

## Moda

Steels with PRE up to 17,  
for mildly corrosive environments.

Outokumpu  
Classic  
family

Steel designations				Performance				Typical chemical composition, % by mass					
Outokumpu name	EN	ASTM		PRE	A <sup>1)</sup> %	R <sub>p0.2</sub> MPa	Grade family	C	Cr	Ni	Mo	N	Others
		Type	UNS										
Moda 430/4016	1.4016	430	S43000	16	20	280	F	0.05	16.2	–	–	–	–
<b>Alternatives</b>													
Moda 4510	1.4510	–	–	16	23	240	F	0.02	16.2	–	–	–	Ti
Moda 439/4510	1.4510	439	S43035	17	23	240	F	0.02	17.1	–	–	–	Ti
Moda 430Ti/4520	1.4520	430Ti	–	16	24	200	F	0.02	16.2	–	–	–	Ti
Moda 4589	1.4589	–	S42035	15	16	420	F	0.05	14	1.7	0.3	–	Ti
<b>Low-Cr alternatives</b>													
Moda 410L/4003	1.4003	410L	S40977	12	20	320	F	0.02	11.5	0.5	–	–	–
Moda 409/4512	1.4512	409	S40910 <sup>2)</sup>	12	25	220	F	0.02	11.5	0.2	–	–	Ti
Moda 410S/4000	1.4000	410S	S41008	13	19	250	F	0.03	12.5	–	–	–	–

Grade family: F = ferritic. <sup>1)</sup> Elongation reference varies between different standards, information referenced here denotes A<sub>80</sub> – otherwise see footnote for specific grade or inquire to reference alternative standard. <sup>2)</sup> UNS S40920 is also possible.

## Core

Steels with PRE 17–22,  
for corrosive environments.

Outokumpu  
Classic  
family

Steel designations				Performance				Typical chemical composition, % by mass					
Outokumpu name	EN	ASTM		PRE	A <sup>1)</sup> %	R <sub>p0.2</sub> MPa	Grade family	C	Cr	Ni	Mo	N	Others
		Type	UNS										
Core 304/4301	1.4301	304	S30400	18	45	230	A	0.04	18.1	8.1	–	–	–
Core 304L/4307	1.4307	304L	S30403	18	45	220	A	0.02	18.1	8.1	–	–	–
<b>Alternatives</b>													
Core 304LN/4311	1.4311	304LN	S30453	21	40	290	A	0.02	18.5	9.2	–	0.14	–
Core 304L/4306	1.4306	304L	S30403	18	45	220	A	0.02	18.2	10.1	–	–	–
Core 305/4303	1.4303	305	S30500	18	45	220	A	0.04	17.7	12.5	–	–	–
Core 321/4541	1.4541	321	S32100	17	40	220	A	0.04	17.3	9.1	–	–	Ti
Core 347/4550	1.4550	347	S34700	18	40	220	A	0.05	17.5	9.5	–	–	Nb
Core 301LN/4318	1.4318	301LN	S30153	20	35	350	A	0.02	17.7	6.5	–	0.14	–
Core 301/4310	1.4310	301	S30100	17	40	250	A	0.1	17	7	–	–	–
<b>Low-Ni alternatives</b>													
Core 201/4372	1.4372	201	S20100	17	45	350	A	0.05	16.1	3.6	–	0.08	Cu 6.6Mn
Core 201LN/4372	1.4372	201LN	S20153	19	45	350	A	0.02	16.2	4.1	–	0.16	Cu 6.6Mn
<b>Ni-free alternatives</b>													
Core 441/4509	1.4509	–	S43940	18	18	250	F	0.02	17.6	–	–	–	Ti Nb
Core 439M	–	–	S43932	18	22 <sup>1)</sup>	205 <sup>1)</sup>	F	0.02	17.6	–	–	–	Ti Nb
Core 4622	1.4622	–	S44330	21	22 <sup>2)</sup>	300 <sup>2)</sup>	F	0.02	21	–	–	–	Ti Nb Cu

Grade family: A = austenitic, F = ferritic. <sup>1)</sup> Min. values acc. to ASTM A240, for strip t ≤ 5 mm. Elongation reference varies between different standards, information referenced here denotes A<sub>80</sub> – otherwise see footnote for specific grade or inquire to reference alternative standard. <sup>2)</sup> Min. values acc. to EN 10028-7.

## Supra

Steels with PRE 22–26,  
for highly corrosive environments.

Outokumpu  
Classic  
family

Steel designations				Performance				Typical chemical composition, % by mass					
Outokumpu name	EN	ASTM		PRE	A <sup>1)</sup> %	R <sub>p0.2</sub> MPa	Grade family	C	Cr	Ni	Mo	N	Others
		Type	UNS										
Supra 316/4401	1.4401	316	S31600	24	40	240	A	0.04	17.2	10.1	2.1	–	–
Supra 316L/4404	1.4404	316L	S31603	24	40	240	A	0.02	17.2	10.1	2.1	–	–
<b>Alternatives</b>													
Supra 316plus	1.4420	–	S31655	26	35 <sup>2)</sup>	350 <sup>2)</sup>	A	0.02	20.3	8.6	0.7	0.19	–
Supra 316/4436	1.4436	316	S31600	25	40	240	A	0.04	16.9	10.7	2.6	–	–
Supra 316L/4432	1.4432	316L	S31603	25	40	240	A	0.02	16.9	10.7	2.6	–	–
Supra 316L/4435	1.4435	316L	S31603	26	40	240	A	0.02	17.3	12.6	2.6	–	–
Supra 316Ti/4571	1.4571	316Ti	S31635	24	40	240	A	0.04	16.8	10.9	2.1	–	Ti
<b>Ni-free alternatives</b>													
Supra 444/4521	1.4521	444	S44400	25	20	320	F	0.02	18	–	2	–	Nb Ti

Grade family: A = austenitic, F = ferritic. <sup>1)</sup> Elongation reference varies between different standards, information referenced here denotes A<sub>80</sub> – otherwise see footnote for specific grade or inquire to reference alternative standard. <sup>2)</sup> Min. values acc. to EN 10028-7.

PRE = %Cr + 3.3 x %Mo + 16 x %N. Values for R<sub>p0.2</sub> yield strength and the A<sub>80</sub> for elongation are according to EN 10088-2 min. values for cold rolled strip. Chemical compositions and PRE calculations are based on Outokumpu typical values.

Steel designations				Performance				Typical chemical composition, % by mass					
Outokumpu name	EN	ASTM		PRE	A <sup>1)</sup> %	R <sub>p0.2</sub> MPa	Grade family	C	Cr	Ni	Mo	N	Others
		Type	UNS										
<b>Duplex, high strength, high corrosion resistance and enhanced resistance to stress corrosion cracking</b>													
Forta DX 2205	1.4462	–	S32205 <sup>2)</sup>	35	20	500	D	0.02	22.4	5.7	3.1	0.17	–
Forta LDX 2101	1.4162	–	S32101	26	20	530	D	0.03	21.5	1.5	0.3	0.22	5Mn Cu
Forta DX 2304	1.4362	–	S32304	26	20	450	D	0.02	23	4.8	0.3	0.1	Cu
Forta EDX 2304	1.4362	–	S32304	28	25 <sup>3)</sup>	500 <sup>3)</sup>	D	0.02	23.8	4.3	0.5	0.18	Cu
Forta LDX 2404	1.4662	–	S82441	34	20	550	D	0.02	24	3.6	1.6	0.27	3Mn Cu
Forta SDX 100	1.4501	–	S32760	42	25 <sup>4)</sup>	530 <sup>4)</sup>	D	0.02	25.4	6.9	3.8	0.27	W Cu
Forta SDX 2507	1.4410	–	S32750	43	20	550	D	0.02	25	7	4	0.27	–
<b>High strength and high ductility</b>													
Forta H400	1.4376	–	–	–	40	400	A	0.04	17.5	4	–	0.2	6.8Mn
Forta H500	–	–	–	–	40 <sup>5)</sup>	500 <sup>5)</sup>	A	0.32	14	–	–	0.32	16Mn
<b>High strength and high hardness (temper rolled)<sup>6)</sup></b>													
Forta H800	–	–	–	–	30 <sup>7)</sup>	800 <sup>7)</sup>	A	0.32	14	–	–	0.32	16Mn
Forta H1000	–	–	–	–	13 <sup>7)</sup>	1000 <sup>7)</sup>	A	0.32	14	–	–	0.32	16Mn
Forta 430/4016	1.4016	430	S43000	16	–	350 – 700	F	0.05	16.2	–	–	–	–
Forta 301LN/4318	1.4318	301LN	S30153	20	–	500 – 900	A	0.02	17.7	6.5	–	0.14	–
Forta 301/4310	1.4310	301	S30100	17	–	500 – 1300	A	0.1	17	7	–	–	–
Forta 304/4301	1.4301	304	S30400	18	–	350 – 1300	A	0.04	18.1	8.1	–	–	–
Forta 304L/4307	1.4307	304L	S30403	18	–	350 – 1300	A	0.02	18.1	8.1	–	–	–
Forta 316/4401	1.4401	316	S31600	24	–	350 – 700	A	0.04	17.2	10.1	2.1	–	–
Forta 316L/4404	1.4404	316L	S31603	24	–	350 – 700	A	0.02	17.2	10.1	2.1	–	–
Forta 316plus	1.4420	–	S31655	25	–	500 – 700 <sup>7)</sup>	A	0.02	20.3	8.6	0.7	0.19	–
Forta 316Ti/4571	1.4571	316Ti	S32100	24	–	350 – 700	A	0.04	16.8	10.9	2.1	–	Ti

Grade family: D = duplex, A = austenitic, F = ferritic. <sup>1)</sup> Min. values acc. to ASTM A240, for strip  $t \leq 5$  mm. Elongation reference varies between different standards, information referenced here denotes A<sub>80</sub> – otherwise see footnote for specific grade or inquire to reference alternative standard. <sup>2)</sup> Also available in S31803. <sup>3)</sup> Outokumpu MDS-D35 for EDX 2304. <sup>4)</sup> Min. values for plate acc. to EN 10088-2. <sup>5)</sup> Values acc. to Stahl-Eisen-Liste. <sup>6)</sup> Products with higher strength available on request. <sup>7)</sup> Outokumpu tested values.

Steel designations				Performance				Typical chemical composition, % by mass					
Outokumpu name	EN	ASTM		PRE	A <sup>1)</sup> %	R <sub>p0.2</sub> MPa	Grade family	C	Cr	Ni	Mo	N	Others
		Type	UNS										
Ultra 904L	1.4539	904L	N08904	34	35	240	A	0.01	19.8	24.2	4.3	–	1.4Cu
Ultra 254 SMO	1.4547	–	S31254	43	35	320	A	0.01	20	18	6.1	0.2	Cu
<b>Alternatives</b>													
Ultra 317L <sup>2)</sup>	(1.4438) <sup>3)</sup>	317L	S31703	28	40 <sup>4)</sup>	205 <sup>4)</sup>	A	0.02	18.2	11.6	3.1	–	–
Ultra 725LN	1.4466	–	S31050	34	40 <sup>5)</sup>	250 <sup>5)</sup>	A	0.01	25	22.3	2.1	0.12	–
Ultra 6XN	1.4529	–	N08926/ N08367	45	40 <sup>5)</sup>	300 <sup>5)</sup>	A	0.01	20.5	24.8	6.5	0.2	Cu
Ultra 654 SMO	1.4652	–	S32654	56	40	430	A	0.01	24	22	7.3	0.5	3.5Mn Cu
Ultra Alloy 825	2.4858 <sup>6)</sup>	–	N08825	34	30 <sup>7)</sup>	241 <sup>7)</sup>	A	0.01	23	39	3.2	–	Cu, Ti

Grade family: A = austenitic. <sup>1)</sup> Elongation reference varies between different standards, for coil the standard typically uses A80 – otherwise see footnote for specific grade.

<sup>2)</sup> Also available with 11.7% Ni which is not consistent with 1.4438. <sup>3)</sup> Quarto plate also available as EN 1.4438. Coil only available as ASTM 317L. <sup>4)</sup> Min values acc. to ASTM A-240

<sup>5)</sup> Min. values for plate acc. to EN 10088-2. <sup>6)</sup> Grade designation according to DIN 17750. <sup>7)</sup> Min. values hot-rolled and cold-rolled acc. to ASTM B424.

Steel designations				Performance			Typical chemical composition, % by mass					
Outokumpu name	EN	ASTM		HRC <sup>1)</sup>	R <sub>m</sub> <sup>2)</sup> MPa	Grade family	C	Cr	Ni	Mo	N	Others
		Type	UNS									
Dura 410/4006	1.4006	410	S41000	–	540	M	0.12	12	–	–	–	–
Dura 4024	1.4024	–	–	–	550	M	0.16	13.2	–	–	–	–
Dura 420/4021	1.4021	420	S42000	44 – 50 <sup>3)</sup>	580	M	0.2	13	–	–	–	–
Dura 420/4028	1.4028	420	S42000	45 – 51 <sup>3)</sup>	620	M	0.3	12.5	–	–	–	–
Dura 420/4031	1.4031	420	S42000	47 – 53 <sup>3)</sup>	640	M	0.38	13.5	–	–	–	–
Dura 420/4034	1.4034	420	S42000	49 – 55 <sup>3)</sup>	700	M	0.45	13.7	–	–	–	–
Dura 4419	1.4419	–	–	46 – 52 <sup>3)</sup>	660	M	0.38	13.3	–	0.9	–	–
Dura 4110	1.4110	–	–	50 – 56 <sup>3)</sup>	680	M	0.5	14.8	–	0.6	–	–
Dura 4116	1.4116	–	–	–	680	M	0.5	14.4	–	0.6	–	V
Dura 4122	1.4122	–	–	47 – 53 <sup>3)</sup>	650	M	0.41	16.1	–	1	–	–
<b>Precipitation hardening</b>												
Dura 17-7PH	1.4568	631	S17700	38 – 41 <sup>4)</sup>	820	PH	0.08	17	7	–	–	Al
Dura 17-4PH	1.4542	630	S17400	24 – 40 <sup>4)</sup>	1100	PH	0.02	15.5	4.8	–	–	3.4Cu Nb

Grade family: M = martensitic, PH = precipitation hardening. <sup>1)</sup> Achievable Rockwell hardness after final heat treatment of the fabricated part. <sup>2)</sup> Tensile strength in mill condition, Outokumpu typical values. <sup>3)</sup> Hardness range according to EN 10088-2. <sup>4)</sup> Hardness range according to ASTM A564 (minimum values for different heat treatment conditions).

Steel designations				Performance		Typical chemical composition, % by mass						
Outokumpu name	EN	ASTM		Max. service temp. (°C) <sup>1)</sup>	Grade family	C	Cr	Ni	Mo	N	Others	
		Type	UNS									
Therma 253 MA	1.4835	–	S30815	1150	A	0.09	21	11	–	0.17	Si Ce	
Therma 310S/4845	1.4845	310S	S31008	1050	A	0.05	25.5	19.1	–	–	–	
<b>Resistance to sulfur containing hot gases, lower thermal expansion</b>												
Therma 4713	1.4713	–	–	800	F	0.06	6.5	–	–	–	Al Si	
Therma 4724	1.4724	–	–	850	F	0.07	12.5	–	–	–	Al Si	
<b>Resistance to carburizing and nitriding/low oxygen hot gas, higher creep strength</b>												
Therma 304H/4948	1.4948	304H	S30409	750	A	0.05	18.1	8.3	–	–	–	
Therma 321H/4878	1.4878	321H	–	850	A	0.05	17.3	9.1	–	–	Ti	
Therma 347H	–	347H	S34709	700	A	0.05	17.5	9.5	–	–	Nb	
Therma 4828	1.4828	–	–	1000	A	0.05	19.3	11.2	–	–	Si	
Therma 309S/4833	1.4833	309S	S30908	1000	A	0.06	22.3	12.3	–	–	–	
Therma 314/4841	1.4841	314	S31400	1150	A	0.06	24.3	19.2	–	–	Si	

Grade family: A = austenitic, F = ferritic. <sup>1)</sup> In dry air acc. EN 10095.

Steel designations				Performance					Typical chemical composition, % by mass						
Outokumpu name	EN	ASTM		PRE	HRB <sup>1)</sup>		CDB <sup>2)</sup>		Grade family	C	Cr	Ni	Mo	N	Others
		Type	UNS		A <sup>3)</sup>	R <sub>p0.2</sub> MPa	A <sup>3)</sup>	R <sub>p0.2</sub> MPa							
<b>Plate</b>															
Prodec 304L/4307 <sup>4)</sup>	1.4307	304L	S30403	18	45 <sup>7)</sup>	200 <sup>7)</sup>	–	–	A	0.02	18.2	8.1	–	–	–
Prodec 316L/4404 <sup>5)</sup>	1.4404	316L	S31603	25	45 <sup>7)</sup>	220	–	–	A	0.02	17.2	11.1	2.3	–	–
Prodec 316L/4432 <sup>6)</sup>	1.4432	316L	S31603	25	45 <sup>7)</sup>	220	–	–	A	0.02	16.8	10.7	2.6	–	–
<b>Bar</b>															
Prodec 304L/4307	1.4307	304L	S30403	18	45	175	25/25/30	400/380/175	A	0.02	18.1	8.1	–	–	0.03S
Prodec 316L/4404	1.4404	316L	S31603	24	40	200	25/25/30	400/380/200	A	0.02	17.2	10.1	2.1	–	0.03S
Prodec 303/4305	1.4305	303	S30300	17	35	190	15/15/20	400/400/190	A	0.05	17.2	8.1	–	–	0.3S
Prodec 17-4PH <sup>8)</sup>	1.4542	630	S17400	–	10	520	10/10/12	600/600/520	PH	0.02	15.5	4.8	–	–	3.4Cu Nb 0.03S

Grade family: A = austenitic, PH = precipitation hardening. <sup>1)</sup> HRB = Hot rolled bar. <sup>2)</sup> CDB = Cold drawn bar. Values are for diameter (d) ≤ 10 mm & 10 < d ≤ 16 mm & 16 < d ≤ 40 mm.

<sup>3)</sup> Elongation reference varies between different standards, for coil the standard typically uses A<sub>30</sub> – otherwise see footnote for specific grade. <sup>4)</sup> Also available as ASTM 304/EN 4301.

<sup>5)</sup> Also available as ASTM 316/EN 4346. <sup>6)</sup> Also available as ASTM 316/EN 4401. <sup>7)</sup> min values plate acc. To 10088-2. <sup>8)</sup> Values for condition +P800.

	EN	ASTM Finish	Description	Available steel grades <sup>1)</sup>	Available versions	Available dimensions <sup>2)</sup>
<b>Polished/brushed</b>						
Deco 4N	2K	4	Most-sold polish at Outokumpu with elegant, satin-like look.	most of Moda, Core and Supra	-	0.5–5.5 mm thick up to 1524 mm wide
Deco Microlon	2K	4	Elegant, dark grey surface finish that gives interior and exterior claddings a classy look.			
Brushed No.5	2J	6	Slightly glossy and elegant finish in between a fine polished and a fine brushed look.			
<b>Patterned</b>						
Deco Square	2M	-	Clearly structured pattern creating a technical impression. Raised and recessed sections have different reflection characteristics.	Moda 430/4016 Core 441/4509 Core 304/4301 Core 304L/4307 Supra 316/4401 Supra 316L/4404 Forta DX 2205	(standard) Star Matt Supermatt	0.3–3.5 mm thick up to 1500 mm wide
Deco Croc Skin	2M	-	Combines the advantages of a stainless steel surface with an organic-like texture.			
Deco Diamonds	2M	-	Strictly geometric pattern given added tension by its diagonal orientation.			
Deco Linen	2M	-	Pattern of closely alternating dots and dashes resembling a textile surface, remains intact even under forming.			
Deco Linen without Slubs	2M	-	Removing the distinctive linen thread makes Deco Linen less directional and increases its even and elegant look.			
Deco Vertical Linen	2M	-	The slubs of regular Deco Linen are tilted by 90° to create a smoother pattern flow and enhanced verticality.			
Deco Nine	2M	-	A coarser version of Deco Linen with more pronounced linen threads.			
Deco Microlinen	2M	-	A scaled-down version of the typical Deco Linen pattern causing a finer, denser and more delicate appearance.			
Deco Microlinen without Slubs	2M	-	The scaled-down version of Deco Linen is available without the linen thread to create a fine, dense and less directional finish.			
Deco Bark	2M	-	Creates an organic allurement by picking up the vertical groove-like structure of wood.			
Deco Rill	2M	-	The highly precise alternation between high and low running rills generates a strict linearity.			
Deco Haze	2M	-	Finish appears like sun shine through fog. Capable of withstanding heavy forming operations.			
Deco Bricks	2M	-	Scaled-down version of a brick wall, creating an industrial impression.			
Deco Austenite	2M	-	Modeled on the microstructure of an austenitic stainless steel, plays with the light to create a dazzling effect.			
Deco Laser	2M	-	Digitalized micro-patterns, randomly arranged without pattern repetition. A nearly homogenous surface is observed under all viewing angles and light conditions.			
Deco Ice Crystals	2M	-	Irregular coarse structure. Insensitive to fingerprints, scratches and other surface damages.			
Deco Leather Grain	2M	-	Irregular structure similar to a leather surface. Insensitive to fingerprints, scratches and other surface damages.			
Deco Sand Surface	2M	-	Fine irregular structure creating the impression of a sand surface.			
<b>Special surfaces</b>						
Deco 2R <sup>2</sup>	2R	BA	High-gloss surface closing the gap between standard bright annealed and mirror polished materials.	Core 304/4301, Core 304L/4307 Supra 316/4401, Supra 316L/4404	-	0.4–1.2 mm thick up to 1500 mm wide
Deco Supermatt	2E	-	Industrially shot blasted surface finish with a homogeneously matt high class appearance.	Core 304/4301, Core 304L/4307 Supra 316/4401, Supra 316L/4404	(standard) Deco Supermatt 1800d Deco Supermatt 2400d	0.5–4.5 mm thick up to 1500 mm wide
Deco Rolled-On	2F	3 / 4	A rolled-on finish with similar properties and appearance to a polished surface but with easy-to-clean properties and good corrosion resistance.	Moda 430/4016 Core 304/4301, Core 304L/4307	-	0.4–3.4 mm thick up to 1219 mm wide

<sup>1)</sup> Other grades on request. <sup>2)</sup> Full details on request.

## Outokumpu product ranges

outokumpu classic	Moda	Core	Supra
	Mildly corrosive environments	Corrosive environments	Highly corrosive environments

outokumpu pro	Forta	Ultra	Dura	Therma	Prodec	Deco
	Duplex & other high strength	Extremely corrosive environments	High hardness	High service temperatures	Improved machinability	Special surfaces

PRE = %Cr + 3.3 x %Mo + 16 x %N. Values for R<sub>30.2</sub> yield strength and the A<sub>50</sub> for elongation are according to EN 10088-2 min. values for cold rolled strip. Chemical compositions and PRE calculations are based on Outokumpu typical values.

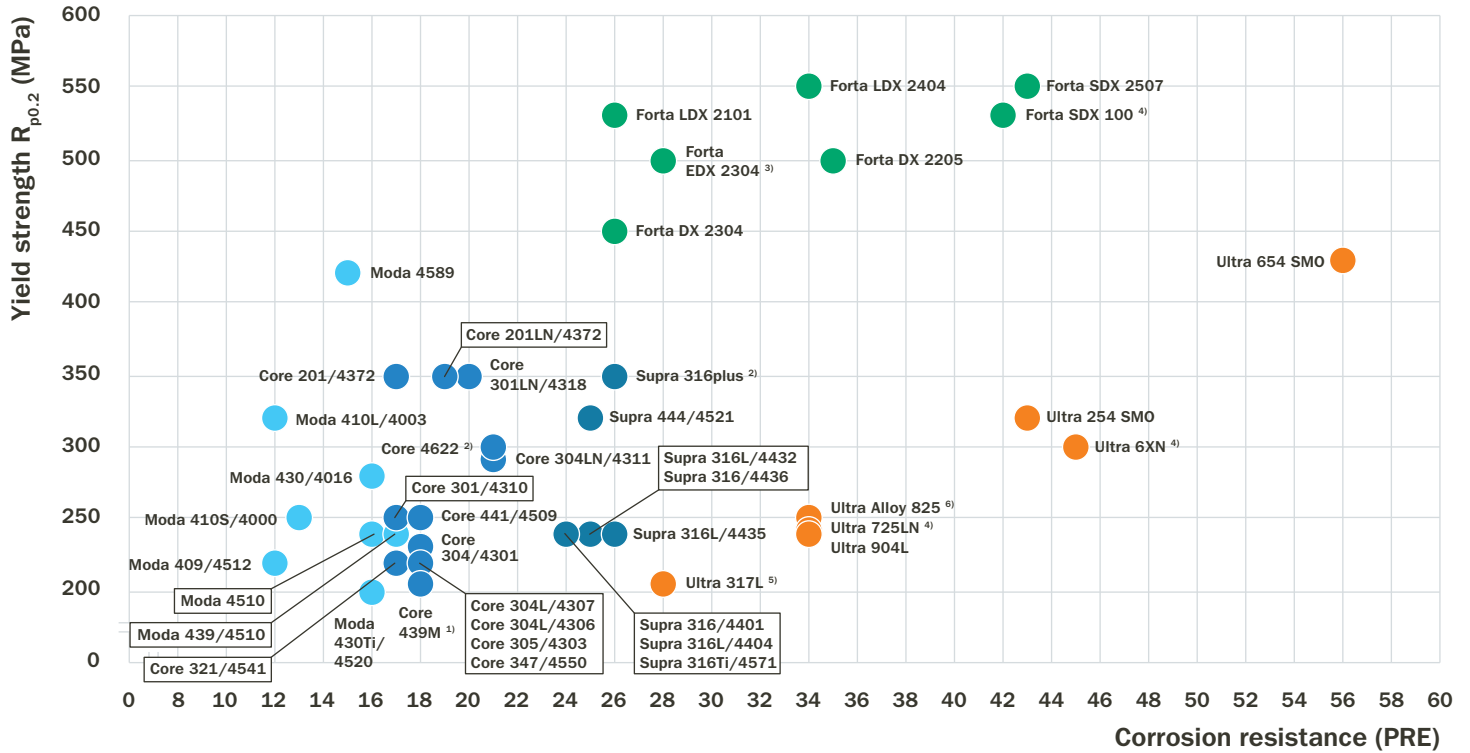
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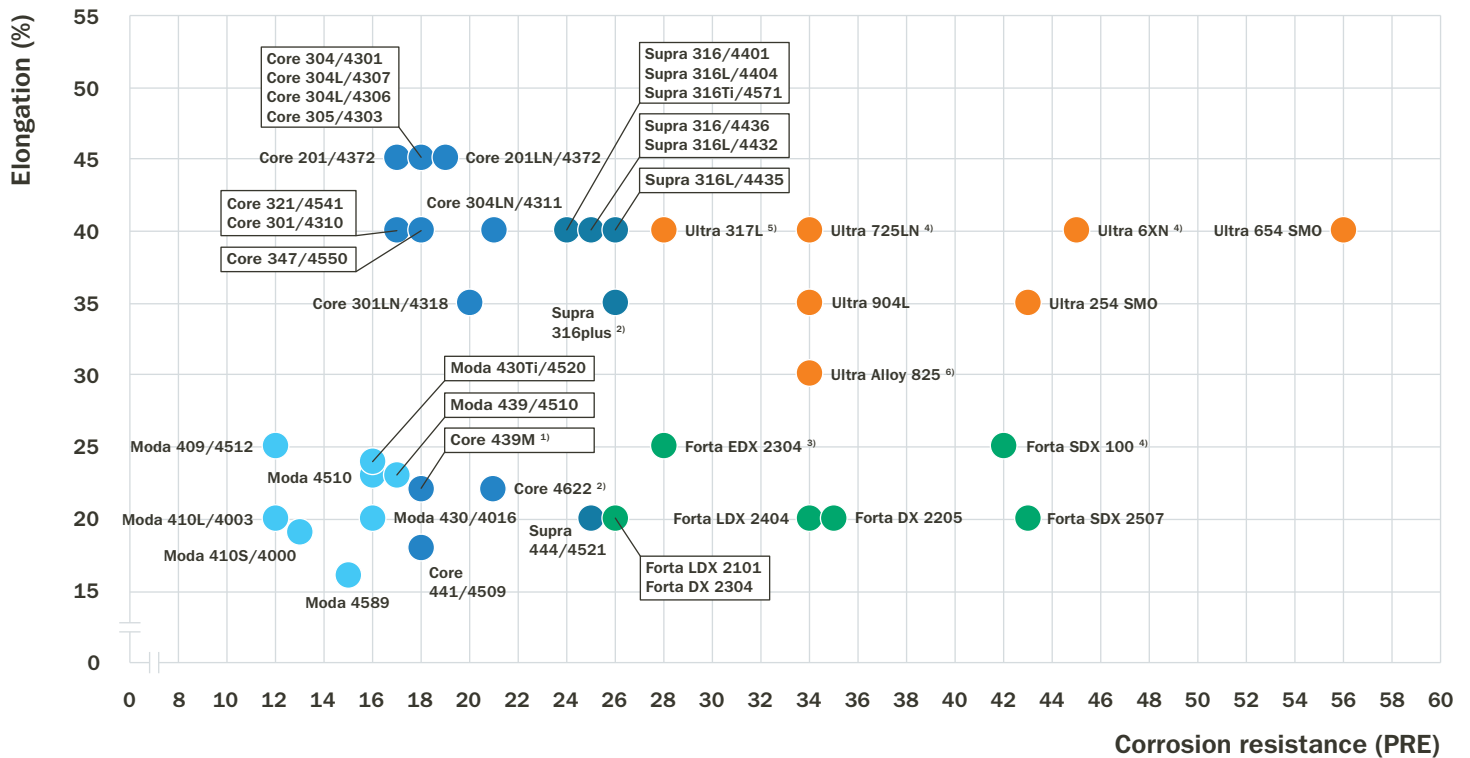
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# Performance

## Strength vs. corrosion resistance



## Elongation vs. corrosion resistance



- Moda – Steels for mildly corrosive environments (PRE ≤17)
- Core – Steels for corrosive environments (PRE 17–22)
- Supra – Steels for highly corrosive environments (PRE 22–26)
- Forta – Duplex steels (PRE 26–43)
- Ultra – Steels for extremely corrosive environments (PRE > 27)

Values for  $R_{p0.2}$  yield strength and the  $A_{80}$  for elongation are according to EN 10088-2 min. values for cold rolled strip. Chemical compositions and PRE calculations are based on Outokumpu typical values.

- <sup>1)</sup> Elongation reference varies between different standards, for coil the standard typically uses  $A_{80}$  – otherwise see footnote for specific grade.
- <sup>2)</sup> Min. values acc. to EN 10028-7.
- <sup>3)</sup> Outokumpu MDS-D35 for EDX 2304.
- <sup>4)</sup> Min. values for plate acc. to EN 10088-2.
- <sup>5)</sup> Min values acc. to ASTM A-240.
- <sup>6)</sup> Min. values hot-rolled and cold-rolled acc. to ASTM B424.

Please see values for other product forms at [steelfinder.outokumpu.com](https://steelfinder.outokumpu.com)