

# Outokumpu high performance bar

outokumpu   
working towards a world that lasts forever

[outokumpu.com/longproducts](https://outokumpu.com/longproducts)



A close-up photograph of a male worker in an industrial setting. He is wearing a black safety helmet with a headlamp and a bright orange high-visibility safety vest over a dark shirt. The vest has the 'outokumpu' logo and 'LONG PRODUCTS' text on it. He is looking down at a large, textured, light-colored industrial component, possibly a piece of machinery or a large pipe. The background is blurred, showing industrial structures and a yellow vertical beam of light.

# Forever stainless

There is now, more than ever, a powerful need for sustainable and lasting solutions that pass the test of time and can be recycled and used time and again. There is a need for stainless steel.

Outokumpu is the global leader in stainless steel. Our customers use it to create civilization's basic structures and its most famous landmarks. Stainless steel is sustainable, durable, and designed to last forever.

We aim to be the best value creator in stainless by 2020, through our competitive edge of customer orientation and efficiency. We are constantly inspired by stainless steel and excited by its possibilities. With our expertise, we can tailor it into any form and for almost any purpose.

Our production facilities are located in Finland, Germany, Mexico, Sweden, the UK, and USA, with a sales and service center network close to our customers worldwide.

In 2017, Outokumpu's sales were 6.4 billion euros with stainless steel deliveries of 2.4 million tonnes. Outokumpu employs 10,000 professionals in more than 30 countries, with headquarters in Helsinki, Finland and shares listed in the Nasdaq Helsinki.

# Outokumpu high-performance bar

Outokumpu produces high-performance stainless steel bar in an industry-leading variety of grades and shapes.

Our end-to-end approach, from melting to testing, means that we can offer a full range of long products with industry-leading consistency, delivery performance, and technical support.

Outokumpu high-performance stainless steel bars are produced in an extremely wide selection of grades, including our Prodec range for superior machinability.

Outokumpu experts have in-depth knowledge about the material needs of the automotive, oil and gas, and chemical industries, as well as industrial components and consumer goods.

Our dedicated teams are always easy to get in touch with. We're here to support you all the way from materials selection to end use, helping you to get the best result possible from our stainless steels.



## Key benefits

Product quality

Delivery reliability

Expert technical advice

Easy to deal with

Learn more at [outokumpu.com/longproducts](https://outokumpu.com/longproducts)

## Our mills



### Sheffield Stainless Bar

Sheffield Stainless Bar (SSB) is a leading producer of hexagon and square bars and Prodec superior machinability bars in small diameters.



### Degerfors Long Products

Outokumpu's hot rolling mill in Degerfors, Sweden is a global supplier of high quality bars as well as rolled and forged billets in a wide range of stainless steel grades.



# Round bar

Outokumpu offers stainless steel peeled and black round bars that are available from stock for quick delivery in Europe. We produce our round bar in a wide range of ferritic, austenitic, duplex, heat resistant, and precipitation hardening stainless steels as well as the Prodec range for superior machinability.

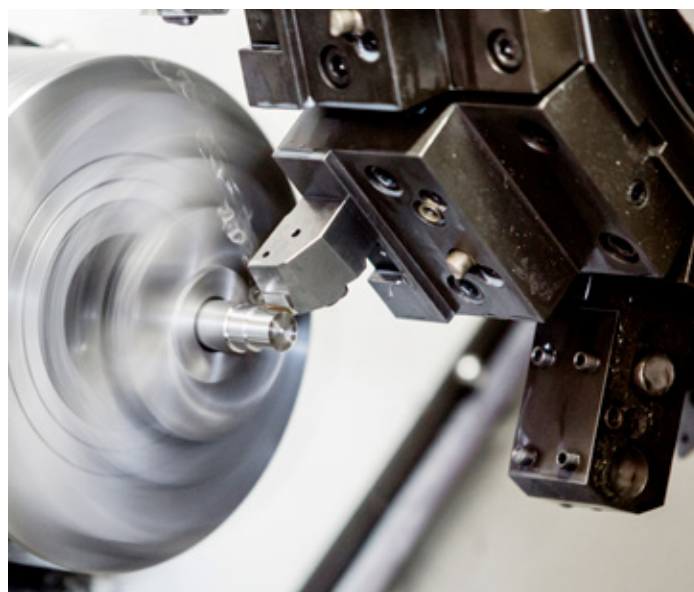
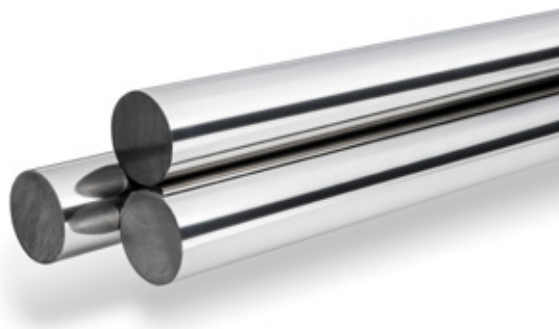
We have also made significant investments to further strengthen our capacity and capability in the products' grades, sizes, and surface conditions. Our bar products have consistently high quality, including their surface, straightness, and chemical composition. Our experts can also guide you through the whole process from material selection to end use, helping you to get the best possible results from our materials.

## Benefits

- Superior machinability with Prodec range grades
- Quick delivery from stock – estimated 1 week in Sweden and 2 weeks in Europe
- High surface quality means bar can be used without further surface treatment
- High tolerance conformance

## Dimensions

6–230 mm / ¼–9 inches



Dimensions		Condition	Tolerance
mm	in		
6–65	¼–2½	Cold drawn	h9
6–65	¼–2½	Ground	h7, h8
6–65	¼–2½	Peeled or polished	h9
6–100	¼–4	Peeled or polished	h9
30–230	1⅜–9	Peeled	k11*, k12, k13
30–230	1⅜–9	Black	To meet EN 10060

\*Peeled k11 dimension up to 170 mm/6¾ inch.

Note: see page 8-9 for commonly available grades. Please contact us to check availability of specific grades, sizes, and products.

# Superior machinability with Prodec

The Prodec range comprises stainless steel grades that are optimized for consistently superior machinability, enabling faster machining speed, longer tool life, and enhanced quality.

Extensive technical knowledge and our end-to-end production chain enables us to optimize the material's machinability properties through all steps of the process.

Unlike typical grades optimized for machinability, Prodec products have similar corrosion resistance to conventionally produced stainless steel grades.

## Prodec benefits

- **Faster machining\***  
Based on  $V_{15}$  testing results you can optimize machining speeds for Prodec 304L/4307 up to 300 m/min. Using higher speeds can lead to significant cost savings per component.
- **Longer tool life\***  
Prodec can double tool lifetime.
- **Superior quality and tolerances**  
Prodec expands the machining window, leading to superior chip formation while avoiding built up edge and tool wear.

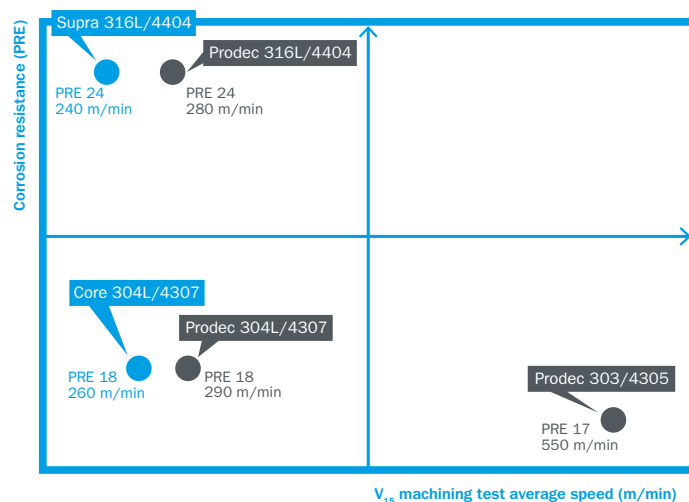
\*Testing done with Outokumpu Prodec and 7 European competitors' bars with improved machinability in grades 316L/4404 and 304L/4307.



Exclusive distributor for Outokumpu Prodec in Germany, Denmark, France, Spain, Portugal, Italy, Belgium, and the Netherlands.

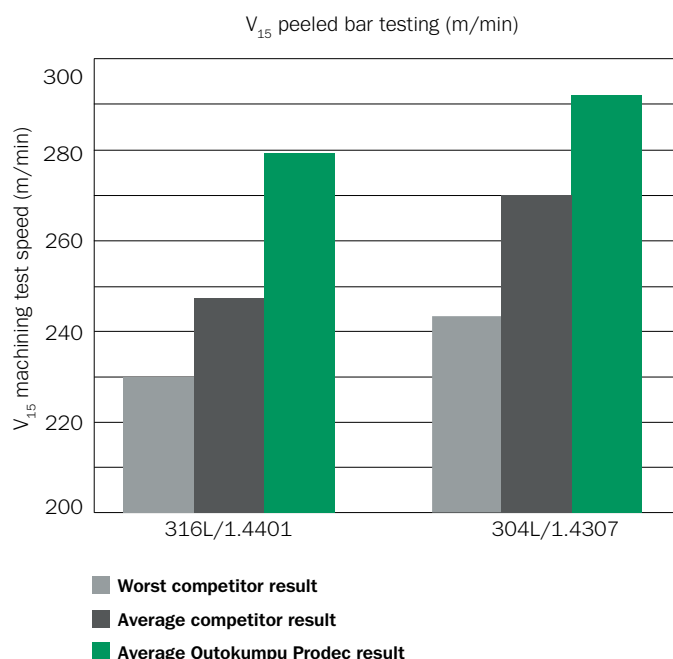
Learn more about the Prodec range at [outokumpu.com/prodec](http://outokumpu.com/prodec) and from our Prodec brochure.

## Comparison of machinability vs. corrosion



Prodec range products have the same corrosion resistance as conventionally produced stainless steels but offer the significant advantage of higher machining speeds. Prodec 303/4305 contains a significant amount of sulfur, which lowers corrosion resistance compared to 304L/4307.

## Faster machining with Prodec



Testing done with Outokumpu Prodec and 7 European competitors' bars with improved machinability in grades 316L/4404 and 304L/4307. The tool used for testing was a CNMG 2015 cemented carbide insert.

# Hexagon bar

Outokumpu and Böllinghaus Steel offer stainless steel hexagon bars from 8–70 mm /  $\frac{5}{16}$ –2 $\frac{3}{4}$  in. We produce our hexagon bar in a wide range of ferritic, austenitic, duplex, heat resistant, and precipitation hardening stainless steels as well as the Prodec range for superior machinability.

Our products have consistently high quality, including their surface, straightness, and chemical composition. Our experts can also guide you through the whole process from material selection to end use, helping you to get the best possible results from our materials.

## Benefits

- High surface quality means bar can be used without further surface treatment
- High machinability with Prodec range grades
- High tolerance conformance

Dimensions		Condition	Tolerance
mm	in		
8–70	$\frac{5}{16}$ –2 $\frac{3}{4}$	Cold drawn	h11



Outokumpu's representative for hexagon, square, and flat bars in Europe, Asia, and Latin America is Böllinghaus Steel.

## Dimensions

8–70 mm /  $\frac{5}{16}$ –2 $\frac{3}{4}$  inches



Note: see page 8-9 for commonly available grades. Please contact us to check availability of specific grades, sizes, and products.

# Square bar

Outokumpu and Böllinghaus Steel offer stainless steel square bars from 8–75 mm / 5⁄16–3 in. We produce our square bar in a wide range of ferritic, austenitic, duplex, heat resistant, and precipitation hardening stainless steels as well as the Prodec range for superior machinability.

Our products have consistently high quality, including their surface, straightness, and chemical composition. Our experts can also guide you through the whole process from material selection to end use, helping you to get the best possible results from our materials.

## Benefits

- High surface quality means bar can be used without further surface treatment
- High machinability with Prodec range grades
- High tolerance conformance

Dimensions		Condition	Tolerance
mm	in		
8–70	5⁄16–2¾	Cold drawn	h11
10–75	½–3	Hot rolled	-

Dimensions  
8–75 mm / 5⁄16–3 inches



# A wide selection of grades

We produce our stainless steel bar in a wide variety of grades. Please contact [sales.bar@outokumpu.com](mailto:sales.bar@outokumpu.com) to check the availability of specific products.

Outokumpu's representative for hexagon and square bars in Europe, Asia, and Latin America is Böllinghaus Steel. The sales contact is Antonio Perea: [perea@boellinghaus.de](mailto:perea@boellinghaus.de)

Outokumpu name	EN	ASTM		UNS	JIS	Grade family	Typical chemical composition, % by mass					
		Type					C	Cr	Ni	Mo	N	Others
Core range for corrosive environments												
Core 304/4301	1.4301	304		S30400	SUS 304	A	0.04	18.1	8.1	–	–	–
Core 304L/4307	1.4307	304L		S30403	SUS 304L	A	0.02	18.1	8.1	–	–	–
Core 304LN/4311	1.4311	304LN		S30453	SUS 304LN	A	0.02	18.5	9.2	–	0.14	–
Core 304L/4306	1.4306	304L		S30404	SUS 304L	A	0.02	18.2	10.1	–	–	–
Core 321/4541	1.4541	321		S32100	SUS 321	A	0.04	17.3	9.1	–	–	Ti
Core 304Cu/4567	1.4567	(304Cu)		S30430	SUS XM7	A	0.01	17.7	9.7	–	–	3Cu
Supra range for highly corrosive environments												
Supra 316/4401	1.4401	316		S31600	SUS 316	A	0.04	17.2	10.1	2.1	–	–
Supra 316L/4404	1.4404	316L		S31603	SUS 316L	A	0.02	17.2	10.1	2.1	–	–
Supra 316Ti/4571	1.4571	316Ti		S31635	SUS 316Ti	A	0.04	16.8	10.9	2.1	–	Ti
Supra 316/4435	1.4435	316L		–	SUS 316L	A	0.02	17.3	12.6	2.6	–	–
Supra 316L/4436	1.4436	316		–	SUS 316	A	0.04	16.9	10.7	2.6	–	–
Supra 316LN/4429	1.4429	316LN		S31653	SUS 316LN	A	0.02	16.7	11.1	2.6	0.14	–
Supra 316Cu/4578	1.4578	(316Cu)		–	–	A	0.02	16.9	10.7	2.1	–	Cu
Forta range for duplex and other high strength stainless steels												
Forta DX 2205	1.4462	–		S32205	SUS 329J3L	D	0.02	22.4	5.7	3.1	0.17	–
Forta LDX 2101	1.4162	–		S32101	–	D	0.03	21.5	1.5	0.3	0.22	5Mn, Cu
Forta SDX 2507	1.4410	–		S32750	–	D	0.02	25.0	7.0	4.0	0.27	–
Forta SDX 100	1.4501	–		S32760	–	D	0.02	25.4	6.9	3.8	0.27	W, Cu
Ultra range for extremely corrosive environments												
Ultra 904L	1.4539	904L		N08904	SUS 890L	A	0.01	19.8	24.20	4.3	–	1.4Cu
Ultra 254 SMO	1.4547	–		S31254	–	A	0.01	20.0	18.00	6.1	0.20	Cu
Ultra XM-19	–	XM-19		S20910	–	A	0.06	21.0	12.00	2.1	0.25	4.5Mn
Ultra 317L	1.4438	317L		S31703	SUS 317L	A	0.02	18.2	13.70	3.1	–	–



Outokumpu name	EN	ASTM		UNS	JIS	Grade family	Typical chemical composition. % by mass					
		Type					C	Cr	Ni	Mo	N	Others
Dura range for heat treatable stainless steels												
Dura 420/4021	1.4021	420	S42000	SUS 420/1	M	0.20	13.0	–	–	–	–	
Dura 410/4006	1.4006	410	S41000	SUS 410	M	0.12	12.0	–	–	–	–	
Dura 17-4PH	1.4542	630	S17400	SUS 630	PH	0.02	15.5	4.80	–	–	Nb, Cu	
Dura 416/4005	1.4005	416	S41600	SUS 416	M	0.10	13.0	–	–	–	S	
Therma range for high service temperatures												
Therma 253 MA	1.4835	–	S30815	–	A	0.09	21.0	11.00	–	0.17	Si, Ce	
Therma 310S/4845	1.4845	310S	S31008	SUS 310S	A	0.05	25.5	19.10	–	–	–	
Therma 321H/4878	1.4878	321H	S32109	SUS 321	A	0.05	17.3	9.10	–	–	Ti	
Therma 4828	1.4828	–	–	–	A	0.04	19.3	11.20	–	–	Si	
Therma 309S/4833	1.4833	309S	S30908	SUS 309	A	0.06	22.3	12.30	–	–	–	
Therma 314/4841	1.4841	314	S31400	–	A	0.06	24.3	19.20	–	–	Si	
Therma 347H/4550	1.4550	347H	S34709	SUS 347	–	0.045	17.3	9.10	–	–	Nb	
Therma 4886	1.4886	330	N08330	SUS 310	–	0.04	18.3	34.50	–	–	1.2Si	
Therma 304H/4948	1.4948	304H	S30409	–	A	0.05	18.1	8.30	–	–	–	
Prodec range for superior machinability												
Prodec 303/4305	1.4305	303	S30300	–	A	0.05	17.2	8.10	–	–	0.3S	
Prodec 304L/4307	1.4307	304L	S30403	–	A	0.02	18.1	8.10	–	–	–	
Prodec 316L/4404	1.4404	316L	S31603	–	A	0.02	17.2	10.10	2.1	–	–	
Prodec 17-4PH	1.4542	630	S17400	–	PH	0.02	16.3	4.70	–	–	Nb, 3.5Cu	

Chemical compositions given as % by mass. Table uses Outokumpu typical values. The required standard will be fully met as specified in the order.

For the full chemical composition list for different standards by stainless steel product, see [steelfinder.outokumpu.com](http://steelfinder.outokumpu.com)

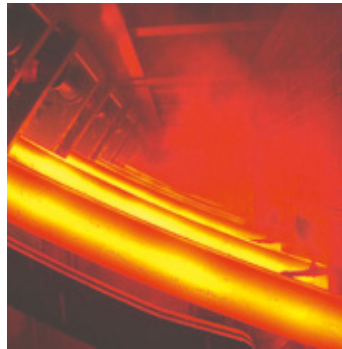
# Ensuring quality with end-to-end production

## Sheffield Stainless Bar



### Melting shop

Consistently produced high quality semis are made at the SMACC melting shop.



### Billet feedstock

Our rolling mill uses billet feedstock produced at the SMACC melting shop.



### Hot rolling into wire rod

Rod coil feedstock is used for bar production at Sheffield Stainless Bar.



### Coil pre-dipping

The surface of the bar is coated with a drawing lubricant to aid cold drawing.



### Preparation for cold drawing

Rod coils are moved from the pre-dipping station to the cold drawing line.



### Cold drawing

Wire rod is drawn through a die, reducing the cross-sectional area of the bar, and cut to lengths.



### Testing

Final process steps include testing and inspection of the material.



### Packing

Packing and shipping is done according to customer-specific requirements.

## High quality according to international standards

Our manufacturing programs are supported by in-house product inspection and testing, and the extensive experience of our technical team. SSB is accredited to recognized international standards, including:

- ISO 9001 - TÜV Nord
- ISO 14001 - TÜV Nord
- BS OHSAS 18001 - TÜV Nord
- AD 2000 Merkblatt WO - TÜV Nord
- CARES - Certificate of Conformity of the Factory Production Control
- CARES - CE Declaration of Conformity

# Degerfors Long Products



## Melting shop

Consistently produced high quality semis are made at the SMACC melting shop.



## Bloom feedstock

The feedstock for the bars is bloom produced at the SMACC melting shop.



## Preheating

The process starts with reheating the bloom or ingot in our eight oxy-fuel heated pit furnaces.



## Rolling

The stainless steel is rolled into its final shape and dimensions. Further processing can be added.



## Cooling

Bars are moved to a cooling bed before finishing operations.



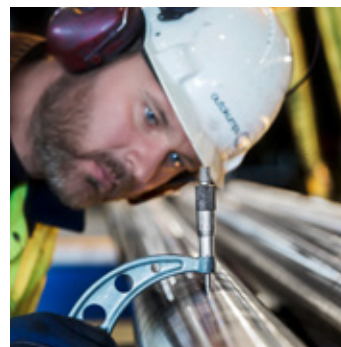
## Straightening

Bars are straightened in final stages of finishing operations.



## Peeling

Peeling of bars enhances surface quality and tolerances.



## Testing

Final process steps include testing, inspection, packing, and shipping.

## High quality according to international standards

Our manufacturing programs are supported by in-house product inspection and testing, and the extensive experience of our technical team. Degerfors Long Products is accredited to recognized international standards, including:

- NORSOK M650
- EN ISO 9001 - TÜV Nord
- AD 2000 Merkblatt WO - TÜV Nord
- PED 97/23/EC - TÜV Nord
- Lloyd's Register 1.4462/2205



# A world that lasts forever

We believe in a world that is efficient, sustainable, and designed to last forever. The world deserves innovations that can stand the test of time and are ready to be born again at the end of their life cycle. Stainless steel is vital in enabling a sustainable world with economic prosperity.

## Contact us

For all enquiries contact either:

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stainless.bar@outokumpu.com

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sales.degerforslp@outokumpu.com

outokumpu  
classic

**Moda**

Mildly  
corrosive  
environments

**Core**

Corrosive  
environments

**Supra**

Highly  
corrosive  
environments

outokumpu  
pro

**Forta**

Duplex  
& other  
high strength

**Ultra**

Extremely  
corrosive  
environments

**Dura**

High  
hardness

**Therma**

High  
service  
temperatures

**Prodec**

Improved  
machinability

**Deco**

Special  
surfaces

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**outokumpu**  
high performance stainless steel



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