



ÇAYIROVA BORU



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ÇAYIROVA BORU



Established in 1978 in the town of Çayirova, some 30 km east of Istanbul, Çayirova Boru has been serving steel pipe industry for more than 35 years with a production capacity of 300,000 tonnes per year. Çayirova Boru manufactures oil pipes, natural gas pipes, water pipes, boiler pipes, general purpose pipes, and structural hollow sections with outside diameter ranging from 3/8" to 12 3/4". Ever since its establishment, company has always employed the up-to-date manufacturing technology with its highly experienced and well-educated staff. Surface protection methods such as hot dip galvanizing, three-layer polyethylene & polypropylene coating, epoxy coating, cement mortar lining, painting and varnishing are presented in wide production range of Çayirova Boru. Having Quality and Production Management Systems certified by reputable international audit organizations, Çayirova Boru has continued its contributions to Turkish Pipe Industry and Turkey's exports by delivering majority of its products to more than 30 countries. With the proud and responsibility of being one of the leader companies in Turkish Pipe industry, it has been an indispensable principle for Çayirova Boru to apply environmentally conscious manufacturing methods. Its ultimate aim, of course, is to perpetuate in future this innovative production approach as well as customer-focused management.



5L-0322
SCT-0619



OIL AND NATURAL GAS PIPES



1.1. Oil and Natural Gas Line Pipes

Application Area: Natural Gas Lines, LPG Installations,
Petroleum and Petrochemical Transmission Lines

Production Standards

API 5L/ISO 3183	GOST 20295
EN 10208-1	EN 10208-2

Material Quality

API 5L PSL1	Gr A, Gr B, X42, X46, X52, X56, X60
API 5L PSL2	Gr BN, X42N, X46N, X52N, X56N, X60N X42M, X46M, X52M, X56M, X60M
EN 10208-1	L210GA, L235GA, L245GA, L290GA, L360GA
EN 10208-2	L245MB, L290MB, L360MB, L415MB L245NB, L290NB, L360NB, L415NB

Heat Treatment

$21.3 \leq OD < 60.3$	Full Body Normalization
$60.3 \leq OD \leq 323.9$	Weld Seam Normalization

Finishing Operations

- Plain End (Square Cut or Bevelled)

Mill Test Certificates

EN 10204 3.1, 3.2

Pipe Lengths

- min. 5 m - max. 14 m

Surface Protection

- Protective Oil
- 3 Layer of Polypropylene Coating
- 3 Layer of Polyethylene Coating
- Water Based Painting
- Epoxy Lining



1.1. Oil and Natural Gas Line Pipes

Production Range

OD (inch)	Wall Thickness T, (mm)																			
	2.8	2.9	3.2	3.4	3.6	3.7	3.9	4.0	4.4	4.8	5.2	5.5	5.6	5.7	6.0	6.4	6.6	7.1	7.5	7.9
1/2																				
3/4																				
1																				
1 1/4																				
1 1/2																				
2																				
2 1/2																				
3																				
3 1/2																				
4																				
5																				
6																				
8																				
10																				
12																				

Dimension-Wall Thickness Production Range

API 5L

Grade		Yield Strength (MPa)				Tensile Strength (MPa)			
		min.		max.		min.		max.	
PSL1	PSL2	PSL1	PSL2	PSL1	PSL2	PSL1	PSL2	PSL1	PSL2
A (L210)	-	210	-	-	-	335	-	-	-
B (L245)	BN/M (L245N/M)	245	-	450	-	415	-	655	-
X42 (L290)	X42N/M (L290N/M)	290	-	495	-	415	-	655	-
X46 (L320)	X46N/M (L320N/M)	320	-	525	-	435	-	655	-
X52 (L360)	X52N/M (L360N/M)	360	-	530	-	460	-	760	-
X56 (L390)	X56N/M (L390N/M)	390	-	545	-	490	-	760	-
X60 (L415)	X60N/M (L415N/M)	415	-	565	-	520	-	760	-

EN 10208-1

Grade	Yield Strength (MPa)		Tensile Strength (MPa)		Elongation (%)
	min.	max.	min.	max.	
L210GA	210	-	335	475	25
L235GA	235	-	370	510	23
L245GA	245	-	415	555	22
L290GA	290	-	415	555	21
L360GA	360	-	460	620	20

EN 10208-2

Grade	Yield Strength (MPa)		Tensile Strength (MPa)		Elongation (%)
	min.	max.	min.	max.	
L245NB/MB	245	440	415	-	22
L290NB/MB	290	440	415	-	21
L360NB/MB	360	510	460	-	20
L415NB/MB	415	565	520	-	18

Dimensions and Weight

API 5L GRADE A, B, X42, X46, X52, X56, X60

Nominal Pipe Size	OD		Wall Thickness		Weight			Standard Hydrostatic Test Pressure (Min.)													
								Grade A		Grade B		X42		X46		X52		X56		X60	
inch	inch	mm	inch	mm	lb/ft	kg/ft	kg/m	MPa	Psi	MPa	Psi	MPa	Psi	MPa	Psi	MPa	Psi	MPa	Psi	MPa	Psi
1/2	0.840	21.3	0.109	2.8	0.85	0.39	1.28	17.0	2470	17.0	2470										
3/4	1.050	26.7	0.113	2.9	1.13	0.51	1.70	17.0	2470	17.0	2470										
1	1.315	33.4	0.133	3.4	1.68	0.76	2.52	17.0	2470	17.0	2470										
1 1/4	1.660	42.2	0.140	3.6	2.27	1.03	3.43	17.0	2470	17.0	2470										
1 1/2	1.900	48.3	0.145	3.7	2.72	1.23	4.07	17.0	2470	17.0	2470										
2	2 3/8	60.3	0.125	3.2	3.00	1.36	4.51	13.4	1940	15.6	2260										
			0.141	3.6	3.37	1.52	5.03	15.0	2180	17.0	2470	18.5	2680	20.4	2960	20.5	2970	20.5	2970	20.5	2970
			0.154	3.9	3.66	1.66	5.42	16.3	2360	17.0	2470	20.5	2970	20.5	2970	20.5	2970	20.5	2970	20.5	2970
			0.172	4.4	4.05	1.84	6.07	17.0	2470	17.0	2470	20.5	2970	20.5	2970	20.5	2970	20.5	2970	20.5	2970
			0.188	4.8	4.40	2.00	6.57	17.0	2470	17.0	2470	20.5	2970	20.5	2970	20.5	2970	20.5	2970	20.5	2970
2 1/2	2 7/8	73.0	0.125	3.2	3.67	1.66	5.51	11.0	1600	12.9	1870	15.3	2220	16.8	2440	18.9	2750	20.3	2940	20.5	2970
			0.141	3.6	4.12	1.87	6.16	12.4	1800	14.5	2100	17.2	2490	18.9	2750	20.5	2970	20.5	2970	20.5	2970
			0.156	4.0	4.53	2.05	6.81	13.8	2000	16.1	2340	19.1	2770	20.5	2970	20.5	2970	20.5	2970	20.5	2970
			0.172	4.4	4.97	2.25	7.44	15.2	2200	17.0	2470	20.5	2970	20.5	2970	20.5	2970	20.5	2970	20.5	2970
			0.188	4.8	5.40	2.45	8.07	16.6	2410	17.0	2470	20.5	2970	20.5	2970	20.5	2970	20.5	2970	20.5	2970
			0.203	5.2	5.80	2.63	8.69	17.0	2470	17.0	2470	20.5	2970	20.5	2970	20.5	2970	20.5	2970	20.5	2970
			0.216	5.5	6.14	2.79	9.16	17.0	2470	17.0	2470	20.5	2970	20.5	2970	20.5	2970	20.5	2970	20.5	2970
3	3 1/2	88.9	0.125	3.2	4.51	2.05	6.76	9.1	1320	10.6	1530	12.5	1810	13.8	2000	15.5	2250	16.7	2420	17.9	2600
			0.141	3.6	5.06	2.30	7.57	10.2	1480	11.9	1730	14.1	2040	15.6	2260	17.4	2520	18.8	2730	20.2	2930
			0.156	4.0	5.58	2.53	8.37	11.3	1640	13.2	1920	15.7	2280	17.3	2510	19.4	2810	20.5	2970	20.5	2970
			0.172	4.4	6.12	2.77	9.17	12.5	1810	14.6	2120	17.2	2490	19.0	2760	20.5	2970	20.5	2970	20.5	2970
			0.188	4.8	6.66	3.02	9.95	13.6	1970	15.9	2310	18.8	2730	20.5	3010	20.5	2970	20.5	2970	20.5	2970
			0.216	5.5	7.58	3.44	11.31	15.6	2260	17.0	2470	20.5	2970	20.5	2970	20.5	2970	20.5	2970	20.5	2970
			0.250	6.4	8.69	3.97	13.02	18.1	2630	17.0	2470	20.5	2970	20.5	2970	20.5	2970	20.5	2970	20.5	2970
3 1/2	4	101.6	0.125	3.2	5.18	2.35	7.76	7.9	1150	9.3	1340	11.0	1590	12.1	1750	13.6	1970	14.6	2120	15.7	2280
			0.141	3.6	5.82	2.64	8.70	8.9	1300	10.4	1510	12.3	1790	13.6	1970	15.3	2220	16.4	2380	17.6	2550
			0.156	4.0	6.41	2.90	9.63	9.9	1440	11.6	1680	13.7	1990	15.1	2190	17.0	2470	18.2	2640	19.6	2840
			0.172	4.4	7.04	3.19	10.55	10.9	1580	12.7	1840	15.1	2190	16.6	2410	18.7	2710	20.1	2920	20.5	2970
			0.188	4.8	7.66	3.47	11.46	11.9	1730	13.9	2010	16.4	2380	18.1	2630	20.4	2960	20.5	2970	20.5	2970
			0.226	5.7	9.12	4.13	13.48	14.1	2040	16.5	2390	19.5	2830	20.5	2970	20.5	2970	20.5	2970	20.5	2970
4	4 1/2	114.3	0.125	3.2	5.85	2.65	8.77	7.1	1020	8.2	1190	9.7	1410	10.8	1560	12.1	1750	13.0	1890	13.9	2020
			0.141	3.6	6.57	2.98	9.83	7.9	1150	9.3	1340	11.0	1590	12.1	1750	13.6	1970	14.6	2120	15.7	2280
			0.156	4.0	7.24	3.28	10.88	8.8	1280	10.3	1490	12.2	1770	13.4	1950	15.1	2190	16.2	2350	17.4	2520
			0.172	4.4	7.96	3.61	11.92	9.7	1410	11.3	1640	13.4	1940	14.8	2140	16.6	2410	17.8	2580	19.2	2780
			0.188	4.8	8.67	3.93	12.96	10.6	1530	12.3	1790	14.6	2120	16.1	2340	18.1	2630	19.5	2830	20.5	2970
			0.203	5.2	9.32	4.23	13.99	11.5	1660	13.4	1940	15.8	2290	17.5	2530	19.6	2840	20.5	2970	20.5	2970
			0.219	5.6	10.02	4.54	15.01	12.3	1790	14.4	2090	17.0	2470	18.8	2730	20.5	2970	20.5	2970	20.5	2970
			0.237	6.0	10.80	4.89	16.02	13.2	1920	15.4	2230	18.3	2650	20.2	2930	20.5	2970	20.5	2970	20.5	2970
			0.250	6.4	11.36	5.19	17.03	14.1	2040	16.5	2390	19.5	2830	20.5	2970	20.5	2970	20.5	2970	20.5	2970
5	5 9/16	141.3	0.188	4.8	10.80	4.89	16.16	8.6	1240	10.0	1450	11.8	1710	13.0	1890	14.6	2120	15.7	2280	16.9	2450
			0.219	5.6	12.51	5.67	18.74	10.0	1450	11.7	1690	13.8	2000	15.2	2210	17.1	2480	18.4	2660	19.7	2860
			0.258	6.6	14.63	6.43	21.92	11.8	1710	13.7	1990	16.3	2360	17.9	2600	20.1	2920	20.5	2970	20.5	2970
			0.281	7.1	15.87	7.16	23.50	12.7	1840	14.8	2140	17.5	2540	19.3	2800	20.5	2970	20.5	2970	20.5	2970

1.1. Oil and Natural Gas Line Pipes

API 5L

Dimensions and Weight

API 5L GRADE B, X42, X46, X52, X56, X60

Nominal Pipe Size	OD		Wall Thickness		Weight			Standard Hydrostatic Test Pressure (Min.)											
								Grade B		X42		X46		X52		X56		X60	
inch	inch	mm	inch	mm	lb/ft	kg/ft	kg/m	MPa	Psi	MPa	Psi	MPa	Psi	MPa	Psi	MPa	Psi	MPa	Psi
6	6 5/8	168.3	0.172	4.4	11.87	5.38	17.78	7.7	1110	11.4	1650	12.5	1810	14.1	2040	15.1	2190	16.3	2360
			0.188	4.8	12.94	3.86	19.35	8.4	1220	12.4	1800	13.7	1990	15.4	2230	16.5	2390	17.8	2580
			0.203	5.2	13.94	6.31	20.91	9.1	1320	13.4	1940	14.8	2140	16.6	2410	17.9	2600	19.2	2780
			0.219	5.6	15.00	6.79	22.47	9.8	1420	14.5	2100	16.0	2320	17.9	2600	19.3	2800	20.5	2970
			0.250	6.4	17.04	7.72	25.55	11.2	1620	16.5	2390	18.3	2650	20.5	2970	20.5	2970	20.5	2970
			0.280	7.1	18.99	8.60	28.22	12.4	1800	18.4	2660	20.2	2930	20.5	2970	20.5	2970	20.5	2970
			0.312	7.9	21.06	9.52	31.25	13.8	2000	20.4	2960	22.5	3270	20.5	2970	20.5	2970	20.5	2970
8	8 5/8	219.1	0.188	4.8	16.96	7.73	25.37	6.4	930	9.5	1380	10.5	1520	11.8	1710	12.7	1840	13.6	1970
			0.203	5.2	18.28	8.29	27.43	7.0	1010	10.3	1500	11.4	1650	12.8	1860	13.7	1990	14.8	2140
			0.219	5.6	19.68	8.92	29.48	7.5	1090	11.1	1610	12.3	1780	13.8	2000	14.8	2140	15.9	2310
			0.250	6.4	22.38	10.14	33.57	8.6	1250	12.7	1840	14.0	2030	15.7	2280	16.9	2450	18.2	2640
			0.277	7.0	34.72	11.20	36.61	9.4	1360	13.9	2020	15.3	2220	17.2	2490	18.5	2680	19.9	2880
			0.312	7.9	27.73	12.56	41.14	10.6	1530	15.7	2280	17.3	2510	19.4	2810	20.5	2970	20.5	2970
			0.322	8.2	28.58	12.95	42.65	11.0	1600	16.3	2360	18.0	2610	20.2	2930	20.5	2970	20.5	2970
10	10 3/4	273.1	0.344	8.7	30.45	13.75	45.14	11.7	1700	17.3	2510	19.1	2770	20.5	2970	20.5	2970	20.5	2970
			0.203	5.2	22.89	10.47	34.35	5.6	1360	9.4	1500	10.4	1690	11.6	1680	12.5	1810	13.4	1940
			0.219	5.6	24.65	11.17	36.94	6.0	870	10.1	1460	11.2	1620	12.5	1810	13.5	1960	14.5	2100
			0.250	6.4	28.06	12.72	42.09	6.9	1000	11.6	1680	12.7	1840	14.3	2070	15.4	2230	16.5	2390
			0.279	7.1	31.23	14.15	46.57	7.6	1110	12.8	1860	14.1	2040	15.9	2310	17.1	2480	18.3	2660
			0.307	7.8	34.27	15.53	51.03	8.4	1220	14.1	2040	15.5	2250	17.4	2520	18.7	2710	20.1	2920
			0.344	8.7	38.27	17.34	56.72	9.4	1360	15.7	2280	17.3	2510	19.4	2810	20.5	2970	20.5	2970
12	12 3/4	323.9	0.365	9.3	40.52	18.44	60.50	10.0	1450	16.8	2430	18.5	2680	20.5	2970	20.5	2970	20.5	2970
			0.203	5.2	27.23	12.46	40.87	4.7	1150	7.9	1270	8.7	1420	9.8	1420	10.5	1520	11.3	1640
			0.219	5.6	29.34	13.31	43.96	5.0	720	8.5	1230	9.3	1340	10.6	1530	11.3	1640	12.2	1770
			0.250	6.4	33.41	15.15	50.11	5.8	840	9.7	1410	10.7	1560	12.1	1750	13.0	1890	13.9	2020
			0.281	7.1	37.46	16.97	55.47	6.4	930	10.8	1570	11.9	1730	13.4	1940	14.4	2090	15.5	2240
			0.312	7.9	41.48	18.80	61.56	7.2	1040	12.0	1740	13.3	1920	14.9	2160	16.0	2320	17.2	2490
			0.330	8.4	43.81	19.85	65.35	7.6	1110	12.8	1860	14.1	2040	15.8	2290	17.0	2470	18.3	2650
			0.344	8.7	45.62	20.67	67.62	7.9	1150	13.2	1920	14.6	2120	16.4	2380	17.6	2550	18.9	2750
			0.375	9.5	49.61	22.48	73.65	8.6	1250	14.5	2100	16.0	2320	17.9	2600	19.2	2780	20.5	2970
			0.406	10.3	53.57	24.28	79.65	9.2	1330	15.7	2280	17.3	2820	19.4	2810	20.5	2970	20.5	2970



1.2. Oil Casing and Tubing Pipes

API 5CT

Application Area : Oil Well Casing and Tubing Pipes

Production Standards

API 5CT

Material Quality

API 5CT

H40, J55, K55

Heat Treatment

$OD \leq 73.0$	Full Body Normalization
$73.0 < OD \leq 323.9$	Weld Seam Normalization

Mill Test Certificates

EN 10204 3.1, 3.2

Finishing Operations

- Plain End (Square Cut or Bevelled)

Surface Protection

- Protective Oil
- Water Based Painting

Pipe Lengths

- min. 5 m - max. 14 m



1.2. Oil Casing and Tubing Pipes

API 5CT

Dimensions and Weight

API 5CT CASING

Labels		OD	Wall Thickness		ID	Drift Dia.	Weight			Hydrostatic Test Pressure (Min.)			
										H 40		J 55	
1	2	mm	inch	mm	mm	mm	lb/ft	kg/ft	kg/m	Psi	MPa	Psi	MPa
4-1/2	9.50	114.30	0.205	5.21	103.88	100.70	9.41	4.27	14.02	2900	20.0	4000	27.5
4-1/2	10.50	114.30	0.224	5.69	102.92	99.74	10.24	4.64	15.24	-	-	4400	30.0
4-1/2	11.60	114.30	0.250	6.35	101.60	98.42	11.36	5.15	16.91	-	-	4900	33.5
5	11.50	127.00	0.220	5.59	115.82	112.64	11.24	5.10	16.74	-	-	3900	26.5
5	13.00	127.00	0.253	6.43	114.14	110.96	12.84	5.83	19.12	-	-	4500	30.5
5	15.00	127.00	0.296	7.52	111.96	108.78	14.88	6.75	22.16	-	-	5200	36.0
5-1/2	14.00	139.70	0.244	6.20	127.30	124.12	13.71	6.22	20.41	2800	19.5	3900	27.0
5-1/2	15.50	139.70	0.275	6.98	125.74	122.56	15.36	6.96	22.85	-	-	4400	30.5
5-1/2	17.00	139.70	0.304	7.72	124.26	121.08	16.89	7.66	25.13	-	-	4900	34.0
6-5/8	20.00	168.28	0.288	7.32	153.64	150.46	19.51	8.86	29.06	2800	19.0	3800	26.5
7	17.00	177.80	0.231	5.87	166.06	162.88	16.72	7.58	24.89	2100	14.5	-	-
7	20.00	177.80	0.272	6.91	163.98	160.80	19.56	8.87	29.12	2500	17.0	3400	23.5
7*	23.00	177.80	0.317	8.05	161.70	158.75°	22.65	10.27	33.70	-	-	4000	27.5
7	23.00	177.80	0.317	8.05	161.70	158.52	22.65	10.27	33.70	-	-	4000	27.5
7-5/8	24.00	193.68	0.300	7.62	178.44	175.26	23.49	10.65	34.96	2500	17.5	-	-
8-5/8	24.00	219.08	0.264	6.71	205.66	202.48	23.60	10.71	35.14	-	-	2700	18.5
8-5/8	28.00	219.08	0.304	7.72	203.64	200.46	27.04	12.26	40.24	2300	15.5	-	-
8-5/8*	32.00	219.08	0.352	8.94	201.20	200.02°	31.13	14.12	46.33	2600	18.0	3600	24.5
8-5/8	32.00	219.08	0.352	8.94	201.20	198.02	31.13	14.12	46.33	2600	18.0	3600	24.5
9-5/8	32.30	244.48	0.312	7.92	228.60	224.66	31.06	14.08	46.20	2100	14.5	-	-
9-5/8	36.00	244.48	0.352	8.94	226.60	222.63	34.89	15.82	51.93	2300	16.0	3200	22.0
10-3/4	32.75	273.05	0.279	7.09	258.90	254.91	31.23	14.17	46.50	1200	8.5	-	-
10-3/4	40.50	273.05	0.350	8.89	255.30	251.31	38.91	17.65	57.91	1600	11.0	2100	15.0
10-3/4*	45.50	273.05	0.400	10.16	252.70	250.82°	44.26	20.07	65.87	-	-	2500	17.0
10-3/4	45.50	273.05	0.400	10.16	252.70	248.77	44.26	20.07	65.87	-	-	2500	17.0

* Alternative drift sizes can be applied.

API 5CT TUBING

Labels		OD	Wall Thickness		ID	Drift Dia.	Weight			Hydrostatic Test Pressure (Min.)			
										H 40		J 55	
1	2NU	mm	inch	mm	mm	mm	lb/ft	kg/ft	kg/m	Psi	MPa	Psi	MPa
2-3/8	4.00	60.32	0.167	4.24	51.84	49.46	3.94	1.78	5.86	4500	31.0	6200	42.5
2-3/8	4.60	60.32	0.190	4.83	50.66	48.28	4.44	2.01	6.61	5100	35.5	7000	48.5
2-7/8	6.40	73.02	0.217	5.51	62.00	59.62	6.17	2.79	9.17	4800	33.5	6600	46.0
3-1/2	7.70	88.90	0.216	5.49	77.92	74.74	7.58	3.44	11.29	3900	27.5	5400	37.5
3-1/2	9.20	88.90	0.254	6.45	76.00	72.82	8.81	3.99	13.12	4600	32.0	6400	44.0
4	9.50	101.60	0.226	5.74	90.12	86.94	9.12	4.13	13.57	3600	25.0	5000	34.5
4	10.70	101.60	0.262	6.65	88.30	85.12	10.47	4.74	15.57	4200	29.0	5800	39.5
4-1/2	12.60	114.30	0.271	6.88	100.54	97.36	12.25	5.55	18.23	3900	26.5	5300	36.5

1.3. Production Properties of Oil and Natural Gas Pipes

Control and inspection methods for gas and oil pipe production are summarized in the table given below.

Quality Properties			Control Methods		
Geometric Properties	Pipe Body	Pipe Diameter	Measurement Control	Product Control	All Pipes
		Wall Thickness			
		Out of Roundness			
		Straightness			
		Length			
	Weld	Ferrite Line Width	Macro Examination	Proses Control	Periodic
		Heat Affected Zone Width			
		Straightness of Ferrite Line			
		Metal Flow Lines			
		Inner and Outer Bead Shape			
Mechanical Properties	Pipe Body	Yield Strength	Tensile Test	Product Control	Acc. to Standard
		Tensile Strength			
		Elongation			
		Toughness Behaviour	Notch Impact Test		
		Hardness	Hardness Test		
	Weld	Tensile Strength	Tensile Test (for $\geq 8"$ OD pipe)	Product Control	Acc. to Standard
		Toughness Behaviour	Notch Impact Test		
		Hardness	Hardness Test		
Other	Weld / Body	Chemical Composition	Spectrometric Chemical Analysis	Product Control	Acc. to Standard
		Metallurgical Structure, Grain Size, Inclusions	Macro Examination		
Defects	Body	Surface Defects, Laminations	Visual Inspection	Product Control	Acc. to Standard
			Ultrasonic Test/Control		
	Weld	Weld Defects	Ultrasonic Test/Control		
			Hydrostatic Test		



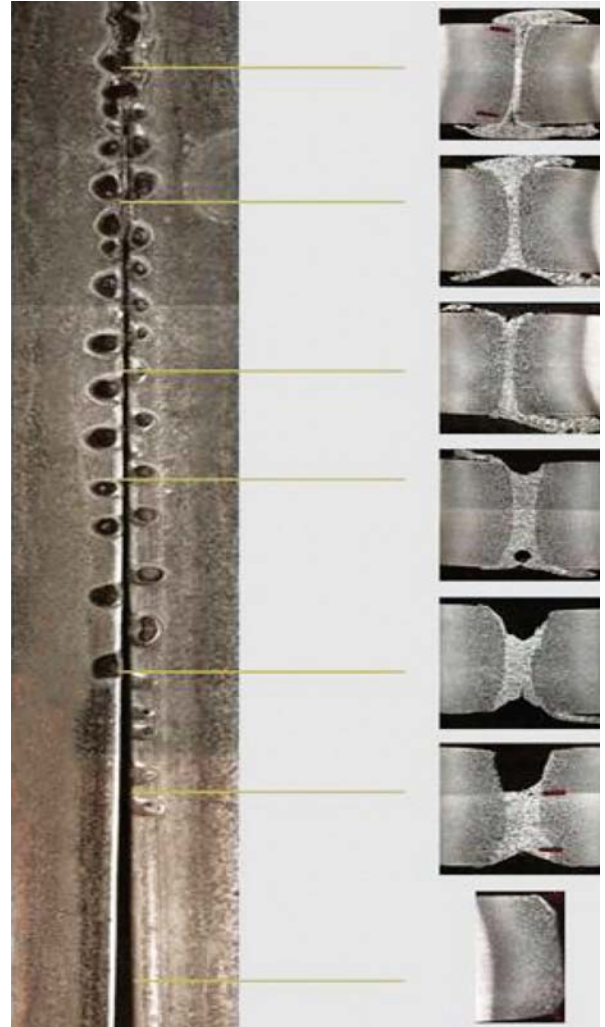
1.3. Production Properties of Oil and Natural Gas Pipes

Weld Formation

In high frequency induction welded pipe production, firstly the tube is formed, called as open pipe, from metal strip and then enters the weld area. Before welding, high frequency alternating current is induced to open pipe. This induced current flows along the edges to the point where they meet, causing rapid heating of the metal. After that, edges are forced by squeezing rollers. This applied pressure forces to molten metal and impurities out of weldment.

Because of direct relationships between welding condition and weld quality, it is extremely important and essential to know and control welding conditions, such as inductive energy input, current-voltage stability, induction-impeder design and resultant form of weld seam.

For Çayirova Boru metallographic examination has a significant importance for the production of natural gas and oil line pipes. Width of the fusion line, width of the heat affected zone, metal flow lines, inner and outer bead shape are always under control to ensure the weld reliability.



Heat Treatment

Çayirova Boru has a technological capability of weld seam annealing and full body annealing depending on standard's requirements and customer requests.

Heat Treatment Types

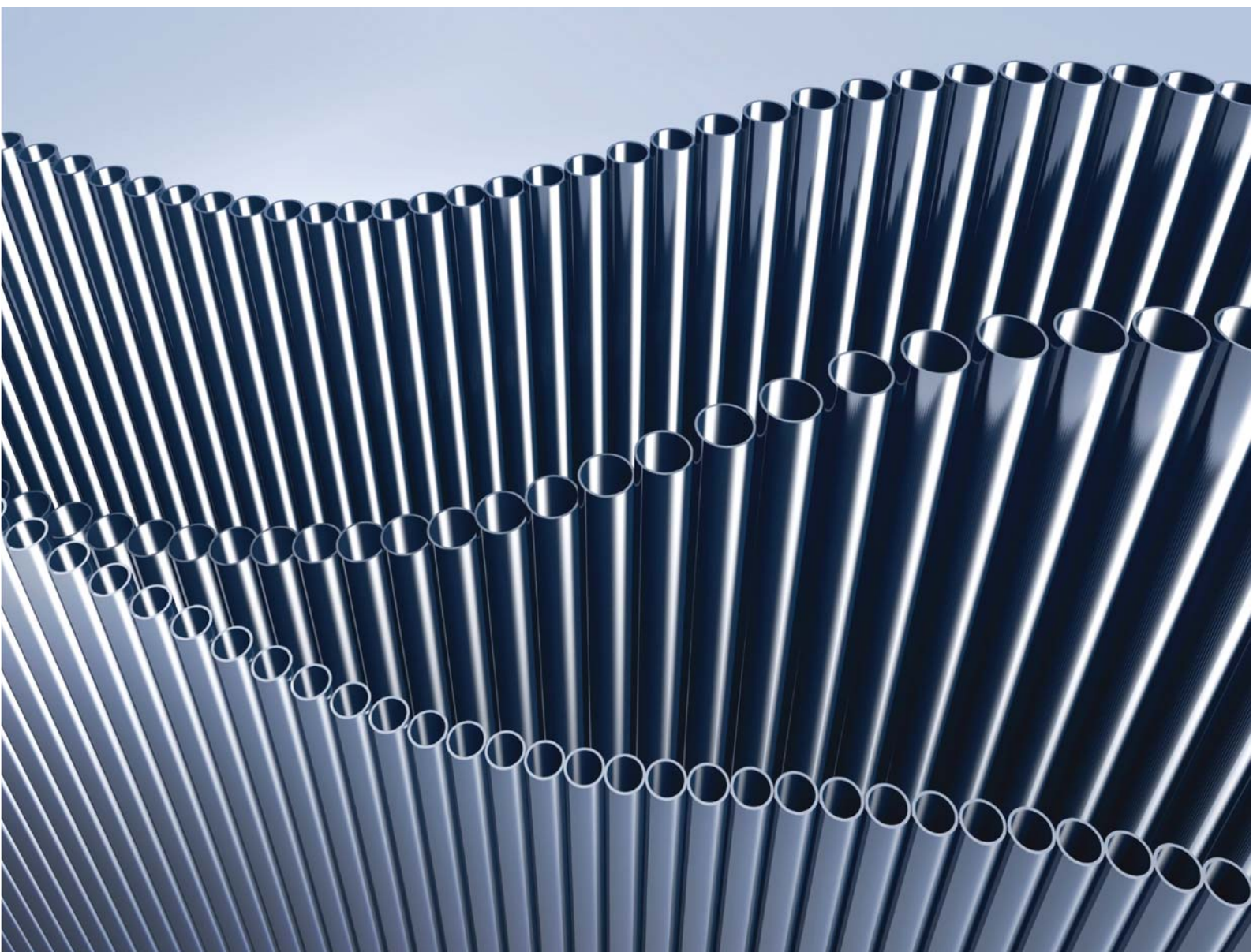
- Stress relieving
- Normalizing



1.3. Production Properties of Oil and Natural Gas Pipes



WATER PIPES



Application Area: Water and Gas Installations,
Non-corrosive Gases and Chemicals, and Compressed Air Installations

Production Standards

EN 10255	EN 10217-1	ISO 65
ASTM A53	ASTM A795	GOST 10705

Material Quality

EN 10255	S195, S235, S275, S355
ASTM A 53	Gr A, Gr B
ASTM A 795	Gr A, Gr B
EN 10217-1	P195, P235, P265

Galvanizing Standards

EN ISO 1461	ASTM A53
EN 10240	

Threading Standards

EN 10226	ISO 7-1
ANSI B1.20.1	BS 21

Mill Test Certificates

EN 10204 2.2, 3.1, 3.2

Finishing Operations

- Plain End (Square Cut or Bevelled)
- Threaded and Coupled
- Bell & Spigot
- Roll Grooved
- Swaged

Surface Protection

- Protective Oil
- Hot Dip Galvanizing
- 3 Layer of Polyethylene Coating
- 3 Layer of Polypropylene Coating
- Water Based Painting
- Epoxy Coating

Pipe Lengths

- min. 5 m - max. 13 m



2. Water Pipes

Production Range

OD (inch)	Wall Thickness T, (mm)																		
	1.50	1.80	2.00	2.30	2.60	2.90	3.20	3.60	4.00	4.50	5.00	5.40	5.60	6.00	7.00	8.00	9.00	10.0	11.0
3/8																			
1/2																			
3/4																			
1																			
1 1/4																			
1 1/2																			
2																			
2 1/2																			
3																			
4																			
5																			
6																			
8																			
10																			
12																			

Dimension-Wall Thickness Production Range



Dimensions and Weight

Medium Series

M

DN	OD		OD Tolerances		Wall Thickness (mm)	Plain End (kg/m)	Threaded & Coupled (kg/m)
	(mm)	(inch)	Max. (mm)	Min. (mm)			
10	17.2	3/8	17.5	16.7	2.30	0.839	0.845
15	21.3	1/2	21.8	21.0	2.60	1.21	1.22
20	26.9	3/4	27.3	26.5	2.60	1.56	1.57
25	33.7	1	34.2	33.3	3.20	2.41	2.43
32	42.4	1 1/4	42.9	42.0	3.20	3.10	3.13
40	48.3	1 1/2	48.8	47.9	3.20	3.56	3.60
50	60.3	2	60.8	59.7	3.60	5.03	5.10
65	76.1	2 1/2	76.6	75.3	3.60	6.42	6.54
80	88.9	3	89.5	88.0	4.00	8.36	8.53
100	114.3	4	115.0	113.1	4.50	12.2	12.5
125	139.7	5	140.8	138.5	5.00	16.6	17.1
150	165.1	6	166.5	163.9	5.00	19.8	20.4

Wall Thickness (mm)	Galvanized* Plain End (kg/m)	Galvanized* Threaded & Coupled (kg/m)
2.30	0.880	0.892
2.60	1.27	1.28
2.60	1.63	1.64
3.20	2.50	2.52
3.20	3.21	3.24
3.20	3.69	3.73
3.60	5.19	5.26
3.60	6.63	6.75
4.00	8.60	8.67
4.50	12.5	12.8
5.00	16.9	17.4
5.00	20.2	20.8

Heavy Series

H

DN	OD		OD Tolerances		Wall Thickness (mm)	Plain End (kg/m)	Threaded & Coupled (kg/m)
	(mm)	(inch)	Max. (mm)	Min. (mm)			
10	17.2	3/8	17.5	16.7	2.9	1.02	1.03
15	21.3	1/2	21.8	21.0	3.2	1.44	1.45
20	26.9	3/4	27.3	26.5	3.2	1.87	1.88
25	33.7	1	34.2	33.3	4.0	2.93	2.95
32	42.4	1 1/4	42.9	42.0	4.0	3.79	3.82
40	48.3	1 1/2	48.8	47.9	4.0	4.37	4.41
50	60.3	2	60.8	59.7	4.5	6.19	6.26
65	76.1	2 1/2	76.6	75.3	4.5	7.93	8.05
80	88.9	3	89.5	88.0	5.0	10.3	10.5
100	114.3	4	115.0	113.1	5.4	14.5	14.8
125	139.7	5	140.8	138.5	5.4	17.9	18.4
150	165.1	6	166.5	163.9	5.4	21.3	21.9

Wall Thickness (mm)	Galvanized* Plain End (kg/m)	Galvanized* Threaded & Coupled (kg/m)
2.9	1.06	1.07
3.2	1.50	1.51
3.2	1.97	1.98
4.0	3.06	3.08
4.0	3.96	3.99
4.0	4.56	4.60
4.5	6.33	6.40
4.5	8.10	8.23
5.0	10.34	10.55
5.4	14.55	14.85
5.4	18.18	18.68
5.4	21.65	22.25

* Çayrova Boru actual weights.



2. Water Pipes

EN 10255

Type L1

Light 1

DN	OD		OD Tolerances		Wall Thickness (mm)	Plain End (kg/m)	Threaded & Coupled (kg/m)
	(mm)	(inch)	Max. (mm)	Min. (mm)			
10	17.2	3/8	17.4	16.7	2.0	0.742	0.748
15	21.3	1/2	21.7	21.0	2.3	1.08	1.09
20	26.9	3/4	27.1	26.4	2.3	1.39	1.40
25	33.7	1	34.0	33.2	2.9	2.20	2.22
32	42.4	1 1/4	42.7	41.9	2.9	2.82	2.85
40	48.3	1 1/2	48.6	47.8	2.9	3.24	3.28
50	60.3	2	60.7	59.6	3.2	4.49	4.56
65	76.1	2 1/2	76.3	75.2	3.2	5.73	5.85
80	88.9	3	89.4	87.9	3.6	7.55	7.72
100	114.3	4	114.9	113.0	4.0	10.8	11.1

Wall Thickness (mm)	Galvanized* Plain End (kg/m)	Galvanized* Threaded & Coupled (kg/m)
2.0	0.789	0.795
2.3	1.14	1.15
2.3	1.45	1.46
2.9	2.29	2.31
2.9	2.93	2.96
2.9	3.37	3.41
3.2	4.65	4.72
3.2	5.94	6.06
3.6	7.79	7.86
4.0	11.1	11.4

Type L2

Light 2

DN	OD		OD Tolerances		Wall Thickness (mm)	Plain End (kg/m)	Threaded & Coupled (kg/m)
	(mm)	(inch)	Max. (mm)	Min. (mm)			
10	17.2	3/8	17.1	16.7	1.8	0.670	0.676
15	21.3	1/2	21.4	21.0	2.0	0.947	0.956
20	26.9	3/4	26.9	26.4	2.3	1.38	1.39
25	33.7	1	33.8	33.2	2.6	1.98	2.00
32	42.4	1 1/4	42.5	41.9	2.6	2.54	2.57
40	48.3	1 1/2	48.4	47.8	2.9	3.23	3.27
50	60.3	2	60.2	59.6	2.9	4.08	4.15
65	76.1	2 1/2	76.0	75.2	3.2	5.71	5.83
80	88.9	3	88.7	87.9	3.2	6.72	6.89
100	114.3	4	113.9	113.0	3.6	9.75	10.0

Wall Thickness (mm)	Galvanized* Plain End (kg/m)	Galvanized* Threaded & Coupled (kg/m)
1.8	0.717	0.723
2.0	1.00	1.01
2.3	1.46	1.47
2.6	2.07	2.09
2.6	2.66	2.69
2.9	3.36	3.40
2.9	4.24	4.31
3.2	5.92	6.03
3.2	6.96	7.13
3.6	10.1	10.4

Type L

Light

DN	OD		OD Tolerances		Wall Thickness (mm)	Plain End (kg/m)	Threaded & Coupled (kg/m)
	(mm)	(inch)	Max. (mm)	Min. (mm)			
10	17.2	3/8	17.4	16.7	2.0	0.750	0.756
15	21.3	1/2	21.7	21.0	2.3	1.08	1.09
20	26.9	3/4	27.1	26.4	2.3	1.40	1.41
25	33.7	1	34.0	33.2	2.9	2.20	2.22
32	42.4	1 1/4	42.7	41.9	2.9	2.82	2.85
40	48.3	1 1/2	48.6	47.8	2.9	3.25	3.29
50	60.3	2	60.7	59.6	3.2	4.51	4.58
65	76.1	2 1/2	76.0	75.2	3.2	5.75	5.87
80	88.9	3	88.7	87.9	3.2	6.76	6.93
90	101.6	3 1/2	101.2	100.3	3.6	8.70	8.88
100	114.3	4	113.9	113.0	3.6	9.83	10.1
125	139.7	5	140.8	138.5	4.5	15.0	15.5
150	165.1	6	166.5	163.9	4.5	17.8	18.4

Wall Thickness (mm)	Galvanized* Plain End (kg/m)	Galvanized* Threaded & Coupled (kg/m)
2.0	0.797	0.803
2.3	1.14	1.15
2.3	1.45	1.46
2.9	2.29	2.31
2.9	2.93	2.96
2.9	3.37	3.41
3.2	4.65	4.72
3.2	5.93	6.05
3.2	7.00	7.07
3.6	8.94	9.01
3.6	10.1	10.4
4.5	15.2	15.7
4.5	18.1	18.7

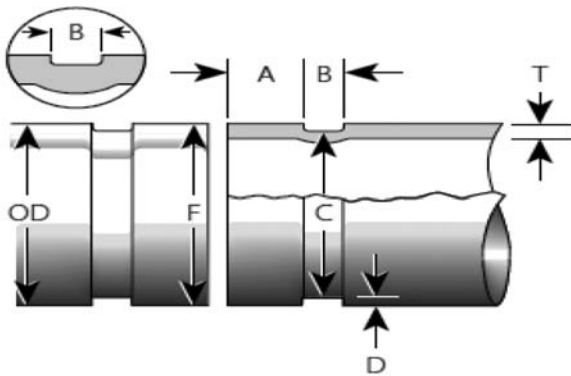
* Çayırova Boru actual weights.

Dimensions and Weight

ASTM A 53

Nominal Pipe Size	OD		Wall Thickness		Weight			Grade A		Grade B		Schedule No.	Weight Class
	inch	mm	inch	mm	lb/ft	kg/m	kg/ft	Psi	Bar	Psi	Bar		
1/2	0.840	21.3	0.109	2.77	0.85	1.27	0.39	700	48	700	48	40	STD
3/4	1.050	26.7	0.113	2.87	1.13	1.69	0.51	700	48	700	48	40	STD
1	1.315	33.4	0.133	3.38	1.68	2.50	0.76	700	48	700	48	40	STD
1 1/4	1.660	42.2	0.140	3.56	2.27	3.39	1.03	1200	83	1300	90	40	STD
1 1/2	1.900	48.3	0.145	3.68	2.72	4.05	1.23	1200	83	1300	90	40	STD
2	2.375	60.3	0.154	3.91	3.66	5.44	1.66	2300	159	2500	172	40	STD
2 1/2	2.875	73.0	0.203	5.16	5.80	8.63	2.63	2500	172	2500	172	40	STD
3	3.500	88.9	0.125	3.18	4.51	6.72	2.05	1290	89	1500	103	-	-
			0.156	3.96	5.58	8.29	2.53	1600	110	1870	129	-	-
			0.188	4.78	6.66	9.92	3.02	1930	133	2260	156	-	-
			0.216	5.49	7.58	11.29	3.44	2220	153	2500	172	40	STD
			0.250	6.35	8.69	12.93	3.94	2500	172	2500	172	-	-
3 1/2	4.000	101.6	0.125	3.18	5.18	7.72	2.35	1120	77	1310	90	-	-
			0.156	3.96	6.41	9.53	2.90	1400	67	1640	113	-	-
			0.188	4.78	7.66	11.41	3.47	1690	117	1970	136	-	-
			0.226	5.74	9.12	13.57	4.13	2030	140	2370	163	40	STD
			0.250	6.35	10.02	14.92	4.54	2250	172	2500	172	-	-
4	4.500	114.3	0.125	3.18	5.85	8.71	2.65	1000	69	1170	81	-	-
			0.156	3.96	7.24	10.78	3.28	1250	87	1460	101	-	-
			0.188	4.78	8.67	12.91	3.93	1500	104	1750	121	-	-
			0.219	5.56	10.02	14.91	4.54	1750	122	2040	142	-	-
			0.237	6.02	10.80	16.07	4.89	1900	130	2210	152	40	STD
5	5.563	141.3	0.250	6.35	11.36	16.90	5.15	2000	138	2330	161	-	-
			0.188	4.78	10.80	16.09	4.90	1220	84	1420	98	-	-
			0.219	5.56	12.51	18.61	5.67	1420	98	1650	115	-	-
			0.258	6.55	14.63	21.77	6.63	1670	116	1950	135	40	STD
			0.188	4.78	12.94	19.27	5.87	1020	70	1190	82	-	-
6	6.625	168.3	0.219	5.56	15.00	22.31	6.80	1190	82	1390	96	-	-
			0.250	6.35	17.04	25.36	7.72	1360	94	1580	109	-	-
			0.280	7.11	18.99	28.26	8.61	1520	105	1780	123	40	STD
			0.312	7.92	21.06	31.32	9.54	1700	117	1980	137	-	-
			0.188	4.78	16.96	25.26	7.69	780	54	920	63	-	-
8	8.625	219.1	0.203	5.16	18.28	27.22	8.29	850	59	1000	69	-	-
			0.219	5.56	19.68	29.28	8.92	910	68	1070	74	-	-
			0.250	6.35	22.38	33.31	10.15	1040	72	1220	84	20	-
			0.277	7.04	24.72	36.31	11.06	1160	78	1350	93	30	-
			0.312	7.92	27.73	41.24	12.56	1300	90	1520	105	-	-
10	10.750	273.0	0.322	8.18	28.58	42.55	12.96	1340	92	1570	108	40	STD
			0.344	8.74	30.45	45.34	13.81	1440	99	1680	116	-	-
			0.203	5.16	22.89	34.08	10.38	680	47	800	55	-	-
			0.219	5.56	24.65	36.67	11.17	730	50	860	59	-	-
			0.250	6.35	28.06	41.75	12.72	840	58	980	68	20	-
12	12.750	323.8	0.279	7.09	31.23	46.49	14.17	930	64	1090	75	-	-
			0.307	7.80	34.27	51.01	15.54	1030	71	1200	83	30	-
			0.344	8.74	38.27	56.96	17.36	1150	79	1340	92	-	-
			0.365	9.27	40.52	60.29	18.36	1220	84	1430	99	40	STD
			0.203	5.16	27.23	40.55	12.35	570	39	670	46	-	-
			0.219	5.56	29.34	43.63	13.29	620	43	720	50	-	-
			0.250	6.35	33.41	49.71	15.15	710	49	820	57	20	-
			0.281	7.14	37.46	55.75	16.99	790	54	930	64	-	-
			0.312	7.92	41.48	61.69	18.80	880	61	1030	71	-	-
			0.330	8.38	43.81	65.18	19.86	930	64	1090	75	30	-
			0.344	8.74	45.62	67.90	20.69	970	67	1130	78	-	-
			0.375	9.52	49.61	73.78	22.48	1060	73	1240	85	-	STD
			0.406	10.31	53.57	79.70	24.29	1150	79	1340	92	40	-

2.1. Roll Grooved Pipes



Standard Roll Groove Dimensions

Nominal Pipe Size (inch) (mm)	Dimensions (inch/mm)									
	OD			Gasket Seat (A) +0.03 +0.76	Groove Width (B) +0.03 +0.76	Groove Diameter (C)		Groove Depth (D) (ref.)	Min. Allow. Wall Thickness T	Max. Allow. Flare Dia. F
	Basic	Tolerances				Basic	Tolerance +0.000 +0.00			
		+	-							
3/4	1.050	1.010	1.010	0.625	0.281	0.938	-0.015	0.056	0.065	1.15
20	26.7	0.25	0.25	15.88	7.14	23.83	-0.38	1.42	1.65	29.2
1	1.315	0.013	0.013	0.625	0.281	1.190	-0.015	0.063	0.065	1.43
25	33.7	0.33	0.33	15.88	7.14	30.23	-0.38	1.60	1.65	36.3
1 1/4	1.660	0.016	0.016	0.625	0.281	1.535	-0.015	0.063	0.065	1.77
32	42.4	0.41	0.41	15.88	7.14	38.99	-0.38	160	1.65	45.0
1 1/2	1.900	0.019	0.019	0.625	0.281	1.775	-0.015	0.063	0.065	2.01
40	48.3	0.48	0.48	15.88	7.14	45.09	-0.38	160	1.65	51.1
2	2.375	0.024	0.024	0.625	0.344	2.250	-0.015	0.063	0.065	2.48
50	60.3	0.61	61	15.88	8.74	57.15	-0.38	160	1.65	63.0
2 1/2	2.875	0.029	0.029	0.625	0.344	2.720	-0.018	0.078	0.083	2.98
65	73.0	0.74	0.74	15.88	8.74	69.09	-0.46	1.98	2.11	75.7
-	3.000	0.030	0.030	0.625	0.344	2.845	-0.018	0.078	0.083	3.10
76.1 mm	76.1	0.76	0.76	15.88	8.74	72.26	-0.46	1.98	2.11	78.7
3	3.500	0.035	0.031	0.625	0.344	3.344	-0.018	0.078	0.083	3.60
80	88.9	0.89	0.79	15.88	8.74	84.94	-0.46	1.98	2.11	91.4
3 1/2	4.000	0.040	0.031	0.625	0.344	3.834	-0.020	0.083	0.083	4.10
90	101.6	1.02	0.79	15.88	8.74	97.38	-0.51	2.11	2.11	104.1
4	4.500	0.045	0.031	0.625	0.344	4.334	-0.020	0.083	0.083	4.60
100	114.3	1.14	0.79	15.88	8.74	110.08	-0.51	2.11	2.11	116.8
-	4.250	0.043	0.031	0.625	0.344	4.084	-0.020	0.083	0.083	4.35
108.0 mm	108.0	1.09	0.79	15.88	8.74	103.73	-0.51	2.11	2.11	110.5
4 1/2	5.000	0.050	0.031	0.625	0.344	4.834	-0.020	0.083	0.095	5.10
120	127.0	1.27	0.79	15.88	8.74	122.78	-0.51	2.11	2.41	129.5
-	5.250	0.053	0.031	0.625	0.344	5.084	-0.020	0.083	0.109	5.35
133.0 mm	133.0	1.35	0.79	15.88	8.74	129.13	-0.51	2.11	2.77	135.9
5 1/2	5.500	0.056	0.031	0.625	0.344	5.334	-0.020	0.083	0.109	5.60
139.7	139.7	1.42	0.79	15.88	8.74	135.48	-0.51	2.11	2.77	142.2
5 9/16	5.563	0.056	0.031	0.625	0.344	5.395	-0.022	0.084	0.109	5.66
125	141.3	1.42	0.79	15.88	8.74	137.03	-0.56	2.13	2.77	143.8
-	6.000	0.056	0.031	0.625	0.344	5.830	-0.022	0.085	0.109	6.10
152.4 mm	152.4	1.42	0.79	15.88	8.74	148.08	-0.56	2.16	2.77	154.9
-	6.250	0.063	0.031	0.625	0.344	6.032	-0.030	0.085	0.109	6.35
159.0 mm	159.0	1.60	0.79	15.88	8.74	153.21	-0.76	2.16	2.77	161.3
-	6.500	0.063	0.031	0.625	0.344	6.330	-0.022	0.085	0.109	6.60
165.1 mm	165.1	1.60	0.79	15.88	8.74	160.78	-0.56	2.16	2.77	167.6
6	6.625	0.063	0.031	0.625	0.344	6.455	-0.022	0.085	0.109	6.73
150	168.3	1.60	0.79	15.88	8.74	163.96	-0.56	2.16	2.77	170.9
-	8.000	0.063	0.031	0.750	0.469	7.816	-0.025	0.092	0.109	8.17
203.2 mm	203.2	1.60	0.79	19.05	11.91	198.53	-0.64	2.34	2.77	207.5
8	8.625	0.063	0.031	0.750	0.469	8.441	-0.025	0.092	0.109	8.80
200	219.1	1.60	0.79	19.05	11.91	214.40	-0.64	2.34	2.77	223.5
10	10.750	0.063	0.031	0.750	0.469	10.562	-0.027	0.094	0.134	10.92
250	273.0	1.60	0.79	19.05	11.91	268.28	-0.69	2.39	3.40	277.4

Dimensions, Weight and Hydrostatic Test Pressures

SCH 10 - LIGHT SERIES

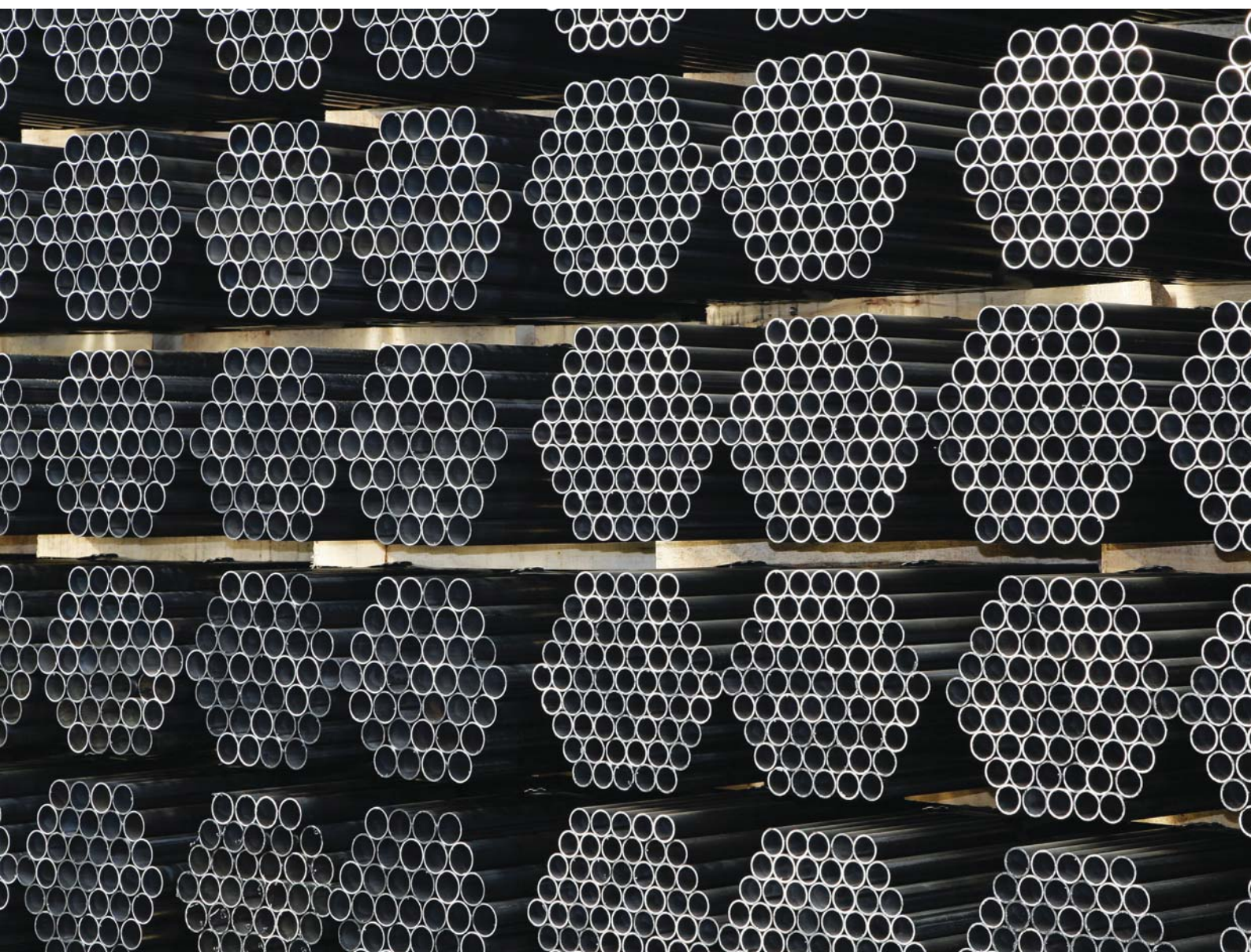
DN	Nominal Size	OD		Wall Thickness		Weight		Test Pressure	
		inch	mm	inch	mm	lb/ft	kg/m	Psi	Bar
20	3/4	1.050	26.7	0.083	2.11	0.86	1.28	700	48
25	1	1.315	33.4	0.109	2.77	1.41	2.09	700	48
32	1 1/4	1.660	42.2	0.109	2.77	1.81	2.69	1000	69
40	1 1/2	1.900	48.3	0.190	2.77	2.09	3.11	1000	69
50	2	2.375	60.3	0.190	2.77	2.64	3.93	1000	69
65	2 1/2	2.875	73.0	0.120	3.05	3.53	5.26	1000	69
80	3	3.500	88.9	0.120	3.05	4.34	6.46	1000	69
90	3 1/2	4.000	101.6	0.120	3.05	4.98	7.41	1200	83
100	4	4.500	114.3	0.120	3.05	5.62	8.37	1200	83
125	5	5.563	141.3	0.134	3.40	7.78	11.58	1200	83
150	6	6.625	168.3	0.134	3.40	9.30	13.85	1000	69
200	8	8.625	219.1	0.188	4.78	16.96	25.26	800	55
250	10	10.750	273.1	0.188	4.78	21.23	31.62	700	48

1/2" - 6" SCH 40, 8" - 10" SCH 30

DN	Nominal Size	OD		Wall Thickness		Weight		Test Pressure	
		inch	mm	inch	mm	lb / ft	kg / m	Psi	Bar
15	1/2	0.840	21.3	0.109	2.77	0.85	1.27	700	48
20	3/4	1.050	26.7	0.113	2.87	1.13	1.69	700	48
25	1	1.315	33.4	0.133	3.38	1.68	2.50	700	48
32	1 1/4	1.660	42.2	0.140	3.56	2.27	3.39	1000	69
40	1 1/2	1.900	48.3	0.145	3.68	2.72	4.05	1000	69
50	2	2.375	60.3	0.154	3.91	3.66	5.45	1000	69
65	2 1/2	2.875	73.0	0.203	5.16	5.80	8.64	1000	69
80	3	3.500	88.9	0.216	5.49	7.58	11.29	1000	69
90	3 1/2	4.000	101.6	0.226	5.74	9.12	13.58	1200	83
100	4	4.500	114.3	0.237	6.02	10.80	16.09	1200	83
125	5	5.563	141.3	0.258	6.55	14.63	21.79	1200	83
150	6	6.625	168.3	0.280	7.11	18.99	28.29	1200	83
200	8	8.625	219.1	0.277	7.04	24.72	36.82	1200	83
250	10	10.750	273.1	0.307	7.80	34.27	51.05	1000	69



PRESSURE TUBES



Application Area: Boiler Tubes, Concrete Pump Pipes,
High Temperature Pressure Pipes

Production Standards

EN 10217 - 1
EN 10217 - 2
EN 10217 - 3
ASTM A 178

Material Quality

EN 10217 - 1	P195TR1, P235TR1, P265TR1
EN 10217 - 2	P235GH, P265GH
EN 10217 - 3	ST 52, P355
ASTM A 178	GR A

Heat Treatment

900°C Full Body Normalizing

Finishing Operations

- Plain End (Square Cut or Bevelled)

Test Certificates

EN 10204 3.1, 3.2

Surface Protection

- Protective Oil
- Water Based Painting

Pipe Lengths

- min. 5 m - max. 12 m



3.1. Tubes for Pressure Purpose

EN 10217-1

Production Range

EN 10217 - 1

OD (mm)			Wall Thickness T, (mm)																		
seri1	seri2	seri3	1.8	2.0	2.3	2.6	2.9	3.2	3.6	4.0	4.5	5.0	5.4	5.6	6.3	7.1	8.0	8.8	10	11	12
17.2			0.684	0.750	0.845	0.936	1.02														
21.3			0.868	0.952	1.08	1.20	1.32	1.43													
26.9			1.11	1.23	1.40	1.56	1.72	1.87	2.07												
33.7			1.42	1.56	1.78	1.99	2.20	2.41	2.67	2.93											
42.4			1.80	1.99	2.27	2.55	2.82	3.09	3.44	3.79	4.21										
48.3			2.06	2.28	2.61	2.93	3.25	3.56	3.97	4.37	4.86										
	51		2.18	2.42	2.76	3.10	3.44	3.77	4.21	4.64	5.16										
60.3			2.60	2.88	3.29	3.70	4.11	4.51	5.03	5.55	6.19	6.82	7.31	7.55							
		73			4.01	4.51	5.01	5.51	6.16	6.81	7.60	8.38	9.00	9.31							
76.1					4.19	4.71	5.24	5.75	6.44	7.11	7.95	8.77	9.42	9.74							
88.9					4.91	5.53	6.15	6.76	7.57	8.38	9.37	10.3	11.1	11.5	12.8	14.3					
	101.6						7.06	7.77	8.70	9.63	10.8	11.9	12.8	13.3	14.8	16.5					
114.3							7.97	8.77	9.83	10.9	12.2	13.5	14.5	15.0	16.8	18.8	21.0				
	127						8.88	9.77	11.0	12.1	13.6	15.0	16.2	16.8	18.8	21.0	23.5				
139.7							9.78	10.8	12.1	13.4	15.0	16.6	17.9	18.5	20.7	23.2	26.0				
		141.3					9.90	10.9	12.2	13.5	15.2	16.8	18.1	18.7	21.0	23.5	26.3				
168.3								13.0	14.6	16.2	18.2	20.1	21.7	22.5	25.2	28.2	31.6				
		177.8						13.8	15.5	17.1	19.2	21.3	23.0	23.8	26.6	29.9	33.5				
		193.7								18.7	21.0	23.3	25.1	26.0	29.1	32.7	36.6	40.1			
219.1									19.1	21.2	23.8	26.4	28.5	29.5	33.1	37.1	41.6	45.6	51.6		
		244.5								23.7	26.6	29.5	31.8	33.0	37.0	41.6	46.7	51.2	57.8		
273										26.5	29.8	33.0	35.6	36.9	44.4	46.6	52.3	57.3	64.9	71.1	
323.9											35.4	39.3	42.4	44.0	49.3	55.5	62.3	68.4	77.4	84.9	92.3

Dimension-Wall Thickness Production Range, kg/m

3.2. Boiler Tubes

EN 10217-2

Production Range

OD (mm)	Wall Thickness (mm)	Length (m)
76	3,2	5-7

EN 10217-2

Steel Grade	Min. Yield Strength, Rp0,2 (MPa)						
	100°C	150°C	200°C	250°C	300°C	350°C	400°C
P235GH	198	187	170	150	132	120	112
P265GH	226	213	192	171	154	141	134

3.3. Concrete Pump Pipes

EN 10217-3

Production Range

EN 10217 - 3

Steel Grade	Outside Diameter (mm)	Wall Thickness (mm)	Length (m)
ST 52, P355	133	4.0	6
	133	4.5	6

* Internal Bead Removed

3.4. Water Well Casing & Tubing Pipes

ASTM A 589

Application Area: Water Well Casing and Tubing Installations

Production Standards

ASTM A 589

Material Quality

ASTM A 589

Gr A, Gr B

Test Certificates

EN 10204 3.1, 3.2

Finishing Operations

- Plain End (Square Cut or Bevelled)

Surface Protection

- Protective Oil
- Water Based Painting
- Hot Dip Galvanizing

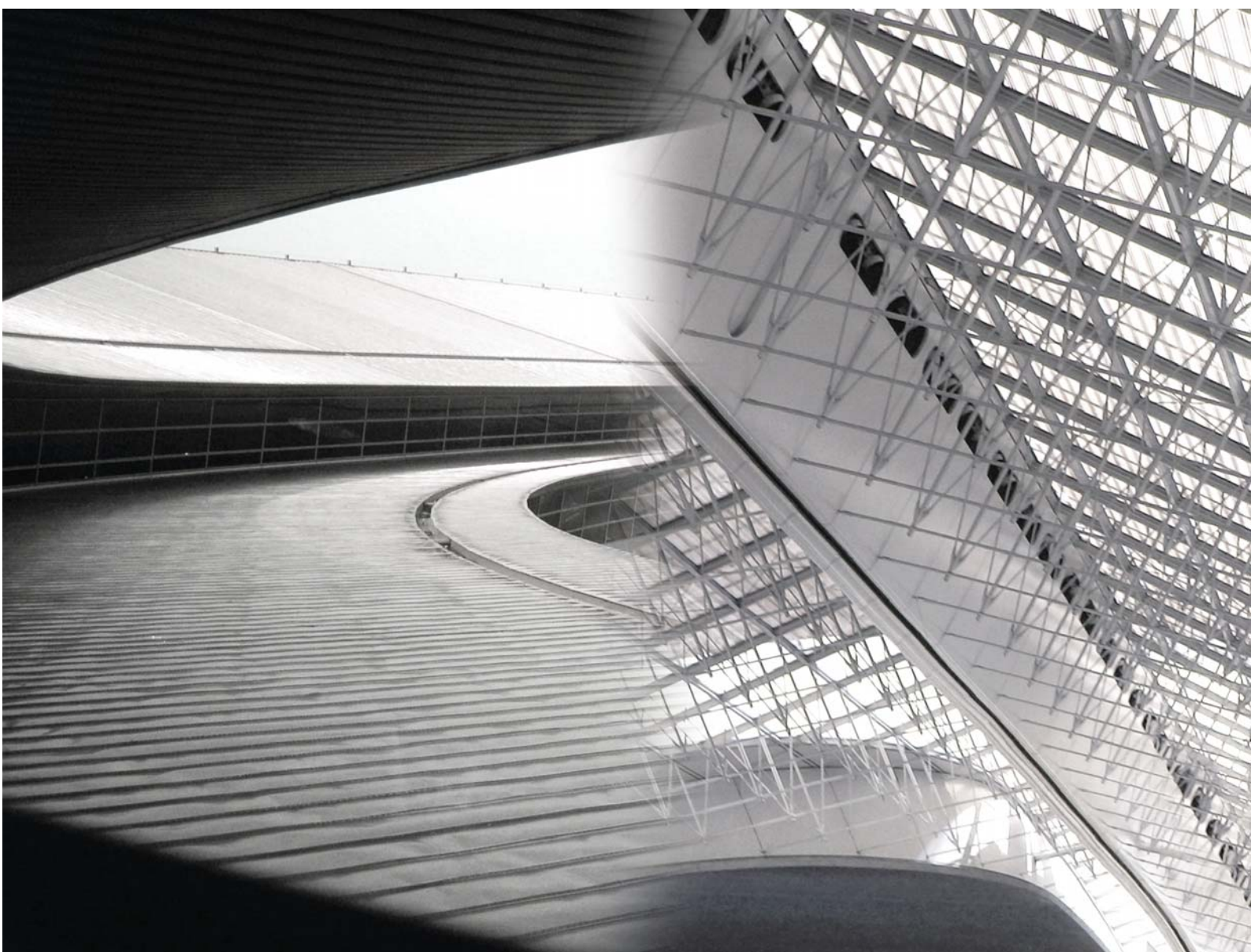
Pipe Lengths

- min. 5 m - max. 12 m

Production Range

	Sizes		Wall Thickness		Sch. No	Plain End
	mm	inch	mm	inch		kg/m
ASTM A 589 TYPE II	114.3	4	6.02	0.237	40	16.06
	168.3	6	7.11	0.280	40	28.23
ASTM A 589 TYPE IV	168.3	6	4.70	0.185	-	18.93

GENERAL PURPOSE PIPES



4.1. Circular Hollow Sections

Application Area: Industrial and General Purpose Constructions

Production Standards

EN 10219	EN 10220
ASTM A 500	

Material Quality

EN 10025	S235, S275, S355
DIN 17100	St 33, St 37, St 44, St 52
ASTM A 500	Gr A, Gr B, Gr C, Gr D

Galvanizing Standards

EN 10240	ASTM A53
EN ISO 1461	

Finishing Operations

- Plain End (Square Cut or Bevelled)

Test Certificates

EN 10204 2.2, 3.1, 3.2

Surface Protection

- Protective Oil
- Hot Dip Galvanizing
- Water Based Painting
- Epoxy Coating

Pipe Lengths

- min. 4 m - max. 12 m



4.1. Circular Hollow Sections

Production Range

OD (mm)	Wall Thickness T, (mm)																					
	1.5	1.8	2.0	2.3	2.5	2.9	3.0	3.2	3.6	4.0	4.2	4.5	5.0	5.2	5.6	6.0	6.3	7.1	8.0	10	11	12
21.3	0.73	0.87	0.95	1.08	1.16	1.32	1.35	1.43														
26.9	0.93	1.11	1.23	1.40	1.50	1.72	1.77	1.87	2.07													
33.7	1.19	1.42	1.56	1.78	1.92	2.20	2.27	2.41	2.67	2.93												
42.4		1.80	1.99	2.27	2.46	2.82	2.91	3.09	3.44	3.79	3.95	4.21										
48.3		2.06	2.28	2.61	2.82	3.25	3.35	3.56	3.97	4.37	4.56	4.86	5.34									
60.3		2.60	2.88	3.29	3.56	4.11	4.24	4.51	5.03	5.55	5.81	6.19	6.82	7.06	7.55							
76.1					4.54	5.24	5.41	5.75	6.44	7.11	7.44	7.95	8.77	9.09	9.74	10.4						
88.9						6.15	6.36	6.76	7.57	8.38	8.77	9.37	10.3	10.7	11.5	12.3	12.8	14.3				
101.6						7.06	7.29	7.77	8.70	9.63	10.1	10.8	11.9	12.3	13.3	14.1	14.8	16.5				
114.3						7.97	8.23	8.77	9.83	10.9	11.4	12.2	13.5	13.9	15.0	16.0	16.8	18.8	21.0			
139.7						9.78	10.1	10.8	12.1	13.4	14.0	15.0	16.6	17.2	18.5	19.8	20.7	23.2	26.0			
168.3							12.2	13.0	14.6	16.2	17.0	18.2	20.1	20.9	22.5	24.0	25.2	28.2	31.6			
177.8										17.1	18.0	19.2	21.3	22.1	23.8	25.4	26.6	29.9	33.5			
193.7										18.7	19.6	21.0	23.3	24.2	26.0	27.8	29.1	32.7	36.6			
219.1									19.1	21.2	22.2	23.8	26.4	27.4	29.5	31.5	33.1	37.1	41.6	51.6		
244.5										23.7	24.8	26.6	29.5	30.7	33.0	35.3	37.0	41.6	46.7	57.8		
273.0										26.5	27.8	29.8	33.0	34.3	36.9	39.5	41.4	46.6	52.3	64.9		
323.9											33.1	35.4	39.3	40.8	44.0	47.0	49.3	55.5	62.3	77.4	84.9	92.3

Dimension-Wall Thickness Production Range, kg/m



4.2. Square & Rectangular Hollow Sections

Application Area: Industrial and General Purpose Constructions

Production Standards

EN 10219	EN 10305
ASTM A 500	

Material Quality

EN 10025	S195, S235JR, S235JO, S235J2, S275JR, S275JO, S275J2, S355JR, S355JO, S355J2, S355K2
ASTM A 500	Gr A, Gr B, Gr C, Gr D
DIN 17100	St12, St33, St37, St44, St52

Galvanizing Standards

EN 10240	ASTM A53
EN ISO 1461	

Surface Protection

- Protective Oil
- Hot Dip Galvanizing
- Water Based Painting

Production Range

EN 10219

SQUARE

Size (mm)	Wall Thickness T, (mm)					
	5.0	6.0	6.3	7.0	8.0	10
200 x 200	30.1	35.8	37.2	41.1	46.5	57.0
250 x 250	38.0	45.2	47.1	52.0	59.1	72.7

EN 10219

RECTANGULAR

Size (mm)	Wall Thickness T, (mm)					
	5.0	6.0	6.3	7.0	8.0	10
250 x 150	30.1	35.8	37.2	41.1	46.5	57.0
300 x 200	38.0	45.2	47.1	52.0	59.1	72.7

Dimension-Wall Thickness Production Range, kg/m



4.3. Scaffolding Pipes

Application Area: Scaffolding Systems

Production Standards

EN 39

Galvanizing Standards

EN ISO 1461

EN 10240

Test Certificates

EN 10204 2.2, 3.1, 3.2

EN 39 (Type 3- Type 4)

OD (mm)	Wall Thickness (mm)	Weight (kg/m)
48.3	3.2	3.56
48.3	4.0	4.37

*Internal Bead Removed.

Material Quality

EN 39

S235GT

Finishing Operations

- Plain End

Surface Protection

- Protective Oil
- Hot Dip Galvanizing
- Water Based Painting

4.4. Fence Pipes

Application Area: Fence Construction

ASTM F 1083

Nominal Diameter		Outside Diameter		Wall Thickness		Weight		
inch	mm	inch	mm	inch	mm	lb/ft	kg/m	kg/ft
1	25	1.315	33.4	0.133	3.38	1.68	2.5	0.762
1 1/4	32	1.660	42.2	0.140	3.56	2.27	3.4	1.03
1 1/2	40	1.900	48.3	0.145	3.68	2.72	4.0	1.21
2	50	2.375	60.3	0.154	3.91	3.65	5.4	1.64
2 1/2	65	2.875	73.0	0.203	5.16	5.80	8.6	2.62
3	80	3.500	88.9	0.216	5.49	7.58	11.3	3.44
3 1/2	90	4.000	101.6	0.226	5.74	9.12	13.6	4.14
4	100	4.500	114.3	0.237	6.02	10.80	16.1	4.90
6	150	6.625	168.3	0.280	7.11	18.99	28.3	8.62
8	200	8.625	219.1	0.322	8.18	28.58	42.5	12.95

5. Pipe Joint Types

5.1. Bell & Spigot Joints

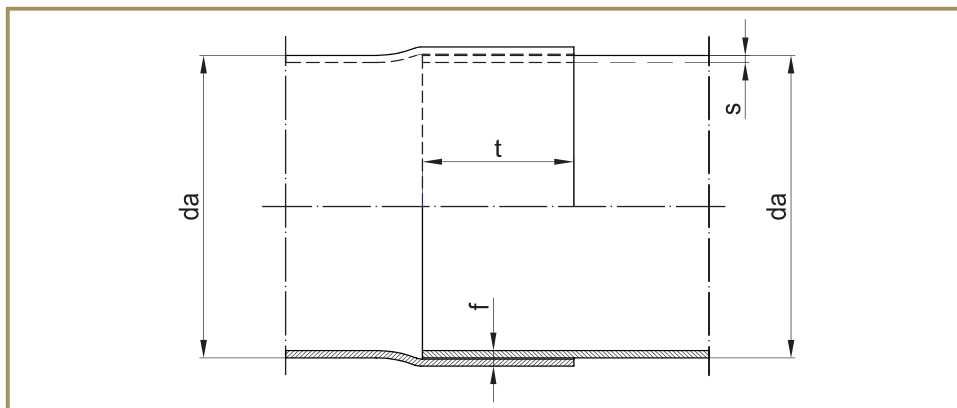
Application Area: Water Transmission Lines

Production Standards

EN 10224

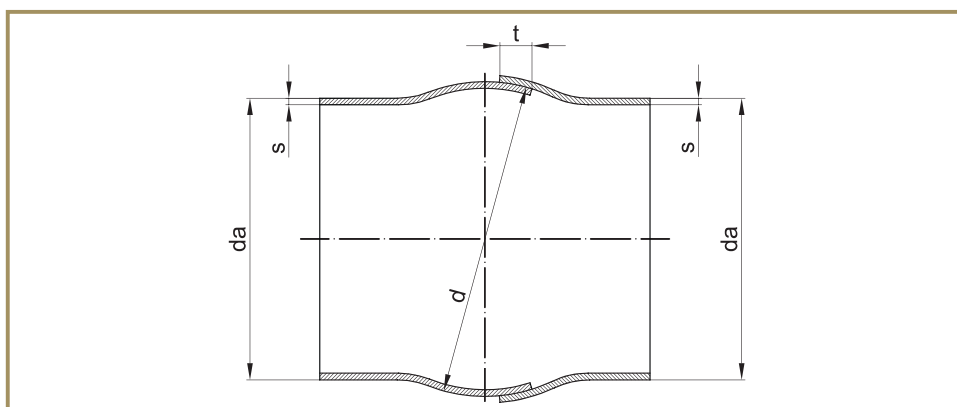


Cylindrical



OD da (mm)	Wall Thickness s (mm)	Weight (kg/m)	Min. Insertion Depth t (mm)	Socket Clearance f (mm)
114.3	3.20	8.83	75	1.5
139.7	3.60	12.2	75	1.5

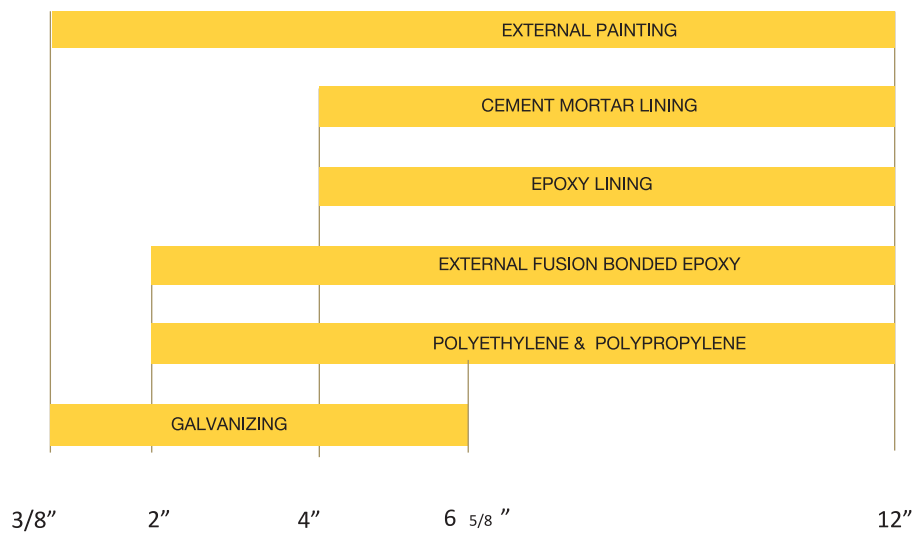
Spherical



OD da (mm)	Wall Thickness s (mm)	Belled Diameter d (mm)	Weight (kg/m)	Min. Insertion Depth t (mm)
168.3	4.00	188	16.3	20
219.1	5.00	245	26.4	30
273.0	5.60	295	36.8	42
323.9	5.90	360	46.2	42



Çayırova Boru successfully applies various coating types and methods for increasing the corrosion resistance of pipes by using superior technologies and own know-how. The main types of these coatings are; **“galvanize coating”, “polyethylene coating”, “polypropylene coating”, “water based painting”, “cement mortar lining” and “ internal & external epoxy coating”**. All these coating applications are carried out according to related international standards and customers requests.



6.1. Polyethylene & Polypropylene Coatings

Application Area: Transmission Lines of Crude Oil and Petroleum Products,
Natural Gas, Water and Semi-Fluid Chemicals

Coating Standards

DIN 30670	NF A 49-710
UNI 9099	NF A 49-711
DIN 30678	



3 Layer Polyethylene Coating - DIN 30670

According to the continuous operating temperature; Low(LDPE), Medium(MDPE) or High(HDPE) Density Polyethylene Coating materials are used.

Continuous operating temperature according to the PE material selection;

LDPE : 50 °C,

MDPE : 70 °C,

HDPE : 85 °C.

DIN 30670 PE Minimum Coating Thickness (mm)

DN	Normal (n)	Reinforced (v)
DN ≤ 100	1.8	2.5
100 < DN ≤ 250	2.0	2.7
250 < DN < 500	2.2	2.9

3 Layer Polypropylene Coating - DIN 30678

Polypropylene coated pipes are used successfully up to 100 °C operating temperature.

DIN 30678 PP Minimum Coating Thickness (mm)

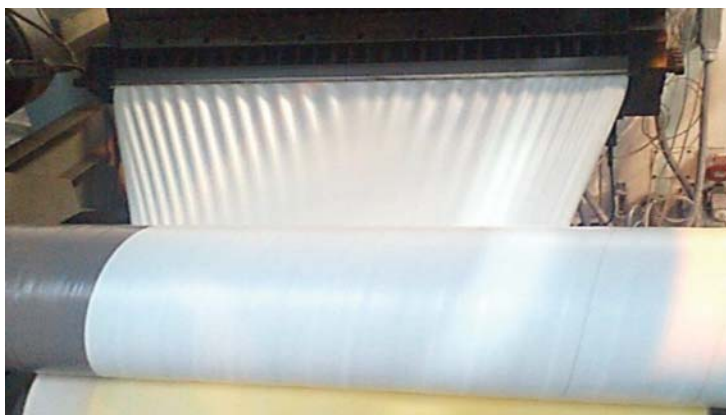
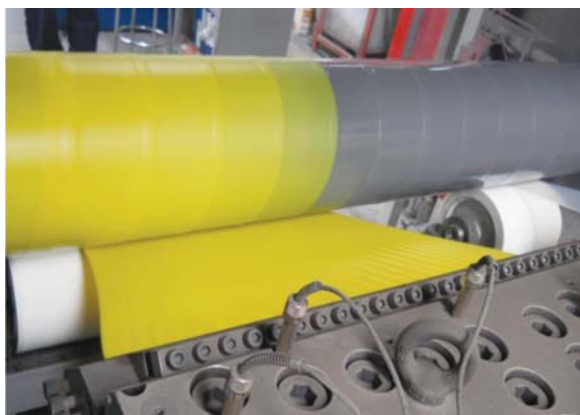
DN	Normal (n)
DN ≤ 100	1.8
100 < DN ≤ 250	2.0
250 < DN ≤ 500	2.2

Pipe Lengths

- min. 5 m - max. 14 m

Surface Preparation (DIN 55928, SIS 55900, ISO 8501)

Surfaces to be coated are cleaned by shot blasting method. At least Sa 3 surface cleanliness level is provided.



3 Layer PE / PP coating is a high quality coating type to protect the steel from corrosion and is applied to the steel pipe which transmits the oil, water and gas.

3 Layer PE / PP coating, greatly affects the service life of the pipeline. PE/PP coating provides a higher level protection than other types of coatings because of being good at impact resistance, peel resistance and aging resistance under heat and light.

PE coating between -40 °C to +85 °C and PP coating between -40 °C to +100 °C of the operating temperature can be safely used to protect steel pipes from corrosion.

6.2. Epoxy Lining & Coating

Technical Properties

Water, carried by water transmission lines, may have chemically quite different properties. Internal coating of pipes should be durable against these different properties of water. For drinking water, coating should provide the hygienic conditions. Epoxy coating applied by Çayırova Boru fully provides all these requirements.



Application Area: Transmission Lines of Crude Oil and Petroleum Products, Natural Gas, Water and Semi-Fluid Chemicals

Coating Standards

AWWA C 210	EN 10289
AWWA C 213	EN 10339
API RP 5L2	

Pipe Lengths

- min. 5 m- max.13 m

Epoxy Coating Applications

Application Surface	Fusion Bonded Epoxy Coating	Liquid Epoxy Coating
Outside	✓	
Inside		✓

Epoxy Coating Thickness

Flow Coat Epoxy Coating; Natural Gas Pipes (API RP 5L2) : min 38 µm or customer demand
Liquid Epoxy Coating; Drinking Water Pipes (AWWA C 210) : min 406 µm or customer demand
Fusion Bonded Epoxy Coating (AWWA C 213) : 305-406 µm or customer demand



Technical Properties

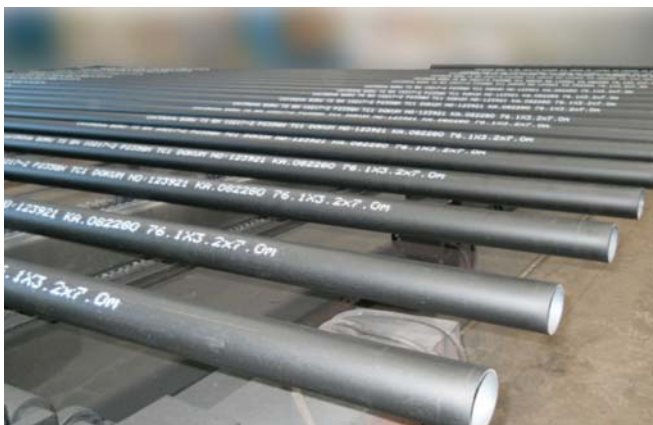
Water-based paint provides protection up to 3 months against corrosive and physical effects. In addition to being environmentally friendly coating material, high corrosion-water resistance and easy applying properties are advantages of water based paint. Due to being solvent free, water based paint has low fire risk. There are no negative effects on health. Shot blasting can be optionally applied before painting. Red, grey and black colors are applied.



Application Area: Water and Gas Pipe Installations, Fire Protection Pipes, General Purpose Constructions, Scaffolding Pipes

Painted Pipe Production Range

OD (mm)	Coating Thickness (μm)	Pipe Lengths (m)
17.2 - 323.9	15 - 20	5-14



6.4. Galvanizing

Technical Properties

Product oriented controls and inspections are done to check quality and compliance of zinc coating with reference to relevant standards. These control and inspection procedures are performed during production.



Galvanizing Standards

EN ISO 1461	ASTM A53
EN 10240	

Pipe Lengths

- min. 5 m - max. 7,5 m

Threading Standards

EN 10226	ISO 7-1
BS 21	ANSI B1.20.1



Technical Properties

Cement mortar lining, provides passive protection by separating pipe from corrosive environment. Also it provides active protection by generating alkaline reactions during the job site operation. Some coating cracks are not considered as a defect for cement mortar lining because of its self-repair feature. Abrasion resistance of concrete coating is very good and it allows approximately 5 m/s flow rates possible.

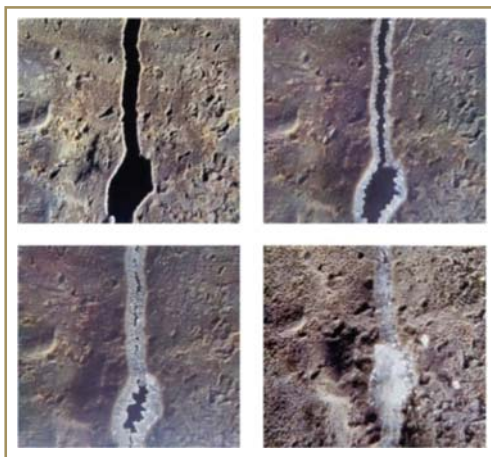
After coating process, one of the important elements in pipe line systems is providing the smooth inner surface. In pipe line hydrodynamic calculations, equivalent sand roughness value for concrete coated steel pipes can be taken between 0.05 -1.0 mm depending on pipe diameter. Concrete coating has a strong resistance against the temperature difference. Temperature changes caused by weather conditions do not have any effect on coating.

Coating Standards

EN 10298	AWWA C 205
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Coating Thickness & Production Range

OD (mm)	Wall Thickness (mm)	Coating Thickness (mm)	Pipe Lengths (m)
114.3 - 323.9	3 - 10	3 - 10	6 - 12



QUALITY ASSURANCE



INTERNATIONAL QUALITY AND STANDARD CERTIFICATES

Product Certificates

TS EN 10255
TS EN10208-1
TS EN 10217-1
TS 5139
TS 9341 EN 10224
TS EN 10289
TS EN 10298

American Standards Registration Certificates

API Spec 5L
API Spec 5CT

German Standards Registration Certificates

DIN-DVGW

Russian Standards Registration Certificates

GOST
HIJYEN

Quality System Certificates

ISO 9001 (TÜV)
ISO 9001 (API)
ISO / TS 29001 (API)
API SPECIFICATION Q1 (API)
TS/OHSAS 18001
ISO 14001

CE Certificates

CE (EN 10219)
CE (EN 10255)

Accordance with Pressure Equipment Directive

97/23 EC PED (TS EN 10217)



7. Quality Assurance

Visual and Dimensional Inspection

Pressure Test

Hydrostatic Test

Non-destructive Inspection

Eddy Current Test

Ultrasonic Test of Weld Seam

Ultrasonic Test of Full Body Lamination

Manual Ultrasonic Test of Pipe End

Mechanical Tests

Tensile Test

Charpy Impact Test

Flattening Test

Bending Test

Expanding Test

Chemical Analysis

Spectral Analysis

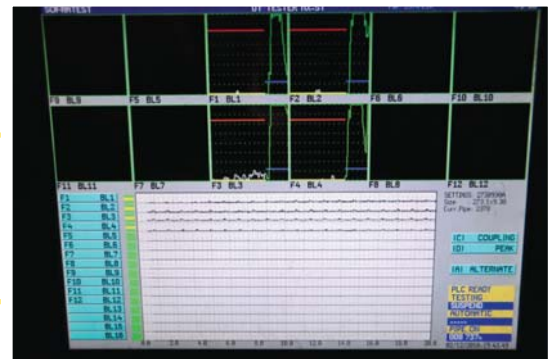
Metallographic Examination

Macro Examination

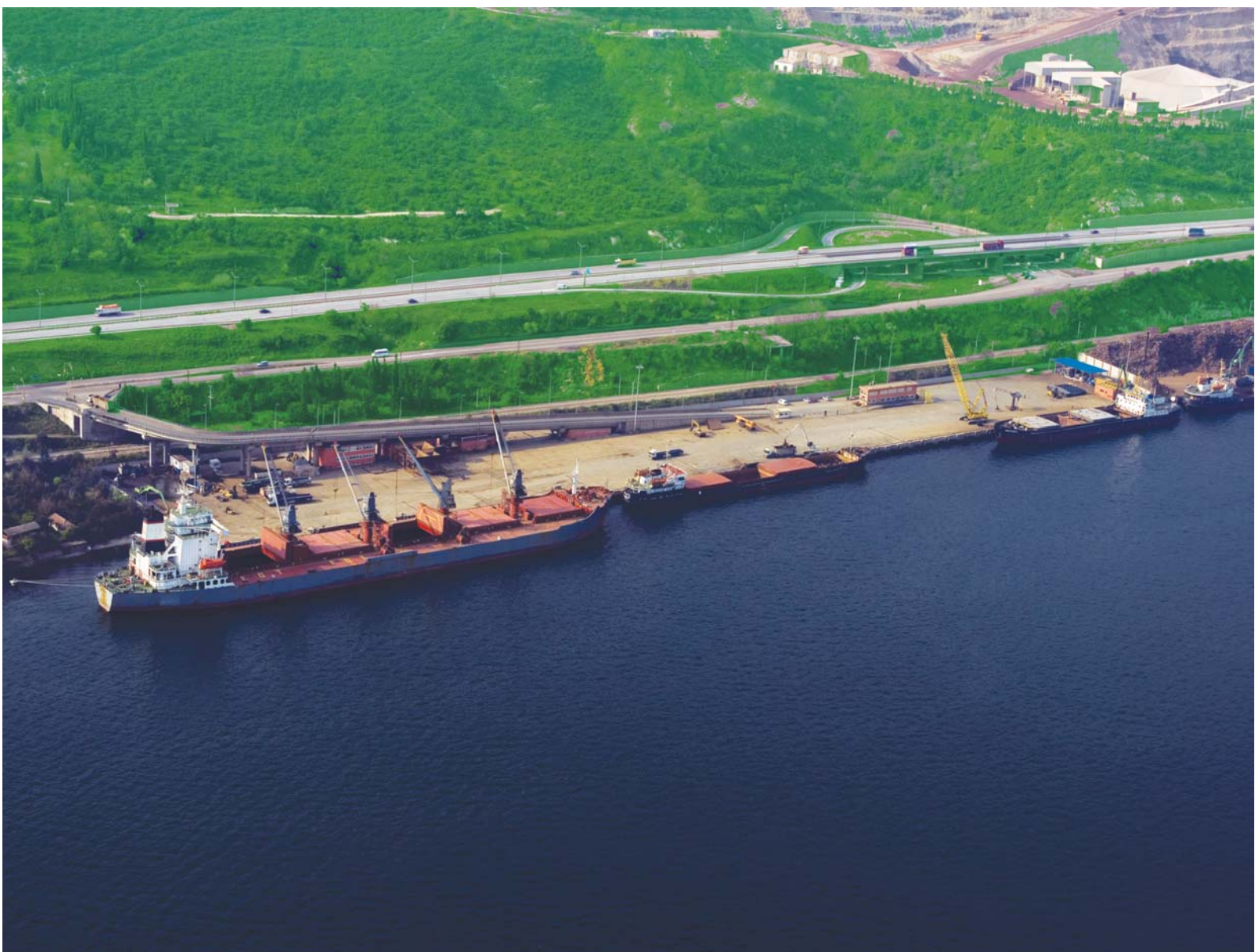
Micro Examination

HV and HRC Hardness Test

Micro Hardness Analysis



LOGISTICS



8. Logistics

Çayırova Boru can operate container shipment, bulk shipment, truck and railway shipments according to the client's needs. Bulk Shipment operations are realized at group company Kroman Çelik A.Ş. port at 20 km far from Çayırova Boru facilities.





ÇAYIROVA BORU

SANAYİ VE TİCARET A.Ş.

www.cayirovaboru.com



Çayırova Boru, is a member of Yücel Group.

Head Office:

Rıhtım Cad. No: 44 34710
Kadıköy - İstanbul - TURKEY
Phone : +90 216 418 10 00 (10 Lines)
Fax : +90 216 414 53 31 (4 Lines)

Factory:

Osmangazi Mah. Aşıroğlu Cad.
No: 170 41400
Darca - KOCAELİ - TURKEY
Phone : 0262 653 61 30 (5 Lines)
Fax : 0262 653 61 35 -36