14	14	14	14	13	12,25	11,5	10,75	10	9	8,75	8	7,5	6,5	6,5	6,5
40,01 - 45,00	14	14	13	12,25	11,5	10,75	10	9,5	8,75	8	7,5	7	6,5	5,5	5,5	5,5
45,01 - 50,00	14	12,5	11,5	11	10	9,75	9	8,5	7,75	7	6,75	6	6	5	5	5
50,01 - 55,00	14	11,25	10,25	9,75	9,25	8,5	8	7,5	7	6,25	6	5,5	5,25	4,5	4,5	4,5
55,01 - 60,00	14	10,25	9,5	9	8,25	8	7,5	7	6,5	5,75	5,5	5	4,75	4	4	4
60,01 - 65,00	12,25	9,25	8,5	8	7,5	7	6,75	6,25	5,75	5,25	5	4,5	4,25			
65,01 - 70,00	12,25	8,5	8	7,5	7	6,5	6,25	5,75	5,25	4,75	4,5	4				
70,01 - 75,00	12,25	8	7,25	7	6,5	6	5,75	5,25	5	4,25	4,25					
75,01 - 80,00	12,25	7,25	6,75	6,5	6	5,75	5,25	5	4,5	4						
80,01 - 90,00	12,25	6,5	6	5,5	5,25	5	4,5	4,25	4							
90,01 - 95,00	12	6	5,5	5,25	5	4,5	4,25	4								
95,01 - 100,00	11,5	5,75	5,25	5	4,5	4,5	4									

Steel Grades

Group No.	Grades
1	3008, 6006, 6224, 7224
2	3010, 3012, 3015, 3018, 3237, 3701, 3702
3	3020, 3241, 3244, 3741, 6018, 6036, 6741, 6838
4	3230, 3152, 3245, 3246, 3249, 3252, 3732, 3736, 9329, 9352, 9335, 9435
5	3030, 3250, 3260, 5035, 5040, 5045, 5050, 5060, 5070, 5080, 5270, 5345, 5360, 5375, 5620, 5622, 5626, 5630, 5631, 8412, 8414, 8416, 8430, 8434, 8440, 8613, 9338, 9342, 9442, 9449, 9455, 9960

Hot Rolled Flat Steel Products

Production Limits

Production Limits For Grades Of As-Rolled Condition

Notes

1) Orders for thickness thinner than or equal to 10 mm are subjected to negotiation.
2) Orders for hot charging compulsory grades, 3260, 5050, 5060, 5070, 5080, 5270, 5345, 5360, 5375, 5622, 5626, 5630, 5631, 8412, 8414, 8416, 8430, 8434, 8440, 8613 are subjected to negotiation. Additionally, orders are not accepted under 25.00 mm in thicknesses for these grades narrower than 1526 mm width.
3) Requests of product type “L” are not accepted for grades 3260, 5035, 5040, 5045, 5050, 5060, 5070, 5080, 5270, 5345, 5360, 5375, 8412, 8414, 8416, 8430, 8434, 8440, 8613
4) Requests of product type” L” in the range of 1300-3050 mm width are accepted 7.90-25.00 mm thickness range.
5) Width tolerances for LKK product are specified in the Erdemir product catalogue.
6) The order length is min. 4000 mm. Producable lengths are specified on the table stated above.
7) Orders for the grades 3008, 3010, 3012, 3015, 3020, 3030, 3237, 3244, 3245, 3252, 5035, 5040, 5045, 5050, 5060, 5070, 5080, 5345, 5360, 5375, 6006, 6018 6224, 8412, 8414, 8416, 8430, 8434, 8440, 8613 over 60 mm in thickness are only accepted up to 1510 mm width.
8) The maximum order thickness is 50.00 mm for grades 6838, 9338 and 9435, 40.00 mm for grade 9442, 32.00 mm for grade 9342, 25.00 mm for grades 9449 and 9455, 16.00 mm for grade 9960.
9) Ultrasonic test is carried out acc. to ASTM A435, ASTM A578 and EN 10160 standards and is accepted in the range of thickness given below.
   In the range of 12.50 - 70.00 thickness acc. to ASTM A435 standard.
   in accordance with “level A” and “ level B” in the range of 10.00 - 50.00 thickness, for “level C” in the range of 10.00 - 40.00 mm acc. to ASTM A578 standard.
   applied classes and thickness ranges acc. to EN 10160 are specified below. In the thickness range of 20.01-40.00 mm is subjected to negotiation for ULT group 3. If requested by the customer, in the range of 8.00-12.49 mm thickness, ultrasonic test according to EN 10160 level S0E0 can be guaranteed without testing .
   Tests performed higher than S0E0 level in the range of 8.00-12,49 mm thicknesses are subjected to negotiation.
10) All plates are marked with paint(by machine or manually).
11) Punch marking request must be specified at the time of order.
12) Punch marking is accepted only 8.00-50.00 mm thickness range. For the other thicknesses, marking are only done manually using solid paint or metal marker.
13) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections,

Thickness range (mm)	ULT Group 1	ULT Group 2	ULT Group 3
Class	8.00-50.00	12.50-40.00	12.50-20.00
	S_1E_1, S_1E_0, S_0E_1 S_0E_0	S_2E_2, S_2E_1, S_2E_0 S_1E_2, S_0E_2	S_3E_3, S_3E_2, S_3E_1, S_3E_0 S_2E_3, S_1E_3, S_0E_3

Production Limits
Production Limits For Normalized Grades

L
Heavy Plate, Hot Rolled, Trimmed Edge - Plate

LKK
Heavy Plate, Hot Rolled, Mill Edge - Plate

Dimensions

Thickness (mm)	Maximum Widht (mm)				
	Group 1	Group 2	Group 3	Group 4	Group 5
7,90-10,00		1600 - 3050	1600 - 3050	1600 - 2600	1600 - 2000
10,01-12,00		1526 - 3050	1526 - 3050	1526 - 3050	1526 - 2600
12,01-15,00		1526 - 3050	1526 - 3050	1526 - 3050	1526 - 3050
15,01 - 60,00		1000 - 3050	1000 - 3050	1000 - 3050	1000 - 3050

Dimensions

Thickness (mm)	Max. Length of plates in the range of 1000-3050 mm width (meter)													
	1000-1525	1526-1599	1600-1699	1700-1799	1800-1899	1900-2000	2001-2099	2100-2199	2200-2299	2300-2450	2451-2500	2501-2600	2601-2699	2700-3050
6,00 - 7,99			10	10	10	10	10	10	10	10				
8,00 - 9,99			12,25	12,25	12,25	12,25	12,25	12,25	12,25	12,25	12,25	12,25	12,25	12,25
10,00 - 11,99		14	14	14	14	14	14	14	14	14	14	14	14	14
12,00 - 15,00		14	14	14	14	14	14	14	14	14	14	14	14	14
15,01 - 18,00	14	14	14	14	14	14	14	14	14	14	14	14	14	14
18,01 -22,00	14	14	14	14	14	14	14	14	14	14	14	14	14	12,5
22,01 - 25,00	14	14	14	14	14	14	14	14	14	14	14	14	12,75	11
25,01 - 27,00	14	14	14	14	14	14	14	14	14	14	14	12,5	11,75	10
27,01 - 30,00	14	14	14	14	14	14	14	14	14	12,25	12	11,25	10,5	9
30,01 - 35,00	14	14	14	14	14	14	13,5	12,25	11,75	10,5	10	9,25	8,75	7,5
35,01 - 40,00	14	14	14	14	13	12,25	11,5	10,75	10	9	8,75	8	7,5	6,5
40,01 - 45,00	14	14	13	12,25	11,5	10,75	10	9,5	8,75	8	7,5	7	6,5	5,5
45,01 - 50,00	14	12,5	11,5	11	10	9,75	9	8,5	7,75	7	6,75	6	6	5
50,01 - 55,00	14	11,25	10,25	9,75	9,25	8,5	8	7,5	7	6,25	6	5,5	5,25	4,5
55,01 - 60,00	14	10,25	9,5	9	8,25	8	7,5	7	6,5	5,75	5,5	5	4,75	4

Steel Grades

Group No.	Grades
1	
2	6037, 6335, 6704, 6705
3	6044, 6237, 6244, 6341
4	3052, 4732, 5051, 5052, 5152, 5246, 5252, 5732, 6051, 6052, 6345, 6347, 6732, 6736, 7252, 9352
5	4736, 5736, 6252, 6284, 6352, 6353, 6355, 6356, 6850, 6855, 6860, 6865, 6870, 9355, 9356, 9952

Hot Rolled Flat Steel Products
Production Limits
Production Limits For Normalized Grades

Notes

1) Orders for thickness thinner than or equal to 10 mm are subjected to negotiation.
2) Requests of product type" L" in the range of 1300-3050 mm width are accepted 7.90-25.00 mm thickness range.
3) The minimum thickness to be ordered for grades 5732, 5736, 6732, 6736, 9952 is 8.00 mm.
4) The maximum order thickness for grades 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 is 50.00 mm.
5) Width tolerances for LKK product are specified in the Erdemir product catalogue.
6) The order length is min. 4000 mm. Producable lengths are specified on the table stated above.
7) For grades 6353, 6860, 6865, 6870 red oxides may occur on the surface of the products which the thickness is less than 16 mm. Because of this reason red oxides claims are not accepted.
8) a) Orders for the grades 4732, 4736, 5732, 5736, 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356,6704, 6705, 6732, 6736, 6850, 9952 in thickness greater than or equal to 8mm,
   Orders for grades 5246, 5252, 6050, 6052, 6252, 6284, 7252, 9355, 9356 in thickness greather than or equal to 10 mm,
   Orders for grades 6037, 6044, 6237, 6244 in thickness greather than 30 mm are accepted on condition that the normalizing of the products is carried out in the normalizing furnace.
   Except the thickness below that is mentioned above, is produced as normalizing rolling.
   b) Orders for grades 6855, 6860, 6865, 6870 in thickness greather than 40 mm are accepted on condition that the normalizing of the products is carried out in the normalizing furnace.
   Orders for these grades in thickness less than or equal to 40 mm ordered with" impact test" special request are accepted on condition that the normalizing of the products is carried out in the normalizing furnace. Thickness greather than 67.00 mm are not accepted for grades 6855, 6860, 6865, 6870 and 6838 in order to ensure 3:1 reduction ratio, according to quality standard.
9) Ultrasonic test is carried out acc. to ASTM A435, ASTM A578 and EN 10160 standards and is accepted in the range of thickness given below.
   In the range of 12.50 - 70.00 thickness acc. to ASTM A435 standard.
   in accordance with "level A" and " level B" in the range of 10.00 - 50.00 thickness, for "level C" in the range of 10.00 - 40.00 mm acc. to ASTM A578 standard.
   applied classes and thickness ranges acc. to EN 10160 are specified below. In the thickness range of 20.01-40.00 mm is subjected to negotiation for ULT group 3.
   If requested by the customer, in the range of 8.00-12.49 mm thickness, ultrasonic test according to EN 10160 level S_0E_0 can be guaranteed without testing .
   Tests performed higher than S_0E_0 level in the range of 8.00-12,49 mm thicknesses are subjected to negotiation.
10) Z15 and Z25 tests are accepted in the range of 16 mm- 50.00 mm thickness on condition that minimum ultrasonic test level S_1E_1 acc. to EN 10160 or "level B" acc. to ASTM A578 .
11) Plate weight is max. 10 tons for products to be normalized.
12) All plates are marked with paint(by machine or manually).
13) Punch marking request must be specified at the time of order.
14) For the normalized plate products that are not ordered with punch marking, marking on the basis of plate is not guaranteed.
15) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections,
16) Less than 16mm thickness and more than 2000mm width, distortion can be occured after normalizing process. Therefore, complaints are not accepted.

Thickness range (mm)	ULT Group 1	ULT Group 2	ULT Group 3
Class	8.00-50.00	12.50-40.00	12.50-20.00
	S_1E_1, S_1E_0, S_0E_1 S_0E_0	S_2E_2, S_2E_1, S_2E_0 S_1E_2, S_0E_2	S_3E_3, S_3E_2, S_3E_1, S_3E_0 S_2E_3, S_1E_3, S_0E_3

Production Limits

DS

Extra Heavy Plate - Lightly Rolled Slab - Slab

Dimensions

Thickness (mm)	Maximum Widht (mm)
	Group 1
61,00 - 200,00	1000 - 1510

Dimensions

Thickness (mm)	Maximum Length (mm)
61,00 - 80,99	12000
81,00 - 90,99	11000
91,00 - 110,00	10000
110,01 - 120,00	9000
120,01 - 130,00	8000
130,01 - 150,00	7000
150,01 - 200,00	6000

Steel Grades

Group No.	Grades
1	3030, 5035, 5040, 5045
2	3008, 3010, 3012, 3015, 3020, 3995, 6006, 6018, 6224

Notes

1) Orders for the grades other than grades Group 1 are subjected to negotiation.
2) The order length is between 4000 mm and 12000 mm. However, under 4000 mm in length is subjected to negotiation
3) Properties other than chemical composition and dimensions (mechanical properties, internal soundness, surface defects e.t.c.) are not guaranteed.
4) Due to the structure of material is casting structure, there may be casting based discontinuities.
5) Request for normalizing is not accepted.
6) Request for ultrasonic test is not accepted.

Production Limits
Painted Plate Products

PLR

Hot Rolled, Trimmed Edge, Shot Blasted And Painted - Plate From Coil

PLRKK

Hot Rolled, Mill Edge, Shot Blasted And Painted - Plate From Coil

Dimensions

Thickness (mm)	Maximum Widht (mm)					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
7,00 - 10,00	1525	1525	1525	1525	1525	1525
10,01 - 15,00	1525	1525	1525	1525	1525	1525

Steel Grades

Group No.	Grades
1	700, 712, 713, 714, 3008, 3901, 3922, 3923, 4009(t≤8,00), 6006, 6211, 6222, 6223, 6224, 6282, 7222
2	720, 2008, 2009, 3010, 3012, 3015, 3018, 3235, 3237, 3281, 3330, 3333, 3336, 3337, 3340, 3430, 3433, 3701, 3702, 3937, 4009 (t>8,00), 4237, 4238, 4240, 4275, 4437, 5437, 6037, 9030 (t≤7,00)
3	3020, 3021, 3037, 3241, 3244, 3285, 3345, 3436, 3440, 3741, 3944, 4044, 4244, 4275, 6018, 6035, 6036, 6040, 6042, 6044, 6237, 6244, 6335, 6340, 6341, 6741, 6838, 9030(t>7,00), 9035, 9042, 9046, 9240
4	3955, 6345, 9329, 9960
5	735, 835, 845, 855, 890, 3030, 3031, 3032, 3033, 3052, 3245, 3246, 3249, 3250, 3252, 3260, 3550, 3660, 3732, 3736, 3949, 3957, 3960, 4249, 4250, 4251, 4252, 4732, 4736, 4846, 4946, 4947, 4950, 5035, 5040,5045, 5050, 5052, 5060, 5070, 5080, 5246, 5252, 5270, 5360, 5375, 5380, 5620, 5622, 5626, 5630, 5631, 5732, 5736, 6050, 6052, 6252, 6258, 6284, 6347,6350, 6352, 6353, 6355, 6356, 6704, 6705, 6732, 6736, 6850, 6852, 6855, 6860, 6865, 6870, 7252, 8412, 8414, 8416, 8430, 8434, 8440, 8613, 9052, 9255, 9256, 9257, 9335 9338, 9342, 9355, 9356, 9360, 9435, 9442, 9449, 9455, 9460, 9952
6	800, 801, 810, 811, 812, 813, 820, 4255, 4932, 4933, 4936, 4937, 4942, , 4943

Notes

1) The minimum width is 700 mm for thickness up to 10 mm . However, 700-899 mm width range is subjected to negotiation.
2) The minimum width is 800 mm for thickness greater than 10 mm. However 800-899 mm width range is subjected to negotiation.
3) Orders for hot charging compulsory grades, 3260, 5045, 5050, 5060, 5070, 5080, 5270, 5360, 5375, 5622, 5626, 5630, 5631 are subjected to negotiation.
4) Orders for special grades, 700, 720, 735, 800, 801, 810, 811, 812, 813, 820, 835 are subjected to negotiation.
5) Orders for the product type of PLR are not accepted for the grades 5050, 5060, 5070, 5080, 5270, 5360, 5375
6) The maximum order width is 1500 mm for product type of PLR.
7) The length is between min. 4000 mm and max. 12000 mm.
8) There is no limitation on bundle weight
9) The maximum thickness to be ordered for the grades 720, 801, 835, 3337, 4044, 6340 is 8.00 mm.
10) The minimum thickness to be ordered for the grades 5732, 5736, 6705, 6732, 6736, 9952 is 8.00 mm.
11) Request for normalizing is accepted for the conditions given below :
    a) The minimum thickness of the product shall be 8 mm.
    b) Orders for grades 4736, 5732, 5736, 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356, 6704, 6705, 6732, 6736, 6850, 9952 of products of 8 mm or over
    in thickness are accepted on condition that the normalizing of the products is carried out in the normalizing furnace. These grades are produced as normalizing rolled below 8 mm.
    c) Orders for grades 6855, 6860, 6865, 6870 of products ordered with “impact test” special request are accepted on condition that the normalizing of products is carried out in the normalizing furnace
    d) For other grades, request for normalizing is accepted provided that the minimum thickness of the products is 11 mm.
12) 6335, 6341, 6345, 6347, 6350, 6352, 6353, 6355, 6356 grades are produced as untreated or normalizing rolled.
13) Ultrasonic test is carried out acc. to ASTM A435 standard and is accepted for min. 12.50 mm thickness. If requested by the customer, in the range of 8.00-12.49 mm thickness, ultrasonic test according to EN 10160 level S_0E_0 can be guaranteed without testing .
14) Plates are shot-blasted to minimum Sa 2½ according to ISO 8501-1.
15) Plates are two-side painted with red or gray coloured paint with a thickness range of 15-25 µm.
16) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections,

Production Limits

Painted Plate Products - Production Limits For Grades Of As-Rolled Condition

PL

Heavy Plate, Hot Rolled, Trimmed Edge, Shot Blasted And Painted - Plate

PLKK

Heavy Plate, Hot Rolled, Mill Edge, Shot Blasted And Painted - Plate

Dimensions

Thickness (mm)	Widht (mm)				
	Group 1	Group 2	Group 3	Group 4	Group 5
7,90-10,00	1600 - 3050	1600 - 3050	1600 - 3050	1600 - 2600	1600 - 2000
10,01-12,00	1526 - 3200	1526 - 3200	1526 - 3200	1526 - 3050	1526 - 2600
12,01-15,00	1526 - 3200	1526 - 3200	1526 - 3200	1526 - 3200	1526 - 3200
15,01-50,00	1000 - 3200	1000 - 3200	1000 - 3200	1000 - 3200	1000 - 3200
50,01-60,00	1000 - 2500	1000 - 2500	1000 - 2500	1000 - 2500	1000 - 2500

Dimensions

Thickness (mm)	Max. Length Of Plates in The Range Of 1526-3200 Mm Width														
	1000-1525	1526-1599	1600-1699	1700-1799	1800-1899	1900-2000	2001-2099	2100-2199	2200-2299	2300-2450	2451-2500	2501-2600	2601-2699	2700-3050	3051-3200
7,90-10,00			12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	
10,01-12,00		12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25
12,01-15,00		12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25
15,01 - 22,00	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25
22,01 - 25,00	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	11	11	11
25,01 - 27,00	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	10	10	10
27,01 - 30,00	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12	11	9	9	9
30,01 - 35,00	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	10.5	10	9	7.5	7.5	7.5
35,01 - 40,00	12.25	12.25	12.25	12.25	12.25	12.25	11	10	9	9	8	8	6.5	6.5	6.5
40,01 - 45,00	12.25	12.25	12.25	12.25	11	10	9	9	8	8	7	6.5	6	5.5	5.5
45,01 - 50,00	12.25	12.25	11	10	9	9	8	8	8	7	6	5.5	5.5	5	5
50,01 - 55,00	12.25	11	10	9	9	8	7	7	6	6	5.5				
55,01 - 60,00	12.25	10	9	8	8	7	7	6	5	5	4.5				

Hot Rolled Flat Steel Products

Production Limits

Painted Plate Products - Production Limits For Grades Of As-Rolled Condition

Steel Grades

Group No.	Grades
1	3008, 6006, 6224, 7224
2	3010, 3012, 3015, 3018, 3237, 3701, 3702,
3	3020, 3241, 3244, 3741, 6018, 6036, 6741, 6838
4	3052, 3152, 3230, 3245, 3246, 3249, 3252, 3732, 3736, 5052, 9329, 9335, 9435
5	3030, 3250, 3260, 5035, 5040, 5045, 5050, 5060, 5070, 5080, 5270, 5345, 5360, 5375, 5620, 5622, 5626, 5630, 5631, 8412, 8414, 8416, 8430, 8434, 8440, 8613, 9338, 9342, 9442, 9449, 9455, 9960

Notes

1) Orders for thickness thinner than or equal to 10 mm are subjected to negotiation.
2) Orders for hot charging compulsory grades, 3260, 5045, 5050, 5060, 5070, 5080, 5270, 5345, 5360, 5375, 5622, 5626, 5630, 5631, 8412, 8414, 8416, 8430, 8434, 8440, 8613 are subjected to negotiation. Additionally, orders are not accepted under 25.00 mm in thicknesses for these grades narrower than 1526 mm width.
3) Requests of product type “PL” are not accepted for grades 3260, 5035, 5040, 5045, 5050, 5060, 5070, 5080, 5270, 5345, 5360, 5375, 8412, 8414, 8416, 8430, 8434, 8440, 8613
4) Requests of product type” PL” in the range of 1300-3050 mm width are accepted 7.90-25.00 mm thickness range.
5) Width tolerances for PLKK product are specified in the Erdemir product catalogue.
6) Orders for the grades 3008, 3010, 3012, 3015, 3020, 3030, 3237, 3244, 3245, 3252, 5035, 5040, 5045, 5050, 5060, 5070, 5080, 5345, 5360, 5375, 6006, 6018, 6224, 8412, 8414, 8416, 8430, 8434, 8440, 8613 over 60 mm in thickness are only accepted up to 1510 mm width.
7) The maximum order thickness is 50.00 mm for grades 6838, 9338 and 9435, 40.00 mm for grade 9442, 32.00 mm for grade 9342, 25.00 mm for grades 9449 and 9455, 16.00 mm for grade 9960.
8) Ultrasonic test is carried out acc. to ASTM A435, ASTM A578 and EN 10160 standards and is accepted in the range of thickness given below.
   in the range of 12.50 - 70.00 thickness acc. to ASTM A435 standard.
   in accordance with “level A” and “ level B” in the range of 10.00 - 50.00 thickness, for “level C” in the range of 10.00 - 40.00 mm acc. to ASTM A578 standard.
   applied classes and thickness ranges acc. to EN 10160 are specified below. In the thickness range of 20.01-40.00 mm is subjected to negotiation for ULT group 3.
   If requested by the customer, in the range of 8.00-12.49 mm thickness, ultrasonic test according to EN 10160 level S_0E_0 can be guaranteed without testing.
   Tests performed higher than S_0E_0 level in the range of 8.00-12.49 mm thicknesses are subjected to negotiation.
9) All plates are marked with paint(by machine or manually).
10) Punch marking request must be specified at the time of order.
11) Punch marking is accepted only 8.00-50.00 mm thickness range. For the other thicknesses, marking are only done manually using solid paint or metal marker.
12) Plates are shot-blasted to minimum Sa 2½ according to ISO 8501-1.
13) Plates are two-side painted with red or gray coloured paint with a thickness range of 15-25 µm.
14) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections,

Thickness range (mm)	ULT Group 1	ULT Group 2	ULT Group 3
Class	8.00-50.00	12.50-40.00	12.50-20.00
	S_1E_1, S_1E_0, S_0E_1 S_0E_0	S_2E_2, S_2E_1, S_2E_0 S_1E_2, S_0E_2	S_3E_3, S_3E_2, S_3E_1, S_3E_0 S_2E_3, S_1E_3, S_0E_3

Production Limits

Painted Plate Products - Production Limits For Normalized Grades

PL

Heavy Plate, Hot Rolled, Trimmed Edge, Shot Blasted And Painted - Plate

PLKK

Heavy Plate, Hot Rolled, Mill Edge, Shot Blasted And Painted - Plate

Dimensions

Thickness (mm)	Widht (mm)				
	Group 1	Group 2	Group 3	Group 4	Group 5
7,90-10,00		1600 - 3050	1600 - 3050	1600 - 2600	1600 - 2000
10,01-12,00		1526 - 3050	1526 - 3050	1526 - 3050	1526 - 2600
12,01-15,00		1526 - 3050	1526 - 3050	1526 - 3050	1526 - 3050
15,01-50,00		1000 - 3050	1000 - 3050	1000 - 3050	1000 - 3050
50,01-60,00		1000 - 2500	1000 - 2500	1000 - 2500	1000 - 2500

Dimensions

Thickness (mm)	Max. Length Of Plates in The Range Of 1526-3050 Mm Width													
	1000-1525	1526-1599	1600-1699	1700-1799	1800-1899	1900-2000	2001-2099	2100-2199	2200-2299	2300-2450	2451-2500	2501-2600	2601-2699	2700-3050
7,90 - 10,00			12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25
10,01 - 12,00		12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25
12,01 - 15,00		12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25
15,01 - 22,00	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25
22,01 - 25,00	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	11.5	11
25,01 - 27,00	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	10	10
27,01 - 30,00	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	11	9	9
30,01 - 35,00	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25	10.5	10	9	7.5	7.5
35,01 - 40,00	12.25	12.25	12.25	12.25	12.25	12.25	11	10	9	9	8	8	6.5	6.5
40,01 - 45,00	12.25	12.25	12,25	12,25	11	10	9	9	8	7.5	7	6.5	6	5.5
45,01 - 50,00	12.25	12,25	11	10	9	9	8	8	8	6.5	6	5.5	5.5	5
50,01 - 55,00	12.25	11	10	9	9	8	7	7	6	6	5.5			
55,01 - 60,00	12.25	10	9	8	8	7	7	6	5	5	4.5			

Hot Rolled Flat Steel Products

Production Limits

Painted Plate Products - Production Limits For Normalized Grades

Steel Grades

Group No.	Grades
1	
2	6037, 6335, 6704, 6705
3	6044, 6237, 6244, 6341
4	4732, 5246, 5252, 5732, 6050, 6052, 6345, 6347, 6732, 6736, 7252
5	4736,5736, 6252,6284, 6352,6353, 6355, 6356, 6850, 6855, 6860, 6865, 6870, 9355, 9356, 9952

Notes

1) Orders for thickness thinner than or equal to 10 mm are subjected to negotiation.
2) Requests of product type" PL" in the range of 1300-3050 mm width are accepted 7.90-25.00 mm thickness range.
3) The minimum thickness to be ordered for grades 5732, 5736, 6732, 6736, 9952 is 8.00 mm.
4) The maximum order thickness for grades 6335, 6341, 6345, 6347, 6352, 6353, 6355 is 50.00 mm.
5) The order length is min. 4000 mm. Producable lengths are specified on the table stated above.
6) a) Orders for the grades 4732, 4736, 5732, 5736, 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356,6704, 6705, 6732, 6736, 6850, 9952 in thickness greater than or equal to 8mm,
   Orders for grades 5246, 5252, 6050, 6052, 6252, 6284, 7252, 9355, 9356 in thickness greather than or equal to 10 mm,
   Orders for grades 6037, 6044, 6237, 6244 in thickness greather than 30 mm are accepted on condition that the normalizing of the products is carried out in the normalizing furnace.
   Except the thickness below that is mentioned above, is produced as normalizing rolling.
   b) Orders for grades 6855, 6860, 6865, 6870 in thickness greather than 40 mm are accepted on condition that the normalizing of the products is carried out in the normalizing furnace.
   Orders for these grades in thickness less than or equal to 40 mm ordered with" impact test" special request are accepted on condition that the normalizing of the products is carried out in the normalizing furnace.
7) Ultrasonic test is carried out acc. to ASTM A435, ASTM A578 and EN 10160 standards and is accepted in the range of thickness given below.
   in the range of 12.50 - 70.00 thickness acc. to ASTM A435 standard.
   in accordance with "level A" and " level B" in the range of 10.00 - 50.00 thickness, for "level C" in the range of 10.00 - 40.00 mm acc. to ASTM A578 standard.
   applied classes and thickness ranges acc. to EN 10160 are specified below. In the thickness range of 20.01-40.00 mm is subjected to negotiation for ULT group 3.

Thickness range (mm)	ULT Group 1	ULT Group 2	ULT Group 3
Class	8.00-50.00	8.00-40.00	8.00-20.00
	S_1E_1, S_1E_0,S_0E_1, S_0E_0	S_2E_2, S_2E_1, S_2E_0, S_1E_2, S_0E_2	S_3E_3, S_3E_2,S_3E_1, S_3E_0, S_2E_3, S_1E_3,S_0E_3

   If requested by the customer, in the range of 8.00-12.49 mm thickness, ultrasonic test according to EN 10160 level S_0E_0 can be guaranteed without testing.
   Tests performed higher than S_0E_0 level in the range of 8.00-12.49 mm thicknesses are subjected to negotiation.
8) Z15 and Z25 tests are accepted in the range of 16 mm- 50.00 mm thickness on condition that minimum ultrasonic test level S_1E_1 acc. to EN 10160 or "level B" acc. to ASTM A578 .
9) Plate weight is max. 10 tons for products to be normalized.
10) All plates are marked with paint(by machine or manually).
11) Punch marking request must be specified at the time of order.
12) Punch marking is accepted only 8.00-50.00 mm thickness range. For the other thicknesses, marking are only done manually using solid paint or metal marker.
13) For the normalized plate products that are not ordered with punch marking, marking on the basis of plate is not guaranteed.
14) Plates are shot-blasted to minimum Sa 2½ according to ISO 8501-1.
15) Plates are two-side painted with red or gray coloured paint with a thickness range of 15-25 µm.
16) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections,
17) Less than 16mm thickness and more than 2000mm width, distortion can be occured after normalizing process. Therefore, complaints are not accepted.

Production Limits

Hot Rolled Pipe Steels For Crude Oil And Natural Gas Industry (API 5L& EN 10208)

RKK & KRKK

Hot Rolled, Mill Edge - Coil

Dimensions

Thickness (mm)	Erdemir Steel Grades						
	9030	9035 - 9036 9042 - 9043 9044 - 9046 9047 - 9048 9052 - 9053 9056 - 9057	9245 - 9246 9290 - 9291 9360 - 9361	9060 - 9061 9065 - 9066	9415 - 9416 - 9450	9070 - 9071 - 9080	9485
	Maximum Widht (mm)						
1,40 - 1,49	1125	1025					
1,50 - 1,79	1225	1025					
1,80 - 1,99	1425	1225		1025		1025	
2,00 - 2,09	1525	1325		1125		1125	
2,10 - 2,29	1525	1325		1225		1225	
2,30 - 2,49	1625	1525		1225		1225	
2.50 - 2.79	1625	1525		1425		1425	
2.80 - 2.99	1725	1625		1425		1425	
3,00 - 3,19	1825	1625		1525		1525	
3,20 - 3,49	1925	1725		1625		1625	
3,50 - 3,59	1925	1725		1625		1625	
3,60 - 3,99	2000	1825		1625		1625	
4,00 - 4,19	2000	1825		1725		1725	
4,20 - 4,49	2000	1925		1725		1725	
4,50 - 4,99	2000	2000		1825		1825	
5,00 - 7,99	2000	2000		1925		1925	
8,00 - 10,00	2000	2000		1925		1925	
10,01 - 12,99	2000	1925		1625		1625	
13,00 - 14,00	2000	1825		1525		1525	
14,01 - 15,00	1925	1825		1525		1525	
15,01 - 16,00	1925	1725		1525		1525	
16,01 - 18,00	1925	1525		1525		1525	
18,01 - 20,60	1925	1525		1525		1425	
20,61 - 22,00	1525	1525					

Notes

1) Production limits will be re-evaluated prior to order according to plant production capabilities and other current orders.
2) Small or big coil orders are accepted for thicnesses between 1,40-1,79 mm and maximum big coil weight is 25 tons.
3) Claims about coil break are not accepted for 9030
4) Small coil orders given with 50 % thickness tolerance (t≤5 mm) are not accepted for RKK product
5) Orders with DWTT request not inclueded within standards are subjected to negotations
6) EN 10163-2 (class B, subclass 3) is guaranteed for surface imperfections
7) Claims related with wave defect will not be accepted upto 15 mm thickness if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length products.
8) Orders, other than specified in production limits, are subject to negotiation up to 25mm thicknesses
9) Mechanical properties are not guarenteed for 7 meters (total) at the head and the tail sections of the coil

Tolerances

Continuously Hot-Rolled Strip And Plate / Sheet Cut From Wide Strip Of Non-Alloy And Alloy Steel

Tolerances On Dimension And Shape
EN 10051 : 2011-02

Symbols of ERDEMİR products covered by this standard

R, RKK, BRKK, KRKK, RP, BRP, RPKK, BRPKK, HCKK, BCKK, TCKK, RD, RPD, TRPD, TR, TRKK, TRP, TRPKK, TLP, TLPKK, THRP, THRPK, HRU, THRU, HRUKK, HRP, HRPKK, LP, LPKK, LR, LRKK, PLR, PLRKK

General Applications

- This European Standard specifies tolerance on dimensions and shape for continuously hot-rolled uncoated plate/sheet and strip with a maximum width of 2200 mm of non-alloy and alloy steels. This European Standard also applies to hot-rolled strip for cold rolling.
- This Standard applies to products with a maximum thickness of 25 mm and widths in the range of 600-2200 mm.
- This Standard does not apply to hot-rolled strip in widths < 600 mm.
- The specified values for tolerances within this Standard shall not apply to the uncropped ends of the coil for a total length which is calculated using the formula : "length (meters) = 90 / nominal thickness (mm)" provided that the result does not exceed 20 meters.

Tolerances on Thickness

- **The tolerances on thickness for continuously hot-rolled low carbon steel sheet/plate and strip for cold forming.**
  Tolerances on thickness are given in Table 1 for grades 700, 712, 713, 714, 1718, 1722, 1726, 3222, 3901, 3922, 3923, 4222, 6006, 6007, 6009, 6211, 6222, 6223, 6224, 6282, 6314, 6315, 6404, 6405, 6406, 6407, 6412, 6413, 6421, 6422, 6423, 6424, 6425, 6426, 6523, 6524, 6624, 7222, 7224, 7414, 7416, 7524

Table 1: Tolerances on thickness for hot rolled low carbon steel sheet/plate and strip for cold forming

Nominal Thickness (mm)	Tolerances for a nominal width (mm)			
	≤1200	>1200 ≤1500	>1500 ≤1800	>1800
≥1.50 ≤ 2.00	± 0.13	± 0.14	± 0.16	-
>2.00 ≤ 2.50	± 0.14	± 0.16	± 0.17	± 0.19
>2.50 ≤ 3.00	± 0.15	± 0.17	± 0.18	± 0.20
>3.00 ≤ 4.00	± 0.17	± 0.18	± 0.20	± 0.20
>4.00 ≤ 5.00	± 0.18	± 0.20	± 0.21	± 0.22
>5.00 ≤ 6.00	± 0.20	± 0.21	± 0.22	± 0.23
>6.00 ≤ 8.00	± 0.22	± 0.23	± 0.23	± 0.26
>8.00 ≤ 11.00	± 0.24	± 0.25	± 0.25	± 0.28

Tolerances

- **Tolerances on thickness for grades with a specified minimum yield strength less than or equal to 300 N/mm² (Re≤300 N/mm²) as indicated Category A:**
  Tolerances on thickness are given in Table 2 for grades 720, 801, 890, 1821, 1822, 1825, 1828, 2008, 2009, 3008, 3010, 3012, 3015, 3018, 3020, 3021, 3037, 3235, 3237, 3241, 3243, 3244, 3245, 3250, 3281, 3285, 3330, 3333, 3336, 3337, 3340, 3430, 3433, 3436, 3440, 3660, 3701, 3702, 3741, 3936, 3937, 3938, 3940, 3944, 3945, 4009, 4044, 4237, 4238, 4239, 4240, 4244, 4246, 4260, 4275, 4437, 5244, 5437, 5554, 5555, 5561, 5562, 5571, 5572, 5581, 5582, 5592, 6018, 6035, 6036, 6037, 6040, 6044, 6237, 6244, 6335, 6340, 6341, 6345, 6347, 6408, 6704, 6705, 6741, 6837, 6838, 6842, 6855, 6860, 6865, 6870, 9030, 9035, 9036, 9240, 9245, 9246, 9329

Table 2: Tolerances on thickness for category A (Re≤300 N/mm²)

Nominal Thickness (mm)	Tolerances for a nominal width (mm)			
	≤1200	>1200 ≤1500	>1500 ≤1800	>1800
≥1.50 ≤ 2.00	± 0.17	± 0.19	± 0.21	-
>2.00 ≤ 2.50	± 0.18	± 0.21	± 0.23	± 0.25
>2.50 ≤ 3.00	± 0.20	± 0.22	± 0.24	± 0.26
>3.00 ≤ 4.00	± 0.22	± 0.24	± 0.26	± 0.27
>4.00 ≤ 5.00	± 0.24	± 0.26	± 0.28	± 0.29
>5.00 ≤ 6.00	± 0.26	± 0.28	± 0.29	± 0.31
>6.00 ≤ 8.00	± 0.29	± 0.30	± 0.31	± 0.35
>8.00 ≤ 10.00	± 0.32	± 0.33	± 0.34	± 0.40
>10.00 ≤ 12.50	± 0.35	± 0.36	± 0.37	± 0.43
>12.50 ≤ 15.00	± 0.37	± 0.38	± 0.40	± 0.46
>15.00 ≤ 25.00	± 0.40	± 0.42	± 0.45	± 0.50

- **Tolerances on thickness for grades with a specified minimum yield strength over 300 N/mm² and up to 360 N/mm² (300<Re≤360 N/mm²) as indicated Category B:**
  Tolerances on thickness are given in Table 3 for grades 721,735, 800, 810, 811, 812, 813, 1832, 1835, 3026, 3030, 3152, 3246, 3249, 3052, 3152, 3252, 3260, 3345, 3350, 3550, 3551, 3732, 3552, 3736, 3945, 3946, 3949, 3955, 4052, 4249, 4250, 4251, 4252, 4249, 4634, 4732, 4736, 4932, 4933, 4936, 4937, 5035, 5040, 5045, 5050, 5051, 5152, 5246, 5052, 5252, 5270, 5536, 5541, 5542, 5548, 5549, 5732, 5736, 6042, 6050, 6051, 6052 ,6053, 6252, 6258, 6284, 6350, 6352, 6353, 6355, 6356, 6732, 6736, 6847, 6848, 6850, 6852, 7252, 9042, 9043, 9044, 9046, 9047, 9048, 9052, 9053, 9290, 9291, 9335, 9355, 9356, 9360, 9361, 9435, 9952, 9960

Table 3: Tolerances on thickness for category B (300<Re≤360 N/mm²)

Nominal Thickness (mm)	Tolerances for a nominal width (mm)			
	≤1200	>1200 ≤1500	>1500 ≤1800	>1800
≥1.50 ≤2.00	± 0.20	± 0.22	± 0.24	-
>2.00 ≤2.50	± 0.21	± 0.24	± 0.26	± 0.29
>2.50 ≤3.00	± 0.23	± 0.25	± 0.28	± 0.30
>3.00 ≤4.00	± 0.25	± 0.28	± 0.30	± 0.31
>4.00 ≤5.00	± 0.28	± 0.30	± 0.32	± 0.33
>5.00 ≤6.00	± 0.30	± 0.32	± 0.33	± 0.36
>6.00 ≤8.00	± 0.33	± 0.35	± 0.36	± 0.40
>8.00 ≤10.00	± 0.37	± 0.38	± 0.39	± 0.46
>10.00 ≤12.50	± 0.40	± 0.41	± 0.43	± 0.49
>12.50 ≤15.00	± 0.43	± 0.44	± 0.46	± 0.53
>15.00 ≤25.00	± 0.46	± 0.48	± 0.52	± 0.58

Hot Rolled Flat
Steel Products

Tolerances

- **Tolerances on thickness for grades with minimum yield strength over 360 N/mm² and up to 420 N/mm² (360<Re≤420 N/mm²) as indicated Category C:**
  Tolerances on thickness are given in Table 4 for grades 820, 3355, 3455, 3905, 3957, 4642, 4942, 4943, 5060, 9056, 9057, 9060, 9061, 9255, 9256, 9257, 9258, 9338, 9342, 9420, 9442

Table 4: Tolerances on thickness for category C (360<Re≤420 N/mm²)

Nominal Thickness (mm)	Tolerances for a nominal width (mm)			
	≤1200	>1200 ≤1500	>1500 ≤1800	>1800
≥1.50 ≤2.00	± 0.22	± 0.25	± 0.27	-
>2.00 ≤2.50	± 0.23	± 0.27	± 0.30	± 0.33
>2.50 ≤3.00	± 0.26	± 0.29	± 0.31	± 0.34
>3.00 ≤4.00	± 0.29	± 0.31	± 0.34	± 0.35
>4.00 ≤5.00	± 0.31	± 0.34	± 0.36	± 0.38
>5.00 ≤6.00	± 0.34	± 0.36	± 0.38	± 0.40
>6.00 ≤8.00	± 0.38	± 0.39	± 0.40	± 0.46
>8.00 ≤10.00	± 0.42	± 0.43	± 0.44	± 0.52
>10.00 ≤12.50	± 0.46	± 0.47	± 0.48	± 0.56
>12.50 ≤15.00	± 0.48	± 0.49	± 0.52	± 0.60
>15.00 ≤25.00	± 0.52	± 0.55	± 0.59	± 0.65

- **Tolerances on thickness for grades with minimum yield strength over 420 N/mm² and up to 900 N/mm² (420<Re≤900 N/mm²) as indicated Category D:**
  Tolerances on thickness are given in Table 5 for grades 835, 842, 845, 846, 850, 855, 859, 860, 3031, 3032, 3033, 3365, 3465, 3960, 4846, 4946, 4947, 4950,4955, 4960, 4965, 4970, 5070, 5080, 5345, 5360, 5375, 5380, 5620, 5622, 5626, 5628, 5630, 5631, 8412, 8414, 8416, 8430, 8434, 8440, 8613, 9065, 9066, 9070, 9071, 9080, 9275, 9280, 9415, 9416, 9449, 9450, 9455, 9460, 9485, 9500

Table 5: Tolerances on thickness for category D (420<Re≤900 N/mm²)

Nominal Thickness (mm)	Tolerances for a nominal width (mm)			
	≤1200	>1200 ≤1500	>1500 ≤1800	>1800
≥1.50 ≤2.00	± 0.24	± 0.27	± 0.29	-
>2.00 ≤2.50	± 0.25	± 0.29	± 0.32	± 0.35
>2.50 ≤3.00	± 0.28	± 0.31	± 0.34	± 0.36
>3.00 ≤4.00	± 0.31	± 0.34	± 0.36	± 0.38
>4.00 ≤5.00	± 0.34	± 0.36	± 0.39	± 0.41
>5.00 ≤6.00	± 0.36	± 0.39	± 0.41	± 0.43
>6.00 ≤8.00	± 0.41	± 0.42	± 0.43	± 0.49
>8.00 ≤10.00	± 0.45	± 0.46	± 0.48	± 0.56
>10.00 ≤12.50	± 0.49	± 0.50	± 0.52	± 0.60
>12.50 ≤15.00	± 0.52	± 0.53	± 0.56	± 0.64
>15.00 ≤25.00	± 0.56	± 0.59	± 0.63	± 0.70

Tolerances

- The thickness shall be measured at any point situated at least 40 mm from the edges for products with mill edges and at least 25 mm from the edges for products with trimmed edges.
- When restricted thickness tolerance is requested, half of thickness tolerance can be applied up to 5 mm thickness (t≤5,00mm) in any case not being less than +/- 0,10 mm. 75% of thickness tolerance can be applied over 5 mm in thickness (t>5,00mm)
- More severe tolerances on thickness may be agreed at the time of enquiry and order.
- The thickness within one coil shall change gradually and the changes shall not be discontinuous.
- The difference in thickness within one coil shall be measured at a line with an invariable distance from the longitudinal edges(at least 40 mm from the edges for products with mill edges and at least 25 mm from the edges for products with trimmed edges).
- Permissible thickness differences within one coil of hot-rolled strip coil for cold rolling are given in Table 6

Table 6: Permissible thickness differences within one coil

Nominal Thickness (mm)	Permissible Thickness Difference For Nominal Width Of Strip (mm)		
		>1200	>1500
	≤1200	≤1500	≤2200
≥1.50 ≤ 2.00	0.20	0.24	0.28
>2.00 ≤ 3.00	0.22	0.27	0.33
>3.00 ≤ 4.00	0.28	0.32	0.40
>4.00 ≤ 8.00	0.28	0.32	0.40

Tolerances on Width

- The width shall be measured at right angles to the longitudinal axis of the product.
- The tolerances on width for sheet/plate shall be as given in Table 7.

Table 7: Tolerances on width

Nominal Width (mm)	Width Tolerances (mm)			
	Trimmed Edges		Mill Edges	
	Lower	Upper	Lower	Upper
≤1200	0	+ 3	0	+ 20
>1200 ≤1850	0	+ 5	0	+ 20
>1850	0	+ 6	0	+ 25

- Tolerances for trimmed edges apply to products with nominal thickness ≤10 mm.
- For nominal thickness >10 mm the upper tolerances shall be agreed at the time of enquiry and order. Maximum +10 mm upper tolerance shall be applied by Erdemir unless otherwise specified at the time of enquiry and order.

Tolerances on Length

- The length of the sheet/plate is the length of the shorter of both longitudinal edges.
- The tolerances on length for sheet/plate shall be as given in Table 8.

Table 8: Tolerances on length for sheet/plate

Nominal Length (mm)	Length Tolerances (mm)	
	Lower	Upper
< 2000	0	+ 10
≥ 2000 < 8000	0	+ 0.005 x nominal length
≥ 8000	0	+ 40

Tolerances

Tolerances on Flatness

- Deviation from flatness for sheet/plate shall be determined by measuring the deviation in distance between the product and a flat horizontal surface on which it is placed.
- Tolerances on flatness are only applied cut to length products(sheet/plate).
- Flatness tolerance is not guaranteed for the products which are cut to length process performed out of Erdemir.
- Hot- rolled low carbon sheet/plate of steels with a specified minimum yield strength Re≤300 N/mm² (Category A) the deviation from flatness shall not exceed the tolerances given in Table 9

Table 9: Tolerances on flatness for category A (Re≤300 N/mm²)

Nominal Thickness (mm)	For The Grades Of Category A					
	Tolerances On Flatness (mm)			Special Tolerances on Flatness (mm)		
	Nominal Width (mm)			Nominal Width (mm)		
		>1200			>1200	
	≤1200	≤1500	>1500	≤ 1200	≤1500	> 1500
≥ 1.50 ≤ 2.00	18	20	25	9	10	13
> 2.00 ≤ 25.00	15	18	23	8	9	12

- Requests for special tolerances on flatness shall be specified at the time of enquiry and order.
- Special tolerances on flatness are subjected to negotiation for the skin-passed products and/or sheet/plate products which cut to length process is performed by Erdemir.
- Hot- rolled low carbon sheet/plate of steels with a specified minimum yield strength 300 N/mm² <Re≤900 N/mm² (Categories B, C, and D) the deviation from flatness shall not exceed the tolerances given in Table 10.

Table 10: Tolerances on flatness for category B, C,D (300<Re≤900 N/mm²)

Groups	For The Grades Of Category B, C, D		
Nominal Thickness ≤25 mm	Tolerances On Flatness (mm)		
	Nominal Width (mm)		
	≤1200	>1200 ≤ 1500	>1500
B	18	23	28
C	23	30	38
D	Shall be agreed at the time of enquiry and order.		

- Closer toleances for categories B,C and D are not accepted.

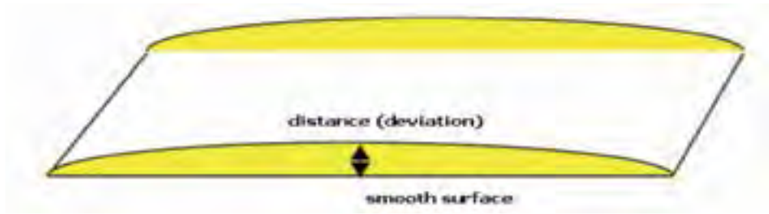


Figure 1 : Mesurement of flatness

Out Of Squareness

- The out-of-squareness u is the orthogonal projection of a transverse edge over a longitudinal edge
- The out-of-squareness u shall not exceed 1 % of the actual width of the sheet/plate.

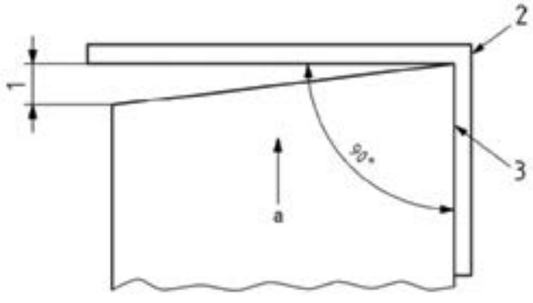


Figure 2 : Measurment of out-of squareness

1 : Out-of squareness (u)
2 : Square
3 : Side edge
a : Rolling direction

Tolerance On Edge Camber

- The edge camber is the maximum deviation of a longitudinal edge from a straight edge measuring base applied to it.
- The camber is measured on the concave edge.
- For sheet/plate the measuring base shall be the length of the product for a nominal length (L)<5000 mm.
- For strip and sheet/plate with a nominal length L≥5000 mm, the measuring base shall be 5000 mm, taken anywhere along the edge but excluding the uncropped ends.

Table 11: Tolerances on edge camber

Type Of Product	Dimensions		Gauge Lengths (mm)	Tolerances (mm)	
	Width (mm)	Length (mm)		Mill Edge	Trimmed Edge
SHEET- PLATE	≥600	≥ 5000	5000	+ 20	+ 15
	≥600	< 5000	Actual Length (L)	+ 0.005 x L	+ 0.005 x L
COIL	≥600	-	5000	+ 20	+ 15
SLITTED COIL	≤600	-	shall be agreed at the time of order.		

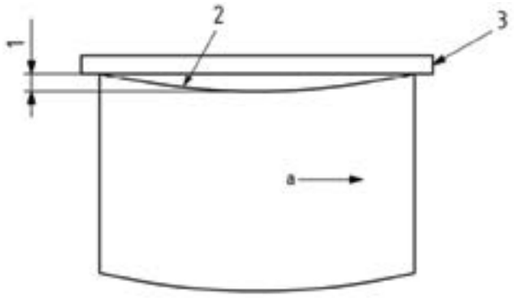


Figure 3 : Measurment of edge camber

1 : Edge Camber
2 : Side Edge (concave side)
3 : Straight edge
a : Rolling direction

Hot Rolled Flat Steel Products

Tolerances

Crown

- The crown shall be measured as the thickness difference between the centre line of the product and a measuring point at 40 mm from any edge of the product in case of mill edges and at 25 mm in case of trimmed/slit edges.
- These tolerances apply to hot rolled products for cold rolling (HCKK, BCKK, TCKK product types)
- More severe tolerances on crown may be agreed at the time of enquiry and order
- Maximum values for crown for hot-rolled strip for cold rolling are given in Table 12.

Table 12: Maximum values for crown for hot-rolled strip for cold rolling

Nominal Width (mm)	Category (mm)			
	A	B	C	D
≤1200	0,10	0,12	0,13	0,14
>1200 ≤1500	0,13	0,15	0,17	0,18
>1500 ≤1800	0,16	0,18	0,21	0,22
>1800 ≤2200	0,20	0,23	0,26	0,28

- Crown values specified in Table 12 category A are applied for hot-rolled low carbon steel strip for cold forming.
- The values for permissible crown shall be lowered by 20 % for hot-rolled strip slit from wide strip meant for cold rolling.

Permissible Deviations From Form Of Coils (Telescopy)

- The standard of “DIN 1016 – 1987” is based on for permissible deviations from form of coils.
- The coils shall be tightly wound as round as possible and straight edged. Gradually stepped displacement of the edges of the coils to one side (telescopy) shall not exceed the deviations given in the table 13.

Table 13: Permissible deviations from form of coil and slitted coil

Type of Product	Nominal Width (mm)	Tolerances (mm)	
		Mill Edge	Trimmed Edge
COIL	≥ 600	+ 60	+ 40
SLITTED COIL	< 600	+ 35	+ 25

Permissible Deviations From Inside Diameter Of Coil

- For deviations from inside diameter of coil, “DIN 1016 – 1987” standard is based on.
- Unless otherwise is specified at the time of order, deviations from inside diameter tolerances given in the table 14 are applied.

Table 14: Permissible deviations from inside diameter of coil and slitted coil

Type of Product	Nominal Width (mm)	Tolerances (mm)	
		Mill Edge	Trimmed Edge
COIL	≥ 600	± % 7	± % 3
SLITTED COIL	< 600	± % 7	± % 3

Hot Rolled Steel Plates – Tolerances On Dimensions And Shape

Tolerance Standard: EN 10029:2011-02
EN 10029:2010

ERDEMİR Symbols Of Products

L, LKK, PL, PLKK

Thickness Tolerances

Table 1 : Tolerances on thickness

Nominal Thickness t (mm)	Tolerances (mm)							
	Class A		Class B		Class C		Class D	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
5 ≤ t < 8	-0,4	+0,8	-0,3	+0,9	0	+1,2	-0,6	+0,6
8 ≤ t < 15	-0,5	+0,9	-0,3	+1,1	0	+1,4	-0,7	+0,7
15 ≤ t < 25	-0,6	+1,0	-0,3	+1,3	0	+1,6	-0,8	+0,8
25 ≤ t < 40	-0,7	+1,3	-0,3	+1,7	0	+2,0	-1,0	+1,0
40 ≤ t < 80	-0,9	+1,7	-0,3	+2,3	0	+2,6	-1,3	+1,3
80 ≤ t < 150	-1,1	+2,1	-0,3	+2,9	0	+3,2	-1,6	+1,6

- If thickness tolerances are not specified by customer, Class A thickness tolerances are applied.
- Class “B” thickness tolerances are applied for the steel grades 6335, 6341, 6345, 6347, 6352, 6353, 6355, 6356 which are produced according to EN 10028 standard. Intended thickness formulation is = “Specified order thickness + [(+) thickness tolerance - (-) thickness tolerance] / 2”
- Thickness shall be measured at any point situated more than 25 mm from the transverse or longitudinal edges of the plate, other than locally ground area
- The thickness shall be measured at any point situated at least 40 mm from the edges for plates with mill edge.
- Requests of product type “L” are accepted only for 6.00-7.99 mm and 10.00-25.00 mm in thickness range with 1300-3000 mm width range
- Requests of product type “PL” are accepted only for 7.00-7.99 mm and 10.00-25.00 mm in thickness range with 1300-3000 mm width range
- For permissible limits concerning surface imperfections, EN 10163-2 (class B, subclass 3) is applied.

Width Tolerance

Table 2a : Tolerances on width for plates with trimmed edge

Nominal Thickness t (mm)	Tolerances (mm)	
	Lower	Upper
t < 40	0	+ 20
40 ≤ t < 150	0	+ 25

Table 2b : Tolerances on width for plates with mill edge

Width (mm)	Tolerances (mm)	
	Lower	Upper
≥ 1000 ≤ 1200	0	+80
> 1200 ≤ 1500	0	+50
> 1500 ≤ 3000	0	+60
> 3000 ≤ 4000	0	+100

- The width shall be measured perpendicular to the major axis of the plate.
- Width tolerance is – 0 / +100 mm in the thickness range 8,00 – 10,00 mm for mill edged plates.

Length Tolerances

Table 3 : Tolerances on length

Length (mm)	Tolerances (mm)	
	Lower	Upper
l <4000	0	+20
4 000 ≤ l < 6 000	0	+30
6 000 ≤ l < 8 000	0	+40
8 000 ≤ l < 10 000	0	+50
10 000 ≤ l < 15 000	0	+75
15 000 ≤ l < 20 000	0	+100

- The length of the plate is the length of the shorter of both longitudinal edges.

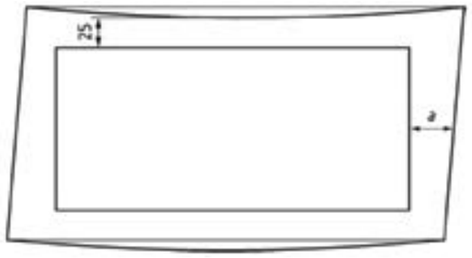
Flatness Tolerance

- Tolerances on flatness are given in Table 4 for normal tolerances (class N)
- Deviation from flatness shall be determined by measuring the distance between the plate and a straight edge. Straight edges of a length of 1000 mm are used if the wave pitches (distance between the points of contact of the straight edge and the plate) are smaller than or equal to 1000 mm. For longer wave pitches straight edges of a length of 2 000 mm are used
- Deviations from flatness ≤ 2 mm shall not be considered as a wave and not be taken into account.

Table 4 : Normal tolerances on flatness (class N)

Nominal Thickness (mm)	Stell Type - L		Stell Type - H	
	Products with a specified minimum yield strength ≤ 460 N/mm², neither quenched nor quenched and tempered products		Products with a specified minimum yield strength > 460 N/mm² and all grades of quenched and guenched and tempered products	
	Measuring Lengths			
	1000 mm	2000 mm	1000 mm	2000 mm
≥5.00<8.00	8	12	11	15
≥8.00<15.00	7	11	10	14
≥15.00<25.00	7	10	10	13
≥25.00<40.00	6	9	9	12
≥40.00<250.00	5	8	8	12

- For distances between the points of contact of two waves between 300 mm and 1 000 mm the maximum flatness tolerance is 1 % for steel type L and 1,5 % of the wave pitch for steel type H, but not exceeding the values in Table 4.
- To measure flatness the plates shall be placed on a flat surface.
- Deviation from flatness shall be determined by measuring the deviation in distance between the plates and a straight edge of 1 000 mm or 2 000 mm long (see Table 4) which may be placed in any direction.
- Only the part situated between the points of contact between the straight-edge and the plate shall be taken into consideration. Deviations shall be measured at a point at least 25 mm from the longitudinal edges and at a distance “a” (200 mm) from the plate ends (see Figure 1).



a : 200 mm for normal tolerances (class N).

Figure 1 : Measuring of flatness

Tolerances For Edge Camber And Out-Of-Squareness

- For plate specified with normal edge camber and out-of squareness in the order, the edge camber and out of squareness shall be so that it is possible to inscribe a rectangle with the dimensions of the ordered plate within the delivered size.

  For plate specified with limited edge camber and out-of squareness in the order, the maximum values for edge camber and out of squareness shall be agreed at the time of enquiry and order

- **Measurement of edge chamber :**
  The edge camber value q is the maximum deviation between the longitudinal edge and the straight line joining the two ends of this edge. It is measured on the concave edge of the plate (see figure 2)

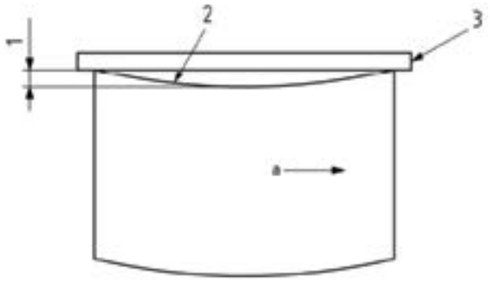


Figure 2 : Measuring of edge chamber

1 : Edge camber q
2 : Side edge (concave side)
3 : Straight edge
a : Rolling direction

- **Measurement of out of squareness :**
  The out-of squareness value u is the orthogonal projection of one transverse edge on one longitudinal edge (see figure 3).

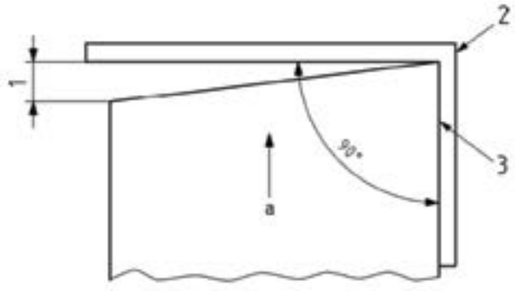


Figure 3 : Measuring of out of squareness

1 : Out-of squareness u
2 : Square
3 : Side edge
a : Rolling direction

Hot Rolled Flat Steel Products

Tolerances

Dimensional Tolerances For Hot Rolled Embossed Steel Products

Tolerance Standard: DIN 59220: 2000-04

Applied ERDEMİR Product Symbol

RKKM, LRKKM, HRUKM

General Scope

- This standard specifies dimensions and tolerances for hot-rolled embossed steel coil, sheet or plate with thickness range 3-10 mm and width range 700-1425 mm. Orders for thicknesses from 3 to 4 mm are subject to negotation.

Surface Pattern

- Standard Surface pattern designed in Erdemir is given in figure 1 and figure 2.

Material

- Materials in accordance with this standard shall generally be made from a steel grade as in EN 10025. Other grades may be used by agreement only. The specifications given in this standard apply only to materials with specific minimum values for the yield point up to 355 N/mm^2.

Thickness Tolerance

- Thickness shall be determined at an unembossed point, minimum 25 mm from the edges

Table 1:

Hot Rolled Embossed Coil / Sheet / Plate Thickness Tolerances		
Nominal Thickness(mm)	Tolerance (mm)	Permissible Variation in Thickness (mm)
3	-0,40 / +0,80	0,80
4	-0,40 / +0,80	0,80
5	-0,40 / +1.10	0,90
6	-0,40 / +1.10	0,90
7	-0,40 / +1,10	0,90
8	-0,50 / +1,20	0,90
9	-0,50 / +1,20	0,90
10	-0,50 / +1,20	0,90

Tolerances

Width Tolerance

- Width shall be measured perpendicular to the longitudinal axis of the sheet / plate.
- Width tolerance is - 0 /+20 mm.

Length Tolerance

- The length of the sheet / plate is the length of the largest rectangle enclosed in it.
- Table 2 shows the upper limit deviations for the length ordered. No single sheet / plate shall be shorter than the nominal length.

Table 2:

Upper limit deviations for the length ordered	
Nominal Length (mm)	Length Tolerance (mm)
L< 4000	20
4000 ≤ L < 6000	30
6000 ≤ L < 8000	40
8000 ≤ L < 10000	50
10000 ≤ L < 15000	75

Hot Rolled Flat
Steel Products

Tolerances

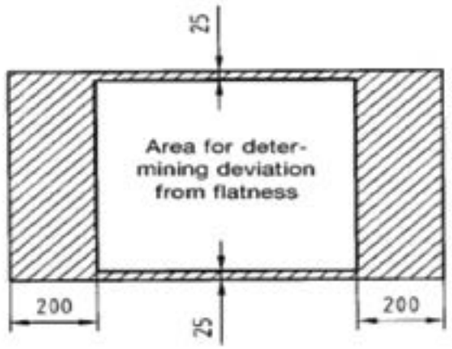
Flatness Tolerance

- For checking plate for deviation from flatness, lay a single plate on a flat horizontal surface so that it rests freely under its own mass. Deviation from flatness shall be measured as the maximum distance between the smooth side of a plate and a straightedge 1000 mm or 2000 mm long, laid on it in any direction. Measurements shall be taken at points not less than 25 mm from the longitudinal edges and not less than 200 mm from either end of the plate.

Table 3:

Hot Rolled Embossed Sheet / Plate Surface Flatness Tolerances		
Nominal Thickness (mm)	Max. Surface Flatness Tolerance (mm)	
	Measurement: 1000 mm(*)	Measurement: 2000 mm
3	9	14
4	9	14
5	8	12
6	8	12
8	7	11
10	7	11

(*) Where the distance between the two points of contact of the plates with the straight edge is less than 1000mm, the deviation from flatness shall not exceed 1 % of this distance, while not exceeding the values in the table. The applies only for gauge length not less than 300 mm.

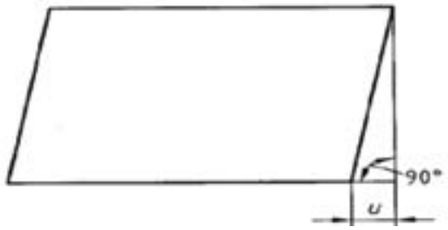


Tolerances For Edge Chamber

- The edge chamber value, is the max deviation between one longitudinal edge and the straight line joining the two ends of this edge, measured on the concave side of the sheet / plate.
- Deviation shall be a max 0.2 % of the actual length of the sheet / plate.

Tolerance For Out Of Squareness

- The out of squareness “u” is the vertical projection of a cross edge on a longitudinal edge.
- The out of squareness “u” shall not exceed 1 % of the actual width of the sheet / plate.



Pattern And Form

- Standard Surface pattern designed in Erdemir is given in figure 1.
- Advised pattern dimensions are given in figure 2.
- Embossing shall not run parallel with the longitudinal edges of the plates.
- Products are supplied in hot rolled condition with untreated surfaces and mill edge.

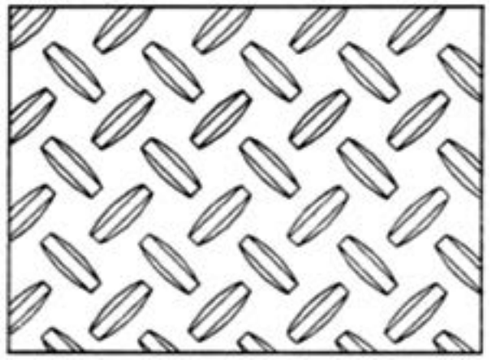
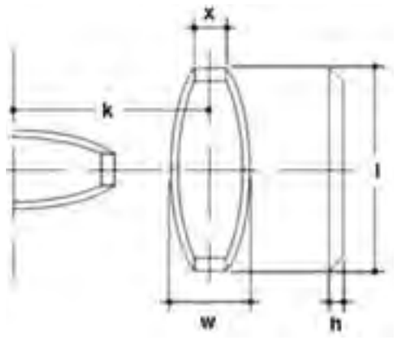


Figure 1: Surface pattern designed in ERDEMİR.



h (Pattern height) » 1 - 2 mm
l (Pattern length) » 17- 27 mm
w (Pattern width) » 8-10,5 mm
x (Pattern upper width) » 3-5 mm
k (Distance between the center of two perpendicular patterns.) » 25± 2,5 mm

Figure 2 : Pattern dimensions
(Reference values)

Tolerances For Casted Slab / Extra Heavy Plates

Erdemir-DS-2001

Applied Product Type Of ERDEMİR

DS

Thickness Tolerance

Tolerance (mm)		
Thickness (mm)	Lower	Upper
61.00 - 189.99	- 4.00	+ 7.00
190.00 - 200.00	-7.00	+ 7.00

Notes
- The thickness shall be measured at any point situated at least 40 mm from the edges

Width Tolerance

Thickness (mm)	With (mm)	Lower	Upper
61.00 - 189.99	100-1525	-30	+50
190.00 - 200.00		-50	+50

Notes
- The width is measured perpendicular to the major axis of the casting slab

Length Tolerance

Length (mm)	Tolerance (mm)			
	Lower		Upper	
	Thickness 61.00-189.99	Thickness 190.00-200.00	Thickness 61.00-189.99	Thickness 190.00-200.00
2000 - 8000	- 50	-100	+ 50	+250
8001 - 12000	- 100	-250	+ 100	+250

Notes
- The length of the slab is the length of the largest rectangle contained within the casting slab

Tolerances

Flatness Tolerance

Notes
• Surface flatness tolerance is max 25mm for 61.00-120.00mm thickness range. Surface flatness is not guaranteed for the thickness t >120 mm

Notes
• Deviation from flatness shall be determined by measuring deviation distance between the casting slab and the horizontal surface on which it is placed
• If the distance between the points of contact of the straight edge and the casting slab is less than 1000 mm, the permissible deviation from flatness shall be max. 1.5 % of the distance, but not exceeding the values given in table above
• Deviations from flatness shall be measured at a point at least 25mm from the longitudinal edges and at a distance at least 200 mm from the casting slab ends

Tolerances On Mass

Thickness (mm)	Excess Mass (%)
100.01 - 200.00	6.5

Notes
• The excess mass is the difference between the actual delivered mass and the theoretical mass, expressed as a percentage of the theoretical mass delivery

Tolerances For Edge Chamber

Notes
• Edge chamber is not guaranteed for casting slab

Tolerances For Out of Squareness

Notes
• Out of squareness is not guaranteed for casting slab

Cold Rolled
Flat Steel Products

Cold Rolled Flat Steel Products

Cold rolled coils or flat steel products are produced by rolling hot rolled flat steels without a heat treatment operation in a thickness range of 0.20 to 2.00mm.

While the product's physical properties are all homogeneous along the strip, surface flatness, width and thickness values have fulfilled expectations at the top level.

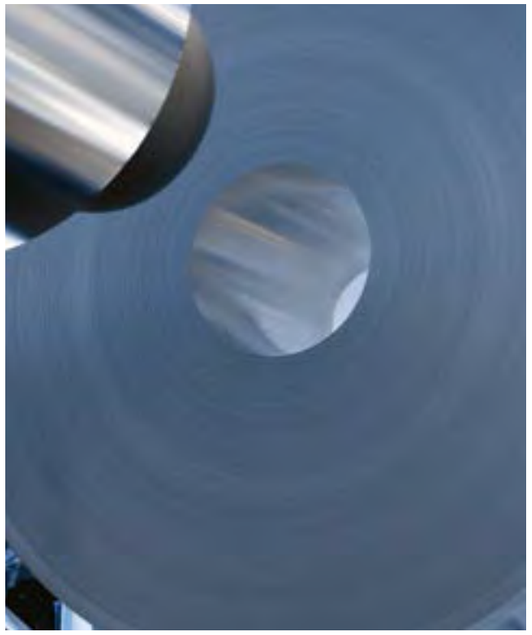
Cold Rolled
Flat Steel Products

Cold Rolled Flat Steel Products

General Application Areas

The steel grades for cold forming can be preferred in bending and deep drawing processes where toughness and ductile properties are required. These steels are mainly used in automotive components such as body panels, metal furniture, appliances, radiators, some profiles and ventilation equipments.

Non-ageing extra deep-drawing steels (IF) are the best material to fulfill the automotive and white goods sector's special expectations, due to their superior formability and weldabilities.



High strength low alloy steels, which combining good formability with improved weldability, having low content of carbon and produced by micro-alloying methods, are mainly used in automotive and its supplier industry

Steels that are suitable for enamelling by one/two layer or one/two firing has deep drawing properties and is therefore much preferred in the manufacture of kitchenware, such as pans, pots etc.

General information about cold rolled products produced at Erdemir.

Products:

We can supply our cold rolled products in the following form and structure:

- As coils, slitted coils or cut to length,
- As trimmed or mill edge,
- As skin-passed after continuous or batch annealing,
- In full-hard structure without being processed through annealing and skin-passing

Dimensions:

- Thickness, width and length values are nominal, unless otherwise specified.
- Coil inner diameter may be 508 or 610 mm (+/- 20 mm) depending on request

Surface Protection:

- **Oiling (O):** The total amount of protective oil (of both surfaces totally) on products' surfaces is given below. Unless otherwise specified normal oiling proportions are used. Orders with requests for special, slight, light and abundant oiling are subject to negotitation.

Slight : 250 - 500 mg/m^2
Light : 500 - 1000 mg/m^2
Normal : 1000 - 2000 mg/m^2
Abundant : 2000 - 3000 mg/m^2 (Normal oiling values for export products)

- The warranty period for corrosion of cold rolled products having a surface protection of at least a "normal" level is 6 months from the production date onwards.
- The warranty period for corrosion of cold rolled products having a surface protection of at least a "normal" level with Quaker N 6130 oil is 3 months from the date on which products are made available.
- Erdemir does not recommend cold rolled products with unoiled or lightly oiled surfaces. In the event of orders of such products Erdemir will not be responsible for any corrosion occurrences on surfaces.
- Erdemir will not be responsible for any corrosion risks of stocking and shipment not provided by Erdemir.

Surface Quality:

A and B surface qualities are ensured to be in accordance with EN 10130 standards. Unless otherwise specified production is made according to 'A' surface quality.

- **A surface:** Imperfections that do not affect the forming or surface coating properties such as pores, shallow dips, small marks, minor scratches and vague colorations are permissible.

- **B surface:** While one side has to be at least of A surface quality level, the other side should not feature any defects which might disrupt the decent smooth surface appearance after painting or electrolytic coating.

Cold Rolled
Flat Steel Products

General Technical Facts

Surface Appearance:

The product's surface may be of bright, semi bright, normal or rough appearance. Unless otherwise specified the product's surface is 'normal'. Further roughness values are subject to negotiation.
- Surface appearance and roughness values:

Surface Appearance	Symbol	Roughness value cut off: 0.8 mm
Bright	b	Ra ≤ 0.40 µm
Fine stone	g	Ra ≤ 0.90 µm
Normal	m	0.6 µm < Ra ≤ 1.9 µm
Rough	r	Ra > 1,6 µm

Weldability:

Our cold rolled products are suitable for standard welding processes. But the welding processes to be applied should be stated at the time of order, especially if gas welding is intended to be conducted.

Applicability for Surface Coating:

Our cold rolled products are mainly designed to be suitable for metalic or organic coatings by hot dip or electrolytic methods, or other coating processes. The coating process and relevant surface quality and appearance, if any is requested, should be stated at the time of order.

Marking:

Some information such as grade, size, etc. is marked with non-corrosive and easily removable ink on some of our cold products.

Mechanical Test:

Tensile test is carried out according to EN ISO 6892-1" Metallic Materials - Tensile Test - Part 1: Tests Performed at Room Temperature " The test certificate containing the mechanical test and chemical analysis results sent to the customer is an inspection document and is prepared according to the standard EN 10204 "Metallic products - Types of Inspection Documents". In case an analysis / test report is requested by our customers within the scope of TS EN ISO / IEC 17025 "General Conditions for the Competence of Testing and Calibration Laboratories", the report can be requested from the sales unit with a request letter.

Grade Index
Application Areas and Brand Correspondence Of Cold Rolled Products

Scope of Application And Main Properties	Corresponding		Erdemir Steel Grade
	Standard	Grade	
General application steels for cold forming (Galvanizing, office equipment, lighting devices, etc.)	SAE J403-2014/ ASTM A1008-16	1006 / CS Type B	6106
	SAE J403-2014/ ASTM A1008-16	1008 /CS Type B	6108
	SAE J403-2014	10B08	7608
	SAE J403-2014/ ASTM A1008-16	1010 / CS Type B	6110
	SAE J403-2014	1012	4112
	SAE J403-2014	1018 Spec.	6118
General application steels for drawing (automotive, refrigerators, washing machines, home appliances, etc)	JIS G 3141:2011	SPCCT	6111
	EN 10130:2006	DC01	6112
	EN 10130:2006	DC03	6113
	EN 10130:2006	DC03	7313
	EN 10130:2006	DC04	6114
	EN 10130:2006	DC05	6115
	EN 10130:2006	DC01 Mod	7110
	EN 10130:2006/ERDEMİR-15	DC01 / ERDEMIR-DC02	7112
	EN 10130:2006	DC01	7612
	EN 10130:2006	DC01 Özel	7109
	ASTM A1008-2015	DS Type B	7113
	TSG3100G	SPC270C	120
	TSG3100G	SPC270C	121
Non-aging extra deep-drawing quality steels (Ultra low carbon IF steels)	EN 10130:2006	DC04	7114
	EN 10130:2006	DC04	145
	EN 10130:2006	DC05	7115
	EN 10130:2006	DC06	7116
	11-04-013	XES	130
	TSG3100G	SPC270D	131
	TSG3100G	SPC270D	132
Non-aging and extra deep-drawing steels suitable for manufacture of white goods	EN 10130:2006	DC01	7122
	EN 10130:2006	DC03	7123
Filter steel for automotive industry	EN 10130:2006	DC04	7124
General application steels for cold forming (Galvanizing, office equipment, lighting devices, etc.)	SAE J403-2014/ ASTM A1008-16	1006 / CS Type B	6106
	SAE J403-2014/ ASTM A1008-16	1008 /CS Type B	6108
	SAE J403-2014	10B08	7608
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	EN 10130:2006	DC03	6113
	EN 10130:2006	DC03	7313
	EN 10130:2006	DC04	6114
	EN 10130:2006	DC05	6115
	EN 10130:2006	DC01 Mod	7110
	EN 10130:2006/ERDEMİR-15	DC01 / ERDEMIR-DC02	7112
	EN 10130:2006	DC01	7612
	EN 10130:2006	DC01 Özel	7109
	ASTM A1008-2015	DS Type B	7113
	TSG3100G	SPC270C	120
	TSG3100G	SPC270C	121

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Corresponding Similar Standards [1]					Page No
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G10060			ASTM A1008 CS Type A		190
G10080					190
G10081					190
G10100					190
G10120					190
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1.0330	St12		ASTM A1008 CS Type B	JIS G3141 SPCC	174
1.0347	RRst13		ASTM A1008 CS Type B	JIS G3141 SPCD	174
1.0347	RRst13		ASTM A 1008 CS Type B	JIS G3141 SPCD	174
1.0338	St14		ASTM A620 CD DDQAK	JIS G3141 SPCEN	174
1.0312	FeP05		ASTM A1008 DDS		174
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1.0330	St12		ASTM A366 CR CQ	JIS G3141 SPCC	174
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	RRst13	DC03	ASTM A619 CR CQ	JIS G3141 SPCD	178
	RRst13	DC03	ASTM A619 CR CQ	JIS G3141 SPCD	178
1.0338	St14		ASTM A1008 DS Type A	JIS G3141 SPCEN	179
1.0338					179
1.0312	FeP05		ASTM A1008 DDS		179
1.0873	FeP06		ASTM A1008 EDDS		179
	St14	DC04	ASTM A620 CR DDQAK	JIS G3141 SPCEN	181
	St14	DC04	ASTM A620 CR DDQAK	JIS G3141 SPCEN	181
	St14	DC04	ASTM A620 CR DDQAK	JIS G3141 SPCEN	181
1.0330	St12		ASTM A366 CR CQ	JIS G3141 SPCC	179
1.0347	RRst13		ASTM A619 CR DQ	JIS G3141 SPCD	179
1.0338	St14		ASTM A620 CR DDQAK	JIS G3141 SPCEN	180
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1.0330	St12		ASTM A1008 CS Type B	JIS G3141 SPCC	174
1.0347	RRst13		ASTM A1008 CS Type B	JIS G3141 SPCD	174
1.0347	RRst13		ASTM A 1008 CS Type B	JIS G3141 SPCD	174
1.0338	St14		ASTM A620 CD DDQAK	JIS G3141 SPCEN	174
1.0312	FeP05		ASTM A1008 DDS		174
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1.0330	St12		ASTM A366 CR CQ	JIS G3141 SPCC	174
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	RRst13	DC03	ASTM A619 CR CQ	JIS G3141 SPCD	178
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Scope of Application And Main Properties	Corresponding		Erdemir Steel Grade
	Standard	Grade	
Non-aging extra deep-drawing quality steels (Ultra low carbon IF steels)	EN 10130:2006	DC04	7114
	EN 10130:2006	DC04	145
	EN 10130:2006	DC05	7115
	EN 10130:2006	DC06	7116
	11-04-013	XES	130
	TSG3100G	SPC270D	131
	TSG3100G	SPC270D	132
Non-aging and extra deep-drawing steels suitable for manufacture of white goods	EN 10130:2006	DC01	7122
	EN 10130:2006	DC03	7123
Filter steel for automotive industry	EN 10130:2006	DC04	7124
Ultra deep-drawing and non-aging steels for automotive industry	EN 10130:2006	DC04	7314
	EN 10130:2006	DC05	7315
	EN 10130:2006	DC06	7316
Cold rolled steels for enamel coating	EN 10209:2013	DC01EK	7512
	EN 10209:2013	DC01EK	6512
	EN 10209:2013	DC04EK	6513
	EN 10209:2013	DC04EK	7513
	EN 10209:2013	DC05EK	513
	EN 10209:2013	DC04ED	7514
	EN 10209:2013	DC04ED Mod	504
	EN 10209:2013	DC06ED	7516
Cold rolled bake-hardening high yield strength steel for cold forming	52814	FEE 220 BH	171
	EN 10268:2006+A1:2013	HC220B	7722
	EN 10268:2006+A1:2013	HC260B	7726
Cold rolled high yield strength steels for cold forming	EN 10268:2006+A1:2013	HC220Y	7022
	EN 10268:2006+A1:2013	HC260Y	7026
Cold rolled high yield strength dual-phase steel for cold forming	EN 10338:2015	HCT490X	7650
	EN 10338:2015	HCT590X	7660
	EN 10338:2015	HCT780X	7680
	EN 10338:2015	HCT 590X Mod	290
High strength steels for cold forming	EN 10268:2006+A1:2013	HC260 LA	7125
	EN 10268:2006+A1:2013	HC300 LA	7128
	EN 10268:2006+A1:2013	HC340 LA	7132
	EN 10268:2006+A1:2013	HC380 LA	7136
	EN 10268:2006+A1:2013	HC420 LA	7140
	EN 10268:2006+A1:2013	HC460 LA	7146
	EN 10268:2006+A1:2013	HC500 LA	7150
	11-04-002	XE-320DR	250
	WSB-M1 A 215-F1	Gr. 300	251
	EN 10268:2006+A1:2013	HC340LA (MOD.)	255
	11-04-002	XE-360DR	260
	52811	FEE 340 F	261
	EN 10268:2006+A1:2013	HC460LA (MOD.)	262
High strength Full-hard structural steels	SAE J403-2014	1030	5130
	SAE J403-2014	1040	5140
	SAE J403-2014	1045	5145
Cold rolled carbon steel for strap production and structural applications	SAE J403-2014	1030 Mod	5131
Intermediate strength structural steel	1623:2009	S215G	4137
Cold rolled steel for strap production	1623:2009	S215G	6137
High strength structural steel	Erdemir-18	S325G (MOD.)	4138
Cold rolled, atmospheric corrosion resistant steels	JIS G 3125:2015	SPA - C	9160
Cold rolled steels for tin coating	JIS G 3303:2017	T-2,5	2726
	JIS G 3303:2017	T-3	2728
	JIS G 3303:2017	T-4	2742

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Material Number	Previous	Europe	American	Japanese	
1.0338	St14		ASTM A1008 DS Type A	JIS G3141 SPCEN	179
1.0338					179
1.0312	FeP05		ASTM A1008 DDS		179
1.0873	FeP06		ASTM A1008 EDDS		179
	St14	DC04	ASTM A620 CR DDQAK	JIS G3141 SPCEN	181
	St14	DC04	ASTM A620 CR DDQAK	JIS G3141 SPCEN	181
	St14	DC04	ASTM A620 CR DDQAK	JIS G3141 SPCEN	181
1.0330	St12		ASTM A366 CR CQ	JIS G3141 SPCC	179
1.0347	RRst13		ASTM A619 CR DQ	JIS G3141 SPCD	179
1.0338	St14		ASTM A620 CR DDQAK	JIS G3141 SPCEN	180
1.0338	St14		ASTM A1008 DS Type A	JIS G3141 SPCEN	180
1.0312	FeP05		ASTM A1008 DDS		180
1.0873	FeP06		ASTM A1008 EDDS		180
1.0390	DIN 1623-3EK2				182
1.0390	DIN 1623-3EK2				182
1.0392	DIN 1623-3EK4		ASTM A424 Type 2		182
1.0392	DIN 1623-3EK4		ASTM A424 Type-2		182
1.0386					182
1.0394					182
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1.0872	FeD6		ASTM A424 Type-3		182
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1.0396	SEW 094 ZStE220 BH				183
1.0400	SEW 094 ZStE260 BH				183
1.0925	SEW 094 ZStE220 P		ASTM A1008 BHS Gr.31		184
1.0928	SEW 094 ZStE260 P				184
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1.0480	SEW093 ZStE240		ASTM A1008 SS Gr.33		186
1.0489	SEW093 ZStE260		ASTM A1008 SS Gr.40		186
1.0548	SEW093 ZStE300		ASTM A1008 HSLAS Gr.45 Class 2		186
1.0550	SEW093 ZStE340		ASTM A1008 HSLAS Gr.50 Class 2		186
1.0556	SEW093 ZStE380		ASTM A1008 HSLAS Gr.55 Class 2		186
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	SEW093 ZStE300	HC340LA	ASTM A607 Gr.45		187
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	TH260	ASTM A623 T55			192
	TH275	ASTM A623 T57			192
	TH415	ASTM A623 T61			192

1) The other corresponding standards specified in the table above may be in exact or similar correspondence. Therefore, the conformity of the other related standards are not guaranteed. The corresponding standards and grades given on this table are only for information

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Cold Rolled Low Carbon Steels For Drawing and Deep Drawing

Standard: EN 10130:2006

Chemical Composition (%)[6][7]

Corresponding		Erdemir Steel Grade	C	P	Cu	S	Mn	B	Ti
Standard	Grade		max.	max.		max.	max.		
EN 10130	DC01	6112	0.12	0.045	-	0.045	0.60	-	(8)
EN 10130	DC01	6182[1]	0.12	0.045	0.15-0.45	0.045	0.60	-	-
EN 10130	DC01	7111[2][3]	0.12	0.045	-	0.045	0.60	-	-
EN 10130	DC01	6612[2][4]	0.12	0.045	-	0.045	0.60	-	-
EN 10130	DC01	7612[2][5]	0.12	0.045	-	0.045	0.60	20-50	-
EN 10130	DC01 Mod	7110	0.12	0.035	-	0.035	0.60	-	-
EN 10130	DC03	6113	0.10	0.035	-	0.035	0.45	-	(8)
EN 10130	DC03	7313	0.10	0.035	-	0.035	0.45	-	(8)
EN 10130	DC04	6114	0.08	0.030	-	0.030	0.40	-	(8)
EN 10130	DC05	6115	0.06	0.025	-	0.025	0.35	-	(8)
EN 10130	DC05	6115	0.06	0.025	-	0.025	0.35	-	(5)

Notes

1) Grade 6182 is produced copper added.
2- The grades are suitable for welding of electric-resistance.
3) Mn % and Al % values vary according to grade 6112.
4) Produced as BA; C % and Mn % values vary according to 6112 produced as BA
5) Grade 7612 is produced boron added.
6) Grades DC03, DC04 and DC05 shall be fully killed. Minimum aluminium to nitrogen ratio is 2:1.
7) Limits which are highlighted with red colour are standard limits. The others are given for reference values according to Erdemir practice.
8) Grades 6112, 6113, 6114 and 6115 can be produced titanium added.

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Steel Grades

Mechanical Properties

Corresponding		Erdemir Steel Grade	Surface Quality	Guarantee Period[7]		R_e[2][5] N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80}[3] (%)	r_{90}[4]	n_{90}[4]
				Absence of Stretcher Strains Marks (month)	Validity of Mechanical Properties (month)					
Standard	Grade					max.		min.	min.	min.
EN 10130	DC01	6112[8]	A	-	-	280 (28.6)	270-410 (27.5-41.8)	28	-	-
			B	3						
EN 10130	DC01	6182[8][8]	A	-	-	280 (28.6)	270-410 (27.5-41.8)	28	-	-
			B	3						
EN 10130	DC01	7111[6]	A	6	-	280 (28.6)	270-410 (27.5-41.8)	28	1.3	-
			B							
EN 10130	DC01	6612[6][8]	A	6	-	280 (28.6)	270-410 (27.5-41.8)	28	1.3	-
			B							
EN 10130	DC01	7612[6]	A	-	-	280 (28.6))	270-410 (27.5-41.8)	28	-	-
			B	3						
EN 10130	DC01 Mod	7110[9]	A	-	-	230-280 (22.5-28.6)	270-410 (27.5-41.8)	28	-	-
			B	3						
EN 10130	DC01	6113	A	6	6	240 (24.5)	270-370 (27.5-37,7)	34	1.3	-
			B							
EN 10130	DC01	7313	A	6	6	240 (24.5)	270-370 (27.5-37,7)	34	1.3	-
			B							
EN 10130	DC01	6114[8]	A	6	6	210 (21.4)	270-350 (27.5-35.7)	38	1.6	0.18
			B							
EN 10130	DC01	6115[8]	A	6	6	180 (18.4)	270-330 (27.5-33.7)	40	1.9	0.20
			B							

Notes

1) Tensile test values apply to “transverse” test pieces
2) The value for yield stress is increased by 20 N/mm² (2,0 kg/mm²) for thickness greater than 0.5 mm and less than or equal to 0.7 mm. For thickness less than or equal to 0.5 mm, the value is increased by 40 N/mm² (4,1 kg/mm²)
3) When the thickness is less than or equal to 0.7 mm and greater than 0.5 mm, the minimum value for elongation is reduced by 2 units. For thickness less than or equal to 0.5 mm, the minimum value is reduced by 4 units.
4) The values of r_{90} and n_{90} only apply to products of thickness $d \geq 0.5$ mm.
5) For design purposes, the lower limit of Re may be assumed to be 140 N/mm² (14,3 kg/mm²)
6) The upper limit Re of 280 Mpa for grades 6112 is valid only for 8 days from the time of the availability of the product and recommended that the products in grades 6112 should be formed within 6 weeks from the time of their availability.
7) Guarantee periods specified in the table begin on the date which products are made available.
8) The grades are produced by “Batch-Annealing” as A surface.
9) It is produced by targeting Re/Rm value as minimum 0.72.

Steel Grades

Cold Rolled Low Carbon Steels For Drawing and Deep Drawing

Standard: ASTM A1008-2015

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn max.	P max.	S max.	Al min.	Cu max.	Ni max.	Cr[1] max.	Mo max.	v max.	Nb max.	Ti[2] max.
Standard	Grade													
ASTM A1008-2015	DS Type B	7113	0,02-0,0	0.50	0.020	0.020	0.020	0.20	0.20	0.15	0.06	0.008	0.008	0.025

Notes

1) Chromium is permitted, at the producer's option, to %0.25 maximum when the carbon content is less than or equal to %0.05
2) For steel containing %0.02 or more carbon, titanium is permitted at the producer's option, to the lesser of %0.025

Mechanical Properties

Corresponding			Erdemir Grade No	R_e[1)2)] N/mm² (kg/mm²)	A_{50}[1)2)] (%) min.	r_{ort}[2)3)] min.	n[2)4)] min.
Standard	Grade	Similar Standard / Grade					
ASTM A1008-2015	DS Type B	-	7113	150-240 (15.3-24.4)	36	1.3-1.7	0.17-0.22

Notes

1) Yield strength and elongation are measured in the longitudinal direction in accordance with A 370 Test Methods and Definitions
2) Specified values are referanced values.
3) r_{ort} value determined by Test Method E517
4) n value determined by Test Method E646

Standard: EN 10130:2006

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	P max.	S max.	Mn max.
Standard	Grade					
EN 10130	DC01 Mod	7109	0.12	0.045	0.045	0.60

Notes

1) Limits which are highlighted with red colour are standard limits. The others are given for reference values according to Erdemir practice.

Mechanical Properties

Corresponding		Erdemir Steel Grade	Surface Quality	Guarantee Period		R_e N/mm² (kg/mm²)	R_m N/mm² (kg/mm²)	A_{50}[1)2)] (%) min.
Standard	Grade			Absence of Stretcher Strains Marks (month)	Validity of Mechanical Properties (month)			
EN 10130	DC01 Özel	7109	A	-	-	280 (28.6)	270-410 (27.5-41.8)	28
			B	3 ay				

Notes

1) Tensile test values apply to "transverse" test pieces
2) The value for yield stress is increased by 40 N/mm2 (4,1 kg/mm2) for thickness less than or equal to 0.5 mm.
3) For design purposes, the lower limit of Re may be assumed to be 140 N/mm² (14,3 kg/mm²)
4) The upper limit Re of 280 Mpa for grades DC01 is valid only for 8 days from the time of the availability of the product and recomended that the products in grades 6112, 6182, 7111, 6612 should be formed within 6 weeks from the time of their availability.
5) Guarantee periods specified in the table begin on the date on which products are made available.

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Steel Grades

Cold Rolled Low Carbon Steels For Drawing and Deep Drawing

Standard: ERDEMİR-15

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Mn max.	P max.	S max.	Ti max.
Standard	Grade						
EN 10130:2006/ ERDEMİR-15	DC01 / ERDEMIR-DC02	7112	0.10	0.45	0.035	0.035	(1)

Notes

1) Should be produced by adding Titanium.

Mechanical Properties

Corresponding			Erdemir Grade No	Surface Quality	Guarantee Period		R_e[1)2)] N/mm² (kg/mm²)	R_m[1)2)] N/mm² (kg/mm²)	A_{50}[1)2)] (%) min.
Standard	Grade	Similar Standard / Grade			Absence of Stretcher Strains Marks (month)	Validity of Mechanical Properties (month)			
EN 0130:2006/ ERDEMİR-15	DC01 / ERDEMIR-DC02	-	7112	A	-	-	180-260	270-390	30
				B	3		18.3-26.4	27.4-39.6	

Notes

1) Tensile test values apply to "transverse" test pieces
2) The value for yield stress is increased by 20 N/mm² (2,0 kg/mm2) for thickness greater than 0.5 mm and less than or equal to 0.7 mm. For thickness less than or equal to 0.5 mm, the value is increased by 40 N/mm2 (4,1 kg/mm²)
3) When the thickness is less than or equal to 0.7 mm and greater than 0.5 mm, the minimum value for elongation is reduced by 2 units. For thickness less than or equal to 0.5 mm, the minimum value is reduced by 4 units.
4) Guarantee periods specified in the table begin on the date on which products are made available.

Cold Rolled Low Carbon Steels For Deep Drawing

Standard: TSG3100G

Chemical Composition (%)

Corresponding			Erdemir[1] Steel Grade	C	Mn	P	S	Si	Al
Standard	Grade	Similar Standard / Grade		max.	max.	max.	max.	max.	min.
TSG3100G	SPC270C	EN 10130 / DC03	120	0.06	0.20	0.020	0.015	0.030	0.080
TSG3100G	SPC270C	EN 10130 / DC03	121	0.06	0.20	0.020	0.015	0.030	0.080

Notes

1) Chemical composition is not specified in customer specification. Limits given in this table are based on Erdemir practice for reference.

Mechanical Properties

Corresponding			Erdemir Steel Grade	Thickness d (mm)	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80} (%)	
Standard	Grade	Similar Standard / Grade				min.	min.	max.
TSG3100G	SPC270C	EN 10130 / DC03	120[2]	0.40≤d<0.80	145-265 (14.8-27.0)	270 (27.6)	36	46
				0.80≤d<1.00	135-255 (13.8-26.0)	270 (27.6)	38	48
TSG3100G	SPC270C	EN 10130 / DC03	121[2]	1.00≤d<1.40	125-245 (12.7-24.9)	270 (27.6)	39	49

Notes

1) Tensile test values apply to “longitudinal” test pieces
2) The mechanical properties are valid for a period of 3 months from the date on which the products are made available.
3) Grades specified in this table are produced according to reference mechanical values above in line with agreements with customers.
4) Elongation values are increased by 1 unit for every 0,2mm thickness.

Cold Rolled Ultra Low Carbon Drawing and Deep Drawing Steels For Home Appliances

Standard: EN 10130:2006

Chemical Composition (%)[2][3]

Corresponding		Erdemir Steel Grade	C	P	S	Mn	Ti
Standard	Grade		max.	max.	max.	max.	max.
EN 10130	DC01	7122	0.12	0.045	0.045	0.60	0.050-0.060
EN 10130	DC03	7123	0.10	0.035	0.035	0.45	0.060-0.070
EN 10130	DC04	7114	0.08	0.030	0.030	0.40	0.065-0.075
EN 10130	DC04	145[1]	0.07	0.030	0.025	0.35	0.085-0.095
EN 10130	DC05	7115	0.06	0.025	0.025	0.35	0.085-0.095
EN 10130	DC06	7116	0.02	0.020	0.020	0.25	0.30

Notes

1) Chemical composition values are not specified in this grade. Limits given in this table are based on Erdemir practice for reference.
2) Limits which are highlighted with red colour are standard limits. The others are given for reference values according to Erdemir practice.
3) Grades DC03, DC04, DC05 and DC06 shall be fully killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding		Erdemir Steel Grade	Surface Quality	Guarantee Period[7]		R_e[2] N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80}[3] (%)	r_{90}[4]	n_{90}[4]
				Absence of Stretcher Strains Marks (month)	Validity of Mechanical Properties (month)					
Standard	Grade					max.		min.	min.	min.
EN 10130	DC01	7122[5]	A	-	-	280 (28.6)	270-410 (27.5-41.8)	28	-	-
			B	3	3					
EN 10130	DC03	7123[5]	A	6	6	240 (24.5)	270-370 (27.5-37.7)	34	1.3	-
			B							
EN 10130	DC04	7114[5]	A	6	6	210 (21.4)	270-350 (27.5-35.7)	38	1.6	0.18
			B							
EN 10130	DC04	145[5][6]	A	6	6	190 (19.3)	270-330 (27.6-33.6)	40	1.6	0.18
			B							
EN 10130	DC05	7115[5]	A	6	6	180 (18.4)	270-330 (27.5-33.7)	40	1.9	0.20
			B							
EN 10130	DC06	7116[8]	A	Unlimited	6	170 (17.3)	270-330 (27.6-33.7)	41	2.1	0.22
			B							

Notes

1) Tensile test values apply to “transverse” test pieces
2) The value for yield stress is increased by 20 N/mm² (2,0 kg/mm²) for thickness greater than 0.5 mm and less than or equal to 0.7 mm. For thickness less than or equal to 0.5 mm, the value is increased by 40 N/mm² (4,1 kg/mm²)
3) When the thickness is less than or equal to 0.7 mm and greater than 0.5 mm, the minimum value for elongation is reduced by 2 units. For thickness less than or equal to 0.5 mm, the minimum value is reduced by 4 units.
4) The values of r_{90} and n_{90} only apply to products of thickness d ≥ 0.5 mm.
5) For design purposes, the lower limit of Re may be assumed to be 140 N/mm² (14.3 kg/mm²)
6) For design purposes, the lower limit of Re may be assumed to be 120 N/mm² (12.2 kg/mm²)
7) Guarantee periods specified in the table begin on the date which products are made available.
8) This grade is produced based on reference values above in line with agreements with customers differently from mechanical values in specification.

Steel Grades

Cold Rolled Ultra Low Carbon Extra Deep Drawing Steels For Automotive Industry

Standard: EN 10130:2006

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C	P	S	Mn	Ti
Standard	Grade		max.	max.	max.	max.	max.
EN 10130	DC04	7124	0.08	0.030	0.030	0.40	-
EN 10130	DC04	7314[1]	0.08	0.030	0.030	0.40	-
EN 10130	DC05	7315[1]	0.06	0.025	0.025	0.35	-
EN 10130	DC06	7316[1]	0.02	0.020	0.020	0.25	0.30

Notes

1) Suitable for spot welding

Mechanical Properties

Corresponding		Erdemir Steel Grade	Guarantee Period[7]		R_e[2] N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80}[3] (%)	r_{90}[4]	n_{90}[4]
			Absence of Stretcher Strains Marks (month)	Validity of Mechanical Properties (month)					
Standard	Grade				max.		min.	min.	min.
EN 10130	DC04	7124[5]	6	6	210 (21.4)	270-350 (27.5-35.7)	38	1.6	0.18
EN 10130	DC04	7314[5]	6	6	210 (21.4)	270-350 (27.5-35.7)	38	1.6	0.18
EN 10130	DC05	7315[5]	6	6	180 (18.4)	270-330 (27.5-33.7)	40	1.9	0.20
EN 10130	DC06	7316[5]	Unlimited	6	170 (17.4)	270-330 (27.5-33.7)	41	2.1	0.22

Notes

1) Tensile test values apply to “Transverse” test pieces
2) The value for yield stress is increased by 20 N/mm² (2,0 kg/mm²) for thickness greater than 0.5 mm and less than or equal to 0.7 mm. For thickness less than or equal to 0.5 mm, the value is increased by 40 N/mm² (4,1 kg/mm²)
3) When the thickness is less than or equal to 0.7 mm and greater than 0.5 mm, the minimum value for elongation is reduced by 2 units. For thickness less than or equal to 0.5 mm, the minimum value is reduced by 4 units.
4) The values of r_{90} and n_{90} only apply to products of thickness d ≥ 0.5 mm.
5) For design purposes, the lower limit of Re may be assumed to be 140 N/mm² (14.3 kg/mm²)
6) For design purposes, the lower limit of Re may be assumed to be 120 N/mm² (12.2 kg/mm²)
7) Guarantee periods specified in the table begin on the date which products are made available.

Steel Grades

Cold Rolled Ultra Low Carbon For Deep Drawing Steels Suitable For Automotive Industry

Standard: Miscellaneous

Chemical Composition (%)

Corresponding			Erdemir Steel Grade	C	Mn	P	S	Si	Ti	Nb	Al	$CE^{1)}$ %
Standard	Grade	Similar Standard/Grade		max.	max.	max.	max.	max.	max.	max.		max.
11-04-013	XES	EN 10130 / DC04	130[3]	0.080	0.50	0.025	0.025	0.04	0.050-0.060	-	0.005-0.070	0.16
TSG3100G	SPC270D	EN 10130 / DC04	131[2]	0.007	0.25	0.015	0.020	0.03	-	-	-	-
TSG3100G	SPC270D	EN 10130 / DC04	132[2]	0.007	0.25	0.015	0.020	0.03	-	-	-	-

Notes

1) “C_{eq} % = C % + (Mn+Si) % / 6” formula applies for carbon equivalent
2) Chemical composition is not specified in customer specification. Limits given in this table are based on Erdemir practice for reference.
3) Limits are highlighted with red colour are customer specification. The others are given for reference values according to Erdemir practice.

Mechanical Properties

Corresponding			Erdemir Steel Grade	Thickness d (mm)	$R_{p0.2}$ N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80} (%)		A_{80} (%)		$\bar{r}$	r_{90}	$\bar{n}$	n_{90}	Guarantee Period
							min.	max.	min.	max.					Mechanical Properties
Standard	Grade	Similar Standard/Grade									min.	min.	min.	min.	
11-04-013	XES	EN 10130 / DC04	130[1][2][3][5]	d ≤ 1.50	160-200 (16.3-20.4)	280-350 (28.6-35.7)			37	-	-	1.80	-	0.19	6 month
				d > 1.50	210 (16.3-21.4)										
TSG3100G	SPC270D	EN 10130 / DC04	131[3][4][7]	0.40 ≤ d < 0.80	135-225 (13.8-22.9)	270 (27.6)	39	49			1.20	-	0.20	-	12 month
				0.80 ≤ d < 1.00	125-215 (12.8-21.9)	270 (27.6)	41	51							
TSG3100G	SPC270D	EN 10130 / DC04	132[3][4][7]	1.00 ≤ d < 1.40	115-205 (11.8-20.9)	270 (27.6)	42	52			1.10	-	0.20	-	12 month

Notes

1) Tensile test values apply to “transverse” test pieces
2) $R_{p02} / R_m \leq 0.66$
3) Guarantee periods specified in the table begin on the date on which products are made available.
4) This grade is produced based on reference values above in line with agreements with customers differently from mechanical values in specification.
5) Unless otherwise agreed, n value is taken between %10-20 elongation range
6) Elongation values are increased by 1 unit for every 0,2mm thickness.
7) Tensile test values apply to “longitudinal” test pieces

Cold Rolled Steels For Enamelling

Standard: EN 10209:2013

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C max.	Ti max.	Mn max.	P max.	S max.
Standard	Grade						
EN 10209	DC01EK	7512	0.08	-	0.60	0.045	0.050
EN 10209	DC01EK	6512 (1)	0.08	-	0.60	0.045	0.050
EN 10209	DC04EK	6513 (1)	0.08	-	0.50	0.030	0.050
EN 10209	DC04EK	7513	0.08	-	0.50	0.030	0.050
EN 10209	DC05EK	513	0.08	-	0.50	0.025	0.050
EN 10209	DC04ED	7514	(2)	(2)	0.40	0.030	0.050
EN 10209	DC04ED Mod	504	0.02	0.30	0.35	0.020	0.050
EN 10209	DC06ED	7516	0.02	0.30	0.35	0.020	0.050

Notes

1) Products of grade 6512 and 6513 are produced by “batch-annealing”.
2) Liquid steel is decarburized and stabilized with “Ti” under vacuum process by targeting max. 0.004 % “C” in product analysis.
3) Deoxidation methods of all products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e (3) N/mm² (kg/mm²)	R_m (1) N/mm² (kg/mm²)	A_{80} (4) (%)	r_{-} (2) (%)	Guarantee Period (7)
							Absence of Strecther Strain Marks and Validity of Mechanical Properties (month)
Standard	Grade		max.		min.	min.	
EN 10209	DC01EK	7512 (5)	270 (27.5)	270-390 (27.5-39.8)	30	-	6
EN 10209	DC01EK	6512 (5)	270 (27.5)	270-390 (27.5-39.8)	30	-	6
EN 10209	DC04EK	6513 (5)	220 (22.4)	270-350 (27.5-35.7)	36	-	6
EN 10209	DC04EK	7513 (5)	220 (22.4)	270-350 (27.5-35.7)	36	-	6
EN 10209	DC05EK	513 (5)(7)	220 (22.4)	270-350 (27.5-35.7)	36	1.5	6
EN 10209	DC04ED	7514 (5)	210 (21.4)	270-350 (27.5-35.7)	38	-	6
EN 10209	DC04ED Mod	504 (5)	220 (22.4)	270-350 (27.5-35.7)	36	1.5	6
EN 10209	DC06ED	7516 (6)	190 (19.4)	270-350 (27.5-35.7)	38	1.6	6

Notes

1) Tensile test values apply to “transverse” test pieces
2) r (average) value applies to material with thicknesses d ≥ 0.5 mm.
3) When the thickness is less than or equal to 0.7 mm and greater than 0.5 mm, the value is increased by 20 N/mm² (2,0 kg/mm²). For thicknesses equal to or less than 0.5 mm, the value for yield stress is increased by 40 N/mm² (4,1 kg/mm²).
4) When the thickness is less than or equal to 0.7 mm and greater than 0.5 mm, the minimum elongation value is reduced by 2 units. For thicknesses equal to or less than 0.5 mm, the minimum value after fracture is reduced by 4 units.
5) For design purposes, the lower limit of Re may be assumed to be 140 N/mm² (14.3 kg/mm²)
6) For design purposes, the lower limit of Re may be assumed to be 120 N/mm² (12.2 kg/mm²)
7) At the request of the purchaser, the DC04EK and DC05EK qualities may be supplied with Re ≤ 210 MPa and A80 ≥ 38 % in the 0,7 mm to 1,5 mm thicknesses.
8) Guarantee periods specified in the table begin on the date on which products are made available.

Cold Rolled High Yield Strength Steels For Cold Forming

Standart: EN 10268:2006+A1:2013

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Si	Mn	P	V	B	S	Al	Ti	Nb
Standard	Grade		max.	max.	max.	max.	max.	max.	max.	min.	min.	max.
EN 10268	HC220Y	7022 (1)	0.01	0.30	0.90	0.08	-	-	0.025	0.01	0.12	0.09
EN 10268	HC260Y	7026 (1)	0.01	0.30	1.60	0.10	-	-	0.025	0.01	0.12	0.09

Mechanical Properties

Corresponding		Erdemir Steel Grade	$R_{p0.2}$ / R_e N/mm² (kg/mm²)	R_m (1) N/mm² (kg/mm²)	A_{80} (2) (%)	r_{90} (3)	n_{90} (3)	Guarantee Period (4) (month)
Standard	Grade				min.	min.	min.	
EN 10268	HC220Y	7022	220-270 (22.4-27.5)	340-420 (35.7-42.8)	33	1.6	0.18	6
EN 10268	HC260Y	7026	260-320 (26.5-32.6)	380-440 (38.8-44.9)	31	1.4	0.17	6

Notes

1) Tensile test values apply to “transverse” test pieces
2) When the thickness is less than or equal to 0.7 mm and greater than 0.5 mm, the elongation value is reduced by 2 units. For a thickness less than or equal to 0.5 mm, the minimum value is reduced by 4 units.
3) The values of r_{90} and n_{90} only apply to products of thickness d ≥ 0.5 mm.
4) Guarantee periods specified in the table begin on the date which products are made available.

Cold Rolled Bake-Hardening High Yield Strength Steel For Cold Forming

Standart: EN 10268:2006+A1:2013

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Si	Al
Standard	Grade		max.	max.	max.	max.	max.	min.
EN 10268	HC220B	7722[1]	0.08	0.70	0.085	0.030	0.50	0.015
EN 10268	HC260B	7726[1]	0.1	1.0	0.10	0.030	0.50	0.015

Notes

1) % Ti+% Nb+% V+% B ≤ 0.22

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	BH_2 N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80}[2] (%)	$r^{[3][4]}$	$n^{[3]}$	Guarantee Period[5] (month)
Standard	Grade			min.		min.	min.	min.	
EN 10268	HC220B	7722	220-270 (22.5-27.5)	35 (3,57)	320-400 (32.7-40.7)	32	1.5	0.16	6
EN 10268	HC260B	7726	260-320 (26.5-32.6)	35 (3.57)	360-440 (36.7-44.9)	29	-	-	6

Notes

1) Tensile test values apply to “transverse” test pieces
2) When the thickness is less than or equal to 0.7 mm and greater than 0.5 mm, the minimum elongation value is reduced by 2 units. For a thickness less than or equal to 0.5 mm, the minimum value is reduced by 4 units.
3) The minimum values for r (trans.) and n (trans.) only apply to products of thickness equal to or greater than 0.5 mm.
4) For thicknesses > 1.2 mm special agreements must be made.
5) Guarantee periods specified in the table begin on the date on which products are made available.

Cold Rolled
Flat Steel Products

Steel Grades

Cold Rolled Bake-Hardening High Yield Strength Steel For Cold Forming

Standard: 52814

Chemical Composition (%)[3][4]

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Si	Al
Standard	Grade					max.	max.	
52814	FEE 220 BH	171[1][2]	0.007-0.06	0.15-0.70	0.05-0.09	0.030	0.50	0.020-0.070

Notes

1) % Ni+% Cu+% Cr+% Mo ≤ 0.5
2) % C+ % P ≤ 0.16
3) Limits are highlighted with red colour are customer specification. The others are given for reference values according to Erdemir practice.
4) Applied chemical composition limits are generated based on aiming mechanical limits, differently from table values, in line with agreements with customers

Mechanical Properties[3]

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	BH(BH2+WH) N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80} (%)	r_{90}	n_{90}	Guarantee Period[2] (month)
Standard	Grade			min.		min.	min.	min.	
52814	FEE 220 BH	171	200-270 (20.5-27.5)	80 (8.16)	305-400 (31.5-40.5)	32	1.6	0.15	6

Notes

1) Tensile test values apply to “transverse” test pieces
2) Guarantee periods specified in the table begin on the date on which products are made available.
3) There may be deviations for the chemical composition, provided that mechanical property limits are guaranteed.

Steel Grades

Cold Rolled High Yield Strength Steels For Cold Forming

Standart: EN 10268:2006+A1:2013

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Si	Mn	P	S	Al	V	B	Nb[1]	Ti[1]
Standard	Grade		max.	max.	max.	max.	max.	min.	max	max.	max.	max.
EN 10268	HC260LA	7125	0.10	0.50	1.0	0.030	0.025	0.015	-	-	0.090	0.15
EN 10268	HC300LA	7128	0.12	0.50	1.4	0.030	0.025	0.015	-	-	0.090	0.15
EN 10268	HC340LA	7132	0.12	0.50	1.5	0.030	0.025	0.015	-	-	0.090	0.15
EN 10268	HC380LA	7136	0.12	0.50	1.60	0.030	0.025	0.015	-	-	0.090	0.15
EN 10268	HC420LA	7140	0.14	0.50	1.60	0.030	0.025	0.015	-	-	0.090	0.15
EN 10268	HC460LA	7146	0.14	0.60	1.80	0.030	0.025	0.015	-	-	0.090	0.15
EN 10268	HC500LA	7150	0.14	0.60	1.80	0.030	0.025	0.015	-	-	0.090	0.15

Notes

1) (Nb + Ti + V + B) % ≤ 0.22

Mechanical Properties

Corresponding		Erdemir Steel Grade	Transverse[1] [4]			Longitudinal[2] [4]		
			$R_{p0.2}/R_{eL}$ N/mm² (kg/mm²)	R_m N/mm² (kg/mm²)	A_{80}[3] (%)	R_e N/mm² (kg/mm²)	R_m N/mm² (kg/mm²)	A_{80}[3] (%)
Standard	Grade				min.			min.
EN 10268	HC260LA	7125	260-330 (26.6-33.6)	350-430 (35.7-43.8)	26	240-310 (24.5-31.6)	340-420 (34.7-42.8)	27
EN 10268	HC300LA	7128	300-380 (30.6-38.7)	380-480 (38.7-48.9)	23	280-360 (28.6-36.7)	370-470 (37.8-47.9)	24
EN 10268	HC340LA	7132	340-420 (34.7-42.8)	410-510 (41.8-52.0)	21	320-410 (32.7-41.8)	400-500 (40.8-51.0)	22
EN 10268	HC380LA	7136	380-480 (38.7-48.9)	440-580 (44.9-59.1)	19	350-450 (35.7-45.9)	430-550 (43.9-56.0)	20
EN 10268	HC420LA	7140	420-520 (42.8-53.0)	470-600 (47.9-61.2)	17	390-500 (39.8-51.0)	460-580 (46.9-59.1)	18
EN 10268	HC460LA	7146	460-580 (46.9-59.1)	510-660 (52.0-67.2)	13	420-560 (42.9-57.0)	480-630 (49.0-64.2)	14
EN 10268	HC500LA	7150	500-620 (51.1-63.2)	550-710 (56.2-72.4)	12	460-600 (46.9-61.2)	520-690 (53.1-70.4)	13

Notes

1) Tensile test values apply to “transverse” test pieces
2) Tensile test may be applied to “longitudinal” test pieces upon request.
3) Elongation values can be decreased by 2 units for thickness range of 0.5mm<d≤0.7mm
   For a thickness less than or equal to 0.5 mm, the minimum value is reduced by 4 units.
4) The mechanical properties are valid for a period of 6 months from the date on which the products are made available.

Steel Grades

Cold Rolled High Yield Strength Steels For Cold Forming

Standard: Miscellaneous

Chemical Composition (%)

Corresponding			Erdemir[5] Steel Grade	C	Mn	P	S	Si	Nb	V	Al	Ti	Cu	$Ceq^{(1)}$ %
Standard	Grade	Similar Standard / Grade		max.	max.	max.	max.	max.	max.	max.		max.	max.	max.
11-04-002	XE-320DR	EN 10268 / HC340LA	250[3]	0.10	1.10	0.030	0.025	0.20	0.100	0.100	0.015-0.080	0.100	-	0.28
WSB-M1 A 215-F1	Gr. 300	EN 10268 / HC340LA	251[4][5]	0.10	0.90	0.025	0.020	0.03	0.080	0.060	-	-	-	-
EN 10268:2006+A1:2013	HC340LA Özel1	WSS-M1A347-A4	255[4]	0.12	1.5	0.030	0.025	0.50	0.090	-	0.015	0.15	-	-
11-04-002	XE-360DR	EN 10268 / HC380LA	260[3]	0.11	1.40	0.030	0.025	0.50	0.100	0.100	0.015-0.080	0.100	-	0.31
52811	FEE 340 F	EN 10268 / HC380LA	261[2][3]	0.12	1.50	0.030	0.030	0.50	0.045-0.055	0.040-0.050	0.015	-	-	-
EN 10268:2006+A1:2013	HC460LA Özel	EN 10268 /HC460LA	262[2][3]	0.12	1.50	0.020	0.020	0.50	0.090	-	0.015	0.15	0.10	-

Notes

1) C_{eq} % = C % + (Mn+Si) % / 6
2) % Nb+Ti+V ≤ 0.22
3) Limits are highlighted with red colour are customer specification. The others are given for reference values according to Erdemir practice.
4) The chemical composition is not specified in customer specification. Limits given in this table are based on Erdemir practice for reference.
5) Deoxidation method of these products is fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding			Erdemir Steel Grade	$R_{p0.2}$ / R_{eL} N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	r_{90}	n_{90}	A_{80} (%)	A_{80} (%)	Bend (Trans., 180 °C) D/a mdb
Standard	Grade	Similar Standard / Grade				min.	min.	min.	min.	min.
11-04-002	XE-320DR	EN 10268 / HC340LA	250[2][3][4]	320-390 (32.7-39.8)	415-480 (42.3-49.0)	0.50	0.13	-	-	24 -
WSB-M1 A 215-F1	Gr. 300	EN 10268 / HC340LA	251[3]	300-400 (30.6-40.8)	400 min. (40.8 min.)	-	-	-	23	- -
EN 10268:2006+A1:2013	HC340LA Mod1	WSS-M1A347-A4	255[5]	350-450 (35.7-45.8)	430 (43.9)	-	-	-	25	- -
11-04-002	XE-360DR	EN 10268 / HC380LA	260[2][3][4]	360-440 (36.7-44.8)	450-530 (45.9-54.1)	0.50	0.13	-	-	21 -
52811	FEE 340 F	EN 10268 / HC380LA	261[3]	340-420 (34.7-42.8)	410 min. (41.8)	-	-	0.13	-	20 0.5
EN 10268:2006+A1:2013	HC460LA Mod	EN 10268 / HC460LA	262[3]	460-580 (46.9-59.1)	529-680 (54.0-69.4)	-	-	0.13	-	16 -

Notes

1) Tensile test values apply to “longitudinal” test pieces
2) $R_{p0.2} / R_m \leq 0.85$
3) The mechanical properties are valid for a period of 6 months from the date on which the products are made available.
4) Unless otherwise agreed, n value is taken between %10-20 elongation range
5) The grades specified in this table are produced according to the reference values stated above, differently from the customer’s specification with mutual agreement.

Cold Rolled Dual Phase High Yield Strength Steel For Cold Forming

Standard: EN 10338:2015

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Si	Mn	P	S	Al	Cr+Mo	Nb+Ti	V	B
Standard	Grade		max.	max.	max.	max.	max.	max.	max.	max.	max.	max.
EN 10338:2015	HCT490X	7650	0.14	0.75	2.00	0.08	0.015	0.015-1.00	1.00	0.15	0.20	0.005
EN 10338:2015	HCT590X	7660	0.15	0.75	2.50	0.04	0.015	0.015-1,50	1.40	0.15	0.20	0.005
EN 10338:2015	HCT590X	7680	0.18	0.80	2.50	0.08	0.015	0.015-2.00	1.40	0.15	0.20	0.005

Mechanical Properties

Corresponding		Erdemir Steel Grade	$R_{p0.2}$ / R_e N/mm² (kg/mm²)	BH_2 N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80}[2] (%)	n_{10-UE}
Standard	Grade			min.	min.	min.	min.
EN 10338:2015	HCT490X	7650	290-380 (29.6-38.7)	30 (3.1)	490 (50.0)	24	0.15
EN 10338:2015	HCT590X	7660	330-430 (33.7-43.8)	30 (3.1)	590 (60.2)	20	0.14
EN 10338:2015	HCT590X	7680	440-550 (44.8-56.1)	30 (3.1)	780 (79.5)	14	-

Notes

1) Tensile test values apply to “transverse” test pieces
2) Elongation values can be decreased by 2 units for thicknesses d<0.6 mm.
3) The mechanical properties are valid for a period of 3 months from the date on which the products are made available.

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Si	Mn	P	S	Al	Cr
Standard	Grade		max.	max.	max.	max.	max.		max.
EN 10338:2015	HCT590X Mod	290[1)]	0.12	0.50	2.00	0.030	0.015	0.015-0.075	0.50

Notes

1) Limits are highlighted with red colour are customer specification.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80} (%)
Standard	Grade			min.	min.
EN 10338:2015	HCT590X Mod	290	300-480 (30.6-49.0)	629 (64.2)	18

Notes

1) Tensile test values apply to “Longitudinal” test pieces
2) The mechanical properties are valid for a period of 3 months from the date on which the products are made available.

Cold Rolled
Flat Steel Products

Steel Grades

Cold Rolled Structural Steels

Standard: DIN 1623:2009

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	N
Standard	Grade		max.	max.	max.	max.	max.
DIN 1623	S215G	4137[1)]	0.18	1.50	0.030	0.025	-
DIN 1623	S215G	6137 [1)]	0.12	1.50	0.030	0.020	0.009

Notes

1) Deoxidation methods of all products are fully-killed. Minimum aluminium to nitrogen ratio is 2:1.

Mechanical Properties

Corresponding		Erdemir Steel Grade	$R_{p0.2}$ / R_{eH} N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80} (%)	Guarante Period[2] (month)
Standard	Grade		min.		min.	
DIN 1623	S215G	4137	215 (21.9)	360-510 (36.7-52.0)	20	6
DIN 1623	S215G	6137	215 (21.9)	360-510 (36.7-52.0)	20	6

Notes

1) Tensile test values apply to “transverse” test pieces
2) Guarantee period specified in the table begins on the date on which products are made available.

Standard: Erdemir-18

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Si	Mn	P	S
Standard	Grade			max.	max.	max.	max.
Erdemir-18	S325G Mod.	4138	0.16 - 0.19	0.03	1.50	0.030	0.025

Notes

1) Mechanical test is not carried out

Steel Grades

Cold Rolled Carbon Steels

Standard: SAE J403-2014

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Si	B	Cu	Ni	Cr	Mo	V	Nb	Ti
Standard	Grade				max.	max.			max.	max.	max.	max.	max.	max.	max.
SAE J403 / ASTM A1008-16	1006 / CS Type B	6106	0.02-0.08	0.45 max.	0.025	0.035	0.10 max.	-	0.20	0.20	0.15	0.06	0.008	0.008	0.025
SAE J403 / ASTM A1008-16	1008 / CS Type B	6108	0.02-0.10	0.50 max.	0.025	0.035	0.10 max.	-	0.20	0.20	0.15	0.06	0.008	0.008	0.025
SAE J403	10B08	7608[2]	0.10 max.	0.50 max.	0.025	0.035	0.10 max.	0.0008-0.005	-	-	-	-	-	-	-
SAE J403-2014/ ASTM A1008-16	1010/CS Type B	6110 [2]	0.08-0.13	0.30-0.60	0.025	0.035	0.10 max.	-	0.20	0.20	0.15	0.06	0.008	0.008	0.025
SAE J403	1012	4112[2]	0.10-0.15	0.30-0.60	0.030	0.035	0.10 max.	-	-	-	-	-	-	-	-
SAE J403	1018 Special	6118[1)2)]	0.15-0.20	1.20-1.70	0.030	0.035	0.40 max.	-	-	-	-	-	-	-	-
SAE J403	1030	5130[1)2)]	0.28-0.34	0.60-0.90	0.030	0.035	0.15-0.35	-	-	-	-	-	-	-	-
SAE J403	1040	5140[1)2)]	0.37-0.44	0.60-0.90	0.030	0.035	0.15-0.35	-	-	-	-	-	-	-	-
SAE J403	1045	5145[1)2)]	0.43-0.50	0.60-0.90	0.030	0.035	0.15-0.35	-	-	-	-	-	-	-	-

Notes

1) Only available as full hard
2) Mechanical test is not carried out
3) Mn content is not specified in SAE standard. In ERDEMIR Mn content is aimed to minimum 0.20

Mechanical Properties

Corresponding			Erdemir Steel Grade	R_e N/mm² (kg/mm²)	A_{50} (%)
Standard	Grade	Similar Standart / Grade		max.	min.
SAE J403-2014/ASTM A1008-16	1006/CS Type B	-	6106	140-275 (14.3-28.0)	30
SAE J403-2014/ASTM A1008-16	1008/CS Type B	-	6108	140-275 (14.3-28.0)	30

Notes

1) Yield strength and elongation are measured in the longitudinal direction in accordance with A 370 Test Methods and Definitions
2) Specified values are referenced values.

Cold Rolled Carbon Steel for Strap Production and Structural Applications

Standard: SAE J403-2014

Chemical Composition (%)

Corresponding		Erdemir[2] Steel Grade	C	Mn	P max.	S max.	Si
Standard	Grade						
SAE J403	1030 Mod	5131[1]	0.25-0.34	1.20-1.70	0.030	0.020	0.15-0.45

Notes

1) Only available as full hard
2) Mechanical test is not carried out

Steel Grades

Cold Rolled Steel For Atmospheric Corrosion Resistance

Standard: JIS G 3125 : 2015

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Si	Mn[1)]	P	S	Cu	Cr	Ni
Standard	Grade		max.		max.		max.			max.
JIS G 3125	SPA-C	9160	0.12	0.20-0.75	0.60	0.070-0.150	0.035	0.25-0.55	0.30-1.25	0.65

Notes

1) Manganese upper limit may be supplied 1.00 % upon request.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1)] N/mm² (kg/mm²)	A_{50} (%)	Bend (long. 180°) mrb
Standard	Grade		min.	min.	min.	(d: thickness)
JIS G 3125	SPA-C	9160[2]	315 (32.1)	450 (45.9)	26	1.0 d

Notes

1) Tensile test values apply to “longitudinal” test pieces
2) Only available for thickness d ≥ 0.60 mm

Steel Grades

Commercial Quality Cold Rolled Carbon Steel According to Japanese Standard

Standard: JIS G 3141: 2011

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S
Standard	Grade		max.	max.	max.	max.
JIS G 3141	SPCCT	6111	0.15	0.60	0.10	0.035

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²) d (mm)	R_m (min)(1) N/mm² (kg/mm²) d (mm)	A_{50} (%) d (mm)					
					≥0.25	≥0.30	≥0.40	≥0.60	≥1.00	≥1.60
Standard	Grade		≥0.25	≥0.25	<0.30	<0.40	<0.60	<1.00	<1.60	< 2.00
JIS G 3141	SPCCT	6111	-	270 (27.6)	28	31	34	36	37	38

Notes

1) Tensile test values apply to “longitudinal” test pieces

Cold rolled steels for tin coating

Chemical Composition (%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Si	Al	N
Standard	Grade		max.	max.	max.	max.	max.	max.	max.
JIS G 3303:2017	T2,5	2726	0.006	0.20-0.35	0.020	0.020	0.020	0.020-0.060	0.006
JIS G 3303:2017	T3	2728	0.02-0.05	0.10-0.25	0.020	0.020	0.030	0.030-0.080	0.005
JIS G 3303:2017	T4	2742	0.03-0.08	0.20-0.35	0.020	0.020	0.030	0.020-0.070	0.009

Notes

1) Specified values are referanced values.

Mechanical Properties(1)(2)

Corresponding		Erdemir Steel Grade	R_e, $R_{p0.2}$ N/mm² (kg/mm²)	Target Values N/mm² (kg/mm²)		R_m N/mm² (kg/mm²)	Hardness Values (HR 30 Tm) d (mm)		
				R_e, $R_{p0.2}$	R_m		d ≤ 0.21	0.21<d≤0.28	d>0.28
Standard	Grade								
JIS G 3303:2017	T2,5	2726	210-310 (21.4-31.6)	260 (26.5)	360 (36.7)	310-410 (31.6-41.8)	52-60	51-59	50-58
JIS G 3303:2017	T3	2728	225-325 (23.0-33.2)	275 (28.1)	375 (38.3)	325-425 (33.2-43.4)	54-62	53-61	52-60
JIS G 3303:2017	T4	2742	365-465 (37.2-47.4)	415 (42.3)	435 (44.4)	385-485 (39.3-49.5)	58-66	57-65	56-64

Notes

1) Tensile test values apply to “longitudinal” test pieces
2) Specified values are referanced values.

Production Limits

Production Limits

* Producibility limits will be evaluated before ordering in according to existing orders and mills’ production conditions.

Cold Rolled Products

Product	Symbol	Page Number
CR	Cold rolled, batch annealed coil	194
CRK	Cold rolled, batch annealed coil with trimmed edge	194
CRSK	Cold rolled, batch annealed sheet cut from coil with trimmed edge	194
CRS	Cold rolled, batch annealed sheet cut from coil	194
SCR	Cold rolled in continuous pickling & tandem Line, batch annealed	195
CCRD	Cold rolled, continuously annealed, slitted coil	197
CRD	Cold rolled, batch annealed, slitted coil	196
CRF	Cold rolled, not annealed (full-hard) coil, produced in cold rolling mill no.1	198
CRFS	Cold rolled, not annealed (full-hard) sheet cut from coil, produced in cold rolling mill no.1	198
ICCR	Cold rolled, continuously annealed thin coil	199
CCR	Cold rolled, continuously annealed coil	200
CCRS	Cold rolled, continouosly annealed sheet cut from coil	200
CCRSK	Cold rolled, continouosly annealed sheet cut from coil with trimmed edge	201
CCRK	Cold rolled, continouosly annealed coil with trimmed edge	201
CCRF	Cold rolled, not annealed (full-hard) coil, produced in cold rolling mill no.2	202
CCRFS	Cold rolled, not annealed (full-hard) sheet cut from coil, produced in cold rolling mill no.2	202
CCRB	Cold rolled, continouosly annealed B surface coil	203
CCRKB	Cold rolled, continouosly annealed B surface coil with trimmed edge	204

Production Limits

CR
Coil - Cold Rolled, Batch Annealed

CRK
Coil - Cold Rolled, Batch Annealed, Trimmed Edge

CRS
Sheet From Coil - Cold Rolled, Batch Annealed

CRSK
Sheet From Coil - Cold Rolled, Batch Annealed, Trimmed Edge

Dimensions

Thickness (mm)	Maximum Width (mm)		
	Group-A	Group-B	Group-C
0,20 - 0,29	1000	1000	
0,30 - 0,50	1200	1200	1000
0,51 - 0,59	1250	1250	1100
0,60 - 0,80	1300	1300	1200
0,81 - 1,20	1400	1400	1200
1,21 - 2,00	1500	1500	1400

Steel Grades

Group	Grades
A	2005, 6106, 6108, 6111, 6112
B	6113, 6114, 6115, 6512, 6513
C	4112, 6110
SPECIAL	4137, 6137, 9160

Available Sizes For Grades Of Special Group			
Grade	Product Type	Thickness (mm)	Width (mm)
4137, 6137	CR, CRS	0,90 - 1,20	900 - 1200
9160	CR, CRS	1,00 - 1,20	700 - 899
			900 - 900

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Export orders for thicknesses up to 0.49 mm are subjected to negotiation.
3) Requests for the products with thicknesses less than 0.40 mm are subjected to negotiation and only accepted for the CR product type. CRS and CRSK product requests are subjected to negotiation for 0.30 mm-0.39 mm thickness range.
4) The coil weights are subjected to negotiation.
5) For thicknesses greater than 0.90 mm CR and CRK products are produced as only “small coil”. For thicknesses less than or equal to 0.90 mm, for maximum 1200 mm width, “big coil” requests are subjected to negotiation.
6) Unless otherwise is specified, orders are produced in the range of Ra 0.61-1.90 µm surface roughness. Special Ra range requests are subjected to negotiation.
7) Group A, Group B and Group C grade orders with maximum 1.20 mm thickness and 1201-1206 mm width range CR and CRS products which are requested to be processed in the cleaning line are subjected to negotiation.
8) For Group A, Group B and Group C grade export orders with thicknesses greater than 1.20 mm or with widths over 1200 mm are not accepted. For Group A, Group B and Group C grade export orders with thicknesses less than and equal to 1.20 mm and widths less than and equal to 1200 mm are not accepted.
9) For domestic Group A, Group B and Group C grade orders with thicknesses greater than 1.20 mm and mother coil widths greater than 1200 mm CRK, CRS and CRSK products are subjected to negotiation. Surface cleanliness claims are not accepted for these orders since the mentioned dimensions can not be processed in the cleaning line. (The residual oil amount is aimed as maximum 7 mg/m^2. However, any oil amount is not guaranteed.)
10) CRS and CRSK product type orders are subjected to negotiation.
11) The minimum thickness for the grade 6113, 6114, 6115, 6512 and 6513 is 0.40 mm.
12) Request for the products equal to or less than 0.28 mm in thicknesses are accepted only as unoiled .
13) Orders for thickness less than or equal to 0.55 mm in Group A for 6106, 6108, 6111, 6112 Group B and Group C grades which are involved in ICCR production limits, are accepted primarily ICCR, CCRK, CCRS and CCRSK product type.
14) For domestic Group A, Group B and Group C grade orders with thicknesses greater than 1.20 mm or widths over 1200 mm are accepted as SCR product.
15) The maximum order width for product types CRK and CRSK is 6 mm less than specified on the table above.
16) The order length is minimum 914 mm and maximum 4880 mm.
17) The maximum bundle weight for products in form of sheet is 6 tons.
18) The oiling range is 0.5-4.0 g/m2. Special oiling requests are not accepted.
19) CR products are produced with only 508 mm coil inner diameter.
20) B (05) surface orders are not accepted.
21) For 2005 tinplate grade orders, only chemical composition is guaranteed. 2005 grade orders are accepted only for “CR” product type with maximum 0.60 mm thickness.
22) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length product.

Production Limits

SCR
Coil - Cold Rolled In Continuous Pickling & Tandem Line, Batch Annealed

Dimensions

Thickness (mm)	Maximum Width (mm)		
	Group - A	Group - B	Group - C
0,40 - 0,50	1200		1000
0,51 - 0,59	1250	1201 - 1250	1100
0,60 - 0,80	1300	1201 - 1300	1200
0,81 - 1,20	1400	1400	1300
1,21 - 2,00	1500	1500	1400

Steel Grades

Group	Grades
A	6106, 6108, 6111, 6112
B	6113, 6114, 6115, 6512, 6513
C	4112, 6110

Notes

1) Export orders are subjected to negotiation.
2) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
3) All products are produced as small coil. The coil weights are subjected to negotiation.
4) Unless otherwise is specified, orders are produced in the range of Ra 0.61-1.90 µm surface roughness. Special Ra range requests are subjected to negotiation.
5) Requests for the products with thicknesses less than 0.60 mm are subjected to negotiation for Group A and Group C.
6) For Group B grade orders equal to or less than 0.80 mm in thicknesses and widths over 1200 mm are are subjected to negotiation.
7) For Group B grade orders equal to or less than 0.80 mm in thicknesses and widths up to maximum 1200 mm are accepted as CR product. Not accepted as SCR product.
8) Surface cleanliness claims are not accepted for all orders, since they are not processed in the cleaning line. (The residual oil amount is aimed as maximum 7 mg/m^2. However, any oil amount is not guarateed.)
9) The oiling range is 0.5-4.0 g/m^2. Special oiling requests are not accepted.
10) CR products are produced with only 508 mm coil inner diameter.
11) B (05) surface orders are not accepted.
12) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length product.

CRD
Slit Coil - Cold Rolled, Batch Annealed

Dimensions

Thickness (mm)	Maximum Width (mm)		
	Group-A	Group-B	Group-C
0,30 - 0,50	597	597	497
0,51 - 0,59	622	622	547
0,60 - 0,80	647	647	597
0,81 - 1,20	697	697	647
1,21 - 2,00	747	747	697

Steel Grades

Group	Grades
A	6106, 6108, 6111, 6112
B	6113, 6114, 6115, 6512, 6513
C	4112, 6110

Notes

1) The minimum order width is 400 mm. However, 400-442 mm order width range is subjected to negotiation.
2) Export orders for thicknesses up to 0.49 mm are subjected to negotiation.
3) Unless otherwise is specified, orders are produced in the range of 0.61-1.90 µm surface roughness. Special Ra range requests are subjected to negotiation. The coil weights are subjected to negotiation.
4) Orders with maximum 1.20 mm thickness and 597-600 mm width range which are requested to be processed in the cleaning line are subjected to negotiation.
5) Orders with thicknesses greater than 1.20 mm or mother coil widths greater than 1200 mm are not accepted for export orders.
6) Export orders with thicknesses less than and equal to 1.20 mm and widths less than and equal to 1200 mm are not accepted.
7) The minimum thickness for the grades 6113, 6114, 6115, 6512 and 6513 is 0.40 mm.
8) Maximum 2 slits are produced depending on the order width. CRD products are produced as 2 slits in a package.
9) Orders for grades in Group A for 6106, 6108, 6111, 6112 grades and 4112 grade in thicknesses less than or equal to 0.55 mm ICCR production limits are accepted primarily as CCRD product type.
10) For Group A, Group B and Group C grade orders with thicknesses greater than 1.20 mm and mother coil widths greater than 1200 mm are subjected to negotiation. Surface cleanliness claims are not accepted for these orders since the mentioned dimensions can not be processed in the cleaning line. (The residual oil amount is aimed as maximum 7 mg/m2. However, any oil amount is not guaranteed.)

11) The oiling range is 0.5-4.0 g/m2. Special oiling required orders are not accepted.
12) B (05) surface orders are not accepted.

Cold Rolled
Flat Steel Products

Production Limits

CCRD
Slit Coil - Cold Rolled, Continuously Annealed

Dimensions

Thickness (mm)	Maximum Width (mm)								
	Group-1	Group-2	Group-3	Group-4	Group-5	Group-6	Group-7	Group-8	Group-9
0,40 - 0,44	502	502		427	427	477	477		
0,45 - 0,48	552	552		427	427	477	477		
0,49 - 0,49	567	567		442	442	492	492		
0,50 - 0,50	592	592	492	442	442	492	492		
0,51 - 0,60	642	642	542	442	442	492	492		442
0,61 - 0,70	642	642	592	442	442	542	542	492	442
0,71 - 0,80	692	692	642	442	442	592	592	542	492
0,81 - 0,90	692	692	692	492	492	642	642	592	492
0,91 - 0,99	692	692	740	542	542	642	642	592	492
1,00 - 1,00	740	740	740	542	542	642	642	592	492
1,01 - 1,20	740	740	740	592	592	692	692	592	542
1,21 - 2,00	740	740	740	592	592	740	740	692	592

Steel Grades

Group	Grades
1	120, 121, 6106, 6108, 6111, 6112, 6113 (domestic), 7112, 7113, 7608, 7612
2	7512, 7513
3	130, 131, 132, 145, 171, 504, 513, 6113 (export), 7022, 7026, 7114, 7115, 7116, 7122, 7123, 7124, 7314, 7315, 7316, 7514, 7516, 7722, 7726
4	250, 251, 255, 7132
5	260, 261, 7136, 7140, 7146
6	4112, 4137, 6110
7	6137, 7125
8	7128
9	7650, 7660, 7680

Notes

1) The minimum order width is 400 mm. However, 400-442 mm order width range is subjected to negotiation.
2) The coil weights are subjected to negotiation.
3) For thicknesses up to 0.49 mm are subjected to negotiation.
4) Orders of Group 1 ve Group 2 grades, in 0.40-0.49 mm thickness range are subjected to negotiation.
5) Export orders for special grades, 120, 121, 130, 131, 132, 145, 171, 250, 251, 255, 260, 261, 7513 are subjected to negotiation.
6) Orders for grades 120, 131 are accepted in $0.40 \leq t < 1.00$ mm thickness range.
7) Maximum 2 slits are produced depending on the order width. CCRD products are produced as 2 slits in a package.
8) Orders for grades 121, 132 are accepted in $1.00 \leq t < 1.40$ mm thickness range.

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Production Limits

CRF

Coil - Cold Rolled, Not Annealed (Full-Hard)

CRFS

Sheet From Coil - Cold Rolled, Not Annealed (Full-Hard)

Dimensions

Thickness (mm)	Maximum Width (mm)	
	Group-A	Group-B
0,20 - 0,29	1000	
0,30 - 0,50	1200	1000
0,51 - 0,59	1200	1100
0,60 - 2,00	1200	1200

Steel Grades

Group	Grades
A	6106, 6108, 6111, 6112, 6113, 6114, 6115
B	4112, 6110
Special	5130, 5131, 5140, 5145

Available Sizes For Grades Of Special Group			
Grade	Product Type	Thickness (mm)	Width (mm)
5130	CRF, CRFS	1,50 - 1,70	700 - 899
			900 - 900
5131	CRF, CRFS	0,80	700 - 842
5140, 5145	CRF, CRFS	1,70	700 - 899
			900 - 900

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Export orders for thicknesses up to 0.49 mm are subjected to negotiation.
3) Orders with thicknesses greater than 1.20 mm for group A and B are subjected to negotiation.
4) Requests for the products with thicknesses less than 0.40 mm are accepted only for the CRF product type. For CRFS product type orders between 0.30 mm-0.39 mm thickness range are subjected to negotiation
5) Requests for the products with thicknesses equal and less than 0.25 mm are subjected to negotiation.
6) The coil weights are subjected to negotiation.
7) CRFS product type orders are subejcted to negotiation.
8) Complaints due to occured thickness differences at each ends of coils for all grades are not accepted
9) Orders for 5130, 5140 and 5145 grades are accepted under the circumstances stated below.
   a) Under the condition that the produced coils are telescopic, if the coils can be packed, they will be sent to the customer and complaints are not accepted.
   b) If the telescopic coils can not be packed, the coils will be cut to the length which is determined by the customer. These bundles (CRFS will be sent to the customer instead of CRF orders.
10) The order length is minimum 914 mm and maximum 4880 mm.
11) The maximum bundle weight for products in form of sheet is 6 t.
12) CRF product is produced with only 508 mm coil inner diameter.
13) Unless otherwise specified at the time of order, CRF product is produced to do batch annealing (BA) process.
14) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length product.
15) Mechanical properties are not guaranteed.
16) 25% thickness tolerance is not accepted. Requests with 50% thickness tolerance is accepted up to 0.70 mm thickness and guaranteed for 90% of coil length.
17) There can be 200 m total amount of off gauge length (out of thickness tolerance); as maximum 100 m at each end of the coils. Thickness tolerance and surface quality properties are not guaranteed in off gauge regions.
18) Telescopy is guaranteed as the maximum of 15 mm in the entire length of the coil and maximum 5 mm between two wraps for maximum 1.20 mm thickness. Telescopy is not guaranteed for thickness more than 1.20 mm and also for first 5 and last 5 wraps.
19) Surface roughness is guaranteed as Ra 0.30-2.00µ depending on thickness. Lower values can be seen in thin thicknesses. Special surface rougness (Ra) requests are subjected to negotiation. Surface roughness is not guaranteed for requests with thicknesses greater than 1.20 mm.
20) “A” surface quality is aimed. Surface cleaning process is recommended for products for which surface cleanliness an important factor in the next processes.
21) There can be total amount of rolling oil and iron fines approximately up to 400 mg/m^2 . Protective oil application is not applied.
22) Flatness tolerance is not applied.

Cold Rolled
Flat Steel Products

Production Limits

ICCR

Coil - Cold Rolled, Continuously Annealed (Light-Gauge)

Dimensions

Thickness (mm)	Maximum Width (mm)				
	Group-A	Group-B	Group-C	Group-D	Group-E
0.20 - 0.29	1000(15)		1050		
0.30 - 0.34	1200				
0.35 - 0.39	1200	910			
0.40 - 0.44	1200	910			
0.45 - 0.55	1200	1000			
0.50 - 0.54	1200	1000		1200	910
0.55 - 0.60	1200[11]			1200	

Steel Grades

Group	Grades
A	4112 , 6106 , 6108 , 6111 , 6112 , 7109 , 7110 , 7512 , 7612
B	513 , 7114 , 7122 , 7123, 7124 , 7513 , 7514 , 7516
C	7112
D	7128
E	7115

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Surface roughness value requests different from Ra 0.6-1.0 µm are subject to negotiation.
3) B (05) surface orders are not accepted.
4) Unless otherwise is specified, requests for the products equal or less than 0.25 mm in thickness are only accepted for unoiled. According to requests for light and very light oiled products should be accepted.
5) The products with thickness less than 0.30 mm are only produced as small coils.
6) There is no limitation for coil weight.
7) Inside diameter of coil is only 508 mm.
8) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as ,cut to lengt product.
9) For 7114, 7122 and 7123 quality with 0.35-0.39mm thickness orders are subjected to negotiation.
10) Grades in group B, 910-1000 mm width range is subjected to negotation for the 0,45-0,55 mm thickness band.
11) For 6112 quality with 0,56-0,60mm thickness orders up to 1200 mm width is subjected to negotiation.
12) 7516 quality orders are subjected to negotation.
13) 7112 quality orders are subjected to negotation.
14) 7128 quality orders are subjected to negotation.
15) 7109 quality can be produced up to 1120mm.

Production Limits

CCR

Coil - Cold Rolled, Continuously Annealed, A Surface

CCRS

Sheet From Coil - Cold Rolled, Continuously Annealed

Dimensions

Thickness (mm)	Maximum Width (mm)									
	Group-1	Group-2	Group-3	Group-4	Group-5	Group-6	Group-7	Group-8	Group-9	Group-10
0,40 - 0,44	1050	1050								
0,45 - 0,49	1150	1150								
0,50 - 0,50	1200	1200	1000	900	900	1015	1000	900	800	1000
0,51 - 0,60	1300	1300	1100	900	900	1015	1000	900	900	1100
0,61 - 0,64	1315	1315	1200	900	900	1115	1100	1000	900	1200
0,65 - 0,70	1315	1315	1230	900	900	1115	1100	1000	900	1230
0,71 - 0,80	1415	1415	1320	900	900	1215	1200	1100	1000	1320
0,81 - 0,90	1415	1415	1400	1000	1000	1315	1300	1200	1000	1400
0,91 - 0,99	1500	1500	1500	1100	1100	1315	1300	1200	1000	1400
1,00 - 1,00	1500	1500	1500	1100	1100	1315	1300	1200	1000	1400
1,01 - 1,19	1500	1500	1500	1200	1200	1415	1400	1300	1100	1400
1.20 - 1.20	1500	1500	1500	1245	1200	1500	1500	1400	1100	1500
1,21 - 2,00	1500	1500	1500	1245	1200	1500	1500	1400	1200	1500

Steel Grades

Group	Grades
1	120, 121, 6106, 6108, 6111, 6112, 6113 (Domestic), 7112, 7113, 7313, 7608, 7612
2	7512, 7513
3	130, 131, 132, 145, 171, 504, 513, 6113 (Export), 7022, 7026, 7114, 7115, 7116, 7122, 7123, 7124, 7314, 7315, 7316, 7513 (Export) 7514, 7516, 7722, 7726
4	250, 251, 255, 7132
5	260, 261, 262, 7136, 7140, 7146, 7150
6	4112, 4137, 6110
7	6137, 7125
8	4138, 7128
9	290, 7650, 7660, 7680
10	171 , 7022 , 7026 , 7722 , 7726

Notes

1) CCRS product type orders are subjected to negotiation.
2) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
3) The maximum order width for Group 3 is 1490 mm for export orders and 1491-1500 width range is subjected to negotiation.
4) The coil weights are subjected to negotiation.
5) For thicknesses up to 0.49 mm are subjected to negotiation.
6) Grades in group 1, 1201-1300 mm width range is subjected to negotiation for the 0,50-0,50 mm thickness band.
7) Export orders for special grades 120, 121, 130, 131, 132, 145, 171, 250, 251, 255, 260, 261, 7513 are subjected to negotiation.
8) Orders for grades 120, 131 are accepted in 0.40 ≤ t < 1.00 mm thickness range.
9) Orders for grades 121, 132 are accepted in 1.00 ≤ t< 1.40 mm thickness range.
10) The order length is minimum 914 mm and maximum 4.880 mm.
11) The maximum bundle weight for products in form of sheet is 6 tons.
12) Orders are not accepted for the surface roughness value less than or equal to Ra 0.40 µm (for Ra<= 0.40 µm).
13) Orders for thickness less than or equal to 0.55 mm in Group 1 for 6106, 6108, 6112 grades Group 2 and Group 3 grades which are involved in ICCR production limits, are accepted as ICCR product type.
14) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length product.
15) Order for thickness less than 0.80 mm for 290 grade is subjected to negotiation.
16) Grades in group 5, 1201-1256 mm width range is subjected to negotation for the 1,01-2,00 mm thickness band.
17) For 6112 quality with 0,56-0,60mm thickness orders up to 1050mm width is subjected to negotiation.

Production Limits

CCRK

Coil - Cold Rolled, Continuously Annealed, Trimmed Edge, A Surface

CCRSK

Sheet From Coil - Cold Rolled, Continuously Annealed, Trimmed Edge

Dimensions

Thickness (mm)	Maximum Width (mm)									
	Group-1	Group-2	Group-3	Group-4	Group-5	Group-6	Group-7	Group-8	Group-9	Group-10
0,40 - 0,44	1050	1050								
0,45 - 0,49	1050	1150								
0,50 - 0,50	1150	1150		885	885	1000	1000		800	
0,51 - 0,60	1185	1185	975	885	885	1000	1000		800	975
0,61 - 0,64	1285	1285	1075	885	885	1000	1000		900	1075
0,65 - 0,70	1300	1300	1175	900	900	1100	1100	985	900	1175
0,71 - 0,80	1400	1400	1275	900	900	1200	1200	1085	1000	1275
0,81 - 0,90	1400	1400	1400	1000	1000	1300	1300	1185	1000	1400
0,91 - 0,99	1485	1485	1475	1100	1100	1300	1300	1185	1000	1400
1,00 - 1,00	1485	1485	1475	1100	1100	1300	1300	1185	1000	1400
1,01 - 1,19	1485	1485	1475	1185	1185	1400	1400	1185	1100	1400
1.20 - 1.20	1485	1485	1475	1200	1185	1400	1400	1185	1100	1475
1,21 - 2,00	1485	1485	1475	1200	1185	1485	1485	1385	1200	1475

Steel Grades

Group	Grades
1	120, 121, 6106, 6108, 6111, 6112, 6113 (Domestic), 7112, 7313, 7113, 7608, 7612
2	7512, 7513
3	130, 131, 132, 145, 171, 504, 513, 6113 (Export), 7022, 7026, 7114, 7115, 7116, 7122, 7123, 7124, 7314, 7315, 7316, 7514, 7516, 7722, 7726
4	250, 251, 255, 7132
5	260, 261, 7136, 7140, 7146
6	4112, 4137, 6110
7	6137, 7125
8	4138, 7128
9	7650, 7660, 7680
10	171 , 7022 , 7026 , 7722 , 7726

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) The coil weights are subjected to negotiation.
3) For thicknesses up to 0.49 mm are subjected to negotiation.
4) Grades in group 1, 1186-1285 mm width range is subjected to negotiation for the 0.50-0.50 mm thickness band.
5) Export orders for grades, 120, 121, 130, 131, 132, 145, 171, 250, 251, 255, 260, 261, 7513 are subjected to negotiation.
6) CCRSK product type orders are subjected to negotiation.
7) Orders for grades 120, 131 are accepted in 0.40≤t<1.00 mm thickness range.
8) Orders for grades 121, 132 are accepted in 1.00≤t<1.40 mm thickness range.
9) The order length is minimum 914 mm and maximum 4880 mm.
10) The maximum bundle weight for products in form of sheet is 6 tons.
11) Orders are not accepted for the surface roughness value less than or equal to Ra 0.40 µm (for Ra<= 0.40 µm).
12) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length product.
13) Order for thickness less than 0.80 mm for 290 grade is subjected to negotiation.

Production Limits

CCRF

Coil - Cold Rolled, Not Annealed (Full-Hard)

CCRFS

Sheet From Coil - Cold Rolled, Not Annealed (Full-Hard)

Dimensions

Thickness (mm)	Maximum Width (mm)									
	Group-1	Group-2	Group-3	Group-4	Group-5	Group-6	Group-7	Group-8	Group-9	Group-10
0,40 - 0,49	1300	1300	1200	900	900	1000	1000	900	800	1200
0,50 - 0,50	1300	1300	1200	900	900	1000	1000	900	800	1200
0,51 - 0,60	1300	1400	1200	900	900	1200	1000	900	900	1200
0,61 - 0,70	1400	1500	1300	900	900	1300	1100	1000	900	1300
0,71 - 0,80	1500	1500	1400	900	900	1315	1200	1100	1000	1400
0,81 - 0,90	1500	1500	1400	1000	1000	1315	1300	1200	1000	1400
0,91 - 0,99	1500	1500	1500	1100	1100	1315	1300	1200	1000	1400
1,00 - 1,00	1500	1500	1500	1100	1100	1315	1300	1200	1000	1400
1,01 - 1,19	1500	1500	1500	1200	1200	1400	1400	1300	1100	1400
1.20 - 1.20	1500	1500	1500	1300	1200	1400	1500	1400	1100	1500
1,21 - 2,00	1500	1500	1500	1300	1200	1500	1500	1400	1200	1500

Steel Grades

Group	Grades
1	6106, 6108, 6111, 6112, 6113 (Domestic), 7608, 7612
2	7512, 7513
3	6113 (Export), 7022, 7026, 7114, 7115, 7116, 7122, 7123, 7124, 7314, 7315, 7316, 7514, 7516, 7722, 7726
4	7132
5	7136, 7140
6	4112, 4137, 6110
7	6137, 7125
8	7128
9	7650, 7660
10	7022 , 7026 , 7722 , 7726
SPECIAL	6118

Available Sizes For Grades Of Special Group			
Grade	Product Type	Thickness (mm)	Width (mm)
6118	CCRF, CCRFS	0,40 - 0,49 0,50 - 0,78	700 - 899
			900 - 900
		0,79 - 2,00	700 - 899
			900 - 1000

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) 7136 grade orders for thicknesses up to 0.49 mm are subjected to negotiation.
3) The maximum order width for Group 3 grades is 1490 mm for export orders and 1491-1500 width range is subjected to negotiation.
4) Surface roughness is guaranteed as Ra 0.30-2.00µ depending on thickness. Lower values can be seen in 0.70mm and under thicknesses. Special surface roughness (Ra) requests are subjected to negotiation.
5) The coil weights are subjected to negotiation.
6) Export orders for grade 7513 are subjected to negotiation.
7) CCRFS product type orders are subjected to negotiation.
8) The order length is minimum 914 mm and maximum 4880 mm.
9) The maximum bundle weight for products in form of sheet is 6 tons.
10) CCRF product is produced with only 508 mm coil inner diameter.
11) Unless otherwise specified at the time of order, CCRF product is produced to do continuous annealing (CA) process.
12) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length product.
13) Mechanical properties are not guaranteed.
14) Thickness tolerance is guaranteed for 90% of coil length for requests with 25% and 50% thickness tolerances.
15) There can be 20 m total amount of off gauge length (out of thickness tolerance) ; as maximum 10 m at each end of the coils. Thickness tolerance and surface quality properties are not guaranteed in off gauge regions.
16) Telescopy is guaranteed as the maximum of 15 mm in the entire length of the coil and maximum 5 mm between two wraps. Telescopy is not guaranteed for first 5 and last 5 wraps.
17) There is maximum one welded part which is maximum 15 m inside of the outer wrap of the CCRF coil.
18) “A” surface quality is aimed. Surface cleaning process is recommended for products for which surface cleanliness an important factor in the next processes.
19) There can be total amount of rolling oil and iron fines approximately up to 400 mg/m^2 . Protective oil application is not applied.
20) Flatness tolerance is not applied.

Cold Rolled
Flat Steel Products

Production Limits

CCRB

Coil - Cold Rolled, Continuously Annealed, B Surface

Dimensions

Thickness (mm)	Maximum Width (mm)			
	Group-1	Group-2	Group-3	Group-10
0,40 - 0,44	1050	1050		
0,45 - 0,49	1150	1150		
0,50 - 0,50	1200	1200	1000	1000
0,51 - 0,60	1300	1300	1100	1100
0,61 - 0,70	1315	1315	1200	1200
0,71 - 0,80	1415	1415	1300	1300
0,81 - 0,90	1415	1415	1400	1400
0,91 - 0,99	1500	1500	1500	1400
1,00 - 1,19	1500	1500	1500	1400
1,20 - 2,00	1500	1500	1500	1500

Steel Grades

Group	Grades
1	120, 121, 6106, 6108, 6111, 6112, 6113 (Domestic), 7112, 7113, 7313, 7608, 7612
2	7512, 7513
3	130, 131, 132, 145, 171, 504, 513, 6113 (Export), 7022, 7026, 7114, 7115, 7116, 7122, 7123, 7124, 7314, 7315, 7316, 7514, 7516, 7722, 7726
10	171, 7022 , 7026 , 7722 , 7726

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) For Group 3 grades the maximum export order width is 1490 mm and 1491-1500 width range is subjected to negotiation.
3) The coil weights are subjected to negotiation.
4) For thicknesses up to 0.49 mm are subjected to negotiation.
5) Grades in group 1, 1201-1300 mm width range is subjected to negotiation for the 0,50-0,50 mm thickness band.
6) Export orders for special grades 120, 121, 130, 131, 132, 145, 171, 7513 are subjected to negotiation.
7) “B” surface orders for grades 250, 251, 260, 261, 7125, 7128, 7132, 7136 and 7140 are subjected to negotiation and orders are accepted according to the CCR product limits.
8) Orders for grades 120, 131 are accepted in 0.40≤t<1.00 mm thickness range.
9) Orders for grades 121, 132 are accepted in 1.00≤t<1.40 mm thickness range.
10) Orders are not accepted for the surface roughness value less than or equal to 0.40 µm (for Ra<= 0.40 µm).
11) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length product.

Production Limits

CCRKB

Dimensions

Thickness (mm)	Maximum Width (mm)			
	Group-1	Group-2	Group-3	Group-10
0,40 - 0,44	1050	1050		
0,45 - 0,49	1150	1150		
0,50 - 0,50	1185	1185	975	975
0,51 - 0,60	1285	1285	1075	1075
0,61 - 0,70	1300	1300	1175	1175
0,71 - 0,80	1400	1400	1275	1275
0,81 - 0,90	1400	1400	1400	1400
0,91 - 0,99	1485	1485	1475	1400
1,00 - 1,19	1485	1485	1475	1400
1,20 - 2,00	1485	1485	1475	1475

Steel Grades

Group	Grades
1	120, 121, 6106, 6108, 6111, 6112, 6113 (Domestic), 7112, 7113, 7313, 7608, 7612
2	7512, 7513
3	130, 131, 132, 145, 171, 504, 513, 6113 (Export), 7022, 7026, 7114, 7115, 7116, 7122, 7123, 7124, 7314, 7315, 7316, 7514, 7516, 7722, 7726
10	171, 7022, 7026, 7722, 7726

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) The coil weights are subjected to negotiation.
3) For thicknesses up to 0.49 mm are subjected to negotiation.
4) Grades in Group 1, 1186-1285 mm width range is subjected to negotiation for the 0.50-0.50 mm thickness band.
5) Export orders for special grades, 120, 121, 130, 131, 132, 145, 171, 7513 are subjected to negotiation.
6) “B” surface orders for grades 250, 251, 260, 261, 7125, 7128, 7132, 7136 and 7140 are subjected to negotiation and orders are accepted according to the CCRK product limits.
7) Orders for grades 120, 131 are accepted in 0,40≤t<1,00 mm thickness range.
8) Orders for grades 121, 132 are accepted in 1.00≤t<1.40 mm thickness range.
9) Orders are not accepted for the surface roughness value less than or equal to 0.40 µm (for Ra<= 0.40 µm).
10) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length product.

BPTNR

Coil - Cold Rolled , Continuously Annealed , Light-Gauge , Suitable For Tin Coating

Dimensions

Thickness (mm)	Maximum Width (mm) CA
0.24 - 0.29	1050
0.30 - 0.34	1200
0.35 - 0.39	1200
0.40 - 0.44	1200
0.45 - 0.55	1200

Steel Grades

Group	Grades
A	2726, 2728 , 2742

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Bright, fine stone and silver surface types are subject to negotiation.
3) Unless otherwise is specified, requests for the products equal or less than 0.25 mm in thickness are only accepted for unoiled. According to requests for light and very light oiled products should be accepted.
4) The products with thickness less than 0.30 mm are only produced as small coils.
5) There is no limitation for coil weight.
6) Inside diameter of coil is only 508 mm.
7) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length product.
8) Surface finish with values of roughness is given in the table below.

SURFACE TYPE	SURFACE ROUGHNESS (Ra , microns)	APPLIED PRODUCTS
BRIGHT	Ra ≤ 0.35	BPTNR
FINE STONE	0.25 ≤ Ra ≤ 0.45	BPTNR
STONE	0.35 ≤ Ra ≤ 0.60	BPTNR
MAT (NORMAL)	0.60 < Ra ≤ 1.90	BPTNR
SILVER	Ra ≥ 0.90	BPTNR

Tolerances

Dimension and Shape Tolerances For Cold Rolled Flat Steel Products

Tolerance Standard: EN 10131 - 2006

Applied Erdemir Product Types

CR, CCR, ICCR, CRS, CCRS, CRF, CRFS, CCRF, CCRFS, CRK, CCRK, CRSK, CCRSK, CRD, CCRD, CCRB, CCRKB

General Application

- This standard is applied to the products which have nominal thickness between 0,35 and 3,00 mm.

Thickness Tolerance

- Thickness shall be measured at any point located more than 40 mm from the edge
- For slitted coils or cut to length products which have widths ≤ 80 mm, thickness measurement is performed --
- The thickness tolerances in the region of cold rolled welds may be increased by a maximum of 50 % over a length of 10 metres for coils and slitted coils.
- 25 % and 50 % thickness tolerances are applied under the conditions given below in tables not being less than +/- 0,020 mm.

25 % thickness tolerance for CCR, CCRK, CCRD, CCRS, CCRSK, CCRF, CCRB, CCRKB, CCRFS products;

Minimum Yield Strength (N/mm²)	Scope of Guarantee
< 340	% 93
≥ 340	% 90

For ICCR, CR, CRK, CRD, CRS, CRSK, CRF, CRFS products

- 25 % thickness tolerance is not applied
- For 50 % thickness tolerance;

Nominal Thickness (mm)	Scope of Guarantee
t ≤ 0,70	% 90
0,71 ≤ t	Not Applied

Tolerances

A) Tolerances on thickness for steel grades with a specified minimum yield strength Re<260N/mm²

120, 121, 130, 131, 132, 145, 171, 504, 513, 4137, 6111, 6112, 6113, 7313, 6114, 6115, 6137, 6512, 6513, 7022, 7109, 7112, 7113, 7114, 7115, 7116, 7122, 7123, 7124, 7314, 7315, 7316, 7512, 7513, 7514, 7516, 7612, 7722

Nominal Thickness (t)	Width (w) (mm) Tolerance (mm)		
	w≤1200	1200<w≤1500	w>1500
0,35 ≤ t ≤ 0,40	± 0,03	± 0,04	± 0,05
0,40 < t ≤ 0,60	± 0,03	± 0,04	± 0,05
0,60 < t ≤ 0,80	± 0,04	± 0,05	± 0,06
0,80 < t ≤ 1,00	± 0,05	± 0,06	± 0,07
1,00 < t ≤ 1,20	± 0,06	± 0,07	± 0,08
1,20 < t ≤ 1,60	± 0,08	± 0,09	± 0,10
1,60 < t ≤ 2,00	± 0,10	± 0,11	± 0,12

B) Tolerances on thickness for steel grades with a specified minimum yield strength 260N/mm²≤Re<340N/mm²

250, 251, 290, 4112, 4138, 6106, 6108, 6110, 6118, 7125, 7026, 7128, 7132, 7608, 7650, 7660, 7726, 9160

Nominal Thickness (t)	Width (w) (mm) Tolerance (mm)		
	w≤1200	1200<w≤1500	w>1500
0,35 ≤ t ≤ 0,40	± 0,04	± 0,05	± 0,06
0,40 < t ≤ 0,60	± 0,04	± 0,05	± 0,06
0,60 < t ≤ 0,80	± 0,05	± 0,06	± 0,07
0,80 < t ≤ 1,00	± 0,06	± 0,07	± 0,08
1,00 < t ≤ 1,20	± 0,07	± 0,08	± 0,10
1,20 < t ≤ 1,60	± 0,09	± 0,11	± 0,12
1,60 < t ≤ 2,00	± 0,12	± 0,13	± 0,14

C) Tolerances on thickness for steel grades with a specified minimum yield strength 340N/mm²≤Re≤420N/mm²

255, 260, 261, 262, 5130, 5131, 5140, 5145, 7136, 7140, 7146

Nominal Thickness (t)	Width (w) (mm) Tolerance (mm)		
	w≤1200	1200<w≤1500	w>1500
0,35 ≤ t ≤ 0,40	± 0,04	± 0,05	± 0,06
0,40 < t ≤ 0,60	± 0,05	± 0,06	± 0,07
0,60 < t ≤ 0,80	± 0,06	± 0,07	± 0,08
0,80 < t ≤ 1,00	± 0,07	± 0,08	± 0,10
1,00 < t ≤ 1,20	± 0,09	± 0,10	± 0,11
1,20 < t ≤ 1,60	± 0,11	± 0,12	± 0,14
1,60 < t ≤ 2,00	± 0,14	± 0,15	± 0,17

Tolerances

Width Tolerances

• Width is measured perpendicularly to the longitudinal axis of the product

a) The tolerances on width of sheet and wide strip :

Nominal Width (w)	Width Tolerance (mm)			
	Normal Tolerances		Special Tolerances (S)	
	Lower Limit	Upper Limit	Lower Limit	Upper Limit
600 ≤ w ≤ 1200	0	+ 4	0	+ 2
1200 < w ≤ 1500	0	+ 5	0	+ 2
w >1500	0	+ 6	0	+ 3

• Special width tolerance (S) is applied to side trimmed or slitted products which have 600 mm or greater width.

b) For slitted coils or sheets which have less than 600 mm width :

Nominal Thickness (mm) (t)	Width Tolerance (mm)							
	w<125		125≤w<250		250≤w<400		400≤w<600	
	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit
t < 0,6	0	+ 0,4	0	+ 0,5	0	+ 0,7	0	+ 1,0
0,6 ≤ t < 1,0	0	+ 0,5	0	+ 0,6	0	+ 0,9	0	+ 1,2
1,0 ≤ t < 2,0	0	+ 0,6	0	+ 0,8	0	+ 1,1	0	+ 1,4

Length Tolerance

• Length is measured along one of the long sides of the sheet or cut lengths.

Nominal Length (mm) (L)	Normal Tolerances (mm)	
	Lower Limit	Upper Limit
< 2000	0	+ 6
≥ 2000	0	% 0,3xL

Tolerances

Flatness Tolerance

- Deviation from flatness is determined by measuring the deviation in distance between the product and a flat horizontal surface on which the sheet is placed.
- Flatness tolerance is only applied to sheet products.
- Flatness tolerance is not applied to sheets of product types CRFS and CCRFS (Full-hard)

A) Flatness tolerances for grades which minimum yield strength Re ≤ 260 N/mm²

Tolerance Type	Nominal Width (w)	Maximum deviation from flatness according to nominal thickness (t)		
		t<0,7	0,7≤t<1,2	t≥1,2
Normal	w <600	7	6	5
	600 ≤ w < 1200	10	8	7
	1200 ≤ w < 1500	12	10	8
	w ≥ 1500	17	15	13
Special (FS)	w < 600	4	3	2
	600 ≤ w < 1200	5	4	3
	1200 ≤ w < 1500	6	5	4
	w ≥ 1500	8	7	6
	w < 1500	If the deviation from flatness length is more than 200 mm, the height of the deviation must be less than 1 % of the deviation length.		
	w ≥ 1500	If the deviation from flatness length is more than 200 mm, the height of the deviation must be less than 1,5 % of the deviation length.		
		If the deviation from flatness length is more than 200 mm, the height of the deviation must be maxi. 2 mm.		

B) Flatness tolerances for grades which minimum yield strength (Re) is between 260 ≤ Re < 340 N/mm²

Tolerance Type	Nominal Width (w)	Maximum deviation from flatness according to nominal thickness (t)		
		t<0,7	0,7≤t<1,2	t≥1,2
Normal	600 ≤ w < 1200	13	10	8
	1200 ≤ w < 1500	15	13	11
	w ≥ 1500	20	19	17
Special (FS)	600 ≤ w < 1200	8	6	5
	1200 ≤ w <1500	9	8	6
	w ≥ 1500	12	10	9

C) Flatness tolerances for grades which minimum yield strength Re ≥ 340 N/mm²

- Flatness tolerance is subject to negotiation at the time of order.

Cold Rolled
Flat Steel Products

Tolerances

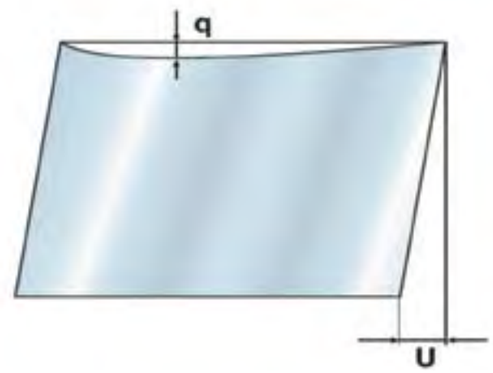
Tolerances For Edge Chamber

- Edge camber “q” is the maximum distance between a longitudinal edge and a straight edge supported on the latter.
- Edge camber shall be measured on the concave edge of the product.
- The basis of measurement shall be a distance of 2 m taken at any point on the edge.
- Special tolerances are not applied for edge camber.

Product Type	Product Dimensions (mm)		Measurement Length (mm)	Tolerance (mm)
	Width	Length		
Sheet	≥ 600	≥ 2000	2000	5
		< 2000	Actual Length (L)	+ 0,0025 L
Coil	≥ 600	-	2000	5
Slitted Coil	< 600	-	2000	5

Tolerances On Out Of Squareness (mm)

- The out-of-squareness “u” is the orthogonal projection of a transverse edge over a longitudinal edge.
- The out-of-squareness shall not exceed 1 % of the actual width of the sheet.



q: Edge camber
u: Out-of-squareness

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Galvanized / Galvannealed Flat Steel Products

Galvanized / Galvannealed Flat Steel Products

Galvanized flat steel is manufactured by zinc-coating both sides of cold rolled metal by hot-dipping process. After having coated the steel surface with zinc, the coating of the interface is transformed into an alloy of iron-zinc layer through heating by induction and the galvannealed steel is produced.

Galvanized/
Galvannealed
Flat Steel Products

Hot dip galvanized steels are continuously coated on both sides with a zinc layer by means of a continuous hot dip galvanizing process. After zinc layer created if induction heating is used to alloy the zinc coating with the steel to create a zinc iron coating, the product is galvannealed steel.

Galvanized products manufactured with this coating, which aims to prevent corrosion on material exposed to atmospheric ambience and to extend its life span, are an important input, particularly for the automotive industry and for sectors producing products for exterior surfaces. Galvanized/galvannealed steels are passivitated by chromating and/or oiling and thus the zinc on the surface preserves the coating against corrosion.

Galvanized materials' surface qualities are produced in accordance with international standards in three different surface types A, B and C (best quality).

Advantages

Corrosion Resistance : Zinc protects the base metal by providing a barrier to corrosive elements with its nature so that presents an excellent corrosion resistance.

Ultimate service life depends on coating thickness and the severity of the environment (humidity, saltiness etc.).

Excellent Surface Appearance : C surface quality can be applied to exposed parts without any difficulties.

Formability: Galvanized steels can be used in manufacture of parts that require extra deep drawing and bending operations.

Paintability : These steels are paintable if relevant pre-treatment (such as degreasing, surface treatment etc.) is performed beforehand.

Weldability : This material is able to be used with most of the welding processes known.

General Application Areas

The use of galvanized/galvannealed products in the automotive industry is growing because of the requirements for improved corrosion resistance and paint adherence. Most automotive manifacturers use galvanized products for both exterior and interior parts, enabling them to guarantee up to life time warranty against corrosion. Hot dip galvanized steels are used for various components of the car body

Structural hot dip galvanized/galvannealed steels are used for a wide range of applications in the building sector. Depending on the atmospheric conditions, the steels, which need different coating thicknesses, are mainly used in cladding, roofs doors, fences, profiling and components for agricultural machinery applications.

Galvanized steels which have been used for non-visible parts in domestic appliances are now also preferable for visible parts. Therefore the steel materials used for domestic appliances are mainly galvanized steels.

General information about galvanized/galvannealed products produced at Erdemir.

Products:

We can supply our Zinc coated (Z) galvanized and zinc-iron alloy coated (ZF) galvannealed products in the following form and structure:

- As coils, slitted coils or cut to length
- As trimmed or mill edge,

Dimensions:

- Thickness values are nominal and those after coating.
- Coil inner diameter may be either 508 or 610 mm (+/- 20 mm) depending on request

Surface Protection:

- Oiling (O): The total amount of protective oil (both surfaces) on products is given below. Unless otherwise specified normal oiling proportions are used. Orders with requests for special, light and abundant oiling are subject to negotitation.

  Light : 100 - 250 mg/m^2
  Normal : 250-500 mg/m^2
  Abundant : 500-1,000 mg/m^2
  Very Abundant : 1,500-3,000 mg/m^2

- Chemical Passivation (C): applied to prevent corrosion on surface during transportation and storage
- Chemical Passivation and Oiling (CO): This combination is used to enhance the corrosion protection.
- Unprotected Surface (U): Erdemir does not recommend products without surface protection. In the event of orders of such products (requested without surface protection) Erdemir will not be responsible for any corrosion occurrences on surfaces.
- Chemical passivation decreases the risk of corrosion. However it may not be fully effective depending on trasportation and storage conditions. Therefore it is recommended to order products oiled at ‘normal’ level or ‘chromated’ + oiled at ‘light’ level. Warranty period for corrosion is 3 months.
- Unless otherwise specified low carbon steels for forming are produced ‘unchromatted-oilled’, and structural steels are produced ‘chromatted-unoilled’.

Surface Quality:

A, B and C surface qualities are ensured to be in accordance with EN 10346 standards. Unless otherwise specified production is carried out according to ‘A’ surface quality.

- A surface: As coated surface
  Imperfections such as dips, scratches, variations in surface appearance, dark spots, light passivation stains are permissible. Stretch levelling breaks or run-off marks may appear.

- B surface:Improved Surface
  This surface quality is obtained by skin passing. Minor imperfections such as slight scratches, skin-pass marks, stretch levelling breaks, run-off marks, surface structure and light passivation stains are permissible.

- C surface:Best quality surface
  This surface quality is obtained by skin passing. The surface shall be of homogenic property to enable high-class paint finishing.
  The reverse surface shall at least have the characteristics of surface quality B

Coating Appearance:

Only minimized spangle (M) production available.

Surface Appearance:

Non skin-passed zinc-coated (Z) galvanized material purport bright surface finishing.

Marking:

For C surface qualities, marking will be done. But for A and B surface qualities marking will not be done.
If marking is required, this should be stated along with the order. Some information such as grade, size, etc. is marked with non-corrosive and easily removable ink on some of our galvanized/galvannealed products (with surface protection).

Mechanical Test:

Tensile test is carried out according to EN ISO 6892-1” Metallic Materials - Tensile Test - Part 1: Tests Performed at Room Temperature “ The test certificate containing the mechanical test and chemical analysis results sent to the customer is an inspection document and is prepared according to the standard EN 10204 “Metallic products - Types of Inspection Documents”. In case an analysis / test report is requested by our customers within the scope of TS EN ISO / IEC 17025 “General Conditions for the Competence of Testing and Calibration Laboratories”, the report can be requested from the sales unit with a request letter.

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Application Areas and Brand Correspondence of Galvanized / Galvannealed Products

Scope of Application And Main Properties	Corresponding		Erdemir Steel Grade
	Standard	Grade	
Zinc coated (galvanized) low carbon steels for cold forming	EN 10346:2015	DX51D+Z	1311
	EN 10346:2015	DX52D+Z	1312
	EN 10346:2015	DX53D+Z	1313
	EN 10346:2015	DX53D+Z	1303
	EN 10346:2015	DX54D+Z	1314
	EN 10346:2015	DX54D+Z	1304
	EN 10346:2015	DX56D+Z	1315
	EN 10346:2015	DX57D+Z	1317
	ASTM A653/A653M-18	CS TYPE B	1306
	WSD-M1 A333	A2 DC05	311
	11-04-013	XE	312
	WSS-M1 A365	A13	320
	WSS-M1 A365	A14	321
	WSD-M1 A333	A3 DC06	323
	11-04-013	XES	324
	B53 3106	XSG	325
	52806/9.52873	FEP04-ZNT/F/2S	326
	52806/9.52873	FEP05-ZNT/F/2S	327
	52806/9.52873	FEP04/FEP05-ZNT/F/2S	328
Zinc coated (galvanized) bake-hardening steels	EN 10346:2015	HX180BD+Z	1118
	EN 10346:2015	HX220BD+Z	1122
	WSS-M1 A341	A7	1124
	EN 10346:2015	HX260BD+Z	1126
	EN 10346:2015	HX300BD+Z	1130
	52814/9.52873	FEE 220 BH-ZNT/F/2S	380
	WSS-M1 A367	A22	381
	WSS-M1 A367	A23	382
	WSS-M1 A341	A5	383
	11-04-013	XE260BH	384
Zinc coated (galvanized) IF steel	EN 10346:2015	HX180YD+Z	1518
	EN 10346:2015	HX220YD+Z	1522
	EN 10346:2015	HX260YD+Z	1526
	52814	FEE180IF	385
	52814	FEE210IF	386
	50002	IF280Y380T	387
High yield strength steel with zinc coating (galvanized) by continuous hot-dip process for cold forming	11-04-002/L	XE280P	388
Zinc coated (galvanized) structural steels	EN 10346:2015	S220GD+Z	1322
	EN 10346:2015	S250GD+Z	1325
	EN 10346:2015	S280GD+Z	1328
	EN 10346:2015	S320GD+Z	1332
	EN 10346:2015	S350GD+Z	1335
	WSB-M1 A215-F1	Gr. 250	355

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Application Areas and Brand Correspondence of Galvanized / Galvannealed Products

Corresponding Similar Standards [1]					Page No
Material No	Previous	Europe	American	Japanese	
1.0917	DIN EN 10142 Fe P02 G Z		ASTM A653 CS Tip C	JIS 3302 SGCC	220
1.0918	DIN EN 10142 Fe P03 G Z		ASTM A653 CS Tip B	JIS 3302 SGCD1	220
1.0951	DIN EN 10142 Fe P05 G Z		ASTM A653 FS Tip B	JIS 3302 SGCD2	220
1.0951	DIN EN 10142 Fe P05 G Z		ASTM A653 FS Tip B	JIS 3302 SGCD3	220
1.0952	DIN EN 10142 Fe P06 G Z		ASTM A653 DDS Tip A	JIS 3302 SGCD3	220
1.0952	DIN EN 10142 Fe P06 G Z		ASTM A 653 DDS Type A	JIS 3302 SGCD3	220
1.0963	DIN EN 10142 Fe P07 G Z		ASTM A653 EDDS		220
1.0964	DIN EN 10142 Fe P07 G Z		ASTM A653 EDDS		220
					221
		DX54 D+Z			221
		DX53 D+Z	ASTM A653 FS		221
		DX54D+Z			221
		DX56D+Z			221
		DX56 D+Z			221
		DX54 D+Z			221
		DX54 D+Z			221
		DX54D+Z			221
		DX56D+Z			221
		DX56D+Z			221
1.0914	DIN EN 10292 HX180LAD+Z		ASTM A653 BHS Gr. 180		223
1.0919	DIN EN 10292 HX220LAD+Z		ASTM A653 BHS Gr. 210		223
			ASTM A 653 BHS Gr. 240		223
1.0924	DIN EN 10292 HX260LAD+Z		ASTM A653 BHS Gr. 280		223
1.0930	DIN EN 10292 HX300LAD+Z		ASTM A653 BHS Gr. 300		223
		HX220BD+Z			224
		HX220BD+Z			224
		HX260BD+Z			224
		HX260BD+Z			224
		HX260BD+Z			224
1.0921	DIN EN 10292 HX180YD+Z				225
1.0923	DIN EN 10292 HX220YD+Z		ASTM A653 SHS Gr. 210		225
	DIN EN 10292 HX260YD+Z				225
		HX180YD+Z			226
		HX220YD+Z			226
		HX220YD+Z			226
					226
1.0241	DIN EN 10147 Fe E 220 G Z		ASTM A653 SS Gr. 230		227
1.0242	DIN EN 10147 Fe E 250 G Z		ASTM A653 SS Gr. 255	JIS SGC 340	227
1.0244	DIN EN 10147 Fe E 280 G Z		ASTM A653 SS Gr. 275	JIS SGC 400	227
1.0250	DIN EN 10147 Fe E 320 G Z		ASTM A53 HSLAS Gr. 340	JIS SGC 440	227
1.0259	DIN EN 10147 Fe E 350 G Z		ASTM A653 HSLAS Gr. 380 Class 2	JIS SGC 490	227
		S250GD+Z			228

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Application Areas and Brand Correspondence of Galvanized / Galvannealed Products

Scope of Application And Main Properties	Corresponding		Erdemir Steel Grade
	Standard	Grade	
High strength, low alloyed, zinc coated (galvanized) steels by continous hot-dip process for cold forming	EN 10346:2015	HX260LAD+Z	1626
	EN 10346:2015	HX300LAD+Z	1630
	EN 10346:2015	HX340LAD+Z	1634
	EN 10346:2015	HX380LAD+Z	1638
	EN 10346:2015	HX420LAD+Z	1642
	EN 10346:2015	HX460LAD+Z	1643
	11-04-002	XE 280D	331
	F-52811/9.52873	FEE 270 F - ZNT/F/2S	360
	52811/9.52873	FEE 300 F - ZNT/F/2S	365
	11-04-002	XE 320D	366
	WSB-M1 A215-F1	Gr. 300	367
	F-52811/9.52873	FEE 340 F - ZNT/F/2S	368
	52811/9.52873	FEE 420 F - ZNT/F/2S	369
	11-04-002	XE-360D	372
Galvanized, dual-phase steel with high yield strength for cold forming	EN 10346:2015	HCT490X+Z	1650
	EN 10346:2015	HCT590X+Z	1660
	EN 10346:2015	HCT780X+Z	1680
	52815/9.52873	FE 600 DP F ZNT/F/2S	390
	WSS-M1A348	A1	391
	52815/9.52873	FE 600 DP F ZNT/F/2S	392
	11-04-002 / - - L	XE360B	393
	WSS-M1 A 368	A14	397
	50002	DPC420Y780T	398
Zinc-iron alloy coated (galvannealed) low carbon steels for cold forming	EN 10346:2015	DX51D+ZF	1411
	EN 10346:2015	DX52D+ZF	1412
	EN 10346:2015	DX53D+ZF	1413
	EN 10346:2015	DX54D+ZF	1414
	EN 10346:2015	DX56D+ZF	1415
	TSG3109G	SCGA 270C	410
	TSG3109G	SCGA 270C	411
	TSG3109G	SCGA 270D	430
	TSG3109G	SCGA 270D	431
	HES C071	JAC270F	432
	TSG3109G	SCGA 440	440
Zinc-iron alloy coated (galvannealed) bake-hardening steels	EN 10346:2015	HX180BD+ZF	1218
	EN 10346:2015	HX220BD+ZF	1222
	EN 10346:2015	HX260BD+ZF	1226
	EN 10346:2015	HX300BD+ZF	1230
	TSG3109G	SCGA 340BH	482
Zinc-iron alloy coated (galvannealed) structural steels	EN 10346:2015	S220GD+ZF	1422
	EN 10346:2015	S250GD+ZF	1425
	EN 10346:2015	S280GD+ZF	1428
	EN 10346:2015	S320GD+ZF	1432
	EN 10346:2015	S350GD+ZF	1435

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Application Areas and Brand Correspondence of Galvanized / Galvannealed Products

Corresponding Similar Standards (1)					Page No
Material No	Previous	Europe	American	Japanese	
	DIN EN 10292 HX260LAD+Z				229
	DIN EN 10292 HX300LAD+Z				229
	DIN EN 10292 HX340LAD+Z				229
	DIN EN 10292 HX380LAD+Z				229
	DIN EN 10292 HX420LAD+Z				229
1.0990	DIN EN 10292 HX420LAD+Z				229
		HX300LAD+Z			230
		HX 300LAD+Z			230
		HX340LAD+Z			230
		HX340LAD+Z			230
		HX340LAD+Z			230
		HX380LAD+Z			230
		HX420LAD+Z			230
		HX380LAD+Z			230
1.0995					232
1.0996					232
		HCT600X+Z			232
		HCT450X+Z (DP450)			232
		HCT600X+Z			232
					233
					232
					232
1.0917	DIN EN 10142 Fe P02 G ZF		ASTM A653 CS Tip C	JIS 3302 SGCC	234
1.0918	DIN EN 10142 Fe P03 G ZF		ASTM A653 CS Tip B	JIS 3302 SGCD1	234
1.0951	DIN EN 10142 Fe P05 G ZF		ASTM A653 FS Tip B	JIS 3302 SGCD2	234
1.0952	DIN EN 10142 Fe P06 G ZF		ASTM A653 DDS Tip A	JIS 3302 SGCD3	234
1.0963	DIN EN 10142 Fe P07 G ZF		ASTM A653 EDDS		234
		DX53 D+ZF	ASTM A653 DQ		235
		DX53 D+ZF	ASTM A653 DQ		235
		DX56 D+ZF			235
		DX56 D+ZF			235
		DX56 D+ZF			235
					235
1.0914	DIN EN 10292 HX180BD+ZF		ASTM A653 BHS Gr. 180		237
1.0919	DIN EN 10292 HX220BD+ZF		ASTM A653 BHS Gr. 210		237
1.0924	DIN EN 10292 HX260BD+ZF		ASTM A653 BHS Gr. 280		237
1.0930	DIN EN 10292 HX300BD+ZF		ASTM A653 BHS Gr. 300		237
		HX220BD+ZF			238
1.0241	DIN EN 10147 Fe E 220 G ZF		ASTM A653 SS Gr. 230		239
1.0242	DIN EN 10147 Fe E 250 G ZF		ASTM A653 SS Gr. 255	JIS SGC 340	239
1.0244	DIN EN 10147 Fe E 280 G ZF		ASTM A653 SS Gr. 275	JIS SGC 400	239
1.0250	DIN EN 10147 Fe E 320 G ZF		ASTM A653 HSLAS Gr. 340	JIS SGC 440	239
1.0259	DIN EN 10147 Fe E 350 G ZF		ASTM A653 HSLAS Gr. 380 Class 2	JIS SGC 490	239

(1) The other corresponding standards specified in the table above may be in exact or similar correspondence. Therefore, the conformity of the other related standards are not guaranteed.
The corresponding standards and grades given on this table are only for information

Zinc Coated (Galvanized) Low Carbon Steels For Cold Forming

Standard: EN 10346 : 2015

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C	Si	Mn	P	S	Ti
Standard	Grade		max.	max.	max.	max.	max.	max.
EN 10346	DX51D+Z	1311	0.18	0.50	1.20	0.12	0.045	0.30
EN 10346	DX52D+Z	1312	0.12	0.50	0.60	0.10	0.045	0.30
EN 10346	DX53D+Z	1313	0.12	0.50	0.60	0.10	0.045	0.30
EN 10346	DX53D+Z	1303	0.12	0.50	0.60	0.10	0.045	0.30
EN 10346	DX54D+Z	1304	0.12	0.50	0.60	0.10	0.045	0.30
EN 10346	DX54D+Z	1314	0.12	0.50	0.60	0.10	0.045	0.30
EN 10346	DX56D+Z	1315	0.12	0.50	0.60	0.10	0.045	0.30
EN 10346	DX57D+Z	1317	0.12	0.50	0.60	0.10	0.045	0.30

Mechanical Properties

Corresponding		Erdemir Steel Grade	Guarantee Period[6]		R_e $R_{p0.2}/R_{eL}$ N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80}[2] (%)	r_{90}	n_{90}
			Validity of Mechanical Properties (month)	Absence of[4] Stretcher Strain Marks(month)					
Standard	Grade						min.	min.	min.
EN 10346	DX51D+Z	1311	1	-	-	270-500 (27.6-51.0)	22	-	-
EN 10346	DX52D+Z	1312	1	-	140-300[3] (14.3-30.6)	270-420 (27.6-42.8)	26	-	-
EN 10346	DX53D+Z	1313	1	-	140-260 (14.3-26.5)	270-380 (27.6-38.7)	30	-	-
EN 10346	DX53D+Z	1303	1	-	140-260 (14.3-26.5)	270-380 (27.6-38.7)	30	-	-
EN 10346	DX54D+Z	1304	6	6	120-220 (12.2-22.4)	260-350 (26.5-35.7)	36	1.6[5]	0.18
EN 10346	DX54D+Z	1314	6	6	120-220 (12.2-22.4)	260-350 (26.5-35.7)	36	1.6[5]	0.18
EN 10346	DX56D+Z	1315	6	6	120-180 (12.2-18.4)	260-350 (26.5-35.7)	39	1.9[5]	0.21
EN 10346	DX57D+Z	1317	6	6	120-170 (12.2-17.3)	260-350 (26.5-35.7)	41	2.1[5]	0.22

Notes

1) Tensile test values apply to “transverse” test pieces
2) Decreased minimum elongation values apply for product thickness d ≤ 0.35 mm (minus 7 units), for 0.35 mm < d ≤ 0.50 mm (minus 4 units) and for 0.50 mm < d ≤ 0.70 mm (minus 2 units).
3) For surface quality A, the upper value for yield strength is 360MPa.
4) Guarantee period is valid for surface quality B and C products.
5) Decreased minimum r_{90} values apply for product thickness 1.50<t<2.00mm (minus 0,2 units)
6) Guarantee periods specified on the table begin on the date on which products are made available.

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Steel Grades

Zinc Coated (Galvanized) Low Carbon Steels For Cold Forming

Standard: ASTM A653/A653M-18

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C	Mn	P	S	Cu	Ni	Cr	Mo	V	Cb	Ti
Standard	Grade		max.	max.	max.	max.	max.	max.	max.	max.	max.	max.	max.
ASTM A653/ A653M-17	CS TYPE B	1306	0.02-0.15	0.60	0.03	0.035	0.25	0.20	0.15	0.06	0.008	0.008	0.025

Notes

1) Mn content is not specified in SAE standard. In ERDEMIR Mn content is aimed to minimum 0.20
2) The limitation requests for the residual elements (Cu, Ni, Cr, Mo) which are not mentioned on the table are subjected to negotitation for special application purposes

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e $R_{p0.2}/R_{eL}$ N/mm² (kg/mm²)	A_{80}[2] (%)
Standard	Grade			min.
ASTM A653/ A653M-17	CS TYPE B	1306	205-380 (20.9-38.7)	22

Notes

1) Yield strenght and elongation are measured in the longitudinal direction.
2) Specified values are referanced values.

Standard: Miscellaneous

Chemical Composition(%)

Corresponding			Erdemir Steel[3] Grade	C max.	Mn max.	P max.	S max.	Si max.	Al	Ti max.	Nb max.	CE % max.
Standard	Grade	Similar Standard / Grade										
WSD-M1 A333	A2 DC05	EN 10346 / DX54D+Z	311	0.008	0.30	0.025	0.020	0.03	-	0.09	0.035	0.21[1]
11-04-013	XE	EN 10346 / DX53D+Z	312	0.080	0.50	0.025	0.025	0.04	0.005-0.070	-	-	0.16[2]
WSS-M1 A365	A13	EN 10346 / DX54D+Z	320	0.010	0.30	0.025	0.020	0.03	0.080 max.	0.09	0.035	-
WSS-M1 A365	A14	EN 10346 / DX56D+Z	321	0.008	0.30	0.025	0.020	0.03	0.080 max.	0.09	0.035	-
WSD-M1 A333	A3 DC06	EN 10346 / DX56D+Z	323	0.008	0.30	0.025	0.020	0.03	-	0.09	0.035	0.21[1]
11-04-013	XES	EN 10346 / DX54D+Z	324	0.080	0.50	0.025	0.025	0.04	0.005-0.070	0.11	-	0.16[2]
B53 3106	XSG	EN 10346 / DX54D+Z	325	0.080	0.40	0.025	0.025	0.10	0.02 min.	0.11	-	0.14[2]
52806/9.52873	FEP04-ZNT/F/2S	EN 10346 / DX54D+Z	326	0.008	0.30	0.025	0.020	0.03	0.02 min.	0.11	-	-
52806/9.52873	FEP05-ZNT/F/2S	EN 10346 / DX56D+Z	327	0.008	0.30	0.025	0.020	0.03	0.02 min.	0.09	0.035	-
52806/9.52873	FEP04/FEP05-ZNT/F/2S	EN 10346 / DX56D+Z	328	0.008	0.30	0.025	0.020	0.03	0.02 min.	0.09	0.035	-

Notes

1) CE = C % + Mn/6 %. formula applies for carbon equivalent
2) CE = C % + (Mn+Si)/6 %’ formula applies for carbon equivalent
3) The limits which are specified with red colour are the limits of the customer’s specifications. The other limits are specified as reference value according to Erdemir manufacturing practice.

Zinc Coated (Galvanized) Low Carbon Steels For Cold Forming

Mechanical Properties

Corresponding			Erdemir Steel Grade	Re N/mm² (kg/mm²)	Rm N/mm² (kg/mm²)	Re/Rm max.	A_{80} (%) min.		r_{90} min.	r_{avg} min.	n_{90} min.
Standard	Grade	Similar Standard / Grade									
WSD-M1 A333	A2 DC05	EN 10346 / DX54D+Z	311[1][3][4][5][9]	140-180 (14.3-18.4)	270-330 (27.6-33.7)	-	40		2.00	-	0.20
11-04-013	XE	EN 10346 / DX53D+Z	312[1][9][12]	180-230 (18.4-23.5)	300-370 (30.6-37.7)	0.74	34		1.30	-	0.17
WSS-M1 A365	A13	EN 10346 / DX54D+Z	320[2][9][11]	140-210 (14.3-21.4)	270-350 (27.6-35.7)	-	38		1.60	1.50	0.18
WSS-M1 A365	A14	EN 10346 / DX56D+Z	321[2][9][11]	140-180 (14.3-18.4)	270-330 (27.6-33.7)	-	40		1.90	1.60	0.20
WSD-M1 A333	A3 DC06	EN 10346 / DX56D+Z	323[1][3][4][5][9]	120-165 (12.2-16.8)	270 - 350 (27.6-35.7)	-	40		2.10	-	0.22
11-04-013	XES	EN 10346 / DX54D+Z	324[1][6][9][12]	160-200 (16.3-20.4)	280-350 (28.6-35.7)	0.66	37		1.80	-	0.19
B53 3106	XSG	EN 10346 / DX54D+Z	325[1][7][8][9]	160-200 (16.3-20.4)	280-340 (28.6-34.6)	-	37		1.80	-	0.19
52806/9.52873	FEP04-ZNT/F/2S	EN 10346 / DX54D+Z	326[1][9]	140-210 (14.3-21.4)	270-350 (27.5-35.7)	-	d<0.70 36	d ≥0.70 38	1.60	-	0.18
52806/9.52873	FEP05-ZNT/F/2S	EN 10346 / DX56D+Z	327[1][9]	140-180 (14.3-18.4)	270-330 (27.5-33.7)	-	d<0.70 38	d ≥0.70 40	1.90	-	0.20
52806/9.52873	FEP05-ZNT/F/2S	DIN EN 10346 / DX56D+Z	328[1][9][10]	140-170 (14.3-17.3)	270-350 (27.5-35.7)	-	d<0,70 38	d ≥0,70 40	1.90	-	0.20

Notes

1) Tensile test values apply to “transverse” test pieces
2) Transverse and longitudinal test values are the same.Tensile tests are carried out only in the transverse direction and specified in the certificate. And also longitudinal test values are guaranteed.
3) Increased yield stress values apply for product thickness d ≤ 0.50 mm (40 N/mm² unit) and for 0.50 mm < d ≤ 0.70 mm (20 N/mm² unit).
4) The elongation value (%) can be decreased by 2 units for products of thickness range 0.5mm<d≤0.7mm
5) r_{90} and n_{90} values apply to products of thicknesses d > 0.5 mm.
6) Max. yield strength value for products of thickness d>1.5 mm is 210 N/mm² max.
7) Yield strength value shall be 160 - 200 N/mm² and $r_{90} \geq 1.80$ for thickness d ≤ 1.47 mm.
   Yield strength value shall be 160 - 210 N/mm² and $r_{90} \geq 1.60$ for thickness 1.47 < d < 1.95 mm.
   Yield strength value shall be 160 - 210 N/mm² and $r_{90} \geq 1.50$ for thickness d ≥ 1.95 mm.
8) Hardness is 50 HRB max.
9) Mechanical properties specified in the table are guaranteed for 6 months beginning from the date on which products are made available.
10) This grade is desgined for the critical moulds of FEPO4/FEPO5 grades.
11) Average Plastic Strain Ratio (ravg) is calculated as a weighted average of the individual r-values, i.e., $(r_0+r_{90}+2r_{45}) / 4$
12) Unless otherwise agreed, n value is taken between %10-20 elongation range

Continuously Hot- Dip Zinc Coated (Galvanized) Bake-Hardening High Yield Strength Steels For Cold Forming

Standard: EN 10346 : 2015

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C max.	Si max.	Mn max.	P max.	S max.	Al min.	Ti max.	Nb max.
Standard	Grade									
EN 10346	HX180BD+Z	1118	0.06	0.50	0.70	0.06	0.025	0.015	0.12	0.09
EN 10346	HX220BD+Z	1122	0.08	0.50	0.70	0.085	0.025	0.015	0.12	0.09
EN 10346	HX260BD+Z	1126	0.10	0.50	1.00	0.10	0.030	0.010	0.12	0.09
EN 10346	HX300BD+Z	1130	0.11	0.50	0.80	0.12	0.025	0.010	0.12	0.09

Mechanical Properties

Corresponding		Erdemir Steel Grade	Guarantee Period[5]		$R_{p0.2}/R_{eL}$ N/mm² (kg/mm²)	BH_2 N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80}[4] (%)	r_{90}[3][6]	n_{90}[6]
			Validity of Mechanical Properties (month)	Absence of Stretcher Strains Marks[2] (month)		min.		min.	min.	min.
Standard	Grade									
EN 10346	HX180BD+Z	1118	3	3	180-240 (18.4-24.5)	30 (3.1)	290-360 (29.6-36.7)	34	1.5	0.16
EN 10346	HX220BD+Z	1122	3	3	220-280 (22.4-28.6)	30 (3.1)	320-400 (32.6-40.8)	32	1.2	0.15
EN 10346	HX260BD+Z	1126	3	3	260-320 (26.5-32.6)	30 (3.1)	360-440 (36.7-44.9)	28	-	-
EN 10346	HX300BD+Z	1130	3	3	300-360 (30.6-36.7)	30 (3.1)	400-480 (40.8-49.0)	26	-	-

Notes

1) Tensile test values apply to “transverse” test pieces
2) It is valid if storage temperature is below 50 °C.
3) Decreased minimum r90 values apply for product thickness 1.50<t<2.00mm (minus 0,2 units),
4) Decreased minimum elongation values apply for product thickness 0.35 mm < d ≤ 0.50 mm (minus 4 units) and for 0.50 mm < d ≤ 0.70 mm (minus 2 units).
5) Guarantee periods specified in the table begin on the date on which products are made available.
6) Decreased minimum r_{90} values apply for product thickness
   0.50 mm < t ≤ 0.70 mm (minus 0.2)
   0.35 mm < t ≤ 0.50 mm (minus 0.4)
   Decreased minimum n_{90} values apply for product thickness
   0.50 mm < t ≤ 0.70 mm (minus 0.01)
   0.35 mm < t ≤ 0.50 mm (minus 0.03)

Standard: WSS-M1 A341

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C max.	Si max.	Mn max.	P max.	S max.	Al min.	Ti[1] max.	Nb[1] max.
Standard	Grade									
WSS-M1 A341	A7	1124	0.005	0.03	0.55	0.080	0.010	0.02	0.020	0.005

Notes

1) (Ti + Nb + V) % ≤ 0.22

Mechanical Properties

Corresponding		Erdemir Steel Grade	$R_{p0.2}/R_{eL}$ N/mm² (kg/mm²)	BH_2 N/mm² (kg/mm²) min.	R_m[1] N/mm² (kg/mm²)	A_{80} (%) min.
Standard	Grade					
WSS-M1 A341	A7	1124	234-280 (23.9-28.6)	35 (3.6)	350-479 (35.7-48.9)	26

Notes

1) Tensile test values apply to “transverse” test pieces
2) Mechanical properties specified in the table are guaranteed for 3 months beginning from the date on which products are made available.

Continuously Hot- Dip Zinc Coated (Galvanized) Bake-Hardening High Yield Strength Steels For Cold Forming

Standard: Miscellaneous

Chemical Composition(%)

Corresponding			Erdemir[3] Steel Grade	C max.	Mn max.	P max.	S max.	Si max.	Al max.	Ti max.	Nb max.	V max.	Ceq[5] max.
Standard	Grade	Similar Standard / Grade											
52814/9.52873	FEE 220 BH-ZNT/F/2S	EN 10346 / HX220BD+Z	380[1)2)]	0.007-0.06	0.15-0.70	0.05-0.09	0.030	0.50	0.02-0.07	-	-	-	-
WSS-M1 A367	A22	EN 10346 / HX220BD+Z	381	0.010	0.70	0.080	0.025	0.10	0.080	0.060	0.030	-	-
WSS-M1 A367	A23	EN 10346 / HX260BD+Z	382	0.010	0.80	0.100	0.025	0.10	0.080	0.060	0.030	-	-
WSS-M1 A341	A5	EN 10346 / HX260BD+Z	383	0.010	0.80	0.10	0.025	0.10	0.080	0.060	0.030	-	-
11-04-013	XE260BH	EN 10346 / HX260BD+Z	384	0.12	0.80	0.03-0.09	0.025	0.25	0.005-0.080	0.12	0.035	0.010	0.30

Notes
1) % Ni + % Cu + % Cr + % Mo ≤ 0.5
2) % C + % P ≤ 0.16
3) The limits which are specified with red colour are the limits of the customer's specifications. The other limits are specified as reference value according to Erdemir manufacturing practice.
4) The chemical analysis limits of grade 380 is specified differently than the customer's specifications with customer's acceptence, in order to provide the mechanical property limits.
5) 'Ceq % = C % + (Mn+Si) %/6' formula applies for carbon equivalent

Mechanical Properties

Corresponding			Erdemir Steel Grade	Re N/mm² (kg/mm²)	Rm N/mm² (kg/mm²)	A_{80} % min.	r_{90} min.	n_{90} min.	r_{ort}[6] min.	BH N/mm² (kg/mm²) min.
Standard	Grade	Similar Standard / Grade								
52814/9.52873	FEE 220 BH-ZNT/F/2S	EN 10346 / HX220BD+Z	380[1)3)4)]	200- 270 (20.4- 27.5)	305- 400 (31.1- 40.7)	32	1.6	0.15	-	80 (8.15)
WSS-M1 A367	A22	EN 10346 / HX220BD+Z	381[2)5)7)]	210-270 (21.4-27.5)	320 min. (32.6)	31	-	0.17	1.10	30 (3.1)
WSS-M1 A367	A23	EN 10346 / HX260BD+Z	382[2)5)7)]	240-300 (24.5-30.6)	340 min. (34.7)	28	-	0.17	1.10	30 (3.1)
WSS-M1 A341	A5	EN 10346 / HX260BD+Z	383[2)7)]	260-310 (26.6-31.6)	370-430 (37.8-43.8)	30	1.40	0.16	-	30 (3.1)
11-04-013	XE260BH	EN 10346 / HX260BD+Z	384[1)7)8)9)]	"260-310 (26.6-31.6)"	370-440 (37.8-44.9)	30	1.3	0.17	-	30 (3.1)

Notes

1) Tensile test values apply to "transverse" test pieces

2) Tensile test values apply to "longitudinal" test pieces

3) Mechanical properties specified in the table are guaranteed for 6 months beginning from the date on which products are made available.

4) BH = BH2 + WH

5) BH value is obtained at 170°C in 20 minutes.

6) Average Plastic Strain Ratio (ravg) is calculated as a weighted average of the individual r-values, i.e., (r0+r90+2r45) / 4

7) Mechanical properties specified in the table are guaranteed for 3 months beginning from the date on which products are made available.

8) Decreased minimum elongation values apply for product thickness d < 0.60 mm (minus 2 units).

9) Yield/tensile ratio is max 0.82.

Galvanized/
Galvannealed
Flat Steel Products

Steel Grades

Zinc Coated (Galvanized) IF Steel

Standard: DIN EN 10346 : 2015

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C max.	Si max.	Mn max.	P max.	S max.	Al min.	Ti max.	Nb max.
Standard	Grade									
EN 10346	HX180YD+Z	1518[1)]	0.01	0.30	0.70	0.06	0.025	0.010	0.12	0.09
EN 10346	HX220YD+Z	1522[1)]	0.01	0.30	0.90	0.08	0.025	0.010	0.12	0.09
EN 10346	HX260YD+Z	1526[1)]	0.01	0.30	1.30	0.10	0.025	0.010	0.12	0.09

Notes

1) IF steel.

Mechanical Properties

Corresponding		Erdemir Steel Grade	Guarantee Period[4)]		$R_{p0.2}/R_{eL}$ N/mm² (kg/mm²)	R_m[1)] N/mm² (kg/mm²)	A_{80}[2)] (%)	r_{90}[3)6)]	n_{90}[6)]
			Validity of Mechanical Properties (month)	Absence of Stretcher Strains Marks[5)] (month)					
Standard	Grade						min.	min.	min.
EN 10346	HX180YD+Z	1518	6	6	180-240 (18.4-24.5)	330-390 (33.6-39.7)	34	1.70	0.18
EN 10346	HX220YD+Z	1522	6	6	220-280 (22.4-28.6)	340-420 (34.7-42.8)	32	1.50	0.17
EN 10346	HX260YD+Z	1526	6	6	260-320 (26.5-32.6)	380-440 (38.7-44.9)	30	1.40	0.16

Notes

1) Tensile test values apply to "transverse" test pieces
2) Decreased minimum elongation values apply for product thickness 0.35 mm < d ≤ 0.50 mm (minus 4 units) and for 0.50 mm < d ≤ 0.70 mm (minus 2 units).
3) Decreased minimum r_{90} values apply for product thickness 1.50<t<2.00mm (minus 0,2 units)
4) Guarantee period specified in the table begins on the date on which products are made available.
5) Guarantee period is valid for products with surface quality B and C
6) Decreased minimum r90 values apply for product thickness
   0.50 mm < t ≤ 0.70 mm (minus 0.2)
   0.35 mm < t ≤ 0.50 mm (minus 0.4)
   0.35 mm (minus 0.6) aplly.
   Decreased minimum n90 values apply for product thickness
   0.50 mm < t ≤ 0.70 mm (minus 0.01)
   0.35 mm < t ≤ 0.50 mm (minus 0.03)
   0.35 mm (minus 0.04) aplly.

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High Yield Strength Steel With Zinc Coating (Galvanized) By Continuous Hot-Dip Process For Cold Forming

Standard: Miscellaneous

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C max.	Si max.	Mn max.	P max.	S max.	Al max.	Ti max.	Nb max.	V max.	C_{eq} [2] max.
Standard	Grade											
52814	FEE 180IF	385[1][5]	0.01	0.70	0.30	0.06	0.025	0.01	-	-	-	-
52814	FEE 210IF	386[1][5]	0.01	0.90	0.30	0.08	0.025	0.01	-	-	-	-
50002	IF280Y380T	387[1][5]	0.01	1.60	0.30	0.10	0.025	0.10	0.15	0.15	-	-
11-04-002/L	XE280P	388[1]	0.08	0.25	1.30	0.10	0.025	0.08	0.10	0.040	0.010	0.28

Notes

1) IF steel.
2) The carbon equivalent is defined by the Ceq formula = C+(Mn+Si)/6.
3) Ti+Nb+V < % 0,10
4) The limits which are specified on the table are the limits of the customer's specifications.
5) % Ni + % Cu + % Cr+ % Mo ≤ 0.5

Mechanical Properties

Corresponding		Erdemir Steel Grade	Guarantee Period[3]		$Rp_{0.2}$ / R_{eL} N/mm² (kg/mm²)	R_y/R_m max.	R_m [1] N/mm² (kg/mm²)	A_{80} (%) min.	r [4] Ag%		n_{90} [5] min.
Standard	Grade		Validity of Mechanical Properties (month)	Absence of Stretcher Strains Marks (month)					Long. min.	Trans. min.	
52814	FEE 180IF	385[1]	6	6	180-240 (18.4-24.4)	-	340 (34.7)	36	-	-	-
52814	FEE 210IF	386[1]	6	6	210-270 (18.4-24.4)	-	340 (34.7)	34	-	-	-
50002	IF280Y380T	387[1]	6	6	280-340 (28.6-34.7)	-	380-470 (38.7-48.0)	39	0.9	-	0.16
11-04-002/L	XE280P	388[2][6]	6	6	280-340 (28.5-34.7)	0.80	385-450 (39.3-45.9)	29	1.3	1.5	0.17

Notes

1) Tensile test values apply to "longitudinal" test pieces
2) Mechanical characteristics expressed in the transversal direction.
3) The supplier guarantees the stability of mechanical characteristics, for a period of 6 months, from the date of the first oiling of the coil by the steel manufacturer in the latter's plant.
4) r : Plastic anisotropy coefficient measured based on the standard ISO 10 113 at Ag%.
5) n :work hardening coefficient measured based on the standard ISO 10 275 (8% longitudinal elongation of the conventional and the elongation measured at Ag%)
6) Unless otherwise agreed, n value is taken between %10-20 elongation range

Galvanized/
Galvannealed
Flat Steel Products

Steel Grades

Zinc Coated (Galvanized) Structural Steels

Standard: EN 10346 : 2015

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C max.	Si max.	Mn max.	P max.	S max.
Standard	Grade						
EN 10346	S220GD+Z	1322	0.20	0.60	1.70	0.10	0.045
EN 10346	S250GD+Z	1325	0.20	0.60	1.70	0.10	0.045
EN 10346	S280GD+Z	1328	0.20	0.60	1.70	0.10	0.045
EN 10346	S320GD+Z	1332	0.20	0.60	1.70	0.10	0.045
EN 10346	S350GD+Z	1335	0.20	0.60	1,70	0.10	0.045

Mechanical Properties[4]

Corresponding		Erdemir Steel Grade	$R_{p0.2}/R_{eH}$ N/mm² (kg/mm²) min.	R_m [1][3] N/mm² (kg/mm²) min.	A_{80} [2] (%) min.
Standard	Grade				
EN 10346	S220GD+Z	1322	220 (22.4)	300 (30.6)	20
EN 10346	S250GD+Z	1325	250 (25.5)	330 (33.6)	19
EN 10346	S280GD+Z	1328	280 (28.6)	360 (36.7)	18
EN 10346	S320GD+Z	1332	320 (32.6)	390 (39.8)	17
EN 10346	S350GD+Z	1335	350 (35.7)	420 (42.8)	16

Notes

1) Tensile test values apply to "longitudinal" test pieces
2) Decreased minimum elongation values apply for product thickness 0.35 mm < d ≤ 0.50 mm (minus 4 units) and for 0.50 mm < d ≤ 0.70 mm (minus 2 units).
3) The values of tensile strength for all the steel grades may be expected to be within a value range of 140 N/mm² (14,3 kg/mm²)
4) Mechanical properties specified in the table are guaranteed for 1 month beginning from the date on which products are made available.

Zinc Coated (Galvanized) Structural Steels

Standard: WSB-M1 A215-F1

Chemical Composition(%)

Corresponding			Erdemir Steel Grade	C	Mn	P	S	Nb	V
Standard	Grade	Similar Standard / Grade		max.	max.	max.	max.	max.	max.
WSB-M1 A215-F1	Gr. 250	EN 10346 / S250GD+Z	355[1]	0.17	0.90	0.020	0.020	0.02	-

Note

1) Grades specified in this table are produced according to agreements with customers

Mechanical Properties

Corresponding			Erdemir Steel Grade	$R_{p0.2}$ N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	$R_{p0.2}/R_m$ max.	A_{50} (%) min.	A_{80} (%) min.
Standard	Grade	Similar Standard/Grade						
WSB-M1 A215-F1	Gr. 250	EN 10346 / S250GD+Z	355	250-350 (25.5-35.7)	350 min. (35.7)	-	25	-

Note

1) The values for the tensile test apply to “longitudinal” test pieces

High Strength Low Alloyed Zinc Coated (galvanized) Steels by Continous Hot-Dip Process for Cold Forming

Standard: EN 10346 : 2015

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C	Mn.	P	S	Si	Al_{Total}	Nb	Ti
Standard	Grade		max.	max.	max.	max.	max.	min.	max.	max.
EN 10346	HX 260LAD+Z	1626	0.11	1.00	0.030	0.025	0.50	0.015	0.09	0.15
EN 10346	HX 300LAD+Z	1630	0.12	1.40	0.030	0.025	0.50	0.015	0.09	0.15
EN 10346	HX 340LAD+Z	1634	0.12	1.40	0.030	0.025	0.50	0.015	0.10	0.15
EN 10346	HX 380LAD+Z	1638	0.12	1.50	0.030	0.025	0.50	0.015	0.10	0.15
EN 10346	HX 420LAD+Z	1642	0.12	1.60	0.030	0.025	0.50	0.015	0.10	0.15
EN 10346	HX460LAD+Z	1643	0.15	1.70	0.03	0.025	0.5	0.015	0.10	0.15

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80}[2] (%) min.
Standard	Grade				
EN 10346	HX 260LAD+Z	1626	260-330 (26.6-33.6)	350-430 (35.7-43.8)	26
EN 10346	HX 300LAD+Z	1630	300-380 (30.6-38.7)	380-480 (38.7-48.9)	23
EN 10346	HX 340LAD+Z	1634	340-420 (34.7-42.8)	410-510 (41.8-52.0)	21
EN 10346	HX 380LAD+Z	1638	380-480 (38.8-48.9)	440-560 (44.8-57.1)	19
EN 10346	HX 420LAD+Z	1642	420-520 (42.9-53.0)	470-590 (48.0-60.1)	17
EN 10346	HX460LAD+Z	1643	460-560 (46.9-57.0)	500-640 (51.0-65.2)	15

Notes

1) Tensile test values apply to “transverse” test pieces
2) Decreased minimum elongation values apply for product thickness 0.35 mm < d ≤ 0.50 mm (minus 4 units) and for 0.50 mm < d ≤ 0.70 mm (minus 2 units).
3) Mechanical properties specified in the table are guaranteed for 6 months beginning from the date on which products are made available.

Steel Grades

High Strength Low Alloyed Zinc Coated (galvanized) Steels by Continous Hot-Dip Process for Cold Forming

Standard: Miscellaneous

Chemical Composition(%)[3]

Corresponding			Erdemir Steel Grade	C max.	Mn max.	P max.	S max.	Si max.	Nb	V max.	Al	Ti max.	CE[1] max.
Standard	Grade	Similar Standard / Grade											
11-04-002	XE 280 D	EN 10346 / HX300LAD+Z	331	0.08	0.60	0.030	0.025	0.10	0.10 max.	0.10	0.015-0.080	0.10	0.28
52811/9.52873	FEE 270 F - ZNT/F/2S	EN 10346 / HX 300LAD+Z	360[2]	0.12	1.00	0.030	0.030	0.50	0.015-0.04	0.10	0.015 min.	-	-
52811/9.52873	FEE 300 F - ZNT/F/2S	EN 10346 / HX340LAD+Z	365[2]	0.12	1.30	0.030	0.030	0.50	0.030-0.070	0.10	0.015 min.	-	-
11-04-002	XE-320D	EN 10346 / HX340LAD+Z	366	0.10	1.10	0.030	0.025	0.20	0.10 max.	0.10	0.015-0.080	0.10	0.28
WSB-M1 A215-F1	Gr. 300	EN 10346 / HX340LAD+Z	367	0.10	0.90	0.030	0.025	0.20	0.10 max.	0.10	0.015 min.	-	-
52811/9.52873	FEE 340 F - ZNT/F/2S	EN 10346 / HX380LAD+Z	368[2]	0.12	1.50	0.030	0.030	0.50	0.10 max.	0.10	0.015 min.	-	-
52811/9.52873	FEE 420 F - ZNT/F/2S	EN 10346 / HX420LAD+Z	369[2]	0.12	1.60	0.030	0.030	0.50	0.10 max.	0.10	0.015 min.	-	-
11-04-002	XE-360D	EN 10346 / HX380LAD+Z	372	0.11	1.40	0.030	0.025	0.50	0.10 max.	0.10	0.015-0.080	0.10	0.31

Notes

1) C_{eq} = C % + (Mn+Si)% / 6 formula applies for carbon equivalent
2) % Nb+Ti+V ≤ 0.22
3) The limits which are specified with red colour are the limits of the customer's specifications.
   The other limits are specified as reference value according to Erdemir manufacturing practice.

Galvanized/
Galvannealed
Flat Steel Products

Steel Grades

High Strength Low Alloyed Zinc Coated (galvanized) Steels by Continous Hot-Dip Process for Cold Forming

Standard: Miscellaneous

Mechanical Properties

Corresponding			Erdemir Steel Grade	$R_{p0.2}$ N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	$R_{p0.2}/R_m$ max.	A_{50} (%) min.	A_{80} (%) min.	r_{90} min.	n_{90} min.
Standard	Grade	Similar Standard / Grade								
11-04-002	XE 280 D	EN 10346 / HX300LAD+Z	331[3] [4]	280-340 (26.6-34.6)	375-440 (38.3-44.9)	0.85	-	28	0.60	0.15
52811/9.52873	FEE 270 F - ZNT/F/2S	EN 10346 / HX 300LAD+Z	360	270-350 (27.6-35.6)	330 min. (33.7)	-	-	24	-	0.15[2]
52811/9.52873	FEE 300 F - ZNT/F/2S	EN 10346 / HX340LAD+Z	365	300-380 (30.6-38.7)	370 (37.8)	-	-	22	-	0.14[2]
11-04-002	XE-320D	EN 10346 / HX340LAD+Z	366[4]	320-390 (32.7-39.7)	415-480 (42.3-49.0)	0.85	-	24	0.50	0.13
WSB-M1 A215-F1	Gr. 300	EN 10346 / HX340LAD+Z	367	300-400 (30.6-40.8)	400 min. (40.8)	-	23	-	-	-
52811/9.52873	FEE 340 F - ZNT/F/2S	EN 10346 / HX380LAD+Z	368	340-420 (34.7-42.8)	410 min. (41.8)	-	-	20	-	0.13[2]
52811/9.52873	FEE 420 F - ZNT/F/2S	EN 10346 / HX420LAD+Z	369	420-520 (42.8-53.0)	480 (48.9)	-	-	16	-	0.11[2]
11-04-002	XE-360D	EN 10346 / HX380LAD+Z	372[4]	360-440 (36.7-44.8)	450-530 (45.9-54.1)	0.85	-	21	0.50	0.13

Notes

1) Tensile test values apply to "longitudinal" test pieces
2) "n" is average value
3) Mechanical properties specified in the table are guaranteed for 6 months beginning from the date on which products are made available.
4) Unless otherwise agreed, n value is taken between %10-20 elongation range

High Yield Strength Dual Phase Steel With Zinc Coating (Galvanized) By Continuous Hot-Dip Process For Cold Forming

Standard: EN 10346:2015

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C max.	Si max.	Mn max.	P max.	S max.	Al max.	Cr+Mo max.	Nb+Ti max.	V max.	B max.
Standard	Grade											
EN 10346	HCT490X+Z	1650	0.14	0.75	2.00	0.08	0.015	0.015 - 1.00	1.00	0.15	0.20	0.005
EN 10346	HCT590X+Z	1660	0.15	0.75	2.50	0.04	0.015	0.015 - 1.50	1.40	0.15	0.20	0.005
EN 10346	HCT780X+Z	1680(1)	0.18	0.80	2.50	0.080	0.015	0.015 - 2.00	1.40	0.15	0.20	0.005

Notes
1) 1680's order is subjected to negotiation.

Mechanical Properties

Corresponding		Erdemir Steel Grade	$Rp_{0.2}$ / R_e N/mm² (kg/mm²)	BH_2 N/mm² (kg/mm²) min.	Rm(1) N/mm² (kg/mm²) min.	A_{80}(2) (%) min.	$n_{10\text{-}UE}$ min.
Standard	Grade						
EN 10346	HCT490X+Z	1650(3)	290-380 (29.6-38.7)	30 (3.1)	490 (50.0)	24	0.15
EN 10346	HCT590X+Z	1660(3)	330-430 (33.7-43.8)	30 (3.1)	590 (60.2)	20	0.14
EN 10346	HCT780X+Z	1680(3)	440-550 (44.9-56.1)	30 (3.1)	780 (79.6)	14	-

Notes
1) Tensile test values apply to "longitudinal" test pieces
2) Decreased minimum elongation values apply for product thickness d < 0.60 mm (minus 2 units).
3) Mechanical properties specified in the table are guaranteed for 3 months beginning from the date on which products are made available.

High Yield Strength Dual Phase Steel With Zinc Coating (Galvanized) By Continuous Hot-Dip Process For Cold Forming

Standard: Miscellaneous

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C max.	Mn max.	P max.	S max.	Si max.	Al min.	Cu max.	B max.	Cr max.	Cr + Mo max.	Nb + Ti max.
Standard	Grade												
52815/9.52873	FE 600 DP F ZNT/F/2S	390(1)(2)(3)	0.23	3.3	0.090	0.015	2.0	0.010	0.20	0.006			
WSS-M1A348	A1	391(4)	0.10	1.30	0.10	0.015	0.40	0.015-0.080	0.20		0.80		
52815/9.52873	52815/9.52873 FE 600 DP F ZNT/F/2S	392(1)(2)(3)	0.23	3.3	0.090	0.015	2.0	0.010	0.20	0.006			
52815/9.52873	A14	397(1)(2)(3)	0.18	2.50	0.050	0.015	1.00	0.015 - 1.00	0.20	0.005		1.40	0.15
MS 50002	DPC420Y780T	398(1)(2)(3)	0.18	2.50	0.080	0.015	1.00	0.01 - 2.00	0.20	0.005		1.40	0.15

Notes
1) %Ni+%Cr+%Mo ≤ 1.5
2) If the carbon value %C < 0.015 , contains a minimum of 0.0003% (3 ppm) boron.
3) The limits which are specified on the table are the limits of the customer's specifications.
4) There is no limit specified in the customer's specificatons. The limits are specified as reference value according to Erdemir manufacturing practice.

Galvanized/
Galvannealed
Flat Steel Products

Steel Grades

Mechanical Properties(4)

Corresponding		Erdemir Steel Grade	$Rp_{0.2}$ / R_e N/mm² (kg/mm²)	R_m (1) N/mm² (kg/mm²) min.	BH_2 N/mm² (kg/mm²) min.	A_{80} (%) min.	A_{50} (%) min.	n 10-20 % min.	n 4-6 % min.
Standard	Grade								
52815/9.52873	FE 600 DP F ZNT/F/2S	390(1)(2)(3)	340-440 (34.7-44.8)	590 (60.1)	30 (3.1)	20	-	0.14	0.18
WSS-M1A348	A1	391(1)(2)	260-330 (26.6-33.6)	450 (45.9)	30 (3.1)	-	30	-	-
52815/9.52873	FE 600 DP F ZNT/F/2S	392(1)(2)(3)	340-400 (34.7-40.7)	590 (60.1)	30 (3.1)	20	-	0.14	0.18
WSS-M1A368	A14	397(1)(2)(3)	420-550 (42.9-56.1)	780 (79.6)	30 (3.1)	14	-	0.11	0.15
MS 50002	DPC420Y780T	398(1)(2)(3)	420-550 (42.9-56.1)	780 (79.6)	30 (3.1)	14	-	0.11	0.15

Notes
1) Tensile test values apply to "longitudinal" test pieces
2) Decreased minimum elongation values apply for product thickness d < 0.50 mm (minus 4 units) and for 0.50 mm ≤ d ≤ 0.70 mm (minus 2 units).
3) If the maximum value of uniform elongation is lower than 20 %, the value of n is determined between 10 % and the maximum value of uniform elongation.
4) Mechanical properties specified in the table are guaranteed for 3 months beginning from the date on which products are made available.

High Yield Strength Dual Phase Steel With Zinc Coating (Galvanized) By Continuous Hot-Dip Process For Cold Forming

Standard: 11 - 04 -002 / - - L

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C max.	Si max.	Mn max.	P max.	S max.	Al total	Nb max.	Ti max.	V max.	Ceq(1) max.
Standard	Grade											
11 - 04 - 002 / -- L	XE360B	393	0.14	0.40	2.10	0.040	0.015	0.015 - 0.080	0.01	0.05	0.01	0.44

Notes
1) 'Ceq % = C % + (Mn+Si) %/6' formula applies for carbon equivalent
2) The limits which are specified on the table are the limits of the customer's specifications.

Mechanical Properties

Corresponding		Erdemir Steel Grade	$Rp_{0.2}$ / R_e N/mm² (kg/mm²)	BH_2 N/mm² (kg/mm²) min.	R_m (1) N/mm² (kg/mm²) min.	A_{80} (%) min.	r (2) Ag%		n90(3)
Standard	Grade						long. min.	trans. min.	min.
11 - 04 - 002 / -- L	SCGA440	393	360-430 (36.8-43.8)	30 (3.1)	590-750 (60.2-76.5)	21	0.8	1.0	0.14

Notes
1) Tensile test values apply to "longitudinal" test pieces
2) r : Plastic anisotropy coefficient measured based on the standard ISO 10 113 at Ag%.
3) n :work hardening coefficient measured based on the standard ISO 10 275 (8% longitudinal elongation of the conventional and the elongation measured at Ag%)
4) Unless otherwise agreed, n value is taken between %10-20 elongation range
5) Yield/tensile ratio is max 0.7.
6) Mechanical properties specified in the table are guaranteed for 3 months beginning from the date on which products are made available.

Zinc-Iron Alloy Coated (Galvannealed) Low Carbon Steels For Cold Forming

Standard: EN 10346 : 2015

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C	Si	Mn	P	S	Ti
Standard	Grade		max.	max.	max.	max.	max.	max.
EN 10346	DX51D+ZF	1411	0.18	0.50	1.20	0.12	0.045	0.30
EN 10346	DX52D+ZF	1412	0.12	0.50	0.60	0.10	0.045	0.30
EN 10346	DX53D+ZF	1413	0.12	0.50	0.60	0.10	0.045	0.30
EN 10346	DX54D+ZF	1414	0.12	0.50	0.60	0.10	0.045	0.30
EN 10346	DX56D+ZF	1415	0.12	0.50	0.60	0.10	0.045	0.30

Mechanical Properties

Corresponding		Erdemir Steel Grade	Guarantee Period[7]		R_e $R_{p0.2}/R_{eL}$ (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80}[2] (%)	r_{90}	n_{90}
Standard	Grade		Validity of Mechanical Properties (month)	Absence of[4] Stretcher Strain Marks (month)			min.	min.	min.
EN 10346	DX51D+ZF	1411	1	-	-	270-500 (27.6-51.0	22	-	-
EN 10346	DX52D+ZF	1412	1	-	140-300[3] (14.3-30.6)	270-420 (27.6-42.8)	26	-	-
EN 10346	DX53D+ZF	1413	1	-	140-260 (14.3-26.5)	270-380 (27.6-38.7)	30	-	-
EN 10346	DX54D+ZF	1414	6	6	120-220 (12.2-22.4)	260-350 (26.5-35.7)	34	1.4[5]	0.18
EN 10346	DX56D+ZF	1415	6	6	120-180 (12.2-18.4)	260-350 (26.5-35.7)	37	1.7[5][6]	0.20[6]

Notes

1) Tensile test values apply to “transverse” test pieces
2) Decreased minimum elongation values apply for product thickness d ≤ 0.35 mm (minus 7 units), for 0.35 mm < d ≤ 0.50 mm (minus 4 units) and for 0.50 mm < d ≤ 0.70 mm (minus 2 units).
3) For surface quality A, the upper value for yield strength is 360MPa.
4) Guarantee period is valid for surface quality for B and C products.
5) Decreased minimum r90 values apply for product thickness 1.50<t<2.00mm (minus 0,2 units)
6) Decreased minimum r_{90} values apply for product thickness
   0.50 mm < t ≤ 0.70 mm (minus 0.2)
   0.35 mm < t ≤ 0.50 mm (minus 0.4)
   0.35 mm (minus 0.6) aplly.
   Decreased minimum n90 values apply for product thickness
   0.50 mm < t ≤ 0.70 mm (minus 0.01)
   0.35 mm < t ≤ 0.50 mm (minus 0.03)
   0.35 mm (minus 0.04) aplly.
7) Guarantee periods specified in the table begin on the date which products are made available.

Galvanized/
Galvannealed
Flat Steel Products

Steel Grades

Zinc-Iron Alloyed (Galvannealed) Low Carbon Steels For Cold Forming

Standard: Miscellaneous

Chemical Composition(%)[1]

Corresponding			Erdemir Steel Grade	C	Mn	P	S	Ti	Nb	Si
Standard	Grade	Similar Standard / Grade		max.	max.	max.	max.	max.	max.	max.
TSG3109G	SCGA 270C	EN 10346 / DX53D+ZF	410	0.080	0.40	0.030	0.025	-	-	-
TSG3109G	SCGA 270C	EN 10346 / DX53D+ZF	411	0.080	0.40	0.030	0.025	-	-	-
TSG3109G	SCGA 270D	EN 10346 / DX56D+ZF	430	0.008	0.25	0.025	0.020	0.10	0.04	-
TSG3109G	SCGA 270D	EN 10346 / DX56D+ZF	431	0.008	0.25	0.025	0.020	0.10	0.04	-
HES C071	JAC270F	EN 10346 / DX56D+ZF	432	0.008	0.25	0.025	0.020	0.10	0.04	-
TSG3109G	SCGA 440	-	440	0.20	1.70	0.10	0.045	-	-	0.60

Notes

1) There is no limit specified in the customer’s specificatons. The limits are specified as reference value according to Erdemir manufacturing practice.

Zinc-Iron Alloyed (Galvannealed) Low Carbon Steels For Cold Forming

Mechanical Properties

Corresponding			Erdemir Steel Grade	R_e N/mm² (kg/mm²)			R_m[1] N/mm² (kg/mm²)	A_{50} (%)		r_{-}	n_{-}	Guarantee Period
Standard	Grade	Similar Standard / Grade		0.4 ≤ d < 0,8	0.8 ≤ d < 1	1 ≤ d	min.	min.	max.	min.	min.	Mechanical Properties
TSG3109G	SCGA 270C	EN 10346 / DX53D+ZF	410[2][3]	180-235 (18.9-31.1)	175-295 (17,9-30)		270 (27.6)	34	44	-	-	3 month
TSG3109G	SCGA 270C	EN 10346 / DX53D+ZF	411[2][3]			165-285 (16,9-29)	270 (27.6)	37	47	-	-	3 month
TSG3109G	SCGA 270D	EN 10346 / DX56D+ZF	430[2][3]	135-225 (13.8-22.9)	125-215 (12,8-21,9)		270 (27.6)	41	51	1.40	0.20	12 month
TSG3109G	SCGA 270D	EN 10346 / DX56D+ZF	431[2][3]			115-205 (11,8-20,9)	270 (27.6)	46	56	1.40	0.20	12 month

Notes

1) Tensile test values apply to “longtidutinal” test pieces
2) Guarantee periods specified in the table begin on the date which products are made available.
3) Elongation values are increased by 1 unit for every 0,2mm thickness.
4) The grades specified in this table are produced according to the reference values stated above, differently from the customer’s specification with mutual agreement.

Mechanical Properties

Corresponding			Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{50} (%)		A_{80} (%)		$\bar{r}$
Standard	Grade	Similar Standard / Grade			min.	min.	max.	min.	max.	min.
HES C071	JAC270F	EN 10346 / DX56D+ZF	432[2]	110-175 (11.2-17.9)	270 (27.6)	46	56	38	47	1.50

Notes

1) Tensile test values apply to “longitudinal” test pieces
2) Mechanical properties specified in the table are guaranteed for 12 months beginning from the date on which products are made available.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e N/mm² (kg/mm²)			R_e N/mm² (kg/mm²)	A_{50} (%)	Guarantee Period
Standard	Grade		0.4 ≤ d < 0,8	0.8 ≤ d < 1	1 ≤ d	min.	min. - max.	Mechanical Properties
TSG3109G	SCGA440	440	295-400 (30.1-40.8)	285-390 (29.1-39.8)	275 - 380 (28.0 - 38.7)	440 (44.9)	25-37	1 month

Notes

1) Tensile test values apply to “transverse” test pieces
2) Mechanical properties specified in the table are guaranteed for 12 months beginning from the date on which products are made available.
3) Elongation values are increased by 1 unit for every 0,2mm thickness.

Continuously Hot-Dip Zinc-Iron Alloy Coated (Galvannealed) Bake-Hardening And High Yield Strength Steels For Cold Forming

Standard: DIN EN 10346 : 2015

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C	Si	Mn	P	S	Al	Ti	Nb
Standard	Grade		max.	max.	max.	max.	max.	min.	max.	max.
EN 10346	HX180BD+ZF	1218	0.06	0.50	0.70	0.06	0.025	0.015	0.12	0.09
EN 10346	HX220BD+ZF	1222	0.08	0.50	0.70	0.085	0.025	0.015	0.12	0.09
EN 10346	HX260BD+ZF	1226	0.10	0.50	1.00	0.10	0.030	0.010	0.12	0.09
EN 10346	HX300BD+ZF	1230	0.11	0.50	0.80	0.12	0.025	0.010	0.12	0.09

Mechanical Properties

Corresponding		Erdemir Steel Grade	Guarantee Period[5]		$R_{p0.2}/R_{eL}$ N/mm² (kg/mm²)	BH_2 N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80}[4][6] (%)	r_{90}[3][6][7]	n_{90}[7]
Standard	Grade		Validity of Mechanical Properties (month)	Absence of Stretcher Strains Marks[2] (month)		min.		min.	min.	min.
EN 10346	HX180BD+ZF	1218	3	3	180-240 (18.4-24.5)	30 (3.1)	290-360 (29.6-36.7)	34	1.5	0.16
EN 10346	HX220BD+ZF	1222	3	3	220-280 (22.4-28.6)	30 (3.1)	320-400 (32.6-40.8)	32	1.2	0.15
EN 10346	HX260BD+ZF	1226	3	3	260-320 (26.5-32.6)	30 (3.1)	360-440 (36.7-44.9)	28	-	-
EN 10346	HX300BD+ZF	1230	3	3	300-360 (30.6-36.7)	30 (3.1)	400-480 (40.8-49.0)	26	-	-

Notes

1) Tensile test values apply to “transverse” test pieces
2) It is valid if storage temperature is below 50 °C.
3) Decreased minimum r_{90} values apply for product thickness 1.50<t<2.00mm (minus 0,2 units)
4) Decreased minimum elongation values apply for product thickness 0.35 mm < d ≤ 0.50 mm (minus 4 units) and for 0.50 mm < d ≤ 0.70 mm (minus 2 units).
5) Guarantee periods specified in the table begin on the date on which products are made available.
6) The min. A_{80} value shall be reduced by 2 units and the min. r_{90} value by 0.2 units
7) Decreased minimum r_{90} values apply for product thickness
   0.50 mm < t ≤ 0.70 mm (minus 0.2)
   0.35 mm < t ≤ 0.50 mm (minus 0.4)
   Decreased minimum n90 values apply for product thickness
   0.50 mm < t ≤ 0.70 mm (minus 0.01)
   0.35 mm < t ≤ 0.50 mm (minus 0.03)

Continuously Hot-Dip Zinc-Iron Alloy Coated (Galvannealed) Bake-Hardening And High Yield Strength Steel For Cold Forming

Standard: TSG3109G

Chemical Composition(%)[1]

Corresponding			Erdemir Steel Grade	C	Mn	P	S	Ti	Nb
Standard	Grade	Similar Standard / Grade		max.	max.	max.	max.	max.	max.
TSG3109G	SCGA 340BH	EN 10346 / HX220BD+ZF	482	0.008	0.70	0.080	0.020	0.05	0.04

Notes

1) There is no limit specified in the customer's specificatons. The limits are specified as reference value according to Erdemir manufacturing practice.

Mechanical Properties[4]

Corresponding			Erdemir Steel Grade	R_e N/mm² (kg/mm²)	R_m[1] N/mm² (kg/mm²)	A_{80} (%)		BH_2[2][3] N/mm² (kg/mm²)	r̄
Standard	Grade	Similar Standard / Grade			min.	min.	max.	min.	min.
TSG3109G	SCGA 340BH	EN 10346 / HX220BD+ZF	482[5]	195-295 (19.9-30.1)	340 (34.7)	34	41	30 (3.1)	1.40

Notes

1) Tensile test values apply to "transverse" test pieces
2) BH_2 value is obtained at temperature 170°C in 20 minutes
3) Intended BH_2 value is 40 N/mm² (4.1 kg/mm²).
4) Mechanical properties are guaranteed for thickness d = 0.70 mm.
5) Mechanical properties specified in the table are guaranteed for 3 months beginning from the date on which products are made available.

Galvanized/
Galvannealed
Flat Steel Products

Steel Grades

Zinc-Iron Alloy Coated (Galvannealed) Structural Steels

Standard: EN 10346 : 2015

Chemical Composition(%)

Corresponding		Erdemir Steel Grade	C	Si	Mn	P	S
Standard	Grade		max.	max.	max.	max.	max.
EN 10346	S220GD+ZF	1422	0.20	0.60	1.70	0.10	0.045
EN 10346	S250GD+ZF	1425	0.20	0.60	1.70	0.10	0.045
EN 10346	S280GD+ZF	1428	0.20	0.60	1.70	0.10	0.045
EN 10346	S320GD+ZF	1432	0.20	0.60	1.70	0.10	0.045
EN 10346	S350GD+ZF	1435	0.20	0.60	1,70	0.10	0.045

Mechanical Properties

Corresponding		Erdemir Steel Grade	$R_{p0.2}/R_{eH}$ N/mm² (kg/mm²)	R_m[1][3] N/mm² (kg/mm²)	A_{80}[2] (%)
Standard	Grade		min.	min.	min.
EN 10346	S220GD+ZF	1422	220 (22.4)	300 (30.6)	20
EN 10346	S250GD+ZF	1425	250 (25.5)	330 (33.6)	19
EN 10346	S280GD+ZF	1428	280 (28.6)	360 (36.7)	18
EN 10346	S320GD+ZF	1432	320 (32.6)	390 (39.8)	17
EN 10346	S350GD+ZF	1435	350 (35.7)	420 (42.8)	16

Notes

1) Tensile test values apply to "longitudinal" test pieces
2) Decreased minimum elongation values apply for product thickness 0.35 mm < d ≤ 0.50 mm (minus 4 units) and for 0.50 mm < d ≤ 0.70 mm (minus 2 units).
3) The values of tensile strength for all the steel grades may be expected to be within a value range of 140 N/mm² (14,3 kg/mm²)
4) Mechanical properties specified in the table are guaranteed for 1 month beginning from the date on which products are made available.

Steel Grades

The current coating properties of the Zinc Coated (Galvanized, Z) Products

Total coating mass[2] for both surfaces	Minimum total coating mass for both surfaces (g/m²)		Surface Quality
(g/m²)	Triple Spot Test	Single Spot Test	Minimized Spangle Type (M)
Z100	100	85	A, B, C
Z140	140	120	A, B, C
Z200	200	170	A, B, C
Z225	225	195	A, B, C
Z275	275	235	A, B, C
Z350[1]	350	300	A[1]
Z450[1]	450	385	A[1]

Notes

1) Orders are accepted based on agreement
2) Orders for any further coating weights, beyond those of the table above, can only be accepted depending on agreement

The current coating properties of the Zinc-Iron Alloy Coated (Galvannealed, ZF) Products

Total coating mass[1] for both surfaces	Minimum total coating mass for both surfaces (g/m²)		Surface Quality Uniform Matt Grey
(g/m²)	Triple Spot Test	Single Spot Test	Apperance Coating Finish
ZF100	100	85	A, B, C
ZF120	120	100	A, B, C

Notes

1) For those coating weights not given in Table, orders are accepted based on agreement

Galvanized/
Galvannealed
Flat Steel Products

Production Limits

Production Limits

* Producibility limits will be evaluated before ordering in according to existing orders and mills' production conditions.

Galvanized And Galvannealed Products

Product	Symbol	Page Number
GZR	Zinc coated, galvanized coil	242
GZRS	Zinc coated sheet cut from galvanized coil	242
GFR	Zinc-iron alloy coated, galvannealed coil	242
GFRS	Zinc-iron alloy coated sheet cut from galvannealed coil	242
GZRK	Zinc coated, galvanized coil with trimmed edge	244
GFRK	Zinc-iron alloy coated, galvannealed coil with trimmed edge	244
GFRKB	Zinc-iron alloy coated, B Surface galvannealed coil with trimmed edge	244
GZRD	Zinc coated, galvanized, slitted coil	246
GFRD	Zinc-iron alloy coated, galvannealed, slitted coil	246
GZRB	Zinc coated, B surface galvanized coil	247
GFRB	Zinc-iron alloy coated, B surface galvannealed coil	242
GZRKB	Zinc coated, B surface galvanized coil with trimmed edge	248
GZRC	Zinc coated, C surface galvanized coil	249
GZRKC	Zinc coated, C surface galvanized coil with trimmed edge	250

Production Limits

GZR/GZRS

Cold Rolled, Zinc Coated A Surface Coil / Sheet

GFR/GFRS

Cold Rolled, Zinc-Iron Alloy Coated Coil / Sheet

GFRB

Cold Rolled , Zınc-Iron Alloy Coated, B Surface

Dimensions

Maximum Width (mm)	Maximum Width (mm)								
	Group - 1	Group - 3	Group - 4	Group - 5	Group - 6	Group - 7	Group - 8	Group - 9	Group - 10
0.30 - 0.35	1000								
0.36 - 0.39	1100								
0.40 - 0.44	1200	1000	900	900	1000	1000	900	800	1000
0.45 - 0.48	1260	1100	900	900	1000	1000	900	800	1100
0.49 - 0.49	1260	1100	900	900	1000	1000	900	800	1100
0.50 - 0.50	1300	1100	900	900	1015	1000	900	800	1100
0.51 - 0.54	1300	1200	900	900	1200	1000	900	900	1190
0.55 - 0.60	1300	1200	900	900	1200	1000	900	900	1190
0.61 - 0.70	1400	1366	900	900	1300	1100	1000	900	1300
0.71 - 0.75	1500	1400	900	900	1400	1200	1100	1000	1400
0.76 - 0.80	1500	1400	900	900	1400	1200	1100	1000	1400
0.81 - 0.90	1500	1500	1000	1000	1500	1300	1200	1000	1400
0.91 - 0.99	1500	1500	1100	1100	1500	1300	1200	1020	1400
1.00 - 1.00	1500	1500	1100	1100	1500	1300	1200	1020	1450
1.01 - 1.20	1500	1500	1200	1200	1500	1400	1300	1100	1450
1.21 - 1.40	1500	1500	1300	1300	1500	1500	1400	1200	1500
1.41 - 1.60	1500	1500	1400	1400	1500	1500	1400	1215	1500
1.61 - 1.80	1500	1500	1400	1400	1500	1500	1400	1300	1500
1.81 - 2.00	1500	1500	1400	1400	1500	1500	1400	1300	1500

Steel Grades

Group	Product Type	Grades
1	GZR , GZRS	1306 , 1310 , 1311 , 1312 , 1313
	GFR , GFRB , GFRS	410 , 411 , 1411 , 1412 , 1413
3	GZR , GZRS	311 , 312 , 320 , 321 , 323 , 324 , 325 , 326 , 327 , 328 , 1303 , 1304 , 1314 , 1315 , 1317
	GFR , GFRB , GFRS	430 , 431 , 432 , 1414 , 1415
4	GZR , GZRS	365 , 366 , 367 , 1634
	GFR , GFRB , GFRS	440
5	GZR, GZRS	368, 369, 372, 1334,1335, 1638, 1642, 1643
	GFR , GFRB , GFRS	1435
6	GZR, GZRS	1322, 1323, 1325
	GFR, GFRS	1422, 1425
7	GZR, GZRS	331, 355, 1328, 1332, 1626
	GFR, GFRS	1428, 1432
8	GZR , GZRS	360, 1630
9	GZR , GZRS	390, 391 , 392, 393, 397, 398, 1650, 1660, 1680
10	GZR, GZRS	380, 381, 382, 383, 384, 385, 386, 387, 388, 1118, 1122, 1124, 1126, 1128, 1130, 1518, 1522, 1526
	GFR , GFRB , GFRS	482, 1218, 1222, 1226, 1230

Galvanized/
Galvannealed
Flat Steel Products

Production Limits

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) GZRS and GFRS product type orders are subjected to negotiation.
3) The maximum export order width is 1490 mm for group 3 grades. However, 1491-1500 width range is subjected to negotiation.
4) Export orders for special grades, 311, 312, 320, 321, 323, 324, 325, 326, 327, 328, 331, 355, 360, 365, 366, 367, 368, 372, 380, 381, 382, 383, 384, 385, 386, 387, 388, 390, 391, 392, 393, 397, 398, 410, 411, 430 , 431, 432, 482 are subjected to negotiation.
5) The coil weight is subjected to negotiation.
6) Max.total coating mass is 600 g/m2 and min.total coating mass is 60 g/m2 for GZR and GZRS products. However,orders width total coating mass equal and greater than 275 g/m2 and less than 80 g/m2 are subjected to negotiation. Orders with total coating mass equal and greater than 275 g/m2 are produced with staggered winding. If staggered winding is not requested, the edge wave and bulking complaints related with heavy coating are not accepted.
7) Coating thicknesses do not include given thicknesses in “Production Limits”. So that thickness have to be considered by subtracting or adding the value related with coating thickness from order thickness for controlling producibility.
8) The order length is minimum 914 mm , maximum 4880 mm.
9) Orders for grades 410 , 430 , 432 are accepted in 0.40≤t<1.00 mm thickness range.
10) Orders for grade 411 are accepted in 1.00≤t<1.60 mm thickness range.
11) Orders for grade 431 are accepted in 1.00≤t<2.00 mm thickness range.
12) Orders for grade 482 are only accepted in 0.70 mm thickness.
13) Maximum bundle weight is 6000 kg.
14) Maximum total coating mass is 120 g/m2 for GFR, GFRS products.
15) Normally structural steel grades in Group 5, 6 and 7 are produced chromated and not oiled and other group grades are produced oiled and not chromated. Surface protection may be requested either with chromated & oil or none of them. (Without surface protection application.) If surface protection is not requested, Erdemir is not responsible from the risk of corrosion.
16) Only on conditions which are mentioned below skin-pass process is applied for the grades 1311 & 1411 otherwise skin-pass is not applied. For 1311 grade, the surface appereance will be bright and stretcher strain marks can be seen if skin-pass is not applied.
    a) If skin-pass is requested. (Surface apperance will be matte)
    b) If surface quality is requested as B or C
    c) If special surface roughness (Ra) is requested.
17) For grades other than 1311, skin-pass is not applied if “bright surface appereance “ is requested for GZR and GZRS products. For “bright surface appereance” orders yield strength (Re) is not guaranteed and strecher strain marks can be seen.
18) Marking process should be carried out for chromated and/or oiled surface protected products by customer request
19) Orders with maximum 0,40 µm Ra are accepted.
20) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length product.
21) Orders for grade 331 and 1626 are subjected to negotiate.
22) GFRB product type orders are subjected to negotiate.

Production Limits

GZRK

Cold Rolled, Zinc Coated, Trimmed Edge

GFRK

Cold Rolled, Zinc-Iron Alloy Coated, Trimmed Edge

GFRKB

Cold Rolled , Zınc-Iron Alloy Coated , Trımmed Edge B Surface

Dimensions

Thickness (mm)	Maximum Width (mm)								
	Group - 1	Group - 3	Group - 4	Group - 5	Group - 6	Group - 7	Group - 8	Group - 9	Group - 10
0.30 - 0.35	1000								
0.36 - 0.39	1100								
0.40 - 0.44	1185	975	885	885	1000	985	885	785	1165
0.45 - 0.48	1254	1125	885	885	1000	985	885	785	1165
0.49 - 0.49	1254	1185	885	885	1000	985	885	785	1175
0.50 - 0.50	1294	1185	897	897	1009	997	897	797	1175
0.51 - 0.54	1294	1194	897	897	1194	997	897	897	1184
0.55 - 0.60	1294	1194	897	897	1194	997	897	897	1184
0.61 - 0.65	1294	1294	897	897	1294	1094	997	897	1294
0.66 - 0.70	1394	1340	897	897	1294	1094	997	897	1294
0.71 - 0.75	1493	1394	897	897	1394	1194	1094	997	1394
0.76 - 0.79	1493	1394	897	897	1394	1194	1094	997	1394
0.80 - 0.80	1493	1394	897	897	1394	1194	1094	997	1394
0.81 - 0.90	1493	1492	997	997	1494	1294	1194	997	1394
0.91 - 0.99	1493	1492	1094	1094	1494	1294	1194	1014	1394
1.00 - 1.00	1493	1492	1094	1094	1494	1294	1194	1014	1444
1.01 - 1.20	1493	1492	1194	1194	1494	1394	1294	1094	1444
1.21 - 1.40	1493	1492	1294	1294	1494	1494	1394	1194	1492
1.41 - 1.60	1493	1492	1394	1394	1494	1494	1394	1194	1492
1.61 - 1.80	1493	1492	1394	1394	1494	1494	1394	1294	1492
1.81 - 2.00	1493	1492	1394	1394	1494	1494	1494	1294	1492

Steel Grades

Group	Product Type	Grades
1	GZRK	1306, 1310 , 1311 , 1312 , 1313
	GFRK , GFRKB	410 , 411 , 1411 , 1412 , 1413
3	GZRK	311 , 312 , 320 , 321 , 323 , 324 , 325 , 326 , 327 , 328 , 1303 , 1304 , 1314 , 1315 , 1317
	GFRK , GFRKB	430 , 431 , 432 , 1414 , 1415
4	GZRK	365 , 366 , 367 , 1634
	GFRK , GFRKB	440
5	GZRK	368, 369, 372, 1334,1335, 1638, 1642, 1643
	GFRK , GFRKB	1435
6	GZRK	1322, 1323, 1325
	GFRK , GFRKB	1422, 1425
7	GZRK	331 , 355 , 1328 , 1332 , 1626
	GFRK , GFRKB	1428, 1432
8	GZRK	360, 1630
9	GZRK	390, 391 , 392, 393, 397, 398, 1650, 1660, 1680
10	GZRK	380, 381, 382, 383, 384, 385, 386, 387, 388, 1118, 1122, 1124, 1126, 1128, 1130, 1518, 1522, 1526
	GFRK , GFRKB	482, 1218, 1222, 1226, 1230

Galvanized/
Galvannealed
Flat Steel Products

Production Limits

Notes

1) The minimum order width is 700 mm. However, 700-899 width range is subjected to negotiation.
2) Export orders for special grades, 311, 312, 320, 321, 323, 324, 325, 326, 327, 328, 331, 355, 360, 365, 366, 367, 368, 369, 372, 380, 381, 382, 383, 384, 385, 386, 387, 388, 390, 391, 392, 393, 397, 398, 410, 411, 430, 431, 432, 482 are subjected to negotiation.
3) The coil weight is subjected to negotiation.
4) Max.total coating mass is 600 g/m2 and min.total coating mass is 60 g/m2 for GZRK products. However,orders width total coating mass equal and greater than 275 g/m2 and less than 80 g/m2 are subjected to negotiation.
5) Coating thicknesses do not include given thicknesses in “Production Limits”. So that thickness have to be considered by subtracting or adding the value related with coating thickness from order thickness for controlling producibility.
6) Orders for grades 410 , 430 , 432 are accepted in 0.40≤t<1.00 mm thickness range.
7) Orders for grade 411 are accepted in 1.00≤t<1.60 mm thickness range.
8) Orders for grade 431 are accepted in 1.00≤t<2.00 mm thickness range.
9) Orders for grade 482 are only accepted in 0.70 mm thickness.
10) Maximum total coating mass is 120 g/m2 for GFRK products.
11) Normally structural steel grades in Group 5, 6 and 7 are produced chromated and not oiled and other group grades are produced oiled and not chromated. Surface protection may be requested either with chromated & oil or none of them. (Without surface protection application.) If surface protection is not requested, Erdemir is not responsable from the risk of corrosion.
12) Only on conditions which are mentioned below skin-pass process is applied for the grades 1311 & 1411 otherwise skin-pass is not applied. For 1311 grade, the surface appereance will be bright and stretcher strain marks can be seen if skin-pass is not applied.
    a) If skin-pass is requested. (Surface apperance will be matte)
    b) If surface quality is requested as B or C
    c) If special surface roughness (Ra) is requested.

13) For grades other than 1311, skin-pass is not applied if “bright surface appereance “ is requested for GZRK products. For “bright surface appereance” orders yield strength (Re) is not guaranteed and strecher strain marks can be seen. Marking process should be carried out for chromated and/or oiled surface protected products by customer request Orders with maximum 0,40 µm Ra are accepted.
14) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice.
15) GFRKB product type orders are subjected to negotiate.

Production Limits

GZRD Slit Coil - Cold Rolled, Zinc Coated
GFRD Slit Coil - Cold Rolled, Zinc-Iron Alloy Coated

Dimensions

Thickness (mm)	Maximum Width (mm)								
	Group - 1	Group - 3	Group - 4	Group - 5	Group - 6	Group - 7	Group - 8	Group - 9	Group - 10
0.30 - 0.35	500								
0.36 - 0.39	550								
0.40 - 0.44	592	492	442	442	500	492	442		492
0.45 - 0.48	630	492	442	442	500	492	442		492
0.49 - 0.49	630	542	442	442	500	492	442		542
0.50 - 0.50	648	548	448	448	504	498	448		548
0.51 - 0.54	648	552	448	448	504	498	448	448	552
0.55 - 0.60	648	557	448	448	504	498	448	448	557
0.61 - 0.65	698	648	448	448	554	548	498	448	648
0.66 - 0.70	698	670	448	448	554	548	498	448	648
0.71 - 0.75	710	698	448	448	604	598	548	498	698
0.76 - 0.79	740	698	448	448	604	598	548	498	698
0.80 - 0.80	740	698	448	448	604	598	548	498	698
0.81 - 0.90	740	698	498	498	654	648	598	498	698
0.91 - 0.99	740	722	548	548	654	648	598	507	698
1.00 - 1.00	740	740	548	548	654	648	598	507	698
1.01 - 1.20	740	740	598	598	704	698	648	548	698
1.21 - 1.80	740	740	637	604	740	740	698	598	740
1.81 - 2.00	740	740	637	604	740	740	698	604	740

Steel Grades

Group	Product Type	Grades
1	GZRD	1306, 1311, 1312, 1313
	GFRD	410, 411, 1411, 1412, 1413
3	GZRD	311, 312, 320, 321, 323, 324, 325, 326, 327, 328, 380, 381, 382, 383, 384, 385, 386, 387, 388, 1118, 1122, 1124, 1126, 1130, 1303, 1304, 1314, 1315, 1317, 1518, 1522
	GFRD	430, 431, 432, 482, 1218, 1222, 1226, 1230, 1414, 1415
4	GZRD	365, 366, 367, 1634
	GFRD	440
5	GZRD	368, 369, 372, 1334, 1335, 1638, 1642, 1643
	GFRD	1435
6	GZRD	1322, 1323, 1325
	GFRD	1422, 1425
7	GZRD	331, 355, 1328, 1332, 1626
	GFRD	1428, 1432
8	GZRD	360, 1630
9	GZRD	390, 391, 392, 393, 397, 398, 1650, 1660, 1680
10	GZRD	380, 381, 382, 383, 384, 385, 386, 387, 388, 1118, 1122, 1124, 1126, 1128, 1130, 1518, 1522, 1526
	GFRD	482, 1218, 1222, 1226, 1230

Notes

1) Minimum order width is 400 mm. However, 400-446 mm width range is subjected to negotiation.
2) Export orders for special grades, 311, 312, 320, 321, 323, 324, 325, 326, 327, 328, 331, 355, 360, 365, 366, 367, 368, 369, 372, 380, 381, 382, 383, 384, 385, 386, 387, 388, 390, 391, 392 , 393, 397 , 398, 410, 411, 430 , 431 , 432 , 482 are subjected to negotiation.
3) Max.total coating mass is 600 g/m2 and min.total coating mass is 60 g/m2 for GZRD products. However,orders width total coating mass equal and greater than 275 g/m2 and less than 80 g/m2 are subjected to negotiation.
4) Coating thicknesses do not include given thicknesses in “Production Limits”. So that thickness have to be considered by subtracting or adding the value related with coating thickness from order thickness for controlling producibility
5) Orders for grades 410 , 430 , 432 are accepted in 0.40≤t<1.00 mm thickness range.
6) Orders for grade 411 are accepted in 1.00≤t<1.60 mm thickness range.
7) Orders for grade 431 are accepted in 1.00≤t<2.00 mm thickness range.
8) Orders for grade 482 are only accepted in 0.70 mm thickness.
9) Orders are not accepted for the thickness less than 0.70 mm with C surface quality.
10) Maximum total coating mass is 120 g/m2 for GFRD products.
11) Normally structural steel grades in Group 5, 6 and 7 are produced chromated and not oiled and other group grades are produced oiled and not chromated. Surface protection may be requested either with chromated & oil or none of them. (Without surface protection application.) If surface protection is not requested, Erdemir is not responsable from the risk of corrosion.
12) Only on conditions which are mentioned below skin-pass process is applied for the grades 1311 & 1411 otherwise skin-pass is not applied. For 1311 grade, the surface appereance will be bright and stretcher strain marks can be seen if skin-pass is not applied.
    a) If skin-pass is requested. (Surface apperance will be matte)
    b) If surface quality is requested as B or C
    c) If special surface roughness (Ra) is requested.
13) For grades other than 1311, skin-pass is not applied if “bright surface appereance “ is requested for GZRD products. For “bright surface appereance” orders yield strength (Re) is not guaranteed and strecher strain marks can be seen.
14) Marking process should be carried out for chromated and/or oiled surface protected products by customer request
15) Orders with maximum 0,40 µm Ra are accepted for only A surface quality orders.

Galvanized/
Galvannealed
Flat Steel Products

Production Limits

GZRB Cold Rolled, Zinc Coated B Surface

Dimensions

Thickness (mm)	Maximum Width (mm)								
	Group 1	Group - 3	Group - 4	Group - 5	Group - 6	Group - 7	Group - 8	Group - 9	Group - 10
0.30 - 0.35	1000								
0.36 - 0.39	1100								
0.40 - 0.44	1200	1000	900	900	1000	1000	900	800	1000
0.45 - 0.48	1260	1100	900	900	1000	1000	900	800	1100
0.49 - 0.49	1260	1100	900	900	1000	1000	900	800	1100
0.50 - 0.50	1300	1100	900	900	1015	1000	900	800	1100
0.51 - 0.54	1300	1200	900	900	1200	1000	900	900	1190
0.55 - 0.60	1300	1200	900	900	1200	1000	900	900	1190
0.61 - 0.70	1400	1366	900	900	1300	1100	1000	900	1300
0.71 - 0.75	1500	1400	900	900	1400	1200	1100	1000	1400
0.76 - 0.80	1500	1400	900	900	1400	1200	1100	1000	1400
0.81 - 0.90	1500	1500	1000	1000	1500	1300	1200	1000	1400
0.91 - 0.99	1500	1500	1100	1100	1500	1300	1200	1020	1400
1.00 - 1.00	1500	1500	1100	1100	1500	1300	1200	1020	1450
1.01 - 1.20	1500	1500	1200	1200	1500	1400	1300	1100	1450
1.21 - 1.40	1500	1500	1300	1300	1500	1500	1400	1200	1500
1.41 - 1.60	1500	1500	1400	1400	1500	1500	1400	1215	1500
1.61 - 1.80	1500	1500	1400	1400	1500	1500	1400	1300	1500
1.81 - 2.00	1500	1500	1400	1400	1500	1500	1400	1300	1500

Steel Grades

Group	Product Type	Grades
1	GZRB	1306, 1311, 1312, 1313
3	GZRB	311, 312, 320 , 321, 323, 324, 325, 326, 327, 328, 1303, 1304, 1314, 1315, 1317
4	GZRB	365, 366, 367, 1634
5	GZRB	368, 369, 372, 1334, 1335, 1638, 1642, 1643
6	GZRB	1322, 1323, 1325,
7	GZRB	331, 355, 1328, 1332, 1626
8	GZRB	360, 1630
9	GZRB	390, 391, 392, 393, 397, 398, 1650, 1660, 1680
10	GZRB	380, 381, 382, 383, 384, 385, 386, 387, 388, 1118, 1122, 1124, 1126, 1128, 1130, 1518, 1522, 1526

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) The maximum export order width is 1490 mm for group 3 grades. However, 1491-1500 width range is subjected to negotiation.
3) Export orders for special grades, 311, 312, 320, 321, 323, 324, 325, 326, 327, 328, 331, 355, 360, 365, 366, 367, 368, 369, 372 , 380, 381, 382, 383, 384, 385, 386, 387, 388, 390, 391, 392, 393, 397, 398, 410, 430, 431, 432, 482 are subjected to negotiation.
4) The coil weight is subjected to negotiation.
5) Max.total coating mass is 250 g/m2 and min.total coating mass is 60 g/m^2 for GZRB products. However,orders width total coating mass equal to 275 g/m^2 and less than 80 g/m^2 are subjected to negotiation.
   Orders with total coating mass equal to 275 g/m2 are produced with staggered winding. If staggered winding is not requested, the edge wave and bulking complaints related with heavy coating are not accepted.
6) Coating thicknesses do not include given thicknesses in “Production Limits”. So that thickness have to be considered by subtracting or adding the value related with coating thickness from order thickness for controlling producibility. (See pages 8/15, 9/15, 10/15).
7) Normally structural steel grades in Group 5, 6 and 7 are produced chromated and not oiled and other group grades are produced oiled and not chromated. Surface protection may be requested either with chromated & oil or none of them. (Without surface protection application.) If surface protection is not requested, Erdemir is not responsible from the risk of corrosion.
8) Marking process should be carried out for chromated and/or oiled surface protected products by customer request
9) Orders with maximum 0.40 µm Ra are not accepted.
10) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length product.
11) The skin-pass process is applied to all grades and “bright surface appereance” orders are not accepted.

Production Limits

GZRKB

Cold Rolled, Zinc Coated, Trimmed Edge B Surface

Dimensions

Thickness (mm)	Maximum Width (mm)								
	Group - 1	Group - 3	Group - 4	Group - 5	Group - 6	Group - 7	Group - 8	Group - 9	Group - 10
0.30 - 0.35	1000								
0.36 - 0.39	1100								
0.40 - 0.44	1185	975	885	885	1000	985	885	785	1165
0.45 - 0.48	1254	1125	885	885	1000	985	885	785	1165
0.49 - 0.49	1254	1185	885	885	1000	985	885	785	1175
0.50 - 0.50	1294	1185	897	897	1009	997	897	797	1175
0.51 - 0.54	1294	1194	897	897	1194	997	897	897	1184
0.55 - 0.60	1294	1194	897	897	1194	997	897	897	1184
0.61 - 0.65	1294	1294	897	897	1294	1094	997	897	1294
0.66 - 0.70	1394	1340	897	897	1294	1094	997	897	1294
0.71 - 0.75	1493	1394	897	897	1394	1194	1094	997	1394
0.76 - 0.79	1493	1394	897	897	1394	1194	1094	997	1394
0.80 - 0.80	1493	1394	897	897	1394	1194	1094	997	1394
0.81 - 0.90	1493	1492	997	997	1494	1294	1194	997	1394
0.91 - 0.99	1493	1492	1094	1094	1494	1294	1194	1014	1394
1.00 - 1.00	1493	1492	1094	1094	1494	1294	1194	1014	1444
1.01 - 1.20	1493	1492	1194	1194	1494	1394	1294	1094	1444
1.21 - 1.40	1493	1492	1294	1294	1494	1494	1394	1194	1492
1.41 - 1.60	1493	1492	1394	1394	1494	1494	1394	1194	1492
1.61 - 1.80	1493	1492	1394	1394	1494	1494	1394	1294	1492
1.81 - 2.00	1493	1492	1394	1394	1494	1494	1494	1294	1492

Steel Grades

Group	Product Type	Grades
1	GZRKB	1306, 1311, 1312, 1313
3	GZRKB	311, 312, 320 , 321, 323, 324, 325, 326, 327, 328, 1303, 1304, 1314, 1315, 1317
4	GZRKB	365, 366, 367, 1634
5	GZRKB	368, 369, 372, 1334, 1335, 1638, 1642, 1643
6	GZRKB	1322, 1323, 1325
7	GZRKB	331, 355, 1328, 1332, 1626
8	GZRKB	360, 1630
9	GZRKB	390, 391, 392, 393, 397, 398, 1650, 1660, 1680
10	GZRKB	380, 381, 382, 383, 384, 385, 386, 387, 388, 1118, 1122, 1124, 1126, 1128, 1130, 1518, 1522, 1526

Notes

1) The minimum order width is 700 mm. However, 700-899 width range is subjected to negotiation.
2) Export orders for special grades, 311, 312, 320, 321, 323, 324, 325, 326, 327, 328, 331, 355, 360, 365, 366, 367, 368, 372, 380, 381, 382, 383, 384, 385, 386, 387, 388, 390, 391, 392, 393 are subjected to negotiation.
3) The coil weight is subjected to negotiation.
4) Max.total coating mass is 250 g/m2 and min.total coating mass is 60 g/m2 for GZRKB products. However,orders width total coating mass equal to 275 g/m2 and less than 80 g/m2 are subjected to negotiation.
5) Coating thicknesses do not include given thicknesses in “Production Limits”. So that thickness have to be considered by subtracting or adding the value related with coating thickness from order thickness for controlling producibility.
6) Normally structural steel grades in Group 5, 6 and 7 are produced chromated and not oiled and other group grades are produced oiled and not chromated. Surface protection may be requested either with chromated & oil or none of them. (Without surface protection application.) If surface protection is not requested, Erdemir is not responsible from the risk of corrosion.
7) Marking process should be carried out for chromated and/or oiled surface protected products by customer request
8) Orders with maximum 0.40 µm Ra are not accepted.
9) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice.
10) The skin-pass process is applied to all grades and “bright surface appereance” orders are not accepted.

Galvanized/
Galvannealed
Flat Steel Products

Production Limits

GZRC

Cold Rolled, Zinc Coated C Surface

Dimensions

Thickness (mm)	Maximum Width (mm)		
	Group-1	Group-3	Group-10
0.30 - 0.35	1000		
0.36 - 0.39	1100		
0.40 - 0.44	1200	1000	1190
0.45 - 0.48	1260	1200	1190
0.49 - 0.49	1260	1200	1190
0.50 - 0.50	1300	1200	1190
0.51 - 0.54	1300	1200	1190
0.55 - 0.60	1300	1200	1190
0.61 - 0.70	1400	1366	1300
0.71 - 0.75	1500	1400	1400
0.76 - 0.80	1500	1400	1400
0.81 - 0.90	1500	1500	1400
0.91 - 0.99	1500	1500	1400
1.00 - 1.00	1500	1500	1450
1.01 - 1.20	1500	1500	1450
1.21 - 1.40	1500	1500	1500
1.41 - 1.60	1500	1500	1500
1.61 - 1.80	1500	1500	1500
1.81 - 2.00	1500	1500	1500

Steel Grades

Group	Product Type	Grades
1	GZRC	1311, 1312, 1313,
3	GZRC	311, 312, 320, 321 323, 324, 325, 326, 327, 328, 1303, 1304, 1314, 1315
10	GZRC	380 , 381 , 382 , 383 , 388 , 1118 , 1122 , 1124 , 1126 , 1130 , 1518 , 1522 , 1526

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) The maximum export order width is 1490 mm for group 3 grades. However, 1491-1500 width range is subjected to negotiation.
3) Export orders for special grades, 311, 312, 320, 321, 323, 324, 325, 326, 327, 328, 380, 381, 382, 383, 388 are subjected to negotiation.
4) For domestic orders; C surface requests of the other grades which are in the limits of GZR products are subjected to negotiation.
5) The coil weight is subjected to negotiation.
6) Minimum total coating mass is 60 g/m^2 and maximum total coating mass is 140. However, orders with total coating mass less than 80 g/m^2 and between 141-160 g/m^2 are subjected to negotiation.
7) Coating thicknesses do not include given thicknesses in “Production Limits”. So that thickness have to be considered by subtracting or adding the value related with coating thickness from order thickness for controlling producibility.
8) Marking process should be carried out for chromated and/or oiled surface protected products for domestic orders. Marking process will be done when it was requested by the customer for export orders.
9) Orders with maximum 0.40 µm Ra are not accepted.
10) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice. To avoid this problem, orders should be given as cut to length product.
11) The skin-pass process is applied to all grades and “bright surface appereance” orders are not accepted.

Production Limits

GZRKC

Cold Rolled, Zinc Coated, Trimmed Edge C Surface

Thickness (mm)	Maximum Width (mm)		
	Group-1	Group-3	Group-10
0.30 - 0.35	1000		
0.36 - 0.39	1100		
0.40 - 0.44	1185	975	1165
0.45 - 0.48	1254	1125	1165
0.49 - 0.49	1254	1185	1175
0.50 - 0.50	1294	1185	1175
0.51 - 0.54	1294	1194	1184
0.55 - 0.60	1294	1194	1184
0.61 - 0.65	1294	1294	1294
0.66 - 0.70	1394	1340	1294
0.71 - 0.75	1493	1394	1394
0.76 - 0.79	1493	1394	1394
0.80 - 0.80	1493	1394	1394
0.81 - 0.90	1493	1492	1394
0.91 - 0.99	1493	1492	1394
1.00 - 1.00	1493	1492	1444
1.01 - 1.20	1493	1492	1444
1.21 - 1.40	1493	1492	1492
1.41 - 1.60	1493	1492	1492
1.61 - 1.80	1493	1492	1492
1.81 - 2.00	1493	1492	1492

Steel Grades

Group	Product Type	Grades
1	GZRKC	1311, 1312, 1313,
3	GZRKC	311, 312, 320, 321 323, 324, 325, 326, 327, 328, 1303, 1304, 1314, 1315
10	GZRKC	380 , 381 , 382 , 383 , 388 , 1118 , 1122 , 1124 , 1126 , 1130 , 1518 , 1522 , 1526

Notes

1) The minimum order width is 700 mm. However, 700-899 mm width range is subjected to negotiation.
2) Export orders for special grades, 311, 312, 320, 321, 323, 324, 325, 326, 327, 328, 380, 381, 382, 383, 388 are subjected to negotiation.
3) For domestic orders; C surface requests of the other grades which are in the limits of GZR products are subjected to negotiation.
4) The coil weight is subjected to negotiation.
5) Minimum total coating mass is 60 g/m^2 and maximum total coating mass is 140. However, orders with total coating mass less than 80 g/m^2 and between 141-160 g/m^2 are subjected to negotiation.
6) Coating thicknesses do not include given thicknesses in “Production Limits”. So that thickness have to be considered by subtracting or adding the value related with coating thickness from order thickness for controlling producibility.
7) Marking process should be carried out for chromated and/or oiled surface protected products for domestic orders. Marking process will be done when it was requested by the customer for export orders.
8) Orders with maximum 0.40 µm Ra are not accepted.
9) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening units and practice.
10) The skin-pass process is applied to all grades and “bright surface appereance” orders are not accepted.

Galvanized/
Galvannealed
Flat Steel Products

Production Limits

Table For Acceptable Order Width Depending On Coating Mass For Galvanized And Galvannealed Products For Group 1 Grades

Coating Code	Total Coating Mass (G/m^2)	Nominal Order Thickness Range (mm)		
		t ≤ 1,19	1,20 ≤ t < 1,50	t ≥ 1,50
		Value Subtracted From Or Added To Nominal Order Thickness (mm)		
51	100	-0.01	0	+0,01
52	120	-0.01	0	+0,01
53	140	-0.01	0	+0,01
54	200	-0.02	-0.01	0
55	225	-0.02	-0.01	0
56	275	-0.03	-0.02	-0.01
57	350	-0.04	-0.03	-0.02
58	450	-0.05	-0.04	-0.03
59	500	-0.06	-0.05	-0.04
60	70	0	+0,01	+0,02
61	90	0	+0,01	+0,02
62	80	0	+0,01	+0,02
63	180	-0.02	-0.01	0
64	250	-0.02	-0.01	0
65	300	-0.03	-0.02	-0.01
66	60	0	+0,01	+0,02
67	400	-0.05	-0.04	-0.03
68	75	0	+0,01	+0,02
69	150	-0.01	0	+0,01
70	110	-0.01	0	+0,01
71	130	-0.01	0	+0,01
72	160	-0.01	0	+0,01
73	106	-0.01	0	+0,01
74	600	-0.07	-0,06	-0.05

Example: Producible max. width is determined for the product GZR-1311 having 0,78 mm thickness and coating weight is equal to 500 g/m^2

1. Step: Total coating mass 500 g/m^2 is matched with value of 0,06 mm,

2. Step: Controlling thickness value is obtained value of 0,06 is subtracted from order thickness (0,78 - 0,06 = 0,72 mm)

3. Step: Producible max. widht is determined as 1420 mm for the thickness 0,72 mm (between 0,71 and 0,75) in the table related with the first group having 1311 quality.

Production Limits

Table For Acceptable Order Width Depending On Coating Mass For Galvanized And Galvannealed Products For Group 3 Grades

Coating Code	Total Coating Mass (G/m²)	Nominal Order Thickness Range (mm)		
		t ≤ 1,19	1,20 ≤ t < 1,80	t ≥ 1,80
		Value Subtracted From Or Added To Nominal Order Thickness (mm)		
51	100	-0.01	0	+0.01
52	120	-0.01	0	+0.01
53	140	-0.01	0	+0.01
54	200	-0.02	-0.01	0
55	225	-0.02	-0.01	0
56	275	-0.03	-0.02	-0.01
57	350	-0.04	-0.03	-0.02
58	450	-0.05	-0.04	-0.03
59	500	-0.06	-0.05	-0.04
60	70	0	+0.01	+0.02
61	90	0	+0.01	+0.02
62	80	0	+0.01	+0.02
63	180	-0.02	-0.01	0
64	250	-0.02	-0.01	0
65	300	-0.03	-0.02	-0.01
66	60	0	+0.01	+0.02
67	400	-0.05	-0.04	-0.03
68	75	0	+0.01	+0.02
69	150	-0.01	0	+0.01
70	110	-0.01	0	+0.01
71	130	-0.01	0	+0.01
72	160	-0.01	0	+0.01
73	106	-0.01	0	+0.01
74	600	-0.07	-0.06	-0.05

Example: Producible max. width is determined for the product GZR-1314 having 0,75 mm thickness and coating weight is equal to 500 g/m²

1. Step: Total coating mass 500 g/m² is matched with value of 0,06 mm,

2. Step: Controlling thickness value is obtained value of 0,06 is subtracted from order thickness (0,75 - 0,06 = 0,69 mm)

3. Step: Producible max. widht is determined as 1346 mm for the thickness 0,69 mm (between 0,66 and 0,70) in the table related with the third group having 1314 quality.

Production Limits

Table For Acceptable Order Width Depending On Coating Mass For Galvanized And Galvannealed Products For Group 4 To 9 Grades

Coating Code	Total Coating Mass (G/m²)	Nominal Order Thickness Range (mm)	
		t ≤ 1,80	t > 1,80
		Value Subtracted From Or Added To Nominal Order Thickness (mm)	
51	100	-0.01	0
52	120	-0.01	0
53	140	-0.01	0
54	200	-0.02	-0.01
55	225	-0.02	-0.01
56	275	-0.03	-0.02
57	350	-0.04	-0.03
58	450	-0.05	-0.04
59	500	-0.06	-0.05
60	70	0	+0.01
61	90	0	+0.01
62	80	0	+0.01
63	180	-0.02	-0.01
64	250	-0.02	-0.01
65	300	-0.03	-0.02
66	60	0	+0.01
67	400	-0.05	-0.04
68	75	0	+0.01
69	150	-0.01	0
70	110	-0.01	0
71	130	-0.01	0
72	160	-0.01	0
73	106	-0.01	0
74	600	-0.07	-0.06

Example: Producible max. width is determined for the product GZR-1332 having 0,81 mm thickness and coating weight is equal to 500 g/m²

1. Step: Total coating mass 500 g/m² is matched with value of 0,06 mm,

2. Step: Controlling thickness value is obtained value of 0,06 is subtracted from order thickness (0,81 - 0,06 = 0,75 mm)

3. Step: Producible max. widht is determined as 1200 mm for the thickness 0,75 mm (between 0,71 and 0,75) in the table related with the seventh group having 1332 quality.

Shape And Dimension Tolerances For Hot Dip Galvanized (Zn Coated) or Hot Dip Galvannealed (Zn-Fe Alloy Coated) Products

Tolerance Standard: EN 10143 - 2006

Applied Erdemir Product Types

GZR, GZRK, GZRD, GZRS, GFR, GFRK, GFRD, GFRS, GZRB, GZRKB, GZRC, GZRKC

General Application

- This standard applies to the products which have nominal thickness between 0,20 and 6,50 mm.

Thickness Tolerances

- The thickness may be measured at any point located more than 40 mm from the edges.
- In the case of slit coils or cut lengths having a width ≤ 80 mm, the position of the measurement shall be at the middle axis.
- Thickness tolerances are maximum 50 % increased for the 10 m long aera of the weld-joint coils or slitted coils.
- For Z450 and Z600 total coating weights, normal and special thcikness tolerances are -/+ 0,01 mm increased.
- 25 % thickness tolerance is not applied for nominal thicknesses less than or equal to 0,45 mm.
- 25 % and 50 % thickness tolerances aer applied not being less than +/- 0,020 mm.
- 25 % thickness tolerance is applied under the conditions menotined below.

Minimum Yield Strength(N/mm²)	Scope of Guarantee
< 360	% 95
≥ 360	% 90

A) Tolerances for steel grades with specified minimum yield strength Re<260 N/mm²

Nominal Thickness (t)	Width (w) (mm) Tolerance (mm)		
	w≤1200	1200<w≤1500	w>1500
0,20 < t ≤ 0,40	± 0,04	± 0,05	± 0,06
0,40 < t ≤ 0,60	± 0,04	± 0,05	± 0,06
0,60 < t ≤ 0,80	± 0,05	± 0,06	± 0,07
0,80 < t ≤ 1,00	± 0,06	± 0,07	± 0,08
1,00 < t ≤ 1,20	± 0,07	± 0,08	± 0,09
1,20 < t ≤ 1,60	± 0,10	± 0,11	± 0,12
1,60 < t ≤ 2,00	± 0,12	± 0,13	± 0,14

B) Tolerances for steel grades with specified minimum yield strength 260 N/mm² ≤ Re<360N/mm² and DX51D grade

Nominal Thickness (t)	Width (w) (mm) Tolerance (mm)		
	w≤1200	1200<w≤1500	w>1500
0,20 < t ≤ 0,40	± 0,05	± 0,06	± 0,07
0,40 < t ≤ 0,60	± 0,05	± 0,06	± 0,07
0,60 < t ≤ 0,80	± 0,06	± 0,07	± 0,08
0,80 < t ≤ 1,00	± 0,07	± 0,08	± 0,09
1,00 < t ≤ 1,20	± 0,08	± 0,09	± 0,11
1,20 < t ≤ 1,60	± 0,11	± 0,13	± 0,14
1,60 < t ≤ 2,00	± 0,14	± 0,15	± 0,16

c) Tolerances for steel grades with specified minimum yield strength 360 N/mm² ≤ Re<420N/mm²

Nominal Thickness (t)	Width (w) (mm) Tolerance (mm)		
	w≤1200	1200<w≤1500	w>1500
0,35 ≤ t ≤ 0,40	± 0,05	± 0,06	± 0,07
0,40 < t ≤ 0,60	± 0,06	± 0,07	± 0,08
0,60 < t ≤ 0,80	± 0,07	± 0,08	± 0,09
0,80 < t ≤ 1,00	± 0,08	± 0,09	± 0,11
1,00 < t ≤ 1,20	± 0,10	± 0,11	± 0,12
1,20 < t ≤ 1,60	± 0,13	± 0,14	± 0,16
1,60 < t ≤ 2,00	± 0,16	± 0,17	± 0,19

Width Tolerances

- Width measurement is performed perpendicularly to the longitudinal axis oft he product.

a) Sheet and wide strip of width ≥ 600 mm

Nominal Width (w)	Width Tolerance (mm)			
	Normal Tolerances		Special Tolerances (S)	
	Lower Limit	Upper Limit	Lower Limit	Upper Limit
600 ≤ w ≤ 1200	0	+ 5	0	+ 2
1200 < w ≤ 1500	0	+ 6	0	+ 2
1500 < w	0	+ 7	0	+ 3

- Special width tolerance (S) is applied to GZRK, GFRK, GZRD, GFRD products which have 600 mm or greater width.

b) For slitted coils or sheets which have less than 600 mm width

Nominal Thickness (mm) (t)	Width Tolerance (mm)							
	w<125		125≤w<250		250≤w<400		400≤w<600	
	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit
t < 0,6	0	+ 0,4	0	+ 0,5	0	+ 0,7	0	+ 1,0
0,6 ≤ t < 1,0	0	+ 0,5	0	+ 0,6	0	+ 0,9	0	+ 1,2
1,0 ≤ t < 2,0	0	+ 0,6	0	+ 0,8	0	+ 1,1	0	+ 1,4

Length Tolerance

- Length is measured along one of the long sides of the sheet or cut lengths.

Nominal Length (mm) (L)	Normal Tolerances	
	Lower Limit	Upper Limit
< 2000	0	+ 6
≥ 2000	0	% 0,3 x L

Tolerances

Flatness Tolerance

- Deviation from flatness is determined by measuring the deviation in distance between the product and a flat horizontal surface on which the sheet is placed.
- Flatness tolerances apply only to sheet products.

A) Flatness tolerances for grades which minimum yield strength Re < 260 N/mm²

		Maximum deviation from flatness according to nominal thickness (t)		
Tolerance Type	Nominal Width (w)	t<0,7	0,7≤t<1,6	1,6≤t<3,0
Normal	w < 1200	10	8	
	1200 ≤ w < 1500	12	10	
	1500 ≤ w	17	15	
Special (FS)	w < 1200	5	4	3
	1200 ≤ w < 1500	6	5	4
	1500 ≤ w	8	7	6

B) Flatness tolerances for grades which minimum yield strength (Re) is between 260 ≤ Re < 360 N/mm² and DX51D grade

		Maximum deviation from flatness according to nominal thickness (t)		
Tolerance Type	Nominal Width (w)	t<0,7	0,7≤t<1,6	1,6≤t<3,0
Normal	w < 1200	13	10	
	1200 ≤ w <1500	15	13	
	1500 ≤ w	20	19	
Special (FS)	w < 1200	8	6	5
	1200 ≤ w < 1500	9	8	6
	1500 ≤ w	12	10	9

C) Flatness tolerances for grades which minimum yield strength Re ≥ 360 N/mm²

- For these steel grades, the values for flatness tolerances shall be specified at the time of enquiry and odrer.

Galvanized/
Galvannealed
Flat Steel Products

Tolerances

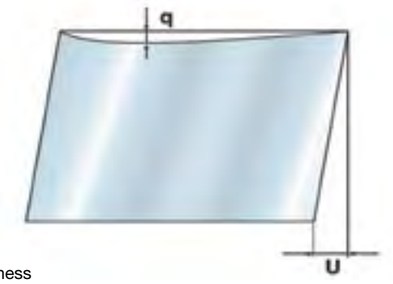
Tolerances For Edge Chamber

- Edge camber “q” is the maximum distance between a longitudinla edge and a straight edge supported on the latter.
- Edge camber shall be measured on the concave edge of the product.
- The basis of measurement shall be a distance of 2 m taken at any point on the edge.
- Special tolerances are not applied for edge camber.

	Product Dimensions (mm)			
Product Type	Width	Length	Measurement Length (mm)	Tolerance (mm)
Sheet	≥ 600	≥ 2000	2000	5
		< 2000	Actual Length (L)	+ 0,0025 L
Coil	≥ 600	-	2000	5
Slitted Coil	< 600	-	2000	5

Tolerances On Out Of Squareness (mm)

- The out-of-squareness “u” is the orthogonal projection of a transverse edge over a longitudinal edge.
- The out-of-squareness shall not exceed 1 % of the actual width of the she.



q: Edge camber
u: Out-of-squareness

erdemironline.com

Electrolytic Tinplate and Electrolytic Chromium Coated Steel (ECCS or TFS)

Electrolytic Tinplate and Electrolytic Chromium Coated Steel (ECCS or TFS)

Electrolytic tinplate is a material that is cold rolled, low carbon, mild flat steels produced by electrolytically chrome or tin coating in a thickness range of 0.12 to 0.60mm in coils or sheets.

General Application

Mainly used in packaging industry to manufacture industrial cans, such as 2 and 3 piece food & beverage cans, aerosols, twist-off caps and crown caps, easy-open lids, decorative packaging, and non packaging products such as for production of stationary and eletrical equipment and toys.

They have a combination of advantages unrivalled in any other material, such as;

- Non-toxic, health friendly
- Light
- Strong
- Easily fabricated into intricate shapes
- Weldability
- Corrosion resistant
- Attractive appearance
- Easily decorated by lithography
- Recyclability

Tinplate and tin free steels are produced after the following production steps;

- **Pickling:** This operation is for the removal of oxide layer formed during hot rolling,in an acid bath at 80°C.

- **Cold Rolling:** The process consists of reducing thickness of hot rolled and pickled coils to desired thickness in several passes.

- **Cleaning:** This operation is for removal of any impurties and lubricant residuces by means of passing the strip trough an alkaline bath

- **Annealing:** During cold rolling internal stress emerges. In order to relieve this stress the material is heated up to a temperature level over the recrystallizaiton point within a reductive (corrosion preventive) atmosphere and then cooled. There are two kinds of annealing, one of these being “batch” and the other being “continuous”.

- **Tempering:** The material is being gradually reduced, in order to provide it the desired hardness, surface condition and quality and mechanical properties. There is also a secondary cold rollling operation applicable at the temper line which is necessary for the production of DR tinplates

- **Coating:** The blackplate is passed continuously through a cleaning, electrolytic pickling, electro-deposition of tin or chromium, induction-melting for tinplate, passivation and oiling procedures. The final product is either a tinplate or a tin free steel. Erdemir produces both single(SR) and double reduced(DR) tin plates. Erdemir’s tin free steel is produced mainly single reduced.

Single Reduced (SR) Tinplate: This type of tinplate is produced by the steel coils being reduced to their ulitmate thicknesses at the tandem rolling mill in one rolling operation and then afterwards being annealed, tempered and then tin or chrome coated.

General Application Areas: Depending on steel quality & annealing type, they are used for angled cans, bottoms and bodies, 2 and 3 pieces round can bodies and lids, beverage cans, easy-open lids, twist-off caps and crown caps, aerosol cans.

Double Reduced (DR) Tinplate: This type of tinplate is produced by, after being reduced and annealed, the steel being 10-30% reduced (instead of being temper milled) and cold rolled for a second time and then finally tin coated.

General Application Areas: Depending on steel quality & annealing type, they are used for 2 and 3 pieces round can bodies and bottoms, angled can bottoms, easy-open lids, twist-off caps, aerosol cans.

The following general information about tinplate and tin free steel (TFS) produced in Erdemir.

Products:

We can supply our tinplate products in the following form and structure:

- As electrolytic tin or chromium coated, low carbon mild steel
- As skin-passed after continuous or batch annealing,
- As single reduced or double reduced
- As coil or cut to length

Dimension:

- Thickness, width and length values are nominal, unless otherwise specified.
- Coil inner diameter can be 420mm (+10 / -15 mm) .

Surface Protection:

- **Oiling (O) :** The total amount of protective oil (of both surfaces totally) on products' surfaces are given below. Unless otherwise specified normal oiling proportions are used. Orders with requests for oiling diferent to these are subject to negotitation.
  Normal : 3.4-8.0 mg/m^2
  Abundant : 10-18 mg/ m^2
- Erdemir does not recommend tinplate products with unoiled or lightly oiled surfaces. In the event of orders of such products Erdemir will not be responsible for any corrosion occurrences on surfaces.

Electrolytic Tinplate and Electrolytic Chromium Coated Steel (ECCS or TFS)

General Technical Facts

Surface Type:

- Surface types and surface roughness values of single reduced tinplates available at Erdemir are as follows:

Product Finish	Surface Roughness
Bright	Ra≤ 0.35
Fine Stone	0.25≤Ra≤0.45
Stone	0.35≤Ra≤0.60
Matt / Normal(1)	0.60≤Ra≤1.90
Silver	Ra≥ 0.90

1) Only applied to tin coated prtoducts.Not applied to chromium coated products.

- Surface types and surface roughness values of double reduced tinplates available at Erdemir are as follows:

Product Finish	Surface Roughness
Stone	0.35≤Ra≤0.60
Fine Stone	0.25≤Ra≤0.45

Marking:

In orders requested with different coating weights the upper face will be relatively heavier coated and it will be marked with continous paralel lines, unless otherwise specified.

Mechanical Test:

Tensile test is carried out according to EN ISO 6892-1" Metallic Materials - Tensile Test - Part 1: Tests Performed at Room Temperature " The test certificate containing the mechanical test and chemical analysis results sent to the customer is an inspection document and is prepared according to the standard EN 10204 "Metallic products - Types of Inspection Documents". In case an analysis / test report is requested by our customers within the scope of TS EN ISO / IEC 17025 "General Conditions for the Competence of Testing and Calibration Laboratories", the report can be requested from the sales unit with a request letter.

Grade Index

Application Areas and Correspondence Standards of Tinplate Products

Scope of Application And Main Properties	Corresponding		Erdemir Steel Grade
	Standard	Grade	
Single reduced and batch annealed tin coated steels for manufacture of packaging and tin cans	EN 10202:2001	TS230	2023
	EN 10202:2001	TS245	2004
	EN 10202:2001	TS260	2026
	EN 10202:2001	TS275	2005
	EN 10202:2001	TS415	2006
	EN 10202:2001	TS415	2007
Single reduced and batch annealed chrome coated steels for manufacture of packaging and cans	EN 10202:2001	TS230	2123
	EN 10202:2001	TS245	2104
	EN 10202:2001	TS260	2126
	EN 10202:2001	TS275	2105
	EN 10202:2001	TS415	2106
Single reduced and continuous annealed tin coated steels	EN 10202:2001	TH230	2223
	EN 10202:2001	TH245	2225
	EN 10202:2001	TH260	2226
	EN 10202:2001	TH275	2228
	EN 10202:2001	TH415	2240
	EN 10202:2001	TH415	2242
	EN 10202:2001	TH435	2244
Double reduced and continuous annealed tin coated steels	Erdemir-20	TH460	2246
	EN 10202:2001	TH520	2252
	Erdemir-21	Tinform8	2254
	EN 10202:2001	TH550	2255
	Erdemir-21	DR8 Mod	2256
	EN 10202:2001	TH580	2258
	EN 10202:2001	TH620	2260
	EN 10202:2001	TH620	2262
Double reduced and continuous annealed chrome coated steels	EN 10202:2001	TH520	2352
	EN 10202:2001	TH550	2355
	EN 10202:2001	TH580	2358
	EN 10202:2001	TH620	2360
	EN 10202:2001	TH620	2362
Single reduced and continuous annealed chrome coated steels	EN 10202:2001	TH230	2323
	EN 10202:2001	TH245	2325
	EN 10202:2001	TH260	2326
	EN 10202:2001	TH275	2328
	EN 10202:2001	TH415	2340
	EN 10202:2001	TH415	2342
	EN 10202:2001	TH435	2344

Electrolytic Tinplate and Electrolytic Chromium Coated Steel (ECCS or TFS)

Grade Index

Application Areas and Correspondence Standards of Tinplate Products

Corresponding Similar Standards [1]				Page No
Material No	Previous	American	Japanese	
1.0371	DIN EN 10203 T1	ASTM A623 T49	JIS G 3303	266
1.0372	DIN EN 10203 T2	ASTM A623 T53	JIS G 3303	266
1.0379	DIN EN 10203 T2,5	ASTM A623 T55	JIS G 3303	266
1.0375	DIN EN 10203 T3	ASTM A623 T57	JIS G 3303	266
1.0377	DIN EN 10203 T4	ASTM A623 T61	JIS G 3303	266
1.0377	DIN EN 10203 T4	ASTM A623 T61	JIS G 3303	266
1.0371	DIN EN 10203 T1	ASTM A623 T49	JIS G 3315	267
1.0372	DIN EN 10203 T2	ASTM A623 T53	JIS G 3315	267
1.0379	DIN EN 10203 T2,5	ASTM A623 T55	JIS G 3315	267
1.0375	DIN EN 10203 T3	ASTM A623 T57	JIS G 3315	267
1.0377	DIN EN 10203 T4	ASTM A623 T61	JIS G 3315	267
1.0371	DIN EN 10203 T1	ASTM A623 T49	JIS G 3303	268
1.0372	DIN EN 10203 T2	ASTM A 623 T53	JIS G 3303	268
1.0379	DIN EN 10203 T2,5	ASTM A623 T55	JIS G 3303	268
1.0375	DIN EN 10203 T3	ASTM A623 T57	JIS G 3303	268
1.0377	DIN EN 10203 T4	ASTM A 623 T61	JIS G 3303	268
1.0377	DIN EN 10203 T4	ASTM A623 T61	JIS G 3303	268
1.0378	DIN EN 10203 T5	ASTM A623 T65	JIS G 3303	268
				271
1.0384	DIN EN 10203 DR 520	ASTM A 623 DR7,5	JIS G 3303	270
				272
1.0373	DIN EN 10203 DR 550	ASTM A 623 DR8	JIS G 3303	270
				271
10.374	DIN EN 10203 DR 620	ASTM A 623 DR9	JIS G 3303	270
10.374	DIN EN 10203 DR 620	ASTM A 623 DR9	JIS G 3303	270
10.384	DIN EN 10203 DR 520	ASTM A 623 DR7,5	JIS G 3303	270
10.384	DIN EN 10203 DR 520	ASTM A 623 DR7,5	JIS G 3303	272
10.373	DIN EN 10203 DR 550	ASTM A 623 DR8	JIS G 3303	272
10.382	DIN EN 10203 DR 580	ASTM A 623 DR8,5	JIS G 3303	272
10.374	DIN EN 10203 DR 620	ASTM A 623 DR9	JIS G 3303	272
10.374	DIN EN 10203 DR 620	ASTM A 623 DR9	JIS G 3303	272
1.0371	DIN EN 10203 T1	ASTM A623 T49	JIS G 3315	269
1.0372	DIN EN 10203 T2	ASTM A 623 T53	JIS G 3315	269
1.0379	DIN EN 10203 T2,5	ASTM A623 T55	JIS G 3315	269
1.0375	DIN EN 10203 T3	ASTM A623 T57	JIS G 3315	269
1.0377	DIN EN 10203 T4	ASTM A 623 T61	JIS G 3315	269
1.0377	DIN EN 10203 T4	ASTM A623 T61	JIS G 3315	269
1.0378	DIN EN 10203 T5	ASTM A623 T65	JIS G 3315	269

1) The other corresponding standards specified in the table above may be in exact or similar correspondence. Therefore, the conformity of the other related standards are not guaranteed. The corresponding standards and grades given on this table are only for information

Steel Grades

Electrolytic Tinplate (Single Cold Reduced, Batch-Annealed)

Standard: EN 10202:2001

Chemical Composition(%)[1]

Corresponding		Erdemir[1] Steel Grade	C	Mn	P	S	Si	Al	N
Standard	Grade				max.	max.	max.		max.
EN 10202	TS230	2023	0.01-0.04	0.10-0.30	0.020	0.020	0.020	0.020-0.070	0.008
EN 10202	TS245	2004	0.03-0.06	0.15-0.35	0.020	0.020	0.020	0.020-0.070	0.008
EN 10202	TS260	2026	0.05-0.09	0.20-0.40	0.020	0.020	0.020	0.020-0.070	0.008
EN 10202	TS275	2005	0.05-0.09	0.20-0.40	0.020	0.020	0.020	0.020-0.070	0.008
EN 10202	TS415	2006	0.09-0.12	0.30-0.50	0.020	0.020	0.020	0.020-0.070	0.008
EN 10202	TS415	2007	0.09-0.12	0.30-0.50	0.020	0.020	0.020	0.020-0.070	0.008

Notes

1) Chemical limits specified in the table are reference values, only for guidance.

Mechanical Properties[1] [2]

Corresponding		Erdemir Steel Grade	R_{eL}, $R_{p0.2}$ N/mm² (kg/mm²)	Aim Values N/mm² (kg/mm²)		R_m N/mm² (kg/mm²)	Previous Standard Designations		Hardness (HR 30 Tm) d (mm)		
Standard	Grade			R_{eL}, $R_{p0.2}$	R_m				d≤0.21	0.21<d≤0.28	d>0.28
EN 10202	TS230	2023	180-280 (18.4-28.6)	230 (23.5)	325 (33.2)	275-375 (28.1-38.3)	T50	T 1	53 max.	52 max.	51 max.
EN 10202	TS245	2004	195-295 (19.9-30.1)	245 (25.0)	340 (34.7)	290-390 (29.6-39.8)	T53	T 2	49-57	48-56	47-55
EN 10202	TS260	2026	210-310 (21.4-31.6)	260 (26.5)	360 (36.7)	310-410 (31.6-41.8)	T55	T 2.5	52-60	51-59	50-58
EN 10202	TS275	2005	225-325 (23.0-33.2)	275 (28.1)	375 (38.3)	325-425 (33.2-43.4)	T57	T 3	54-62	53-61	52-60
EN 10202	TS415	2006	365-465 (37.2-47.4)	415 (42.3)	435 (44.4)	385-485 (39.3-49.5)	T61	T 4	58-66	57-65	56-64
EN 10202	TS415	2007	365-465 (37.2-47.4)	415 (42.3)	435 (44.4)	385-485 (39.3-49.5)	T61	T 4	58-66	57-65	56-64

Notes

1) Tensile test values apply to “longitudinal” test pieces
2) Mechanical properties specified in the table are reference values only for guidance.

Electrolytic Tinplate and Electrolytic Chromium Coated Steel (ECCS or TFS)

Steel Grades

Electrolytic Chromium Coated Steels (TFS) (Single Cold Reduced, Batch-Annealed)

Standard: EN 10202:2001

Chemical Composition(%)[1]

Corresponding		Erdemir[1] Steel Grade	C	Mn	P	S	Si	Al	N
Standard	Grade				max.	max.	max.		max.
EN 10202	TS230	2123	0.01-0.04	0.10-0.30	0.020	0.020	0.020	0.020-0.070	0.008
EN 10202	TS245	2104	0.03-0.06	0.15-0.35	0.020	0.020	0.020	0.020-0.070	0.008
EN 10202	TS260	2126	0.05-0.09	0.20-0.40	0.020	0.020	0.020	0.020-0.070	0.008
EN 10202	TS275	2105	0.05-0.09	0.20-0.40	0.020	0.020	0.020	0.020-0.070	0.008
EN 10202	TS415	2106	0.09-0.12	0.30-0.50	0.020	0.020	0.020	0.020-0.070	0.008

Notes

1) Chemical limits specified in the table are reference values only for guidance.

Mechanical Properties[1] [2]

Corresponding		Erdemir Steel Grade	R_{eL}, $R_{p0.2}$ N/mm² (kg/mm²)	Aim Values N/mm² (kg/mm²)		R_m N/mm² (kg/mm²)	Previous Standard Designations		Hardness (HR 30 Tm) d (mm)		
Standard	Grade			R_{eL}, $R_{p0.2}$	R_m				d≤0.21	0.21<d≤0.28	d>0.28
EN 10202	TS230	2123	180-280 (18.4-28.6)	230 (23.5)	325 (33.2)	275-375 (28.1-38.3)	T50	T 1	53 max.	52 max.	51 max.
EN 10202	TS245	2104	195-295 (19.9-30.1)	245 (25.0)	340 (34.7)	290-390 (29.6-39.8)	T53	T 2	49-57	48-56	47-55
EN 10202	TS260	2126	210-310 (21.4-31.6)	260 (26.5)	360 (36.7)	310-410 (31.6-41.8)	T55	T 2.5	52-60	51-59	50-58
EN 10202	TS275	2105	225-325 (23.0-33.2)	275 (28.1)	375 (38.3)	325-425 (33.2-43.4)	T57	T 3	54-62	53-61	52-60
EN 10202	TS415	2106	365-465 (37.2-47.4)	415 (42.3)	435 (44.4)	385-485 (39.3-49.5)	T61	T 4	58-66	57-65	56-64

Notes

1) Tensile test values apply to “longitudinal” test pieces
2) Mechanical properties specified in the table are reference values only for guidance.

Steel Grades

Electrolytic Tinplate (Single Cold Reduced, Continuous Annealed)

Standard: EN 10202:2001

Chemical Composition(%)

Corresponding		Erdemir[1] Steel Grade	C	Mn	P	S	Si	Al	N
Standard	Grade				max.	max.	max.		max.
EN 10202	TH230	2223	0.004 max.	0.10-0.25	0.020	0.015	0.020	0.020-0.070	0.005
EN 10202	TH245	2225	0.004 max.	0.10-0.25	0.020	0.015	0.020	0.020-0.070	0.005
EN 10202	TH260	2226	0.006 max.	0.20-0.35	0.020	0.020	0.020	0.020-0.060	0.006
EN 10202	TH275	2228	0.02-0.05	0.10-0.25	0.020	0.020	0.030	0.030-0.080	0.005
EN 10202	TH415	2240[2]	0.03-0.05	0.30-0.40	0.018	0.020	0.030	0.020-0.050	0.005
EN 10202	TH415	2242	0.03-0.08	0.20-0.35	0.020	0.020	0.030	0.020-0.070	0.009
EN 10202	TH435	2244	0.03-0.08	0.20-0.40	0.020	0.020	0.030	0.020-0.070	0.015

Notes

1) Chemical limits specified in the table are reference values only for guidance.
2) For Easy Open End Cap Production

Mechanical Properties[1] [2]

Corresponding		Erdemir Steel Grade	R_e, $R_{p0.2}$ N/mm² (kg/mm²)	Aim Values N/mm² (kg/mm²)		R_m N/mm² (kg/mm²)	Previous Standard Designations		Hardness (HR 30 Tm) d (mm)		
Standard	Grade			R_e, $R_{p0.2}$	R_m				d≤0.21	0.21<d≤0.28	d>0.28
EN 10202	TH230	2223	180-280 (18.4-28.6)	230 (23.5)	325 (33.2)	275-375 (28.1-38.3)	T50	T1	53 max.	52 max.	51 max.
EN 10202	TH245	2225	195-295 (19.9-30.1)	245 (25.0)	340 (34.7)	290-390 (29.6-39.8)	T53	T2	49-57	48-56	47-55
EN 10202	TH260	2226	210-310 (21.4-31.6)	260 (26.5)	360 (36.7)	310-410 (31.6-41.8)	T55	T2,5	52-60	51-59	50-58
EN 10202	TH275	2228	225-325 (23.0-33.2)	275 (28.1)	375 (38.3)	325-425 (33.2-43.4)	T57	T3	54-62	53-61	52-60
EN 10202	TH415	2240	365-465 (37.2-47.4)	415 (42.3)	435 (44.4)	385-485 (39.3-49.5)	T61	T4	58-66	57-65	-
EN 10202	TH415	2242	365-465 (37.2-47.4)	415 (42.3)	435 (44.4)	385-485 (39.3-49.5)	T61	T4	58-66	57-65	56-64
EN 10202	TH435	2244	385-485 (39.3-49.5)	435 (44.4)	460 (46.9)	410-510 (41.8-52.0)	T65	T5	61-69	61-69	60-68

Notes

1) Tensile test values apply to “longitudinal” test pieces
2) Mechanical properties specified in the table are reference values only for guidance.

Electrolytic Tinplate and Electrolytic Chromium Coated Steel (ECCS or TFS)

Steel Grades

Electrolytic Chromium Coated Steel (TFS) (Single Cold Reduced, Continuous Annealed)

Standard: EN 10202:2001

Chemical Composition(%)[1]

Corresponding		Erdemir[1] Steel Grade	C	Mn	P	S	Si	Al	N
Standard	Grade				max.	max.	max.		max.
EN 10202	TH230	2323	0.004 max.	0.10-0.25	0.020	0.015	0.020	0.020-0.070	0.005
EN 10202	TH245	2325	0.004 max.	0.10-0.25	0.020	0.015	0.020	0.020-0.070	0.005
EN 10202	TH260	2326	0.006 max.	0.20-0.35	0.020	0.020	0.020	0.020-0.070	0.006
EN 10202	TH275	2328	0.02-0.05	0.10-0.25	0.020	0.020	0.030	0.030-0.080	0.005
EN 10202	TH415	2340[2]	0.03-0.05	0.30-0.40	0.018	0.020	0.030	0.020-0.050	0.005
EN 10202	TH415	2342	0.03-0.07	0.20-0.40	0.020	0.020	0.030	0.020-0.070	0.015
EN 10202	TH435	2344	0.04-0.08	0.25-0.45	0.020	0.020	0.030	0.020-0.070	0.015

Notes

1) Chemical limits specified in the table are reference values only for guidance.
2) For Easy Open End Cap Production

Mechanical Properties[1] [2]

Corresponding		Erdemir Steel Grade	R_e, $R_{p0.2}$ N/mm² (kg/mm²)	Aim Values N/mm² (kg/mm²)		R_m N/mm² (kg/mm²)	Previous Standard Designations		Hardness (HR 30 Tm) d (mm)		
Standard	Grade			R_e, $R_{p0.2}$	R_m				d≤0.21	0.21<d≤0.28	d>0.28
EN 10202	TH230	2323	180-280 (18.4-28.6)	230 (23.5)	325 (33.2)	275-375 (28.1-38.3)	T50	T1	53 max.	52 max.	51 max.
EN 10202	TH245	2325	195-295 (19.9-30.1)	245 (25.0)	340 (34.7)	290-390 (29.6-39.8)	T53	T2	49-57	48-56	47-55
EN 10202	TH260	2326	210-310 (21.4-31.6)	260 (26.5)	360 (36.7)	310-410 (31.6-41.8)	T55	T2,5	52-60	51-59	50-58
EN 10202	TH275	2328	225-325 (23.0-33.2)	275 (28.1)	375 (38.3)	325-425 (33.2-43.4)	T57	T3	54-62	53-61	52-60
EN 10202	TH415	2340[3]	365-465 (37.2-47.4)	415 (42.3)	435 (44.4)	385-485 (39.3-49.5)	T61	T4	58-66	57-65	
EN 10202	TH415	2342	365-465 (37.2-47.4)	415 (42.3)	435 (44.4)	385-485 (39.3-49.5)	T61	T4	58-66	57-65	56-64
EN 10202	TH435	2344	385-485 (39.3-49.5)	435 (44.4)	460 (46.9)	410-510 (41.8-52.0)	T65	T5	61-69	61-69	60-68

Notes

1) Tensile test values apply to “longitudinal” test pieces
2) Mechanical properties specified in the table are reference values only for guidance.
3) Mechanical properties are the referance values after baking process.

Steel Grades

Electrolytic Tinplate (Double Cold Reduced, Continuous Annealed)

Standard: EN 10202:2001

Chemical Composition(%)[1]

Corresponding		Erdemir[1] Steel Grade	C	Mn	P	S	Si	Al	N
Standard	Grade		max.	max.	max.	max.	max.		max.
EN 10202	TH520	2252	0.08	0.35	0.020	0.020	0.030	0.025-0.070	0.009
EN 10202	TH550	2255	0.08	0.35	0.020	0.020	0.030	0.025-0.070	0.009
EN 10202	TH580	2258	0.08	0.35	0.020	0.020	0.030	0.025-0.070	0.009
EN 10202	TH620	2260[2]	0.006	0.40	0.020	0.020	0.030	0.030 max.	0.006
EN 10202	TH620	2262	0.08	0.40	0.020	0.020	0.030	0.025-0.070	0.015

Notes

1) Chemical limits specified in the table are reference values only for guidance.
2) For twist-off cap production

Mechanical Properties[1] [2]

Corresponding		Erdemir Steel Grade	R_e, $R_{p0.2}$ N/mm² (kg/mm²)	Aim Values N/mm² (kg/mm²)		R_m N/mm² (kg/mm²)	Previous Standard Designations		Hardness (HR 30 Tm)		
				R_e, $R_{p0.2}$	R_m		Previous	ASTM A623	min.	Intended	max.
Standard	Grade										
EN 10202	TH520	2252	470-570 (48.0-58.2)	520 (53.1)	540 (55.1)	490-590 (50.0-60.2)	DR520	DR7.5	67	71	75
EN 10202	TH550	2255	500-600 (51.0-61.2)	550 (56.1)	570 (58.2)	520-620 (53.1-63.3)	DR550	DR8	68	72	76
EN 10202	TH580	2258	530-630 (54.1-64.3)	580 (59.2)	590 (60.2)	540-640 (55.1-65.3)	DR580	DR8.5	69	73	77
EN 10202	TH620	2260[3]	570-670 (58.2-68.4)	620 (63.3)	625 (63.8)	575-675 (58.7-68.9)	DR620	DR9	71	75	79
EN 10202	TH620	2262	570-670 (58.2-68.4)	620 (63.3)	625 (63.8)	575-675 (58.7-68.9)	DR620	DR9	71	75	79

Notes

1) Tensile test values apply to “longitudinal” test pieces
2) Mechanical properties specified in the table are reference values only for guidance.
3) Mechanical properties are the referance values after baking process.

Electrolytic Tinplate and Electrolytic Chromium Coated Steel (ECCS or TFS)

Steel Grades

Electrolytic Tinplate (Double Cold Reduced, Continuous Annealed)

Standard: Erdemir

Chemical Composition(%)

Corresponding		Erdemir[1] Steel Grade	C	Mn	P	S	Si	Al	N
Standard	Grade				max.	max.	max.		max.
Erdemir-20	TH460	2246	0.05-0.09	0.20-0.40	0.020	0.020	0.020	0.020-0.070	0.008
Erdemir-21	DR8 Özel	2256	0.05-0.09	0.20-0.40	0.020	0.020	0.020	0.020-0.070	0.008

Notes

1) Chemical limits specified in the table are reference values, only for guidance.
2) Thickness’s is less than 0,20 mm orders for grade 2246 are subjected to negotiation.
3) 2256 grade orders are subjected to negotiation.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e, $R_{p0.2}$ N/mm² (kg/mm²)	Aim Values N/mm² (kg/mm²)		R_m N/mm² (kg/mm²)	$A_{80^{mm}}$ % min.	Previous Standard Designations		Hardness (HR 30 Tm)		
				R_e, $R_{p0.2}$	R_m			Previous	ASTM A623	min.	Intended	max.
Standard	Grade											
Erdemir-20	TH460	2246	410-510 (41.8-52.0)	460 (46.9)	480 (49.0)	425-535 (43.3-54.6)	-	TH460	DR6	63	67	71
Erdemir-21	DR8 Özel	2256	500-600 (51.0-61.2)	550 (56.1)	570 (58.2)	520-620 (53.1-63.3)	2,5	-		68	72	76

Notes

1) Tensile test values apply to “(0°- 45°- 90°)” test pieces
2) Mechanical properties specified in the table are reference values only for guidance.
3) % Elongation value in the table before baking process and (0°- 45°- 90°) is guaranteed.
4) Burrs on the edges of samples should be grinded for accurate % elongation measurement.

Steel Grades

Electrolytic Tinplate (Double Cold Reduced, Continuous Annealed)

Standard: Erdemir

Chemical Composition(%)

Corresponding		Erdemir[1] Steel Grade	C	Mn	P	S	Si	Al	N
Standard	Grade				max.	max.	max.		max.
Erdemir-21	Tinform8	2254	0.08	0.35	0.020	0.020	0.030	0.070	0.020

Notes

1) Chemical limits specified in the table are reference values, only for guidance.
2) Tinform8 grade orders are subjected to negotiation.
3) Tinform8 grade is suitable for EOE products.

Mechanical Properties

Corresponding		Erdemir Steel Grade	R_e, $R_{p0.2}$ N/mm² (kg/mm²)	Aim Values N/mm² (kg/mm²)		R_m N/mm² (kg/mm²)	$A_{80^{mm}}$ % min.	Hardness (HR 30 Tm)		
Standard	Grade			R_e, $R_{p0.2}$	R_m			min.	Intended	max.
Erdemir-21	Tinform8	2254	500-600 (51.0-61.2)	550 (56.1)	570 (58.2)	520-620 (53.1-63.3)	5	68	72	76

Notes

1) Tensile test values apply to “(0°- 45°- 90°)” test pieces
2) Mechanical properties specified in the table are reference values only for guidance.
3) % Elongation value in the table before baking process and (0°- 45°- 90°) is guaranteed.
4) Burrs on the edges of samples should be grinded for accurate % elongation measurement.

Production Limits

Electrolytic Chromium Coated (Double Cold Reduced, Continuous Annealed)

Standard: EN 10202:2001

Chemical Composition(%)[1]

Corresponding		Erdemir[1] Steel Grade	C	Mn	P	S	Si	Al	N
Standard	Grade		max.	max.	max.	max.	max.		max.
EN 10202	TH520	2352	0.08	0.35	0.020	0.020	0.030	0.025-0.070	0.009
EN 10202	TH550	2355	0.08	0.35	0.020	0.020	0.030	0.025-0.070	0.009
EN 10202	TH580	2358	0.08	0.35	0.020	0.020	0.030	0.025-0.070	0.009
EN 10202	TH620	2360	0.006	0.40	0.020	0.020	0.030	0.030	0.006
EN 10202	TH620	2362	0.08	0.40	0.020	0.020	0.030	0.025-0.070	0.015

Notes

1) Chemical limits specified in the table are reference values only for guidance.
2) Orders are subjected to negotiation.

Mechanical Properties[1] [2]

Corresponding		Erdemir Steel Grade	R_e, $R_{p0.2}$ N/mm² (kg/mm²)	Aim Values N/mm² (kg/mm²)		R_m N/mm² (kg/mm²)	Previous Standard Designations		Hardness (HR 30 Tm)		
Standard	Grade			R_e, $R_{p0.2}$	R_m		Previous	ASTM A623	min.	Intended	max.
EN 10202	TH520	2352	470-570 (48.0-58.2)	520 (53.1)	540 (55.1)	490-590 (50.0-60.2)	DR520	DR7.5	67	71	75
EN 10202	TH550	2355	500-600 (51.0-61.2)	550 (56.1)	570 (58.2)	520-620 (53.1-63.3)	DR550	DR8	68	72	76
EN 10202	TH580	2358	530-630 (54.1-64.3)	580 (59.2)	590 (60.2)	540-640 (55.1-65.3)	DR580	DR8.5	69	73	77
EN 10202	TH620	2360	570-670 (63.3-68.4)	620 (63.3)	625 (63.8)	575-675 (58.7-68.9)	DR620	DR9	71	75	79
EN 10202	TH620	2362	570-670 (63.3-68.4)	620 (63.3)	625 (63.8)	575-675 (58.7-68.9)	DR620	DR9	71	75	79

Notes

1) Tensile test values apply to **“longitudinal”** test pieces
2) Mechanical properties specified in the table are reference values only for guidance.
3) Mechanical properties are the referance values after baking process.

Production Limits

* Producibility limits will be evaluated before ordering in according to existing orders and mills' production conditions.

Electrolytic Tinplate and Electrolytic Chromium Coated Steel (TFS) Products

Product	Symbol	Page Number
DTNR	Double reduced electrolytic tinplate coil	275
DTNRS	Double reduced electrolytic tinplate sheet cut from coil	275
DTFR	Double reduced chromium coated steel coil	275
TNR	Single reduced electrolytic tinplate coil	276
TNRS	Single reduced electrolytic tinplate sheet cut from coil	276
TFR	Single reduced chromium coated steel coil	276
TFRS	Single reduced chromium coated steel sheet cut from coil	276

Electrolytic Tinplate and Electrolytic Chromium Coated Steel (ECCS or TFS)

Production Limits

DTNR

Coil - Double Reduced, Electrolytic Tinplate

DTFR

Coil - Double Reduced, Chromium Plated Tin Free Steel

DTNRS

Sheet - Double Reduced, Electrolytic Tinplate

Dimensions

Thickness (mm)	Maximum Width (mm)			
	Group-CA1	Group-CA2	Group-CA3	Group-CA4
0,120 - 0,125	860	860		
0,130 - 0,145	910	910		
0,150	960	960	889	889
0,155	960	960	989	989
0,160 - 0,190	1032	1016	989	989
0,195 - 0,300	1032	1016		

Steel Grades

Group	Product Type	Annealing Type	Grades
CA1	DTNR	Continuous	2246, 2252 , 2254 , 2255 , 2256 , 2258 , 2262
	DTFR	Continuous	2352 , 2355, 2358 , 2362
CA2	DTNRS	Continuous	2246, 2252 , 2254 , 2255 , 2256 , 2258 , 2262
CA3	DTNR	Continuous	2260
	DTFR	Continuous	2360
CA4	DTNRS	Continuous	2260

Notes

1) Inside diameter of coil is 420 mm. Orders with 508 mm coil inner diameter are subjected to negotiation.
2) Only fine stone finish is produced for the product type DTNR between the thickness 0.12 mm and 0.15 mm. Other surface types are subjected to negotiation.
3) 2260 grade orders are subjected to negotiation
4) The minimum width is 650 mm.
5) All of the products are produced according to EN 10202 and TS EN 10202
6) Orders are accepted for the product type DTNRS between the thickness 0,15 mm and 0,30 mm.
7) Ordered width for the product type DTNRS is max. 1016 mm.
8) The temper designation is T72 for the grades 2252 and 2352
   The temper designation is T73 for the grades 2255 and 2355
   The temper designation is T74 for the grade 2258
   The temper designation is T76 for the grade 2260
   The temper designation is T76 for the grade 2262
9) Length: min. 450 mm, max. 1168 mm.
10) Coil weight: min. 3000 kg, max 20500 kg.
11) Maximum bundle weight : 2700 kg.
12) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening unit equipment and practice. To avoid this problem, orders should be given as cut to length product.
13) Surface finish with values of roughness is given in the table below.
14) DTFR orders are subjected to negotiation.
15) 2246 grade orders are subjected to negotiation.
16) 2254 and 2256 grade orders are subjected to negotiation.

Surface Type	Surface Roughness (Ra, mikron)	Applied Products
STONE	$0.35 \leq Ra \leq 0.60$	DTNR, DTNRS
FINE STONE	$0.25 \leq Ra \leq 0.45$	DTNR, DTNRS

TNR/TNRS

Single Reduced, Electrolytic Tinplate Coil / Sheet

TFR/TFRS

Single Reduced, Chromium - Plated Tin Free Steel Coil / Sheet

Dimensions

Thickness (mm)	Maximum Width (mm)[6]		
	Group-CA1	Group-CA2	Group-BA
0,160 - 0,175	871	860	860
0,180 - 0,195	924	932	917
0,200 - 0,215	970	950	960
0,220 - 0,245	1032	975	1032
0,250 - 0,555	1050	1050	1050
0,560 - 0,600			1050

Steel Grades

Group	Product Type	Annealing Type	Grades
CA1	TNR, TNRS	Continuous	2223, 2225, 2226, 2228, 2240, 2242
	TFR, TFRS	Continuous	2323, 2325, 2326, 2328, 2340, 2342
CA2	TNR, TNRS	Continuous	2244
	TFR, TFRS	Continuous	2344
BA	TNR, TNRS	Batch	2004 , 2005 , 2006 , 2007, 2023 , 2026
	TFR, TFRS	Batch	2104, 2105, 2106, 2123, 2126

Notes

1) Orders for thicknesses greater than 0,35 mm are subjected to negotiation.
2) Order for grades 2006, 2106 with thickness thinner than 0,24 mm are subjected to negotiation.
3) The minimum & maximum order thicknesses are 0.20 and 0.22 mm for grades 2240 and 2340.
4) Inner diameter of coil is 420 mm. Orders with 508 mm coil inner diameter are subjected to negotiation.
5) The minimum width is 650 mm.
6) All of the products are produced acc. to EN 10202 and TS EN 10202
7) The temper designation is T50(T1) for the grades 2023, 2123, 2223, 2323.
   The temper designation is T52(T2) for the grades 2004, 2104, 2225, 2325.
   The temper designation is T55(T2,5) for the grades 2026, 2126, 2226, 2326.
   The temper designation is T57(T3) for the grades 2005, 2105, 2228, 2328.
   The temper designation is T61(T4) for the grades 2006, 2106, 2242, 2342.
   The temper designation is T65(T5) for the grades 2244, 2344.
8) The minimum thickness to be ordered for grades 2223, 2225, 2226, 2323, 2325, 2326 is 0,220 mm.
9) Ordered width for the product type TNRS and TFRS is max. 1025 mm.
10) Length: min. 450 mm, max. 1168 mm.
11) Coil weight: min. 3000 kg, max 20500 kg.
12) Maximum bundle weight : 2700 kg.
13) For Erdemir 2228 grade orders, which is the rolling width is greater than 800 mm and if the material will be used for producing can which has volume greater than 18 litres, are subjected to negotiation. Otherwise strecher strain and rupture complaints are not accepted.
14) Claims related with wave defect will not be accepted if the cutting into length will be applied to the ordered coils by themselves without using adequate flattening unit equipment and practice. To avoid this problem, orders should be given as cut to length product.
15) Surface finish with values of roughness is given in the table below.

Surface Type	Surface Roughness (Ra, mikron)	Applied Products
BRIGHT	Ra ≤ 0.35	TNR, TFR, TNRS, TFRS
FINE STONE	0.25 ≤ Ra ≤ 0.45	TNR, TFR, TNRS, TFRS
STONE	0.35 ≤ Ra ≤ 0.60	TNR, TFR, TNRS, TFRS
MATT (NORMAL)	0.60 < Ra ≤ 1.90	TNR, TNRS
SILVER	Ra ≥ 0.90	TNR, TFR, TNRS, TFRS

Electrolytic Tinplate and Electrolytic Chromium Coated Steel (ECCS or TFS)

Production Limits

Coating Weight(Mass) Table

Erdemir Coating Code	lb/bb				g/m²	
	Upper Surface		Bottom Surface		Upper Surface	Bottom Surface
		Coating Code Acc. To ASTM A624		Coating Code Acc. To ASTM A624		
01	0.050	10	0.050	10	1.12	1.12
02	0.100	20	0.100	20	2.24	2.24
03	0.125	25	0.063	12	2.80	1.40
04	0.089	18	0.125	25	2.00	2.80
05	0.125	25	0.089	18	2.80	2.00
06	0.223	45	0.089	18	5.00	2.00
07	0.179	35	0.179	35	4.00	4.00
11	0.125	25	0.125	25	2.80	2.80
12	0.250	50	0.125	25	5.60	2.80
13	0.375	75	0.125	25	8.40	2.80
14	0.500	100	0.125	25	11.20	2.80
21	0.125	25	0.250	50	2.80	5.60
22	0.250	50	0.250	50	5.60	5.60
23	0.375	75	0.250	50	8.40	5.60
24	0.500	100	0.250	50	11.20	5.60
31	0.125	25	0.375	75	2.80	8.40
33	0.375	75	0.375	75	8.40	8.40
34	0.500	100	0.375	75	11.20	8.40
44	0.500	100	0.500	100	11.20	11.20
45	0.063	12	0.125	25	1.40	2.80
46	0.063	12	0.063	12	1.40	1.40
99	0.089	18	0.089	18	2.00	2.00
88	90 mg/m² chromium coating for both side					

Notes

1) Coatings heavier than 5,60 g/m² (0,25 lb/bb) are subjected to negotiation.
2) Orders for width over 950 mm are not accepted for the coating 11,2 g/m² (0,50 lb/bb)
3) 1,4/1,4 g/m² and 1,12/1,12 g/m² coatings are subjected to negotiation.

Tolerance Standard: EN 10202:2001

Applied Erdemir Product Types

DTNR, DTFR, DTNRS, TNR, TNRS, TFR, TFRS

General Application

Tin mill products consist of single and double reduced low carbon mild steel electrolytical coated with either tin (tinplate) or chromium / chromium oxide (ECCS)

It should be noted that double cold reduced tinmill products are relatively less ductile than single cold rolled products and have very distinct directional properties, so for some uses, e.g. for 3- piece can bodies, the direction of rolling should be stated.

Surface Type

Double rolled products are only produced in stone finish and fine stone finish surface types.

Product Finish	Tinplate / ECCS	Nominal Surface Roughness Ra (µm)
Bright	Tinplate	≤ 0.35
Fine Stone	Tinplate / ECCS	0.25-0.45
Stone	Tinplate / ECCS	0.35-0.60
Silver	Tinplate	≥ 0.90
Matt	Tinplate	Various

Passivation

- Under normal conditions of transport and storage, tinmill products shall be suitable for surface treatments such as established lacquering and printing operations

- ECCS is not subject to a passivation treatment

- There are 2 tinplate passivation processes in common use:

a) Code 311 : Values per surface for total chromium shall be 3.5 to 9 mg/m^2

b) Code 300 : Values per surface for total chromium shall be 1.0 to 3.0 mg/m^2

- Code 311 will normally be supplied unless otherwise specified

Electrolytic Tinplate and Electrolytic Chromium Coated Steel (ECCS or TFS)

Tolerances

Coatings

Tin Coating

Single Spot Values For Tin Coatings					
Nominal Coating Designations		High Speed Welding Applications[1] (g/m^2)		Other Application (g/m^2)	
g/m^2	LB/BB	min.	max.	min.	max.
1.0	0.09	0.75	1.80	0.75	-
1.4	0.13	1.10	2.30	1.10	-
2.0	0.18	1.60	3.00	1.60	-
2.8	0.25	2.30	3.90	2.30	-
4.0	0.36	3.35	5.30	3.35	-
5.0	0.45	4.20	6.50	4.20	-
5.6	0.50	4.70	7.20	4.70	-
8.4	0.75	7.15	-	7.15	-
11.2	1.00	9.55	-	9.55	-

1) The values for tin coatings per single surfaces shall be used for high speed welding applications (continuous electrical resistance welding at speed grater than 30 m/ min)

- The purity of tin use to produce the coating shall be not less than 99.85 %

- In order to distinguish between tin plate with differential coatings on the two surfaces and that with equal coatings, differential coated tinplate shall be marked on one surface with straight parallel lines about 1 mm wide.

- Marking shall be lines space at 75 mm intervals, indicating that the tinplate is differentially coated but does not identified the precise specification. The heavier coated surface shall normally be marked with continuous lines unless specified otherwise by the purchaser, Where marking is required on the lighter coated surface, interrupter lines shall be used.

Chromium / Chromium Oxide Coating

- Total chromium and chromium oxide coating masses are given at the table below.

Chromium Coating Mass		
Form of Chromium	Coating Mass Each Surface (mg/m^2)[1]	
	min.	max.
Total Chromium	50	140
Chromium in Oxide	7	35

1) The values shall apply to the average of three single spot measurements

Thickness Tolerance

Thickness (mm)	Tolerance (mm)	Thickness (mm)	Tolerance (mm)	Thickness (mm)	Tolerance (mm)
0.13	± 0.006	0.26	± 0.013	0.39	± 0.019
0.14	± 0.007	0.27	± 0.013	0.40	± 0.020
0.15	± 0.007	0.28	± 0.014	0.41	± 0.020
0.16	± 0.008	0.29	± 0.014	0.42	± 0.021
0.17	± 0.008	0.30	± 0.015	0.43	± 0.021
0.18	± 0.009	0.31	± 0.015	0.44	± 0.022
0.19	± 0.009	0.32	± 0.016	0.45	± 0.022
0.20	± 0.010	0.33	± 0.016	0.46	± 0.023
0.21	± 0.010	0.34	± 0.017	0.47	± 0.023
0.22	± 0.011	0.35	± 0.017	0.48	± 0.024
0.23	± 0.011	0.36	± 0.018	0.49	± 0.024
0.24	± 0.012	0.37	± 0.018		
0.25	± 0.012	0.38	± 0.019		

Notes

1) Thickness shall be measured using a spring loaded micrometer accurate to 0.001 mm
2) Thickness at individual points shall not be measured within 6 mm of an edge
3) The thickness of the material shall conform to the following:
   a) The deviation from the agreed thickness measured at the centerline of the strip shall not exceed “± 5 %”
b) The deviation from the agreed thickness measured at any ponits not within 6mm of the mill trimmed edge shall be within “+ 5 % to -8 %
c) The average thickness shall not deviate from the nominal thickness by more than “± 2 %” for consignments comprising more than 10000 sheets (or meter equivalent when in coil form)

Feather Edge (Transverse Thickness Profile)

• Feather edge is thinning of material along the mill trimmed coil edge for both sheet and coil, the thickness when measured at a distance of 6mm from the mill trimmed edge shall not vary by more than 6 % from the center thickness measured at right angles to the trimmed edge

Width & Length Tolerance

Type of Product	Dimensions (mm)	Tolerance (mm)	
		Lower	Upper
Coil	Width	0	+ 3
Sheet	Width	0	+ 3
	Length	0	+ 3

Notes

1) The width and length is measured across the center of sheet laying on a flat surface, at right angles to the edges of the product
2) A rectangle of the ordered dimension shall be available from within each sheet

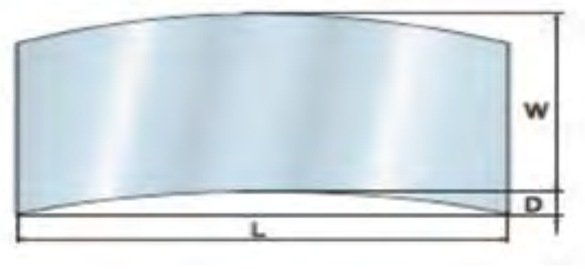
Tolerances For Out Of Squareness

$$\text{Out Of Squareness (\%)} = \frac{\text{Deviation (A)}}{\text{Sheet dimensions (B)}} \times 100$$

Notes

1) Out of squareness is deviation of an edge from a straight line drawn at a right angle to the other side of the sheet, touching one corner and extending to the opposite edge.
2) For each sheet in sample, the out of squareness shall not exceed 0.15 %

Short Pitch Chamber of Coils (Lateral Weave)

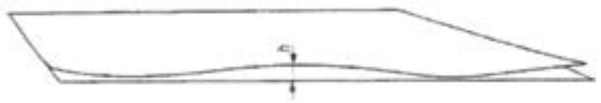


W: Width
L: Length
D: Deviation

Notes

1) Short pitch chamber is measured as the maximum deviation of the mill-trimmed edge from a straight line forming a chord to it over a relatively short distance
2) Short pitch chamber, measured over a chord length of 1 meter, shall not exceed 0.3 mm when measured prior to shearing

Edge Wave

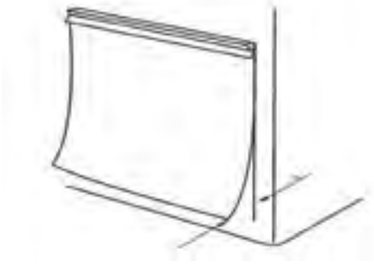


The wave height (h) at any point shall not exceed 2.5mm. No more than 6 waves in excess of 1.5mm shall be present over a cut length of 1 m.

Electrolytic Tinplate and Electrolytic Chromium Coated Steel (ECCS or TFS)

Tolerances

Bow

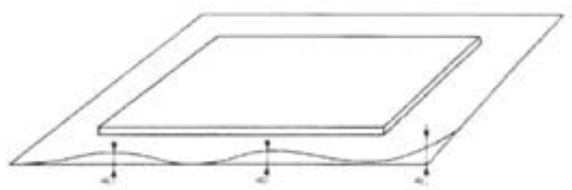


Bow is the residual curvature in sheet or coil such that the distance between the edges is less than the apropriate sheet or coil dimension. Bow may be either convex or concave face uppermost on the bulk package. The normal convension is to express convex bow uppermost as a positive (+) value and concave bow as a negative (-) value.

The individual values of both longitidunal and transverse bow shall not exceed 30mm. When purchased as coil, this shall apply after normal levelling operations.

Where both convex and concave bowed sheets are present in same bulk package, the sum of the maximum values of each, ignoring the sign (+ / -), shall not exceed 30mm.

Center Fullnes



Centre fullness shall be determined by measurement of edge lift developed during the test. The value shall not exceed 9mm.

Tolerances

Burr

Burr shall not be present such and extend as to interfere with the processing of the product.

Welds Within a Coil

The number of welds in a coil shall not exceed 3 in lengths of 10000m.
The location of each weld in a coil shall be marked with a punched hole and additionally be indicated visibly.
The total thickness of any weld shall not exceed 1.5 times the nominal thickness of the material forming the weld.
In any lap weld, the total length of overlap shall not exceed 10mm. The free overlap shall not exceed 5mm.

Permissible Deviations From Inside and Outside Diameter Of Coil

Inside diameter of coil : 420 mm. (+10mm / -15 mm)
Outside diameter of coil : min. 970 mm, max. 1580 mm

Foreign Standards

National Standards	Related Bodies	Country
ABS	American Bureau of Shipping	U.S.A
AFNOR	Association Française de Normalisation	FRANCE
AISI	American Iron and Steel Institute	U.S.A
ANSI	American National Standards Institute	U.S.A
API	American Petroleum Institute	U.S.A
ASME	American Society of Mechanical Engineers	U.S.A
ASMI	American Society for Materials International	U.S.A
ASTM	American Society for Testing and Materials	U.S.A
BS	British Standard	U.K
BSI	British Standards Institution	U.K
BV	Bureau Veritas	FRANCE
CSA	Canadian Standards Association	CANADA
DIN	Deutsches Institut für Normung	GERMANY
DNV	Det Norske Veritas	DENMARK
DS	Dansk Standard	GREECE
ELOT	Hellenic Organization for Standardization	EUROPE
EN	European Standard	EUROPE
EU	EURONORM	FINLAND
FSA	Finnish Standards Association	RUSSIA
GOST	USSR State Standard	BELGIUM
IBN	Institut Belge de Normalisation	INTERNATIONAL
ISO	International Organization for Standardization	JAPAN
JIS	Japanese Industrial Standard	JAPAN
JSA	Japanese Standards Association	U.K
LRS	Lloyd's Register of Shipping	U.S.A
MIL	US Military Standards	FRANCE
NF	Norme Française	NEDHERLANDS
NNI	Netherlands Normalisatie Instituut	NORWAY
NSF	Norges Standardiseringsforbund	AUSTRIA
ON	Austrian Standards Institute	U.S.A
RINA	Registro Italiano Navale	SWITZERLAND
SAE	Society of Automotive Engineers	TURKEY
SNV	Swiss Association for Standardization	TURKEY
TL	Turkish Lloyd	ITALY
TSE	Turkish Standards Institution	TURKEY
UNI	Ente Nazionale Italiano di Unificazione	ITALY

Additional Information

Conversion Table

Units to Convert		Unit Equivalents		
Mass				
1 ounce (oz)	=	28,349523125 g	0,06250 lb	141,747615625 carat
1 pound (lb)	=	453,59237 g	16 oz	0,00045359237 MT
1 kilogram (kg)	=	2,204622622 lb	35,27396195 oz	0,0685217659 slug
1 metric ton (MT)	=	1000 kg	2204,622621849 lb	1,102311311 ST
1 short ton (ST)	=	907,18474 kg	2000 lb	0,892857143 LT
1 long ton (LT)	=	1016,0469088 kg	1,12 ST	2240 lb

Units to Convert		Unit Equivalents		
Length				
1 inch (in)	=	25,4 mm	0,0833333333 ft	25400 micron
1 mikroinch (min)	=	0.0254 mikron	0,0000254 mm	25,4 millimicron
1 foot (ft)	=	30,48 cm	12 in	0,3333333333 yard
1 milimeter (mm)	=	0.0393700787 in	0,0032808399 ft	1000 micron
1 micron (mikron)	=	0,001 mm	10000 angstrom	0,0000393700787 in
1 meter (m)	=	39,37007874 in	3,280839895 ft	1,093613298 yard
1 yard (yd)	=	91,44 cm	36 in	3 ft

Units to Convert		Unit Equivalents		
Area				
1 inch^2	=	6,4516 cm^2	645,16 mm^2	0,00694444 ft^2
1 cm^2	=	100 mm^2	0,15500031 in^2	0,00107639 ft^2
1 mm^2	=	0.01 cm^2	0,00155 in^2	0,0000107639 ft^2
1 ft^2	=	92903,04 mm^2	0,09290304 m^2	144 in^2

Units to Convert		Unit Equivalents		
Volume-Density				
1 in^3	=	16,387064 cm^3	16387,064 mm^3	0,016387064 dm^3
1 cm^3	=	0.001 dm^3	0,000001 m^3	0,00003531467 ft^3
1 US gallon (gal)	=	3,785411784 dm^3	231 inch^3	0,133680556 ft^3
1 barrel (bbl)	=	158,987294928 dm^3	9702 inch^3	5,614583333 ft^3
1 kg/dm^3	=	1 g/cm^3	1000 kg/m^3	0,001 kg/cm^3
1 g/cm^3	=	0.001 kg/cm^3	0,03613 lbm/in^3	62,42197 lbm/ft^3

Units to Convert		Unit Equivalents		
Force				
1 kilogram - force (kgf)	=	9,80665 N	2,204622622 lbf	980665 dyne
1 Newton (N)	=	0.101971621 kgf	0,224808943 lbf	100000 dyne

Units to Convert		Unit Equivalents		
Stress-Pressure				
1 kgf/mm^2	=	9,80665 N/mm^2	1422,3343307 psi	980665 dyne/mm^2
1 N/mm^2	=	1 Mpa	0,1019716213 kgf/mm^2	9,869232667 atm
1 lbf/in^2 (psi)	=	0.00070306958 kgf/mm^2	0,00689475729 N/mm^2	0,0680459639 atm
1 atmosphere (atm)	=	1.01325 bar	760 tor	760 mm Hg
1 bar	=	0,986923267 atm	0,1 N/mm^2	14,503773773 psi

Units to Convert		Unit Equivalents		
Energy				
1 kgf . m	=	9,80665 J	2,34385602 kal	7,233013851 ft.lbf
1 joule (J)	=	0,101971621 kgf.m	0,737562149 ft.lbf	0,000947817120 Btu
1 calorie (kal)	=	4,1819 J	41819000 erg	0,426435123105 kgf.m
1 Btu	=	107,585755851 kgf.m	1055,055852620 J	778,169262266 ft.lbf

Units to Convert		Unit Equivalents		
Temperature				
°C (formula)	=	(°F - 32) / 1,8	K - 273,15	[Rk x (5 / 9)] - 273,15
-20 °C	=	-4 °F	253,15 K	455,67 Rk
-10 °C	=	14 °F	263,15 K	473,67 Rk
‘0 °C	=	32 °F	273,15 K	491,67 Rk
10 °C	=	50 °F	283,15 K	509,67 Rk
20 °C	=	68 °F	293,15 K	527,67 Rk

By - Products List

Erdemir & İsdemir By Products

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BLAST FURNACE SLUDGE	
STEEL PLANT SLUDGE	
FLUE DUST	

Coke Plants

Ammonium Sulphate (Erdemir & İsdemir)

Appearance	: White color, Crystal
Chemical Compound	: (NH4]2S04
Moisture	: %0,5 max
Free Acid Content	: %0,1 max
Total Nitrogen	: %20,5 - %20,9
Packing	: Bulk

Crude Benzene (Erdemir)

Appearance		Clear, Bright and No Sediment
Color		Brown
Density (d20°C)(ASTMD3505)	gr/cm³	0,925 max.
Destilasyon (ASTM D 850)		
Initial Dropping Point °C	°C	70- 85
Passing Material @ 90 °C	ml	30- 45
Passing Material @ 100 °C	ml	55- 65
Passing Material @ 110 °C	ml	65- 70
Passing Material @ 120 °C	ml	70- 75
Passing Material @ 130 °C	ml	75- 79
Passing Material @ 150 °C	ml	79- 83
Passing Material @ 180 °C	ml	80- 85
Drying Temperature °C	°C	> 240
Reaction		Neutral
Water	%	0,3 max.
Free Water	%	0,001 max.
Benzene	% by weight	50 - 60
Toluene	% by weight	12 - 18
Xylene	% by weight	3- 5
Naphthalene	% by weight	10 - 19

Crude Benzene (İsdemir)

	Crude Benzene	
Appearance		Clear, Bright and No Sediment
Color		Brown
Density (d20°C)(ASTMD3505)	gr/cm³	0,892 max.
Destilasyon (ASTM D 850)		
Initial Dropping Point °C	°C	75 - 85
Passing Material @ 100 °C	ml	40 - 60
Passing Material @ 125 °C	ml	65 - 85
Passing Material @ 150 °C	ml	80 - 90
Passing Material @ 180 °C	ml	88- 95
Drying Temperature °C	°C	240 max
Reaction		Neutral
Water	%	0,3 max.
Total Sulfur	%	0,230 max
Carbon diSulfide CS2	%	0,280 max
Free Water	%	0,001 max.
Benzene	% by weight	50 - 60
Toluene	% by weight	21 - 26
Xylene (p-, m-, o-)	% by weight	4 - 8
Naphthalene	% by weight	3 - 8

Crude Coal Tar (Erdemir)

Crude Coal Tar Specs	Unit	Value	Standard
Water	%	4,0 max	ASTM D 95-99
Insoluble in Toluene	%	10,0 max	Gost Method
Calorific Value (brut)	kcal/kg	8.900-9.300	ASTM D 2015-00
Insoluble in Quinoline	%	4,0 max	Gost Method
Density (d20)	g/cm3	1,20 max	Gost Method
Ash	%	0,3 max	ASTM D 0482-009
Sulphur	%	0,9 max	ASTM D 129-00
Naphtalene	%	10,0 max	Gost Method
Phenol	%	2,0 max	Gost Method
Distillation			
Passing material at 0 - 180 °C	%	1-6	Gost Method
Passing material at 180 - 230 °C	%	6-10	Gost Method
Passing material at 230 - 270 °C	%	6-14	Gost Method
Passing material at 270 - 360 °C	%	14-25	Gost Method
>360 °C (pitch)	%	55-65	Gost Method
Pour Point	oC	-15 + 4	ASTM D 97
Flash Point	oC	108 max	ASTM D 92

Crude Coal Tar (İsdemir)

Crude Coal Tar Specs	Unit	Value	Standard
Water	%	4,0 max	ASTM D95-05 (Reapproved 2010)
Insoluble in Toluene	%	17,0 max	ASTM D4312-95a (Reapproved 2010)
Calorific Value (brut)	kcal/kg	8.850-9.300	ASTM D5865-12
Insoluble in Quinoline	%	10,0 max	ASTM D2318-98 (Reapproved 2008)
Density (d20)	g/cm3	1,25 max	ASTM D1298-12b
Ash	%	0,3 max	ASTM D2415-98 (Reapproved 2012)
Sulphur	%	0,9 max	ASTM D1552-08
Bituminous Matter	%	86,0 min	ASTM D4-86 (Reapproved 2010)
Phenol	%	2,0 max	GOST Method
Distillation			
Passing material at 0 - 180 °C	%	0-4	ASTM D-86 (Reapproved 2012)
Passing material at 180 - 230 °C	%	2-10	ASTM D-86 (Reapproved 2012)
Passing material at 230 - 270 °C	%	6-20	ASTM D-86 (Reapproved 2012)
Passing material at 270 - 360 °C	%	12-27	ASTM D-86 (Reapproved 2012)
>360 °C (pitch)	%	55-70	ASTM D-86 (Reapproved 2012)

Coke (İsdemir)

	Foundry Coke		Metallurgical Coke			Nut Coke	
	60+ mm		25-60 mm			10-25 mm	
Physical Specifications							
Size	90 + mm	60 - mm	60 + mm	25 + mm	25 - mm	25+ mm	10 - mm
(%)	15	15	15	90	10	10	10
Chemical Specifications							
Total Moisture (%)	6.0		6.0			11.0	
Ash (%)	12.0		12.0			12.5	
Volatile Matter (%)	1.5		1.5			1.7	
Fixed Carbon (%)	86.0		86.0			85.0	
S (%)	0.7		0.7			0.7	
P (%)	0.1		0.1			0.1	
Stability	60		60				
CRI	25.8		25.8			25.8	
CSR	65.3		65.3			65.3	
K2O (in ash) (%)	2.0		2.0			2.0	
Na2O(in ash) (%)	1.0		1.0			1.0	
SiO2(in ash) (%)							
Total Alkali (%)	3.0		3.0			3.0	
Net Calorific Value	6,700.0		6,700.0			6,700.0	
Initial Deformation Temperature	1,412.0		1,412.0			1,412.0	
Flow Fluid Temperature	1,451.0		1,451.0			1,451.0	
Melting Temperature	1,438.0		1,451.0			1,451.0	
Softening Temperature	1,428.0		1,451.0			1,451.0	

Coke Breeze (İsdemir)

Fixed Carbon: % 75 min.
Ash: % 18 max.
Volatile Matter: %3 max.
Sulphur: %0,7 max.
Lower Heating Value/Lower Heat Capacity (cal/g): 6.500 min.
Ditribution of Grain Size: <20 mm
Moisture: Uncertain

Steel Making (Converter) Slag (Erdemir)

Steel Making (Converter) Slag	%
CaO	51.38
T. Fe	17.99
SiO2	12.01
MgO	4.62
MnO	3.10
Al2O3	2.91
P2O5	1.22
TiO2	0.47
S	0.18
K2O	0.04
Na2O	0.03

Steel Making (Converter) Slag (İsdemir)

Steel Making (Converter) Slag	%
CaO	43.23
T. Fe	19.59
SiO2	16.00
MgO	2.41
MnO	4.22
Al2O3	2.63
P2O5	0.86
TiO2	0.39
S	0.29
K2O	0.13
Na2O	0.24

Granulated Blast Furnace Slag (Erdemir)

Chemical Composition	Mean	Range	Distribution of Grain Size	Range
CaO	35.1%	%26-38	+ 6,35 mm.	%1 max.
MgO	6.8%	%5-10	- 6.35, + 3,15 mm	%2 max.
SiO2	41.8%	%38-45	- 3.15, + 1,60 mm	%16-19
Al2O3	12.5%	%13-19	- 1.60, + 1,00 mm.	%33 -37
S	0.5%	%1,5 max.	- 1.00, + 0,40 mm.	%35-40
MnO	1.1%	%2,5 max.	- 0.40, + 0,15 mm.	%3-6
FeO	0.06%	%1,0 max.	- 0,15 mm	%6 max.
K2O	0.7%	%2,0 max.	Moisture	%7-20
TiO2	0.5%	%1,5 max.	Bulk Density (t/m3)	1-1,3

Granulated Blast Furnace Slag (İsdemir)

Chemical Composition	Mean	Range	Distribution of Grain Size	Range
CaO	34.4%	%30-40	+ 6,35 mm.	%1 max.
MgO	6.8%	%4-10	- 6.35, + 3,15 mm	%2 max.
SiO2	42%	%38-48	- 3.15, + 1,60 mm	%16-19
Al2O3	12.2%	%8-14	- 1.60, + 1,00 mm.	%33 -37
S	0.6%	%1,5 max.	- 1.00, + 0,40 mm.	%35-40
MnO	1.1%	%2,5 max.	- 0.40, + 0,15 mm.	%3-6
FeO	0.1%	%1,0 max.	- 0,15 mm	%6 max.
K2O	0.9%	%2,0 max.	Moisture	%7-20
TiO2	0.7%	%1,5 max.	Bulk Density (t/m3)	1-1,3

Blast Furnace

Air Cooled Blast Furnace Slag (İsdemir)

Chemical Composition	Mean	Range
CaO	34.5%	%32-36
MgO	6.8%	%6-8
SiO2	42.3%	%40-44
Al2O3	11.0%	%9-13
S	0.7%	%0,50-0,80
MnO	1.7%	%1,60-2
Distribution of Grain Size		
0-40mm	25.0%	
40-130mm	50.0%	
+130mm	25.0%	

Pig Iron (İsdemir)

Pig Iron										
Isdemir Standard	C_MIN	C_MAX	Si_MIN	Si_MAX	Mn_MIN	Mn_MAX	P_MIN	P_MAX	S_MIN	S_MAX
C2 Basic	3.5	5.84	0.15	1.05	0.15	0.9	0	0.1	0	0.08
C1 Basic	3.5	5.84	1.06	1.45	0.15	0.9	0	0.1	0	0.08
H2 Hematite	3.5	5.84	1.46	1.85	0.15	0.9	0	0.1	0	0.08
H1 Hematite	3.5	5.84	1.86	2.35	0.15	0.9	0	0.1	0	0.08

Acid Regeneration Plant (ARP)

Grey Iron Oxide (Erdemir)

Chemical Composition	
Fe (Fe2O3)	69%
Zn	% 0.017
Cl	% 0.020
SiO2	% 0.003
Density	5.7 g/cm3
Bulk Weight	3.1 g/cm3

Distribution of Grain Size (%)	
> 1.00 mm	%18.7
0.75 - 1.00 mm	%15.4
0.60 - 0.74 mm	%13.8
0.30 - 0.59 mm	%50.9
< 0.30 mm	%1.20

Red Iron Oxide (Erdemir)

Chemical Composition	
Cl- wt.	% ≤0.25
SiO2 wt.	% ≤0.10
CaO wt.	% ≤0.20
Na2O wt.	% ≤0.05
Al2O3 wt.	% ≤0.20
Fe2O3 wt.	%≥98.5
Bulk Density gr/cm3	0.45 - 0.60
Moisture	0.96

Air Seperation Plant (ASP)

Liquid Oxygen (LOX) Erdemir & İsdemir

Purity	Min. % 99.5
Smell and Appearance	Scentless, Light Blue
Concentration in Air	20.99 %
Molecular Weight	31.9988 gr/mol
Boiling Point	-182.95 °C
Density (Gas)	1.428 kg/m3
Density (Liquid)	1.14 gr/cm3
Critical Temperature	-118.574 °C
Critical Pressure	50.43 bar

Liquid Nitrogen (LIN) Erdemir & İsdemir

Purity	> % 99.999
∑ O2	≤ 4 (v) ppm
∑ H2O	≤ 5 (v) ppm
∑ Hydrocarbon	≤ 0.2 (v) ppm
Smell and Appearance	Scentless, Colorless
Concentration in Air	78.03 %
Molecular Weight	28.03 gr/mol
Boiling Point	-195.8 °C
Density (Gas)	1.249 kg/m3
Density (Liquid)	0.812 gr/cm3
Critical Temperature	-147 °C
Critical Pressure	33.99 bar

Liquid Argon (LAR) Erdemir & İsdemir

Purity	> % 99.999
∑ O2	≤ 3 (v) ppm
∑ N2	≤ 5 (v) ppm
∑ H2O	≤ 3 (v) ppm
∑ Hydrocarbon	≤ 0.2 (v) ppm
Smell and Appearance	Scentless, Colorless
Concentration in Air	0.933 %
Molecular Weight	39.948 gr/mol
Boiling Point	-185.7 °C
Density (Gas)	1.783 kg/m3
Density (Liquid)	1.400 gr/cm3
Critical Temperature	-122.3°C
Critical Pressure	48.98 bar

Packaging

Hot Rolled Sheet and Plate Products

HRU	Hot rolled sheet cut from coil with trimmed edge
HRUKK	Hot rolled sheet cut from coil with mill edge
THRU	Hot rolled, skin-passed sheet cut from coil with trimmed edge
LR	Hot rolled plate cut from coil with trimmed edge
LRKK	Hot rolled plate cut from coil with mill edge
L	Heavy plate with trimmed edge
LKK	Heavy plate with mill edge
PLR	Painted, Shotblasted hot rolled plate cut from coil with trimmed edge
PLRKK	Painted, Shotblasted hot rolled plate cut from coil with mill edge
PL	Painted, Shotblasted heavy plate with trimmed edge
PLKK	Painted, Shotblasted heavy plate with mill edge
DS	Casted slab (extra heavy plate with mill edge)

HRU, HRUKK, THRU, LR, LRKK, PLR, PLRKK If material length ≤3 m, thickness ≤6mm, goods strapped on wooden pallets.

HRU, HRUKK, THRU, LR, LRKK, L, LKK, PLR, PLRKK, PL, PLKK If material length >3 m, thickness >6mm, goods strapped on wooden skids

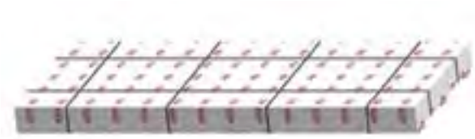
L, LKK, PL, PLKK, DS If material thickness >6mm (regardless of length) goods on wooden chocks, without being strapped

LR, LRKK, L, LKK, PLR, PLRKK, PL, PLKK, DS If material thickness >6mm (regardless of length) goods strapped on wooden chocks

Hot Rolled Pickled Cut To Length Sheet and Plate Products

HRP	Hot rolled, pickled sheet cut from coil with trimmed edge
LP	Hot rolled, pickled plate cut from coil with trimmed edge
TLPKK	Hot rolled, skin-passed and pickled sheet cut from coil with mill edge
THRPK	Hot rolled, skin-passed and pickled sheet cut from coil with mill edge
HRPKK	Hot rolled, pickled sheet cut from coil with mill edge
LPKK	Hot rolled, pickled plate cut from coil with mill edge
TLP	Hot rolled, skin-passed and pickled sheet cut from coil with trimmed edge
THRP	Hot rolled, skin-passed and pickled sheet cut from coil with trimmed edge

HRP, LP, TLPKK, THRPK, HRPKK, LPKK, TLP, THRP. If material length ≤3 m, thickness ≤6mm, goods packed in paper and strapped on wooden pallets



HRP, LP, TLPKK, THRPK, HRPKK, LPKK, TLP, THRP. If material length >3 m, thickness ≤6mm, goods packed in paper and strapped on wooden skids (5X9,5X250 cm) lengthwise

LP, LPKK, TLP, TLPKK. If material length >3 m, thickness >6mm, goods packed in paper and strapped on chocks crosswise

Overseas Shipments

If length<3m, thickness <6mm, goods are wrapped in metal (galvanized sheet), galvanized brackets placed in corners. bundle is strapped.

Length> 3m, thickness>6mm. Wooden skids-crosswise (8x8x80-100cm) PE waterproof paper and strapping. (Waterproof paper is not valid for L or LKK)

Hot Rolled Coil Products

R	Hot rolled coil with trimmed edge
RKK	Hot rolled coil with mill edge
TRKK	Hot rolled skin-passed coil with mill edge
RKKM	Hot rolled, patterned coil with mill edge
BCKK	Hot rolled coil with mill edge processed in recoiling line for cold rolling
HCKK	Hot rolled coil with mill edge for cold rolling
TCKK	Hot rolled coil with mill edge skin-passed in recoiling line for cold rolling
BRKK	Hot rolled coil with mill edge processed in recoiling line
KRKK	Hot rolled heavy-thickness coil with mill edge
TR	Hot rolled skin-passed coil with trimmed edge

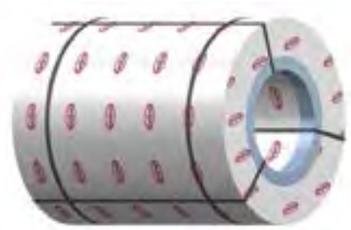
3 circumferential straps + 3 radial straps

Overseas Shipment

minimum 3 circumferential straps + 2 radial straps

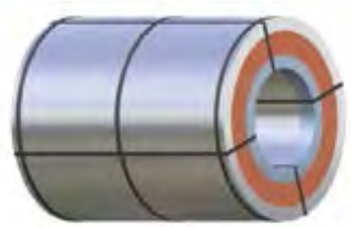
Hot Rolled Pickled Coil Products

RP	Hot rolled, pickled coil with trimmed edge
RPKK	Hot rolled, pickled coil with mill edge
TRP	Hot rolled, skin-passed, pickled coil with trimmed edge
TRPKK	Hot rolled, skin-passed, pickled coil with mill edge
BRP	Hot rolled, pickled coil with trimmed edge processed in recoiling line
BRPKK	Hot rolled, pickled coil with mill processed in recoiling line



PE waterproof paper. 2 inside edge protection rings. 2 circumferential straps. 3 radial straps.

Overseas Shipment



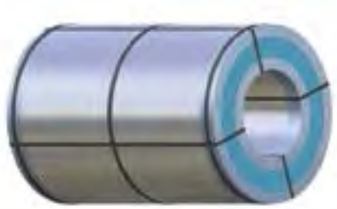
PE waterproof paper. 2 inside edge protection rings. 2 outside edge protection rings. 2 protection disks. Inside protection cover (Galvanized sheet). Outside protection cover (Galvanized sheet). 3 circumferential straps. 4 radial straps.

Cold Rolled (Continuously or Batch Annealed) Coil Products

CR	Cold rolled, batch annealed coil
CRK	Cold rolled, batch annealed coil with trimmed edge
CRF	Cold rolled, not annealed (full-hard) coil, produced in cold rolling mill no.1
ICCR	Cold rolled, continuously annealed thin coil
CCR	Cold rolled, continuously annealed coil
CCRK	Cold rolled, continuously annealed coil with trimmed edge
CCRF	Cold rolled, not annealed (full hard) coil, produced in cold rolling mill no.2

PE waterproof paper. 2 inside edge protection rings. 2 outside edge protection rings. 2 circumferential straps. 4 radial straps.

Overseas Shipment



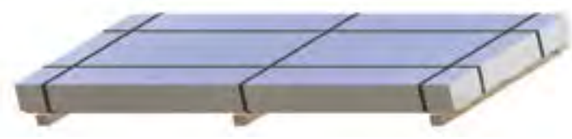
PE waterproof paper. 2 inside edge protection rings. 2 outside edge protection(blue coloured) rings. 2 side protection disks. Inside protection cover(galvanized sheet) Outside protection cover (galvanized sheet) 3 circumferential straps. 4 radial straps.

Cold Rolled (Continuously or Batch Annealed) Cut-Into-Length Products

CRS	Cold rolled, batch annealed sheet cut from coil
CCRS	Cold rolled, continuously annealed sheet cut from coil
CRFS	Cold rolled, not annealed (full-hard) sheet cut from coil, produced in cold rolling mill no.1
CCRFS	Cold rolled, not annealed (full-hard) sheet cut from coil, produced in cold rolling mill no.2
CCRSK	Cold rolled, continuously annealed sheet cut from coil with trimmed edge
CRSK	Cold rolled, batch annealed sheet cut from coil with trimmed edge

Wooden pallet. PE waterproof paper and with strapping.

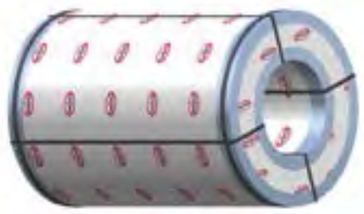
Overseas Shipment



Wooden pallet PE waterproof paper. Galvanized metal cover, place galvanized brackets and strapping.

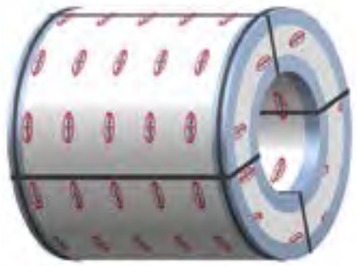
Cold (Continuously or Batch Annealed) Rolled Slitted Coil Products

CCRD Cold rolled, continuously annealed, slitted coil



Every single band with 2 circumferential straps and 4 radial straps. Cardboard placed between bands. Wrapping of bands with PE waterproof paper.

CRD Cold rolled, batch annealed, slitted coil



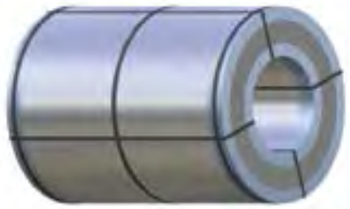
Every single band with 2 circumferential straps and 4 radial straps. Wrapping of bands with PE waterproof paper.

Galvanized/Galvannealed Coil Products

GZR Zinc coated,galvanized coil
GFR Zinc-iron alloy coated, galvannealed coil
GZRK Zinc coated,galvanized coil with trimmed edge
GFRK Zinc-iron alloy coated, galvannealed coil with trimmed edge

PE waterproof paper. 2 inside edge protection rings. 2 outside edge protection rings. 2 circumferential straps. 4 radial straps. Cardboard inside roller

Overseas Shipment

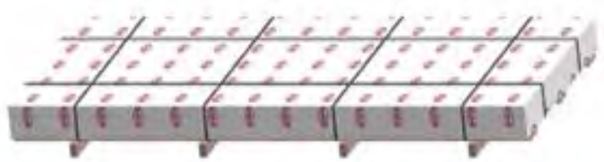


PE waterproof paper. 2 inside edge protection rings. 2 outside edge protection rings. 2 side protection grey disks. Inside protection cover (galvanized sheet). Outside protection cover (galvanized sheet). 3 circumferential straps. 4 radial straps.

Galvanized/Galvannealed Sheet Products

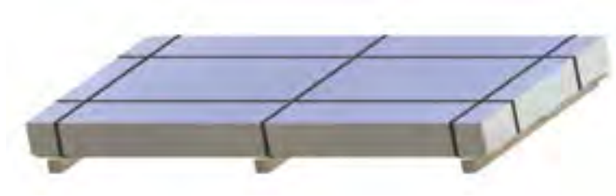
Galvanized/Galvannealed Cut-Into-Length Products

GZRS Zinc coated sheet cut from galvanized coil
GFRS Zinc-iron alloy coated sheet cut from galvannealed coil



Wooden pallet. PE waterproof paper and strapping.

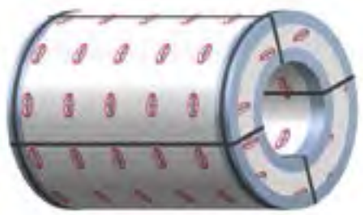
Overseas Shipment



Wooden pallet. PE waterproof paper. Galvanized metal cover,place galvanized brackets and strapping.

Galvanized/Galvannealed Slitted Coil Products

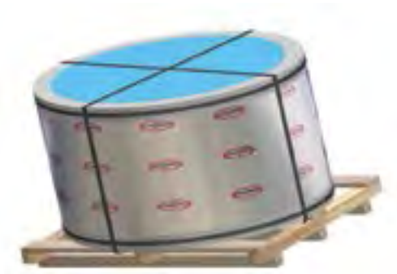
GZRD Zinc coated, galvanized, slitted coil
GFRD Zinc-iron alloy coated, galvannealed, slitted coil



Every single band with 2 circumferential straps and 4 radial straps. Cardboard placed between bands. Wrapping of bands with PE waterproof paper. Cardboard inside roller.

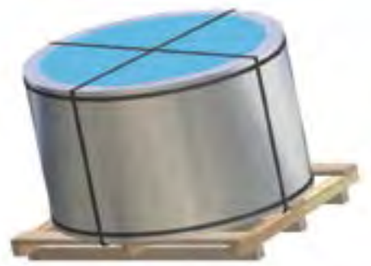
Electrolytic Tinplate and Chromium Coated Steel (TFS) Coil Products

TNR Single reduced electrolytic tinplate coil
DTNR Double reduced electrolytic tinplate coil
TFR Single reduced chromium coated steel coil



PE waterproof paper. 2 edge protection corrugated cardboard. Circumferential cardboard. Inside cardboard paper. Plastic transparent layer. 2 cardboard side protection disks. 2 L shaped cardboard paper for edge protection. 1 side protection cover disk. (metal) 2 outside protection rings. Final paper covering Wooden pallet and strapping.

Overseas Shipment



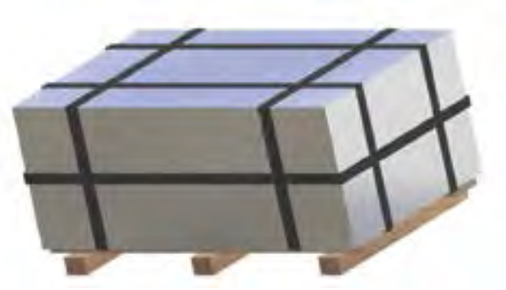
PE waterproof paper. 2 edge protection corrugated cardboard. Circumferential cardboard. Inside cardboard paper. Plastic transparent layer. 2 cardboard side protection disks. 2 side protection cover disk. (metal) 2 L shaped cardboard paper for edge protection. 2 outside protection rings. Final paper covering Metal cover.(galvanized sheet) Wooden pallet and strapping.

Electrolytic Tinplate and Chromium Coated Steel (TFS) Cut-Into-Length

TNRS Single reduced electrolytic tinplate sheet cut from coil
DTNRS Double reduced electrolytic tinplate sheet cut from coil
TFRS Single reduced chromium coated steel sheet cut from coil

Cardboard for bottom and top sides. PE coated kraft paper. Cardboard covering Edge protection with galvanized steel. Wooden pallet and strapping.

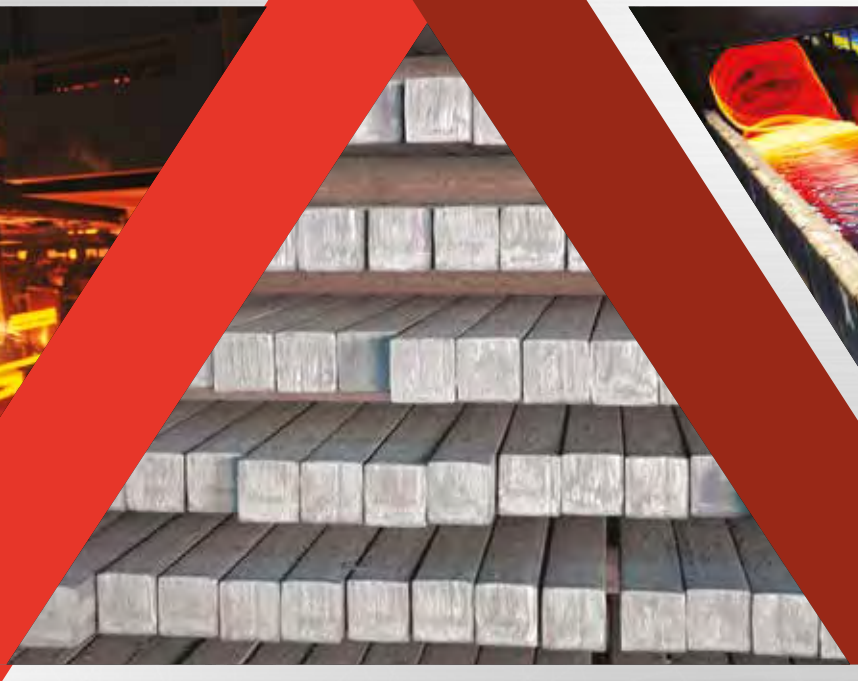
Overseas Shipment



Top and bottom sides grey cardboard. PE coated paper. Edge protection L shape galvanized steel. Products are packed with cardboard and metal cover on wooden pallet with strapping.

We are there for you whenever you need us
Since 1965...

İSDEMİR



OYAK MINING METALLURGY GROUP

LONG PRODUCT CATALOGUE

OYAK MINING METALLURGY GROUP

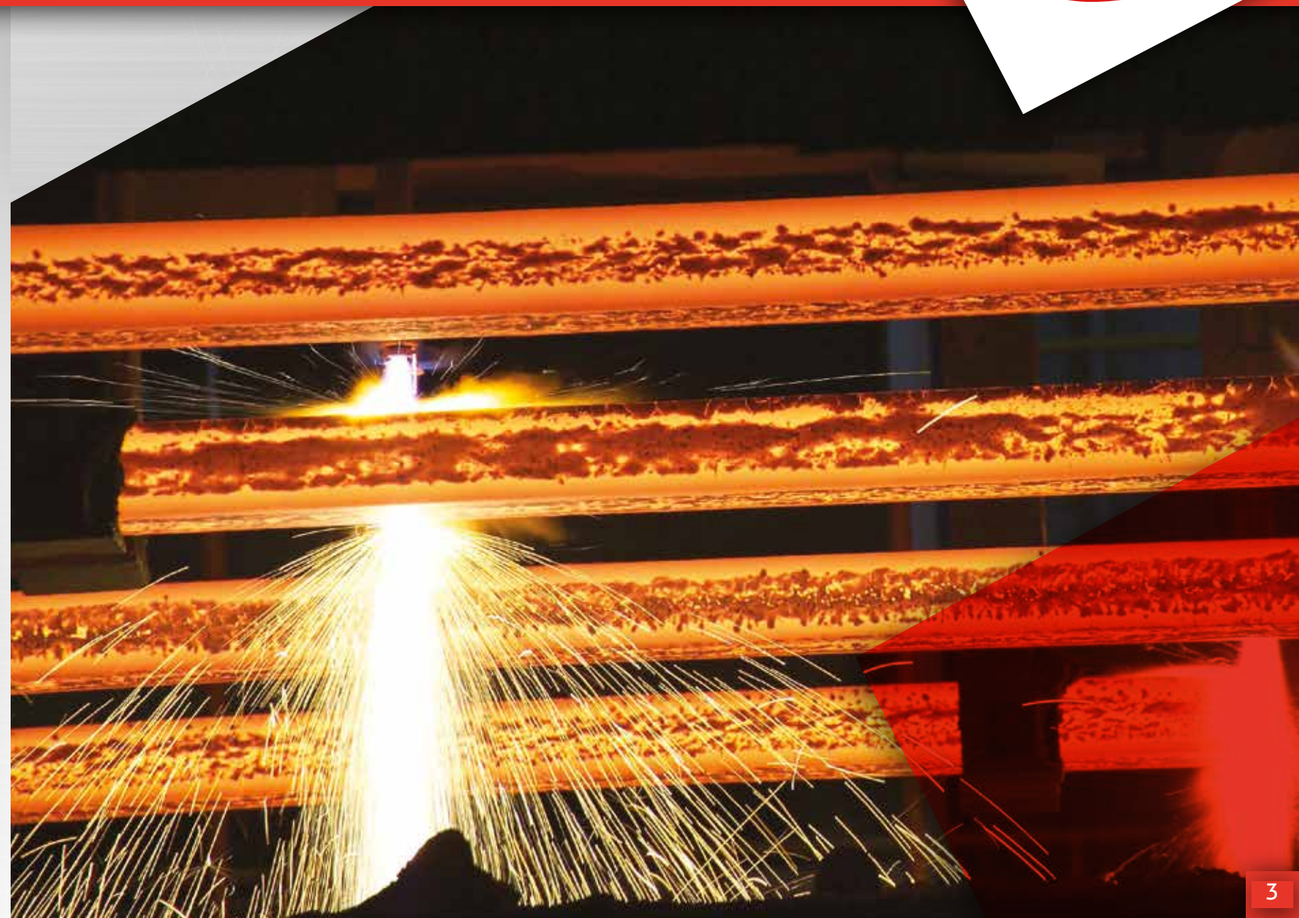
As the leading producer of the Turkish steel industry, OYAK Mining Metallurgy Group is working for a steel future with 8 companies, which operates in flat and long steel production, steel service center services, mining, engineering and project management. The OYAK Mining Metallurgy Group companies are producing for the development of our industry, contributing to employment, is investing in the future of our country over a half century. Group provides raw materials in almost each branch of the industry such as automotive, white goods, general machinery, pipe profile, packaging, shipbuilding, building, etc.

OYAK Mining Metallurgy Group has the following companies:

- Erdemir, first and largest integrated flat steel producer of Turkey;
- Isdemir, which produces flat and long steel;
- Erdemir Mining, which has its mining sites in Sivas and Malatya;
- Erdemir Romania, which produces silicon flat steel in Romania;
- Erdemir Engineering, which provides to the Group companies with any engineering management services;
- Erdemir Steel Service Center, which meets the need for flat steel in the sector,
- Erdemir Asia Pacific Pte, which conducts its activities in the Asia Pacific region of the Group. Ltd and
- Isdemir Linde Gaz Partnership Incorporation Company.

Erdemir's shares have been trading since 1986, when BIST was established as one of the locomotives of the stock exchange, and are listed in the BIST 30 index. Isdemir's shares have also been quoted with "ISDMR" transaction code in the Pre-Market Transaction Platform since 28 March 2016.

Isdemir was founded on October 3, 1970 in Payas (Yakacık) region 17 km away from Iskenderun. Isdemir, which is the third largest integrated iron and steel factory as of establishment of our company, and the largest one in Turkey in terms of long product production capacity.
it was handed over to Erdemir in 2002. Today, Isdemir is the unique integrated plant, which produces any flat and long products in our country, today has a capacity to produce about 5.8 million tons/year liquid steel, 3.5 million tons/year flat products, 0.6 million tons/year wire rod and 2.5 million tons /year billet products.



QUALITY MANAGEMENT SYSTEM CERTIFICATES

OYAK MINING METALLURGY GROUP MANAGEMENT SYSTEM CERTIFICATES

Management System	Erdemir	İsdemir	Ersem	Erdemir Romania	Erdemir Mining
ISO 9001 Quality	√	√	√	√	
ISO 14001 Environment	√	√		√	
OHSAS 18001 Occupational Health and Safety	√	√		√	√
ISO 50001 Energy	√	√		√	
IATF 16949:2016 Quality for Automotive Industry	√	√	√		
ISO/IEC 27001 Information Security	√	√	√		

QUALITY METALLURGY AND LABORATORY

Through the management systems implemented in Isdemir, all processes are managed systematically until the final product is delivered to the customer through the entrance of the raw material to the Isdemir area. Each stage of production is followed by determining the most appropriate solution to meet the need. In Isdemir, where the quality and process application parameters belonging to the facilities are defined on a product basis, all production data, chemical analysis results of each process and mechanical test results may be recorded and monitored in the information management system. In the Isdemir laboratories, which have the TSE EN ISO 17025 Laboratory Qualification Certificate since 2004, any raw material input controls, process analyzes and tests and analyzes up to the final product are carried out in accordance with international standards.
In Isdemir, which manufactures any products from iron ores, the following tests are performed for any long products:

- Steel production analysis measurements (ICP-OES, XRD and XRF)
- Macro sample reviews
- Mechanical test reviews (bending, pulling and pressing)
- Metallographic micro structure studies (SEM, decarburization, inclusion scanning, general microstructure and grain size)

Laboratories used in raw material, energy and material analysis through advanced equipment park and many years of testing and analysis experience:

- Mechanical Physics Test;
- Spectral Analysis;
- Steelworks Laboratory;
- Sample Preparation and Physical Test Laboratories;
- Technological Test Laboratory;
- XRF – XRD Laboratory;
- Refractory Test Laboratory;
- Coke Test Laboratory;
- Coal-Coke Laboratory;
- By-Products Laboratories;
- Oil Fuel Laboratory;
- Inorganic Laboratories;
- ICP-OES Laboratory; and
- Water-Gas Laboratory.

PORT

Depending on the geographical location of the place to be shipped, a range of services, which are based on customer satisfaction of Isdemir through its land, sea and railways, is completed with all kinds of transportation possibilities.

The Isdemir Port, the largest port operator in the Mediterranean Region of our country, has a bulk and general cargo handling capacity of 20 million tons/year and a port handling area of 1,072,248m^2. Isdemir Port, which is located in a position to serve a wide area of our country, contributes to the economy of the country and the region by operating its the current capacity commercially as well as the needs of the company.

Quay Name	Length (m)	Maximum Draft Length (m)	DWT	Intended Use	Crane Quantity
Quay No (1)	500	17.5	180,000	Loading/ Unloading	2 cranes/ 50t
Quay No (2)	240	17.5	50,000	Loading/ Unloading	5 cranes/ 15t
Quay No (3)	260	7.5	8,500	Loading/ Unloading	4 cranes/ 10t
Quay No (4)	220	12.5	60,000	Loading/ Unloading	2 cranes/ 55t
Quay No (5)	200	12	60,000	Loading/ Unloading	2 cranes/ 55t
Quay No (6)	160	13	60,000	Loading/ Unloading	

İsdemir Port provides its customers and third parties with all kinds of loading/ unloading, storage and terminal services to 7 days and 24 hours.
In the seaports, which serves to any vessels with a capacity of 180,000 DWT, the cargo handling services are carried out safely and quickly for all vessels including 60,000 DWT vessels

The Isdemir Port, which implements the International Ship and Port Facility Security Code (ISPS Code), is protected against all risks and threats with a special security organization.

Thanks to its railway network with a direct connection with the Turkish State Railways, all products, which are ready for shipment, are transported by cards.

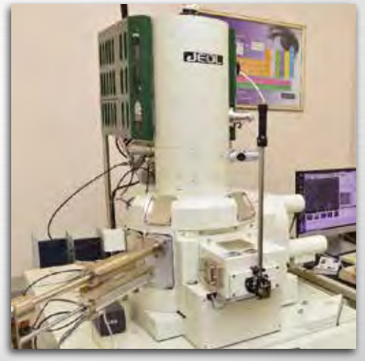
In İsdemir port, 24/7 maritime service provided.

R&D

Oyak Mining Metallurgy Group considers any Research and Development Activities as the most important component of its sustainability.

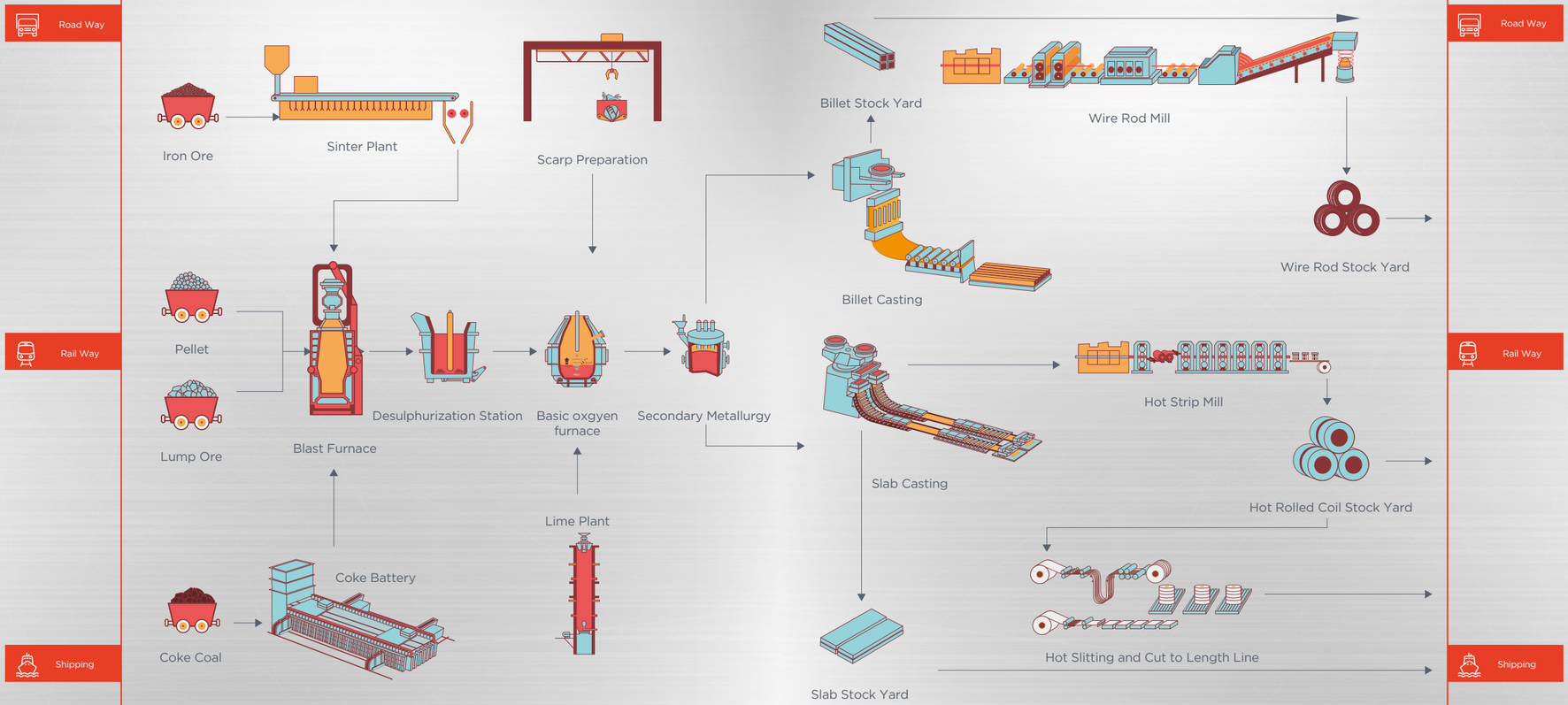
The R&D Center, which provides the Group with any services and is located in Erdemir, was established with its vision to serve expansion of a development model based on any value-added and competitive products and information. The R&D Center aims to manufacture competitive, value-added new products at reasonable costs and reduce raw material input costs through innovative solutions in line with the growing needs and expectations of steel user sectors such as white goods, pipe profile industry, automotive and subcontracting industries and heat and pressure vessel equipment.

Our R & D Center operates in a closed area of 1,385m2 totally including main building and Raw Materials and Iron Production R&D building.



OYAK Mining Metallurgy Group works for a sustainable future with its R&D activites and investments.

PRODUCTION LAYOUT



BILLET

Isdemir billet casting mills manufacture billets in accordance with international standards to meet the expectations of customers in liquid steel produced in steel houses. The state-of-the-art steel mill and the pot metallurgical plant provide homogeneous and clean steel production. Billet casting facilities; electromagnetic stirring and submerged casting.

The billets produced in Isdemir are used for the manufacture of coils, construction steel, profiles and seamless pipes. All special and commercial and all billets used in the Coil rolling mill are produced at the billet casting plant.

Through the know-how gained in steel production and the advanced technology it possesses, it serves to different sectors in steel qualities developed to meet customer expectations.

The billet, which is the raw material of the construction steel, can be produced in Isdemir in the qualities suitable for hot and thermomechanical rolling, and can also be produced as alloy to meet special mechanical and chemical requirements.

Ship profile (bulb flats) as to manufacture special profiles in accordance with Turkey's leading manufacturer of billet production İsdemir, it has become a leading company in domestic and foreign markets with these products.

Billet Qualities Produced in İsdemir

- Chrome - Silica - Sulfur Alloy Steels
- Chrome Alloy High Carbon Steels
- Unalloyed High Strength Steels
- Angles - Profile - Steels Suitable for Ship Profiles
- Steels for pipe manufacturing
- Steels suitable for construction steel production
- Reinforcing Bars

Billet Sizes

- The nominal dimensions of the square section billets vary as 100x100mm, 110x110mm, 120x120 mm, 130x130mm, 150x150mm, and 160x160mm.
- Production is done in the range of 6-12 meters length.
- Tolerances of nominal size;
  +/- 3.0mm for 130x130mm, 150x150mm, 160x160 mm
  +/- 2.5mm for 100x100mm, 110x110mm, 120x120mm.

WIRE ROD

In Isdemir, which is the unique integrated flat steel and long steel production facility in Turkey, performs Isdemir, coils are produced through the high quality steel and clean steel production technology and by using iron ores.
Isdemir produces commercial and special quality coils suitable for use in many industries by rolling the billets that it produces at its facilities. As the biggest advantage of producing the raw material, every stage of the production from the blast furnace is controlled. Isdemir, which makes progress every year through its trained workforce in value-added coil quality, became a leader in product development in Turkey.

Several quality improvements are obtained in line with customer collaboration study carried out first time in Turkey. Isdemir, who made a contribution to the wire drawing industry by producing steel products suitable for the production of very fine and thin wires in special products, has also reached a wide variety of products by transferring the acceleration that it reaches in this area to other sectors. In high-carbon (up to 0.90% carbon) steel qualities, any products are offered to sectors of high quality precision such as spring, wire and rope manufacturing.

In case of the connection elements, the production of steel qualities suitable for the manufacture of bolts, nuts and screws is carried out. With steel with a low impurity level, it contributes to the development of low-steel, welded and electrode sectors.

Coil Sizes

Coils are produced in size between 5.5mm and 16mm depending on the quality.
Size tolerances;
+/- 0.3mm for thicknesses between 5.5mm and 9.5mm
+/- 0.4mm for 10 to 14mm
+/- 0.5 mm for over 15mm

PRODUCTS BY GENERAL APPLICATIONS AND TECHNICAL FACTS

	GRADE CODE	CORRESPONDING STANDARDS	Chemical Composition (%)					
			C		Mn		P	
			min.	max.	min.	max.	min.	max.
CARBON STEELS FOR EXTRA THIN WIRE DRAWING	1.1005_01	SAE J403 1005 (2014)		0.06		0.35		0.040
	5.1005_01	SAE J403 1005 (2014)		0.06		0.35		0.040
CARBON STEELS FOR THIN WIRE DRAWING	1.1006_00	SAE J403 1006 (2014)		0.08	0.25	0.40		0.040
	1.1006_01	SAE J403 1006 (2014)		0.08	0.25	0.40		0.040
	1.1006_02	SAE J403 1006 (2014)		0.08	0.25	0.40		0.040
	1.1006_03	SAE J403 1006 (MODIFIED) (2014)		0.08	0.25	0.60		0.040
	1.1006_04	SAE J403 1006 (MODIFIED) (2014)		0.08	0.25	0.65		0.040
	1.1006_05	SAE J403 1006 (MODIFIED) (2014)		0.08	0.20	0.65		0.040
	1.1006_25	SAE J403 1006 (2014)		0.08	0.25	0.40		0.040
	1.2006_00	SAE J403 1006 (2014)		0.08	0.25	0.40		0.040
	1.2008_00	SAE J403 1008 (2014)		0.08	0.30	0.50		0.040
	1.3006_00	SAE J403 1006 (2014)		0.08	0.25	0.40		0.040
	1.3006_01	SAE J403 1006 (2014)		0.08	0.25	0.40		0.040
	1.3008_00	SAE J403 1008 (2014)		0.08	0.30	0.50		0.040
	4.1006_00	SAE J403 1006 (MODIFIED) (2014)		0.08	0.25	0.55		0.040
	5.1006_00	SAE J403 1006 (MODIFIED) (2014) (BORON)		0.08	0.25	0.60		0.040
	5.1006_01	SAE J403 1006 (2014) (BORON)		0.08	0.25	0.40		0.040
	5.1006_02	SAE J403 1006 (MODIFIED) (2014) (BORON)		0.08	0.25	0.60		0.040
	5.1006_03	SAE J403 1006 (MODIFIED) (2014) (BORON)		0.08	0.25	0.65		0.040
	5.1006_04	SAE J403 1006 (MODIFIED) (2014) (BORON)		0.08	0.25	0.60		0.040

S		Al		Cu		Ni		Cr		Mo		B (ppm)	
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
	0.050				0.35		0.25		0.20		0.06		
	0.050				0.35		0.25		0.20		0.06		80
	0.050				0.35		0.25		0.20		0.06		
	0.050				0.35		0.25		0.20		0.06		
	0.050				0.35		0.25		0.20		0.06		
	0.050				0.35		0.25		0.20		0.06		
	0.050				0.35		0.25		0.20		0.06		
	0.050				0.35		0.25		0.20		0.06		
	0.050		0.100		0.35		0.25		0.20		0.06		
	0.050		0.100		0.35		0.25		0.20		0.06		
	0.050				0.35		0.25		0.20		0.06		
	0.050				0.35		0.25		0.20		0.06		
	0.050				0.35		0.25		0.20		0.06		
	0.050				0.35		0.25		0.20		0.06		
	0.050				0.35		0.25		0.20		0.06		80
	0.050				0.35		0.25		0.20		0.06		80
	0.050				0.35		0.25		0.20		0.06		80
	0.050				0.35		0.25		0.20		0.06		80
	0.050				0.35		0.25		0.20		0.06		80

Wire

	GRADE CODE	CORRESPONDING STANDARDS	Chemical Composition (%)													
			C		Mn		P		S		Al		Cu		Ni	
			min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
CARBON STEELS FOR EXTRA THIN WIRE DRAWING	5.1006_05	SAE J403 1006 (MODIFIED) (2014) (BORON)		0.08	0.25	0.55		0.040		0.050				0.35		0.25
	5.1006_06	SAE J403 1006 (MODIFIED) (2014) (BORON)		0.08	0.25	0.55		0.040		0.050				0.35		0.25
	5.1006_07	SAE J403 1006 (MODIFIED) (2014) (BORON)		0.08	0.25	0.55		0.040		0.050				0.35		0.25
	5.1006_08	SAE J403 1006 (MODIFIED) (2014) (BORON)		0.08	0.25	0.50		0.040		0.050				0.35		0.25
	5.1008_00	SAE J403 1008 (2014)		0.08	0.30	0.50		0.040		0.050				0.35		0.25
	5.3006_00	SAE J403 1006 (2014) (BORON)		0.08	0.25	0.40		0.040		0.050				0.35		0.25
	5.3006_01	SAE J403 1006 (2014) (BORON)		0.08	0.25	0.40		0.040		0.050				0.35		0.25
CARBON STEELS FOR WIRE DRAWING	1.1008_00	SAE J403 1008 (2014)		0.10	0.30	0.50		0.040		0.050				0.35		0.25
	1.1008_01	SAE J403 1008 (2014)		0.10	0.30	0.50		0.040		0.050				0.35		0.25
	1.1008_02	SAE J403 1008 (2014)		0.10	0.30	0.50		0.040		0.050				0.35		0.25
	1.1008_03	SAE J403 1008 (2014)		0.10	0.30	0.50		0.040		0.050				0.35		0.25
	1.1008_04	SAE J403 1008 (2014)		0.10	0.30	0.50		0.040		0.050				0.35		0.25
	1.1008_05	SAE J403 1008 (MODIFIED) (2014)		0.10	0.30	1.00		0.040		0.050				0.35		0.25
	4.1008_00	SAE J403 1008 (2014)		0.10	0.30	0.50		0.040		0.050				0.35		0.25
	1.1010_00	SAE J403 1010 (2014)	0.08	0.13	0.30	0.60		0.040		0.050				0.35		0.25
	1.1010_01	SAE J403 1010 (2014)	0.08	0.13	0.30	0.60		0.040		0.050				0.35		0.25
	1.1010_02	SAE J403 1010 (2014)	0.08	0.13	0.30	0.60		0.040		0.050				0.35		0.25

Chemical Composition (%)												
Mo		B (ppm)										
min.	max.	min.	max.									
	0.20		0.06		80							
	0.20		0.06		80							
	0.20		0.06		80							
	0.20		0.06		80							
	0.20		0.06									
	0.20		0.06		120							
	0.20		0.06		120							
	0.20		0.06									
	0.20		0.06									
	0.20		0.06									
	0.20		0.06									
	0.20		0.06									
	0.20		0.06									
	0.20		0.06									
	0.20		0.06									
	0.20		0.06									
	0.20		0.06									
	0.20		0.06									

	Chemical Composition (%)													
	GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Al		Cu	
			min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
Carbon Steels For Wire Drawing	1.1010_03	SAE J403 1010 (2014)	0.08	0.13	0.30	0.60		0.040		0.050				0.35
	1.1010_04	SAE J403 1010 (MODIFIED) (2014)	0.08	0.14	0.30	0.60		0.040		0.050				0.35
Steels For Bailing Wire Production	1.1281_01	ASTM A615 Grade 40 (2016)	0.23	0.31	0.80	1.40		0.050		0.050				0.55
Steels For High Strength Staple Production	5.1026_00	SAE J403 1026 (MODIFIED) (2014)	0.22	0.28	0.60	1.00		0.040		0.050				0.35

Chemical Composition (%)												
Ni		Cr		Mo		B (ppm)	
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
	0.25		0.20		0.06						
	0.25		0.20		0.06						
	0.30		0.25								
	0.25		0.20		0.06						80

Wire

SAE J403 (2014) , DIN EN 10025-2 (2004)

Chemical Composition (%)

GRADE CODE	CORRESPONDING STANDARDS	C min.	C max.	Mn min.	Mn max.	Si min.	Si max.	P min.	P max.	S min.	S max.
1.1011_00	DIN EN 10025-2 S235JR (2004)		0.17		1.40				0.040		0.040
1.1012_00	SAE J403 1012 (2014)	0.10	0.15	0.30	0.60				0.040		0.050
1.1012_01	SAE J403 1012 (2014)	0.10	0.15	0.30	0.60				0.040		0.050
1.1013_00	SAE J403 1013 (MODIFIED) (2014)	0.11	0.16	0.30	0.80				0.040		0.050
1.1013_01	SAE J403 1013 (MODIFIED) (2014)	0.11	0.16	0.30	0.75				0.040		0.050
1.1015_00	SAE J403 1015 (2014)	0.13	0.18	0.30	0.60				0.040		0.050
1.1015_01	SAE J403 1015 (2014)	0.13	0.18	0.30	0.60				0.040		0.050
1.1017_00	SAE J403 1017 (MODIFIED) (2014)	0.15	0.21	0.30	0.60				0.040		0.050
1.1018_00	SAE J403 1018 (2014)	0.15	0.20	0.60	0.90				0.040		0.050
1.1018_01	SAE J403 1018 (2014)	0.15	0.20	0.60	0.90				0.040		0.050
1.1018_02	SAE J403 1018 (MODIFIED) (2014)	0.14	0.20	0.50	0.90				0.040		0.050
1.1018_03	SAE J403 1018 (2014)	0.15	0.20	0.60	0.90				0.040		0.050
1.1018_04	SAE J403 1018 (MODIFIED) (2014)	0.15	0.21	0.60	0.90				0.040		0.050
1.1018_05	SAE J403 1018 (MODIFIED) (2014)	0.15	0.22	0.60	0.90				0.040		0.050
1.1020_00	SAE J403 1020 (MODIFIED) (2014)	0.18	0.23						0.040		0.050
1.1021_00	SAE J403 1021 (2014)	0.18	0.23	0.60	0.90				0.040		0.050
1.1022_00	SAE J403 1022 (2014)	0.18	0.23	0.70	1.00				0.040		0.050
1.1022_01	SAE J403 1022 (MODIFIED) (2014)	0.18	0.24	0.60	1.00				0.040		0.050
1.2018_00	DIN EN 10025-2 S235JR (2004)		0.17		1.40				0.040		0.040

GRADE CODE	Al min.	Al max.	N min.	N max.	Cu min.	Cu max.	Ni min.	Ni max.	Cr min.	Cr max.	Mo min.	Mo max.	V min.	V max.	B (ppm) min.	B (ppm) max.	Ceq min.	Ceq max.
1.1011_00				0.012		0.55												0.35
1.1012_00						0.35		0.25		0.20		0.06						
1.1012_01						0.35		0.25		0.20		0.06						
1.1013_00						0.35		0.25		0.20		0.06						
1.1013_01						0.35		0.25		0.20		0.06						
1.1015_00						0.35		0.25		0.20		0.06						
1.1015_01						0.35		0.25		0.20		0.06						
1.1017_00						0.35		0.25		0.20		0.06						
1.1018_00						0.35		0.25		0.20		0.06						
1.1018_01						0.35		0.25		0.20		0.06						
1.1018_02						0.35		0.25		0.20		0.06						
1.1018_03						0.35		0.25		0.20		0.06						
1.1018_04						0.35		0.25		0.20		0.06						
1.1018_05						0.35		0.25		0.20		0.06						
1.1020_00						0.35		0.25		0.20		0.06						
1.1021_00						0.35		0.25		0.20		0.06						
1.1022_00						0.35		0.25		0.20		0.06						
1.1022_01		0.030				0.35		0.25		0.20		0.06						
1.2018_00				0.012		0.55												0.35

SAE J403 (2014) , DIN EN 10025-2 (2004)

Chemical Composition (%)

GRADE CODE	CORRESPONDING STANDARDS	C		Mn		Si		P		S	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
1.2022_00	SAE J403 1022 (MODIFIED) (2014)	0.18	0.24	0.60	1.00				0.040		0.050
1.2023_00	SAE J403 1023 (MODIFIED) (2014)	0.19	0.26	0.30	1.00				0.040		0.050
8.1023_00	SAE J403 1023 (MODIFIED) (2014)	0.18	0.26	0.30	0.95				0.040		**0.050**
8.1023_01	SAE J403 1023 (MODIFIED) (2014)	0.20	0.28	0.30	0.85				0.040		0.050
1.1032_00	DIN EN ISO 16120-2 C32D (2011)	0.30	0.35	0.50	0.80	0.10	0.30		0.030		0.030
8.1035_00	SAE J403 1035 (2014)	0.32	0.38	0.60	0.90				0.040		0.050
8.1038_00	SAE J403 1038 (MODIFIED) (2014)	0.30	0.42	0.50	0.90				0.040		0.050
8.1039_00	SAE J403 1038 (MODIFIED) (2014)	0.33	0.42	0.50	0.90				0.040		0.050
1.1040_00	SAE J403 1040 (2014)	0.37	0.44	0.60	0.90				0.040		0.050
1.1040_25	SAE J403 1040 (2014)	0.37	0.44	0.60	0.90				0.040		0.050
1.1042_00	SAE J403 1042 (MODIFIED) (2014)	0.39	0.47	0.60	0.90				0.040		0.050
1.2045_00	SAE J403 1042 (2014)	0.40	0.47	0.60	0.90				0.040		0.050

Carbon Steels For Nail & Angle Iron & Profile Production

Al		N		Cu		Ni		Cr		Mo		V		B (ppm)		Ceq	
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
	0.080				0.35		0.25		0.20		0.06						
	0.080				0.35		0.25		0.20		0.06						
	0.040				0.35		0.25		0.20		0.06						
					0.35		0.25		0.20		0.06						
	0.010				0.30		0.25		0.20		0.05						
					0.35		0.25		0.20		0.06						
					0.35		0.25		0.20		0.06						
					0.35		0.25		0.25		0.06						
					0.35		0.25		0.20		0.06						
					0.35		0.25		0.20		0.06						
					0.35		0.25		0.20		0.06						
	0.060				0.35		0.25		0.20		0.06						

Micro Alloyed And Non - Alloyed High Strength Carbon Steels For Wire - Spring - Rope Production

DIN EN ISO 16120-2 (2011) , DIN EN 10083-2 (2006) , DIN EN 10089 (2002) , SAE J403 (2014)

Chemical Composition (%)

GRADE CODE	CORRESPONDING STANDARDS	C		Mn		Si		P		S	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
1.1045_00	SAE J403 1042 (2014)	0.40	0.47	0.60	0.90				0.040		0.050
1.1045_01[1]	DIN EN 10083-2 C45 (2006)	0.42	0.50	0.50	0.80		0.40		0.045		0.045
1.1045_02	DIN EN ISO 16120-2 C42D (2011)	0.40	0.45	0.50	0.80	0.10	0.30		0.030		0.030
5.1045_00[1]	DIN EN 10083-2 C45E (2006)	0.42	0.50	0.50	0.80		0.40		0.030		0.035
5.1045_01	DIN EN ISO 16120-2 C42D (2011)	0.40	0.45	0.50	0.80	0.10	0.30		0.030		0.030
5.1045_02	SAE J403 1045 (MODIFIED)	0.43	0.50	0.60	1.10				0.040		0.050
1.1050_00	SAE J403 1050 (2014)	0.48	0.55	0.60	0.90				0.040		0.050
1.1052_00	DIN EN ISO 16120-2 C52D (2011)	0.50	0.55	0.50	0.80	0.10	0.30		0.030		0.030
5.1052_00	DIN EN ISO 16120-2 C52D (2011)	0.50	0.55	0.50	0.80	0.10	0.30		0.030		0.030
1.1055_00	SAE J403 1055 (2014)	0.50	0.60	0.60	0.90				0.040		0.050
5.1055_00	DIN EN ISO 16120-2 C56D (2011)	0.53	0.58	0.50	0.80	0.10	0.30		0.030		0.030
1.1060_00	SAE J403 1060 (2014)	0.55	0.65	0.60	0.90				0.040		0.050
1.1060_01	SAE J403 1060 (2014)	0.55	0.65	0.60	0.90				0.040		0.050
5.1060_00	SAE J403 1060 (MODIFIED)	0.55	0.65	0.60	1.10				0.040		0.050
5.1060_01	SAE J403 1060 (MODIFIED)	0.55	0.65	0.60	0.90				0.040		0.050
5.1062_00	DIN EN ISO 16120-2 C62D (2011)	0.60	0.65	0.50	0.80	0.10	0.30		0.030		0.030
1.1065_00	DIN EN ISO 16120-2 C66D (2011)	0.63	0.68	0.50	0.80	0.10	0.30		0.030		0.030
1.1065_01	DIN EN ISO 16120-2 C66D (2011)	0.63	0.68	0.50	0.80	0.10	0.30		0.030		0.030

Micro Alloyed And Non - Alloyed High Strength Carbon Steels For Wire - Spring - Rope Production

Al		Cu		Ni		Cr		Mo		V		B (ppm)	
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
	0.050		0.35		0.25		0.20		0.06				
					0.40		0.40		0.10				
	0.010		0.30		0.25		0.20		0.05				
					0.40		0.40		0.10				80
	0.010		0.30		0.25		0.20		0.05				80
			0.40		0.40		0.40		0.10				80
	0.050		0.35		0.25		0.20		0.06				
	0.010		0.25		0.20		0.15		0.05				
	0.010		0.25		0.20		0.15		0.05				80
			0.35		0.25		0.20		0.06				
	0.010		0.25		0.20		0.15		0.05				80
			0.35		0.25		0.20		0.06				
			0.35		0.25		0.20		0.06				
			0.40		0.40		0.40		0.10				80
			0.35		0.25		0.40		0.06				
	0.010		0.25		0.20		0.15		0.05				80
	0.010		0.25		0.20		0.15		0.05				
	0.010		0.25		0.20		0.15		0.05				

Micro Alloyed And Non - Alloyed High Strength Carbon Steels For Wire - Spring - Rope Production

DIN EN ISO 16120-2 (2011) , DIN EN 10083-2 (2006) , DIN EN 10089 (2002) , SAE J403 (2014)

Chemical Composition (%)

GRADE CODE	ORRESPONDING STANDARDS	C		Mn		Si		P		S	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
5.1065_00	DIN EN ISO 16120-2 C66D (2011)	0.63	0.68	0.50	0.80	0.10	0.30		0.030		0.030
5.1065_01	DIN EN ISO 16120-2 C66D (2011)	0.63	0.68	0.50	0.80	0.10	0.30		0.030		0.030
5.1065_02	DIN EN ISO 16120-2 C66D (2011)	0.63	0.68	0.50	0.80	0.10	0.30		0.030		0.030
1.1068_00	DIN EN ISO 16120-2 C68D (2011)	0.65	0.70	0.50	0.80	0.10	0.30		0.030		0.030
5.1068_00	DIN EN ISO 16120-2 C68D (2011)	0.65	0.70	0.50	0.80	0.10	0.30		0.030		0.030
1.1070_00	DIN EN ISO 16120-2 C70D (2011)	0.68	0.73	0.50	0.80	0.10	0.30		0.030		0.030
1.1070_01	SAE J403 1070 (2014)	0.65	0.75	0.60	0.90				0.040		0.050
1.1070_02	İSDEMİR 1070 ÖZEL (BEKAERT SPEC. GS-02-011/TCN1)	0.68	0.77	0.40	0.80		0.40		0.025		0.025
5.1070_00	DIN EN ISO 16120-2 C70D (2011)	0.68	0.73	0.50	0.80	0.10	0.30		0.030		0.030
5.1070_01	DIN EN ISO 16120-2 C70D (2011)	0.68	0.73	0.50	0.80	0.10	0.30		0.030		0.030
5.1074_00	SAE J403 1074 (MODIFIED) (2014)	0.70	0.80	0.50	0.80				0.040		0.050
5.1075_00	DIN EN ISO 16120-2 C72D (2011)	0.70	0.75	0.50	0.80	0.10	0.30		0.030		0.030
5.1075_01	DIN EN ISO 16120-2 C72D (2011)	0.70	0.75	0.50	0.80	0.10	0.30		0.030		0.030
5.1076_00	SAE J403 1074 (2014)	0.70	0.80	0.50	0.80				0.040		0.050
5.1076_01	DIN EN ISO 16120-2 C76D (2011)	0.73	0.78	0.50	0.80	0.10	0.30		0.030		0.030
5.1078_00	DIN EN ISO 16120-2 C78D (2011)	0.75	0.80	0.50	0.80	0.10	0.30		0.030		0.030
1.1082_00	DIN EN ISO 16120-2 C82D (2011)	0.80	0.85	0.50	0.80	0.10	0.30		0.030		0.030

Micro Alloyed And Non - Alloyed High Strength Carbon Steels For Wire - Spring - Rope Production

Al		Cu		Ni		Cr		Mo		V		B (ppm)	
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
	0.010		0.25		0.20		0.15		0.05				80
	0.010		0.25		0.20		0.15		0.05				80
	0.010		0.25		0.20		0.15		0.05				80
	0.010		0.25		0.20		0.15		0.05				
	0.010		0.25		0.20		0.15		0.05				80
	0.010		0.25		0.20		0.15		0.05				
			0.35		0.25		0.20		0.06				
	0.010		0.25		0.20		0.15		0.05				
	0.010		0.25		0.20		0.15		0.05				80
	0.010		0.25		0.20		0.15		0.05				80
			0.35		0.25		0.50		0.06		0.06		80
	0.010		0.25		0.20		0.15		0.05				80
	0.010		0.25		0.20		0.15		0.05		0.06		80
			0.35		0.25		0.20		0.06				80
	0.010		0.25		0.20		0.15		0.05				80
	0.010		0.25		0.20		0.15		0.05				80
			0.25		0.20		0.15		0.05				

Micro Alloyed And Non - Alloyed High Strength Carbon Steels For Wire - Spring - Rope Production

DIN EN ISO 16120-2 (2011) , DIN EN 10083-2 (2006) , DIN EN 10089 (2002) , SAE J403 (2014)

Chemical Composition (%)																			
GRADE CODE	CORRESPONDING STANDARDS	C		Mn		Si		P		S		Al		Cu		Ni		Cr	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
1.1090_00	SAE J403 1090 (2014)	0.85	0.98	0.60	0.90				0.040		0.050				0.35		0.25		0.20
5.1082_00	DIN EN ISO 16120-2 C82D (2011)	0.80	0.85	0.50	0.80	0.10	0.30		0.030		0.030				0.25		0.20		0.15
1.1082_01[2]	SAE J403 1080 (2014)	0.75	0.88	0.60	0.90				0.040		0.050				0.35		0.25		0.60
1.1082_02[2]	SAE J403 1080 (2014)	0.75	0.88	0.60	0.90				0.040		0.050				0.35		0.25		0.40
1.1082_03[2]	SAE J403 1080 (2014)	0.75	0.88	0.60	0.90				0.040		0.050				0.35		0.25		0.60

Chemical Composition (%)													
Mo		V		B (ppm)									
min.	max.	min.	max.	min.	max.								
	0.06												
	0.05				80								
	0.06		0.08										
	0.06		0.06										
	0.06		0.10										

Notes

1- Cr + Mo + Ni ≤ % 0,63
2- According to SAE J403: 2014 standard belongs to the trace group “D” elements.

Micro Alloyed And Non - Alloyed High Strength Carbon Steels For Wire - Spring - Rope Production

DIN EN 10025-2 (2004) , GOST 380 (2005) , SAE J403 (2014) , JIS G3101 (2015) , DNV-P2 (2011) , API 5CT (2011)
DIN EN 10216-2 (2013) , ASTM A572 (2015) , DIN EN 10149-2 (2013)

Chemical Composition (%)

GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Si		Al		Nb	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
1.1234_00	DIN EN 10025-2 S235JR (2004)		0.17		1.40		0.040		0.040						
1.1235_00	DIN EN 10025-2 S235JR (2004)		0.17		1.40		0.040		0.040						
1.1235_01	DIN EN 10025-2 S235JR (2004)		0.17		1.40		0.040		0.040						
1.1236_00	DIN EN 10025-2 S235JR (2004)		0.17		1.40		0.040		0.040						
1.1236_01	DIN EN 10025-2 S235JR (2004)		0.17		1.40		0.040		0.040						
1.1236_02	DIN EN 10025-2 S235JR (2004)		0.17		1.40		0.040		0.040						
1.1245_00	JIS G3101 SS400 (2015)	0.10	0.20	0.40	1.20		0.050		0.050						
1.1245_01	DNV-P2 GRADE NAVY A (2011)		0.21	0.30			0.035		0.035		0.50				
1.1275_00	DIN EN 10025-2 S275JR (2004)		0.21		1.50		0.040		0.040						
1.1275_01	DIN EN 10025-2 S275JR (2004)		0.21		1.50		0.040		0.040						
1.1275_02	DIN EN 10025-2 S275JR (2004)		0.21		1.50		0.040		0.040						
1.1275_03	DIN EN 10025-2 S275JR (2004)		0.21		1.50		0.040		0.040						
1.1275_04	DIN EN 10025-2 S275JR (2004)		0.21		1.50		0.040		0.040						
1.1355_00	DIN EN 10025-2 S355JR (2004)		0.24		1.60		0.040		0.040		0.55				
1.1355_01	DIN EN 10025-2 S355JR (MODIFIED) (2004)		0.26		1.60		0.040		0.040		0.55				

Carbon Steels For Nail & Angle Iron & Profile Production

V		Ti		N		Cu		Ni		Cr		B		Mo		Ceq	
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
					0.012		0.55										0.35
					0.012		0.55										0.35
					0.012		0.55										0.35
					0.012		0.55										0.35
					0.012		0.55										0.35
					0.012		0.55										0.35
					0.012		0.55										0.40
					0.012		0.55										0.40
					0.012		0.55										0.40
					0.012		0.55										0.40
					0.012		0.55										0.40
					0.012		0.55										0.45
					0.012		0.55										0.45

Carbon Steels For Nail & Angle Iron & Profile Production

DIN EN 10025-2 (2004) , GOST 380 (2005) , SAE J403 (2014) , JIS G3101 (2015) , DNV-P2 (2011) , API 5CT (2011) , DIN EN 10216-2 (2013) , ASTM A572 (2015) , DIN EN 10149-2 (2013)

Chemical Composition (%)

GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Si		Al	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
1.1355_02	DIN EN 10025-2 S355JR (2004)		0.24		1.60		0.040		0.040		0.55		
1.1355_03	DIN EN 10025-2 S355JR (2004)		0.24		1.60		0.040		0.040		0.55		
1.1355_04	DIN EN 10025-2 S355JR (2004)		0.24		1.60		0.040		0.040		0.55		
1.1355_05	DIN EN 10025-2 S355JR (2004)		0.24		1.60		0.040		0.040		0.55		
1.1355_25	DIN EN 10025-2 S355JR (2004)		0.24		1.60		0.040		0.040		0.55		
1.1380_00[1]	GOST 380 St3sp (2005)	0.14	0.22	0.40	0.65		0.040		0.050		0.15		
1.1380_01	GOST 380 St3sp (MODIFIED) (2005)	0.14	0.22	0.40	0.75		0.040		0.050		0.15		
1.1380_02	GOST 380 St3sp (MODIFIED) (2005)	0.14	0.22	0.40	0.85		0.040		0.050		0.15		
1.2017_00	SAE J403 1017 (2014)	0.15	0.20	0.30	0.60		0.040		0.050				0.100
1.2275_00	DIN EN 10025-2 S275J2 (2004)		0.18				0.030		0.030				0.080
1.2275_01	DNV-P2 GRADE A36 / D36 (2011)		0.18	0.90	1.60		0.035		0.035		0.50	0.020	
1.2275_02	DNV-P2 GRADE A36 / D36 (2011)		0.18	0.90	1.60		0.035		0.035		0.50		0.010
1.2355_00	DIN EN 10025-2 S355JR (2004)		0.24		1.60		0.040		0.040		0.55		0.080
1.2355_01	DIN EN 10025-2 S355J0 (MODIFIED) (2004)		0.22		1.60		0.035		0.035		0.55		0.080
1.2355_02	DIN EN 10025-2 S355JR (2004)		0.24		1.60		0.040		0.040		0.55		0.080

Carbon Steels For Nail & Angle Iron & Profile Production

Nb		V		Ti		N		Cu		Ni		Cr		B		Mo		Ceq	
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
							0.012		0.55										0.45
							0.012		0.55										0.45
							0.012		0.55										0.45
							0.012		0.55										0.45
							0.012		0.55										0.45
									0.30		0.30		0.30						
									0.30		0.30		0.30						
									0.30		0.30		0.30						
									0.35		0.25		0.20				0.06		
									0.55										0.40
									0.35		0.40		0.20				0.08		
		0.050	0.100						0.35		0.40		0.20				0.08		
							0.012		0.55										0.45
							0.012		0.55										0.48
							0.012		0.55										0.45

DIN EN 10025-2 (2004) , GOST 380 (2005) , SAE J403 (2014) , JIS G3101 (2015) , DNV-P2 (2011) , API 5CT (2011) , DIN EN 10216-2 (2013) , ASTM A572 (2015) , DIN EN 10149-2 (2013)

Chemical Composition (%)

GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Si		Al	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
1.2355_03	DIN EN 10025-2 S355JR (2004)		0.24		1.60		0.040		0.040		0.55		0.080
1.2355_04	DIN EN 10025-2 S355J2 (MODIFIED) (2004)		0.22		1.60		0.030		0.030		0.55		0.080
1.2355_05	DIN EN 10025-2 S355J2 (2004)		0.20		1.60		0.030		0.030		0.55		0.080
1.3235_00	DIN EN 10025-2 S235JR (2004)		0.17		1.40		0.040		0.040				
1.3380_00	API 5CT J55 (2011)	0.30	0.42		1.60		0.030		0.030				
4.1235_00	DIN EN 10025-2 S235JR (2004)		0.17		1.40		0.040		0.040				0.040
5.1270_00	DIN EN 10216-2 16Mo3 (2013)	0.12	0.20	0.40	0.90		0.025		0.010		0.35		0.040
5.1345_00	ASTM A572 Gr 50 Type2 (2015)		0.23		1.35		0.030		0.030		0.40		
5.1355_00	DIN EN 10025-2 S355JR (2004)		0.24		1.60		0.040		0.040		0.55		
5.1355_01	DIN EN 10025-2 S355JR (2004)		0.24		1.60		0.040		0.040		0.55		
5.1355_02	DIN EN 10025-2 S355JR (MODIFIED) (2004)		0.24		1.60		0.040		0.040		0.55		0.040
5.1355_03	DIN EN 10025-2 S355JR (2004)		0.24		1.60		0.040		0.040		0.55		
5.2460_00[2]	DIN EN 10149-2 S460MC (2013)		0.12		1.60		0.025		0.015		0.50	0.015	
5.2700_00	DIN EN 10149-2 S7000MC (MODIFIED) (2013)		0.12		2.20		0.025		0.015		0.60	0.015	

Notes

1- % As: 0.08 max. ve % N: 0.008 max. olacaktır. / % As: 0.08 max. and % N: 0.008 max.

2- % Nb + Ti + V : 0.22 max. olacaktır. / % Nb + Ti + V : 0.22 max.

Carbon Steels For Nail & Angle Iron & Profile Production

Nb		V		Ti		N		Cu		Ni		Cr		B		Mo		Ceq	
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
							0.012		0.55										0.45
									0.55										0.48
									0.55										0.45
							0.012		0.55										0.35
							0.012		0.55										0.35
									0.30		0.30		0.30			0.25	0.35		
		0.010	0.150																
			0.080				0.012		0.55										0.45
	0.080						0.012		0.55										0.45
	0.080						0.012		0.55										0.50
	0.080						0.012		0.55										0.45
	0.090		0.20		0.15														
	0.25		0.20		0.22										0.005		0.50		

ABS-P2 (2016) , DIN EN 10025-2 (2004)

Chemical Composition (%)

GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Si		Al	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
5.2355_00	ABS-P2 AH36 / DH36 / EH36 (2016)		0.18	0.90	1.60		0.035		0.035	0.10	0.50	0.015	
5.2355_01	ABS-P2 AH36 / DH36 / EH36 (2016)		0.18	0.90	1.60		0.035		0.035	0.10	0.50	0.015	
5.2355_02	ABS-P2 AH36 / DH36 / EH36 (2016)		0.18	0.90	1.60		0.035		0.035	0.10	0.50	0.015	
5.2355_03	ABS-P2 AH36 / DH36 / EH36 (2016)		0.18	0.90	1.60		0.035		0.035	0.10	0.50	0.015	
5.2355_04	ABS-P2 AH36 / DH36 / EH36 (2016)		0.18	0.90	1.60		0.035		0.035	0.10	0.50	0.015	
5.2355_05	ABS-P2 AH36 / DH36 / EH36 (2016)		0.18	0.90	1.60		0.035		0.035	0.10	0.50	0.015	
5.2355_06	ABS-P2 AH36 / DH36 / EH36 (2016)		0.18	0.90	1.60		0.035		0.035	0.10	0.50	0.015	
5.2355_07	ABS-P2 AH36 / DH36 / EH36 (2016)		0.18	0.90	1.60		0.035		0.035	0.10	0.50	0.015	
5.2355_08	ABS-P2 AH36 / DH36 / EH36 (2016)		0.18	0.90	1.60		0.035		0.035	0.10	0.50	0.015	
5.2355_09	DIN EN 10025-2 S355J2 (2004)		0.20		1.60		0.030		0.030		0.55		0.080

Steels For Ship Profile Production

V		Nb		Mo		Ti		Cu		Ni		Cr		Ceq	
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
0.030					0.08		0.02		0.35		0.40		0.20		
0.030					0.08		0.02		0.35		0.40		0.20		
			0.010		0.08		0.02		0.35		0.40		0.20		
			0.010		0.08		0.02		0.35		0.40		0.20		
0.030					0.08		0.02		0.35		0.40		0.20		
0.030					0.08		0.02		0.35		0.40		0.20		
0.030					0.08		0.02		0.35		0.40		0.20		
0.030					0.08		0.02		0.35		0.40		0.20		
0.030					0.08		0.02		0.35		0.40		0.20		
	0.050								0.55						0.45

Sulphur Alloyed High Carbon Steels

SAE J403 (2014) , DIN EN 10025-2 (2004) , DIN EN 10083-2 (2006) , DIN EN 10084 (2008)

Chemical Composition (%)

GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Si		Al	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
7.1235_00	DIN EN 10025-2 S235JR (2004)		0.17		1.40		0.040		0.040				
7.1018_00[1]	SAE J403 1018 (MODIFIED) (2014)	0.15	0.20	0.60	0.90		0.040	0.010	0.050				
7.1020_00	DIN EN 10083-2 C22R (MODIFIED)	0.17	0.24	0.30	0.70		0.040	0.010	0.040		0.40		
7.1030_00	SAE J403 1030 (2014)	0.27	0.35	0.50	1.00		0.040	0.010	0.050				
7.1039_00	DIN EN 10083-2 C35R (MODIFIED)	0.32	0.41	0.50	0.80		0.040	0.010	0.040		0.40		
7.1040_00	DIN EN 10083-2 C40R (MODIFIED)	0.37	0.44	0.50	0.80		0.040	0.010	0.040		0.40		
7.1045_00[2]	DIN EN 10083-2 C45R (2006)	0.42	0.50	0.50	0.80		0.030	0.020	0.040		0.40		
7.1050_00	DIN EN 10083-2 C50R (MODIFIED)	0.47	0.55	0.60	0.90		0.040	0.010	0.040		0.40		
7.2016_00	DIN EN 10084 16MnCrS5 (MODIFIED) (2008)	0.14	0.19	1.00	1.30		0.025	0.015	0.040		0.40		0.080
7.2060_00[2]	DIN EN 10083-2 C60R (2006)	0.57	0.65	0.60	0.90		0.030	0.020	0.040		0.40		0.080

Notes

1- According to SAE J403: 2014 standard belongs to the trace group "D" elements.
2- Cr + Mo + Ni ≤ % 0,63

Sulphur Alloyed High Carbon Steels

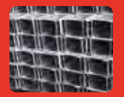
Ni		Cr		Mo		N		Cu		Ceq	
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
							0.012		0.55		0.35
	0.40		0.40		0.10						
	0.40		0.40		0.10						
	0.40		0.40		0.10						
	0.40		0.40		0.10						
	0.40		0.40		0.10						
		0.70	1.20								
	0.40		0.40		0.10						

SAE J403 (2014)

Chemical Composition (%)												
GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Cu		Ni	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
1.1009_00	SAE J403 1009 (2014)		0.15		0.60		0.040		0.050		0.35		0.25
1.1009_01	SAE J403 1009 (MODIFIED) (2014)		0.15		0.75		0.040		0.050		0.35		0.25


Steels For Mesh Quality Steel Production

Cr		Mo	
min.	max.	min.	max.
	0.20		0.06
	0.20		0.06



Chromium Alloyed High Carbon Steels

DIN EN 10083-3 (2006) , SAE J1249 (2008) , SAE J1268 (2010) , DIN EN 10089 (2002)

Chemical Composition (%)

GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Si		Al	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
5.5140_00	DIN EN 10083-3 41Cr4 (2006)	0.38	0.45	0.60	0.90		0.025		0.035		0.40		
5.5140_01	DIN EN 10083-3 41Cr4 (2006)	0.38	0.45	0.60	0.90		0.025		0.035		0.40		0.080
5.5142_00	DIN EN 10083-3 42CrMo4 (2006)	0.38	0.45	0.60	0.90		0.025		0.035		0.40		
5.5145_00	SAE J1249 5145 (2008)	0.43	0.48	0.70	0.90		0.035		0.040	0.15	0.30		
5.5150_00	SAE J1268 5150H (2010)	0.47	0.54	0.60	1.00					0.15	0.35		
5.5155_00	DIN EN 10089 55Cr3 (2002)	0.52	0.59	0.70	1.00		0.025		0.025		0.40		
5.5155_01	DIN EN 10089 55Cr3 (2002)	0.52	0.59	0.70	1.00		0.025		0.025		0.40		
5.5155_02	DIN EN 10089 55Cr3 (2002)	0.52	0.59	0.70	1.00		0.025		0.025		0.40		
5.5155_03	DIN EN 10089 55Cr3 (2002)	0.52	0.59	0.70	1.00		0.025		0.025		0.40		
5.6150_00	DIN EN 10083-3 51CrV4 (2006)	0.47	0.55	0.70	1.10		0.025		0.025		0.40		
5.6150_01	DIN EN 10083-3 51CrV4 (2006)	0.47	0.55	0.70	1.10		0.025		0.025		0.40		

Chromium Alloyed High Carbon Steels

Cr		Mo		V	
min.	max.	min.	max.	min.	max.
0.90	1.20				
0.90	1.20				
0.90	1.20	0.15	0.30		
0.70	0.90				
0.60	1.00				
0.70	1.00				
0.70	1.00				
0.70	1.00				
0.70	1.00				
0.90	1.20			0.10	0.25
0.90	1.20			0.10	0.25

DIN EN ISO 16120-2 (2011) , DIN EN 10083-2 (2006) , DIN EN 10089 (2002) , SAE J403 (2014)

Chemical Composition (%)

GRADE CODE	CORRESPONDING STANDARDS	C		Mn		Si		P		S		Cu	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
1.7038_00	DIN EN 10089 38Si7 (2002)	0.35	0.42	0.50	0.80	1.50	1.80		0.025		0.025		
1.7038_01	DIN EN 10089 38Si7 (2002)	0.35	0.42	0.50	0.80	1.50	1.80		0.025		0.025		
1.7060_00	İSDEMİR ÖZEL 60SiMn5	0.56	0.66	0.80	1.20	0.90	1.40		0.040		0.050		0.40

Ni		Cr		Mo	
min.	max.	min.	max.	min.	max.
	0.40		0.40		0.06

Steels For Deformed Reinforcing Steel Bar Production

SAE J403 (2014) , ASTM A615 (2016) , GOST 380 (2005) , DIN EN 10025-2 (2004) , SI 4466 - SI 739 (2000) , BS 4449 (2009)

Chemical Composition (%)

GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Si		N	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
1.1029_00	SAE J403 1029 (2014)	0.25	0.31	0.60	0.90		0.040		0.050				
1.1030_00	SAE J403 1030 (2014)	0.28	0.34	0.60	0.90		0.040		0.050				
1.1280_00	ASTM A615 Grade 40 (2016)	0.19	0.29	0.50	1.20		0.050		0.050				
1.1280_01	ASTM A615 Grade 40 (2016)	0.20	0.34	0.35	1.20		0.050		0.050				
1.1280_02	ASTM A615 Grade 40 (2016)	0.27	0.38	0.35	0.90		0.050		0.050				
1.1280_03	ASTM A615 Grade 40 (2016)	0.11	0.20	0.90	1.50		0.050		0.050				
1.1281_00	ASTM A615 Grade 40 (2016)	0.20	0.33	0.80	1.40		0.050		0.050				
1.1281_02	ASTM A615 Grade 40 (2016)	0.23	0.35	0.70	1.30		0.050		0.050				
1.1295_00	GOST 380 St5sp (2005)	0.28	0.37	0.50	0.80		0.040		0.050	0.15	0.30		
1.1295_01	GOST 380 St5sp (MODIFIED) (2005)	0.28	0.37	0.50	0.95		0.040		0.050	0.15	0.30		
1.1324_00	ASTM A615 Grade 40 (2016)	0.17	0.31	0.70	1.40		0.050		0.050				
1.1350_00	20MnSi (China Norm)	0.17	0.27	1.10	1.70		0.045		0.045	0.30	0.80		

Steels For Deformed Reinforcing Steel Bar Production

V		Cu		Ni		Cr		Mo		Ceq	
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
			0.35		0.25		0.20		0.06		
			0.35		0.25		0.20		0.06		
			0.30		0.30		0.30				
			0.30		0.30		0.30				
			0.30		0.30		0.30				

Steels For Deformed Reinforcing Steel Bar Production

SAE J403 (2014) , ASTM A615 (2016) , GOST 380 (2005) , DIN EN 10025-2 (2004) , SI 4466 - SI 739 (2000) , BS 4449 (2009)

Chemical Composition (%)																			
GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Si		N		V		Cu		Ni	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
1.1420_00	ASTM A615 Grade 60 (2016)	0.27	0.43	0.80	1.70		0.050		0.050										
1.1420_01	ASTM A615 Grade 60 (2016)	0.29	0.40	0.85	1.60		0.050		0.050										
1.1420_02	ASTM A615 Grade 60 (2016)	0.29	0.39	0.90	1.50		0.050		0.050										
1.1421_00	ASTM A615 Grade 60 (2016)	0.29	0.40	1.10	1.70		0.050		0.050										
1.1421_01	ASTM A615 Grade 60 (2016)	0.33	0.44	0.90	1.50		0.050		0.050										
1.1421_02	ASTM A615 Grade 60 (2016)	0.32	0.43	0.80	1.45		0.050		0.050										
1.1421_03	ASTM A615 Grade 60 (2016)	0.30	0.39	1.15	1.70		0.050		0.050										
1.1422_00	ASTM A615 Grade 60 (2016)	0.33	0.43	1.00	1.75		0.050		0.050										
1.8300_00	DIN EN 10025-2 S275 JR (2004)		0.21		1.50		0.040		0.040				0.012				0.55		
1.8420_00	BS 4449 B500 (2009)		0.22	0.65	1.35		0.050		0.050				0.012				0.80		
1.8420_01	BS 4449 B500 (2009)		0.22	0.50	1.20		0.050		0.050				0.012				0.80		
1.8420_02	BS 4449 B500 (2009)		0.22	0.40	1.00		0.050		0.050				0.012				0.80		
1.8420_03	BS 4449 B500 (2009)		0.22	0.50	1.10		0.050		0.050				0.012				0.80		
1.8420_04	BS 4449 B500 (2009)		0.22	0.70	1.30		0.050		0.050				0.012				0.80		
1.8420_05	BS 4449 B500 (2009)		0.22	0.30	0.90		0.050		0.050				0.012				0.80		
1.8420_06	BS 4449 B500 (MODIFIED) (2009)		0.24	0.70	1.30		0.050		0.050				0.012				0.80		

Cr		Mo		Ceq															
min.	max.	min.	max.	min.	max.														

Steels For Deformed Reinforcing Steel Bar Production

Steels For Deformed Reinforcing Steel Bar Production

SAE J403 (2014) , ASTM A615 (2016) , GOST 380 (2005) , DIN EN 10025-2 (2004) , SI 4466 - SI 739 (2000) , BS 4449 (2009)

Chemical Composition (%)

GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Si		N	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
1.8420_30	BS 4449 B500 (2009)		0.22	0.30	0.90		0.050		0.050				0.012
5.1400_00	SI 4466, SI 739 S400 (2000)	0.30	0.39	0.80	1.40		(%S+%P)=0.080 max.				0.40		
5.1420_00	ASTM A615 Grade 60 (2016)	0.22	0.33	1.05	1.75		0.050		0.050				
5.1422_00	ASTM A615 Grade 60 (2016)	0.34	0.43	1.15	1.70		0.050		0.050				
5.1460_00	BS 4449 B500 (MODIFIED) (2009)		0.27	1.00	1.55		0.050		0.050				0.012
8.1400_00	SI 4466, SI 739 S400 (2000)	0.29	0.39	0.90	1.60		(%S+%P)=0.080 max.				0.40		
8.1400_01	SI 4466, SI 739 S400 (2000)	0.30	0.39	0.95	1.65		(%S+%P)=0.080 max.				0.40		
8.1400_02	SI 4466, SI 739 S400 (2000)	0.31	0.40	0.70	1.50		(%S+%P)=0.080 max.				0.40		
8.1423_00	ASTM A615 Grade 60 (2016)	0.36	0.46	1.10	1.65		0.050		0.050				
8.1423_01	ASTM A615 Grade 60 (2016)	0.38	0.47	1.10	1.65		0.050		0.050				
8.1423_02	ASTM A615 Grade 60 (2016)	0.35	0.44	1.00	1.60		0.050		0.050				

Steels For Deformed Reinforcing Steel Bar Production

V		Cu		Ni		Cr		Mo		Ceq	
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
			0.80								0.50
	0.040		0.20		0.20		0.20				0.60
	0.100										
	0.100										
	0.110		0.80								0.50
			0.20		0.20		0.20				0.60
			0.20		0.20		0.20				0.60
			0.20		0.20		0.20				0.60
	0.060										

Steels For Electrode And Welding Wire Production

SAE J403 (2014) , DIN EN ISO 14171 (2010) , DIN 8559-P1 (1984)

Chemical Composition (%)

GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Si		Al	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
6.1300_00	DIN EN ISO 14171 S2Mo (2010)	0.07	0.15	0.80	1.30		0.025		0.025	0.05	0.25		
6.1470_04	DIN EN ISO 14171 S3Mo (2010)	0.07	0.15	1.30	1.75		0.025		0.025	0.05	0.25		
6.1360_05	DIN 8559-P1 SG1 (1984)	0.06	0.12	1.00	1.30		0.025		0.025	0.50	0.70		0.020
6.1360_00	DIN 8559-P1 SG2 (1984)	0.06	0.13	1.30	1.60		0.025		0.025	0.70	1.00		0.020
6.1360_01	DIN 8559-P1 SG2 (1984) (BORON)	0.06	0.13	1.30	1.60		0.025		0.025	0.70	1.00		0.020
6.1360_02	DIN 8559-P1 SG2 (1984)	0.06	0.13	1.30	1.60		0.025		0.025	0.70	1.00		0.020
6.1360_10	DIN 8559-P1 SG2 (1984) (TITANIUM)	0.06	0.13	1.30	1.60		0.025		0.025	0.70	1.00		0.020
6.1360_03	DIN 8559-P1 SG3 (1984)	0.06	0.13	1.60	1.90		0.025		0.025	0.80	1.20		0.020
6.1360_04	DIN 8559-P1 SG3 (1984)	0.06	0.13	1.30	1.60		0.025		0.025	0.70	1.00		0.020
6.1360_06	DIN 8559-P1 SG3 (1984)	0.06	0.13	1.60	1.90		0.025		0.025	0.80	1.20		0.020
6.1470_00	DIN EN ISO 14171 S2 (2010)	0.07	0.15	0.80	1.30		0.025		0.025		0.15		
6.1470_02	DIN EN ISO 14171 S2 (2010)	0.07	0.15	0.80	1.30		0.025		0.025		0.15		
6.2470_00	DIN EN ISO 14171 S2 (2010)	0.07	0.15	0.80	1.30		0.025		0.025		0.15		0.040
6.1470_03	DIN EN ISO 14171 S2 (MODIFIED) (2010)	0.07	0.15	0.80	1.30		0.025		0.025		0.35		
6.1470_01	DIN EN ISO 14171 S2Si (2010)	0.07	0.15	0.80	1.30		0.025		0.025	0.70	0.40		
6.2008_00	DIN EN ISO 14171 S1 (2010)	0.05	0.15	0.35	0.60		0.025		0.025		0.15		

Steels For Electrode And Welding Wire Production

Mo		Ti - Zr		B(ppm)		V		Cu		Ni		Cr	
min.	max.	min	max.	min..	max.	min.	max.	min.	max.	min.	max.	min.	max.
0.45	0.65								0.30		0.15		0.15
0.45	0.65								0.30		0.15		0.15
	0.15		0.15				0.030		0.30		0.15		0.15
	0.15		0.15				0.030		0.30		0.15		0.15
	0.15		0.15		80		0.030		0.30		0.15		0.15
	0.15		0.15				0.030		0.30		0.15		0.15
	0.15		0.15				0.030		0.30		0.15		0.15
	0.15		0.15				0.030		0.30		0.15		0.15
	0.15		0.15				0.030		0.30		0.15		0.15
	0.15		0.15				0.030		0.30		0.15		0.15
	0.15								0.30		0.15		0.15
	0.15								0.30		0.15		0.15
	0.15								0.30		0.15		0.15
	0.15								0.30		0.15		0.15
	0.15								0.30		0.15		0.15
	0.15								0.30		0.15		0.15

SAE J403 (2014) , DIN EN ISO 14171 (2010) , DIN 8559-P1 (1984)

Chemical Composition (%)

GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Si		Al	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
6.2008_01	DIN EN ISO 14171 S1 (2010)	0.05	0.15	0.35	0.60		0.025		0.025		0.15		
6.3006_00	SAE J403 1006 (MODIFIED) (2014)		0.08	0.25	0.55		0.040		0.050				
6.3008_00	DIN EN ISO 14171 S1 (2010)	0.05	0.15	0.35	0.60		0.025		0.025		0.15		
6.3008_01	DIN EN ISO 14171 S1 (2010)	0.05	0.15	0.35	0.60		0.025		0.025		0.15		
6.3008_02	DIN EN ISO 14171 S1 (2010)	0.05	0.15	0.35	0.60		0.025		0.025		0.15		
6.3008_03	DIN EN ISO 14171 S1 (2010)	0.05	0.15	0.35	0.60		0.025		0.025		0.15		
6.3008_04	DIN EN ISO 14171 S1 (2010)	0.05	0.15	0.35	0.60		0.025		0.025		0.15		
6.3008_05	DIN EN ISO 14171 S1 (2010)	0.05	0.15	0.35	0.60		0.025		0.025		0.15		

Steels For Electrode And Welding Wire Production

Mo		Ti - Zr	B(ppm)		V		Cu		Ni		Ceq	
min.	max.		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
	0.15							0.30		0.15		0.15
	0.06							0.35		0.25		0.20
	0.15							0.30		0.15		0.15
	0.15							0.30		0.15		0.15
	0.15							0.30		0.15		0.15
	0.15							0.30		0.15		0.15
	0.15							0.30		0.15		0.15
	0.15							0.30		0.15		0.15

DIN EN 10263-2 (2001) , SAE J403 (2014)

GRADE CODE	CORRESPONDING STANDARDS	Chemical Composition (%)											
		C		Mn		P		S		Si		Al	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
1.2010_00	SAE J403 1010 (2014)	0.08	0.13	0.30	0.60		0.040		0.050				0.060
1.2390_00	DIN EN 10263-2 C4C (2001)	0.02	0.06	0.25	0.40		0.020		0.025		0.10	0.020	0.060
1.2410_00	DIN EN 10263-2 C8C (2001)	0.06	0.10	0.25	0.45		0.020		0.025		0.10	0.020	0.060
1.2410_01	DIN EN 10263-2 C8C (MODI-FIED) (2001)	0.06	0.10	0.25	0.45		0.020		0.025		0.40	0.010	0.060
1.2430_00	DIN EN 10263-2 C10C (2001)	0.08	0.12	0.30	0.50		0.025		0.025		0.10	0.020	0.060
1.2460_00	DIN EN 10263-2 C15C (2001)	0.13	0.17	0.35	0.60		0.025		0.025		0.10	0.020	0.060

Steel For Screw & Nut Production

								Mechanical Properties	
Cu		Ni		Cr		Mo		Rm (N/mm2)	Reduction In Area
min.	max.	min.	max.	min.	max.	min.	max.	max.	
	0.35		0.25		0.20		0.06		
								390	70
								410	65
								410	65
								430	60
								460	58

DIN EN 10263-3 (2001) , DIN EN 10263-4 (2001) , 17MnV7

Chemical Composition (%)													
GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Si		Al	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
5.2450_00	17MnV7 WNr. :1.0870		0.20	1.40	1.90		0.035		0.035		0.55	0.020	
5.2500_00	DIN EN 10263-3 15B2 (2001)	0.13	0.16	0.60	0.80		0.025		0.025		0.30		0.080
5.2500_01	DIN EN 10263-3 15B2 (2001)	0.13	0.16	0.60	0.80		0.025		0.025		0.30		0.080
5.2570_00	DIN EN 10263-4 17MnB4 (2001)	0.15	0.20	0.90	1.20		0.025		0.025		0.30		0.080
5.2570_01	DIN EN 10263-4 17MnB4 (2001)	0.15	0.20	0.90	1.20		0.025		0.025		0.30		0.080
5.2570_02	DIN EN 10263-4 17MnB4 (MODIFIED) / 17MnB3 (2001)	0.15	0.24	0.70	1.20		0.025		0.025		0.30		0.080
5.2580_00	DIN EN 10263-4 20MnB4 (2001)	0.18	0.23	0.90	1.20		0.025		0.025		0.30		0.080
5.2580_01	DIN EN 10263-4 20MnB4 (2001)	0.18	0.23	0.90	1.20		0.025		0.025		0.30		0.080
5.2580_02	DIN EN 10263-4 20MnB4 (2001)	0.18	0.23	0.90	1.20		0.025		0.025	0.10	0.25		0.080

Steels For Bolt Production

														Mechanical Properties	
B(ppm)		N		Nb		Ti		V		Cu		Cr		Rm (N/mm2)	Reduction In Area
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	max.	
			0.025		0.080				0.20						
8	50										0.25			500	58
8	50										0.25			500	58
8	50										0.25		0.30	570	60
8	50						0.080				0.25		0.30	570	60
8	50						0.080				0.25		0.30	570	60
8	50						0.080				0.25		0.30	580	60
8	50						0.080				0.25		0.30	580	60
8	50						0.080				0.25		0.30	580	60

DIN EN 10263-3 (2001) , DIN EN 10263-4 (2001) , 17MnV7

Chemical Composition (%)													
GRADE CODE	CORRESPONDING STANDARDS	C		Mn		P		S		Si		Al	
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
5.2580_03	DIN EN 10263-4 20MnB4 (2001)	0.18	0.23	0.90	1.20		0.025		0.025		0.30		0.080
5.2600_00	DIN EN 10263-4 23B2 (2001)	0.20	0.25	0.60	0.90		0.025		0.025		0.30		0.080
5.2600_01	DIN EN 10263-4 23MnB4 (2001)	0.20	0.25	0.90	1.20		0.025		0.025		0.30		0.080
5.2600_02	DIN EN 10263-4 27MnB4 (MODIFIED) (2001)	0.25	0.30	0.90	1.20		0.025		0.025		0.30		0.080
5.2600_03	DIN EN 10263-4 30MnB4 (MODIFIED) (2001)	0.27	0.34	0.80	1.30		0.025		0.025		0.30		0.080
5.2600_04	DIN EN 10263-4 23MnB4 (2001)	0.20	0.25	0.90	1.20		0.025		0.025	0.10	0.25		0.080
5.2600_05	DIN EN 10263-4 27MnB4 (MODIFIED) (2001)	0.25	0.30	0.90	1.20		0.025		0.025	0.10	0.25		0.080
5.2600_06	DIN EN 10263-4 30MnB4 (MODIFIED) (2001)	0.27	0.34	0.80	1.30		0.025		0.025	0.10	0.25		0.080
5.2600_07	DIN EN 10263-4 30MnB4 (MODIFIED) (2001)	0.30	0.35	0.80	1.30		0.025		0.025	0.10	0.25		0.080

Steels For Bolt Production

														Mechanical Properties	
B(ppm)		N		Nb		Tİ		V		Cu		Cr		Rm (N/mm2)	Reduction In Area
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	max.	
8	50						0.080				0.25		0.30	580	60
8	50										0.25		0.30	600	60
8	50						0.080				0.25		0.30	600	60
8	50						0.080				0.25		0.30		
8	50						0.080				0.25		0.50	-	-
8	50						0.080				0.25		0.30	600	60
8	50						0.080				0.25		0.30		
8	50						0.080				0.25		0.50		
8	50						0.080				0.25		0.50		

Wire Rod Tolerance

TOLERANCE STANDARD	
DIN EN 10017 (2004)	
DIAMETER TOLERANCES	
Diameter (mm)	Tolerances (mm)
5,5	±0.3
6	
6,5	
6,8	
7	
7,5	
8	
8,5	
9	
9,5	
10	±0.4
10,5	
11	
11,5	
12	
12,5	
13	
14	
15,5	
≥ 16	±0.5

* Wire rods are packaged in avarage 1.560 (+60 / -100) kg wire coils.
** Min. wire rod weight is 900 kg.

CCM Billets Tolerance

TOLERANCE STANDARD							
TS 9016 (1991)							
SIZE TOLERANCES							
Size	Dimensions and tolerances				Roundness	Weight (*)	Cross Section
	a (mm)	Tolerance	b (mm)	Tolerance	R (mm) (max)	(Kg/m)	cm²
100X100	100	± 2.5	100	± 2.5	12	77,91	98,76
110X110	110					94,35	119,76
120X120	120		120			112,36	142,76
130X130	130	± 3.0	130	± 3.0	12	131,93	167,76
150X150	150				15	175,78	223,07
160X160	160		160			200,05	254,07

(*) : THESE ARE THEORETICAL VALUES.

SHAPE TOLERANCES		
RHOMBOIDITY	:	≤ 5 %
CAMBER	:	≤ 10 mm/m
TWIST	:	≤ 1º /m
FACE BULGING	:	2.5 %
DEPRESSIONS	:	2.5 %
SIDE DIMENSIONS	:	± 3 %
CUTTING LENGTH	:	± 100 mm

Contact

For Technical Questions
long.product@isdemir.com.tr

OYAK MINING METALLURGY GROUP
Address : Barbaros Mah.
Ardıç Sok. No: 6
Ataşehir /İstanbul - TURKEY
Phone : +90 (216) 578 80 00
Fax : +90 (216) 469 48 10
web : www.oyakmadenmetalurji.com.tr

İSKENDERUN DEMİR VE ÇELİK A.Ş.
Address : Karşı Mahalle Şehit Yüzbaşı
Ali Oğuz Bulvarı No:1
Payas / Hatay - TURKEY
Phone : +90 (326) 758 40 40
Fax : +90 (326) 758 53 51 – 758 38 38
email : info@isdemir.com.tr
web : www.isdemir.com.tr

MARKETING AND SALES
Address : Barbaros Mah. Ardıç Sok. No: 6
PK: 34746
Ataşehir /İstanbul - TURKEY
Phone : +90 (216) 578 82 00
Fax : +90 (216) 578 82 01 – (372) 333 15 28
email : erdemir.sales@erdemir.com.tr

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www.isdemir.com.tr