RANGE OF SUPPLY

Hot-rolled steel strip
Cold-rolled steel strip
Electro-galvanized steel strip
Hot-dip galvanized steel strip
Electrical steel – isovac®

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INDEX

HOT-ROLLED STEEL STRIP

Range of supply
October 2021

STRUCTURAL STEELS

Steel grade	Standards and specifications	Yield strength R_{eH} transverse min. [MPa] ≤ 16 mm	Yield strength R_{eH} transverse min. [MPa] > 16 mm	Tensile strength R_m transverse [MPa] < 3 mm	Tensile strength R_m transverse [MPa] ≥ 3 mm	Total elongation transverse min. [%] A_{80} ≤ 1.50 mm	A_{80} 1.51 - 2.00 mm	A_{80} 2.01 - 2.50 mm	A_{80} 2.51 - 2.99 mm	A_5 ≥ 3 mm	Notch impact energy KV_2 [1] Test temperature [°C]	Notch impact energy KV_2 [1] KV_2 [Joule]
Unalloyed structural steels / Edging grades												
EN 10025-2		**≤ 16 mm**	**> 16 mm**	**< 3 mm**	**≥ 3 mm**	**≤ 1.50 mm**	**1.51 - 2.00 mm**	**2.01 - 2.50 mm**	**2.51 - 2.99 mm**	**≥ 3 mm**	**Test temperature [°C]**	**KV_2 [Joule]**
S185	EN 10025-2	185	175	310 - 540	290 - 510	9	10	11	12	16	-	-
S235JR [2] [3]	EN 10025-2	235	225	360 - 510	360 - 510	16	17	18	19	24	20	27
S235J0 [2] [3]	EN 10025-2	235	225	360 - 510	360 - 510	16	17	18	19	24	0	27
S235J2 [2] [3]	EN 10025-2	235	225	360 - 510	360 - 510	16	17	18	19	24	-20	27
S275JR [2] [3]	EN 10025-2	275	265	430 - 580	410 - 560	14	15	16	17	21	20	27
S275J0 [2] [3]	EN 10025-2	275	265	430 - 580	410 - 560	14	15	16	17	21	0	27
S275J2 [2] [3]	EN 10025-2	275	265	430 - 580	410 - 560	14	15	16	17	21	-20	27
S355JR [2] [3]	EN 10025-2	355	345	510 - 680	470 - 630	13	14	15	16	20	20	27
S355J0 [2] [3]	EN 10025-2	355	345	510 - 680	470 - 630	13	14	15	16	20	0	27
S355J2 [2] [3]	EN 10025-2	355	345	510 - 680	470 - 630	13	14	15	16	20	-20	27
S355K2 [2] [3]	EN 10025-2	355	345	510 - 680	470 - 630	13	14	15	16	20	-20	40
E295	EN 10025-2	295	285	490 - 660	470 - 610	11	12	13	14	18	-	-
E335	EN 10025-2	335	325	590 - 770	570 - 710	7	8	9	10	14	-	-
E360	EN 10025-2	360	355	690 - 900	670 - 830	4	5	6	7	10	-	-
Weather-resistant structural steels												
EN 10025-5		**≤ 16 mm**	**> 16 mm**	**< 3 mm**	**≥ 3 mm**	**≤ 1.50 mm**	**1.51 - 2.00 mm**	**2.01 - 2.50 mm**	**2.51 - 2.99 mm**	**≥ 3 mm**	**Test temperature [°C]**	**KV_2 [Joule]**
S355J2W [3]	EN 10025-5	355	345	510 - 680	470 - 630	-	14	15	16	20	-20	27
S355 J0W [3]	EN 10025-5	355	345	510 - 680	470 - 630	-	14	15	16	20	0	27

[1] KV_2 minimum mean value from three samples (ISO-V, longitudinal), full samples (10 x 10 mm)
[2] Code letter “C” stands for bendability and roll-formability
[3] As-delivered condition: +N (normalized-rolled), +AR (as-rolled)

MILD STEELS

Steel grade	Standards and specifications	Thickness [mm]	Yield strength $R_{p0.2}$ transverse [MPa]	Tensile strength R_m transverse max. [MPa]	Total elongation transverse min. [%] A_{80}	Total elongation transverse min. [%] A_5	Bending test transverse Bending mandrel Angle = 180° Sheet thickness = s	Period of validity
Mild unalloyed steels for cold forming								
EN 10111		**Thickness**	**$R_{p0.2}$**	**R_m**	**A_{80}**	**A_5**	**Mandrel diameter**	**Months**
DD11	EN 10111	1.5 < 2.0 2.0 < 3.0 ≥ 3.0	170 - 360 170 - 340 170 - 340	440	23 24 -	- - 28	-	-
DD12	EN 10111	1.5 < 2.0 2.0 < 3.0 ≥ 3.0	170 - 340 170 - 320 170 - 320	420	25 26 -	- - 30	-	6 months
DD13	EN 10111	1.5 < 2.0 2.0 < 3.0 ≥ 3.0	170 - 330 170 - 310 170 - 310	400	28 29 -	- - 33	-	6 months
DD14	EN 10111	1.5 < 2.0 2.0 < 3.0 ≥ 3.0	170 - 310 170 - 290 170 - 290	380	31 32 -	- - 36	-	6 months
Unalloyed special steels for cold forming								
Special voestalpine grade		**Thickness**	**$R_{p0.2}$**	**R_m**	**A_{80}**	**A_5**	**Mandrel diameter**	**Months**
DD11mod.H	voestalpine	< 3.0 ≥ 3.0	250 - 340 235 - 325	360 - 420 350 - 410	28 -	- 32	0 s	-
DD12mod.H	voestalpine	< 3.0 ≥ 3.0	250 - 340 235 - 325	360 - 420 350 - 410	30 -	- 34	0 s	-
DD13mod.H	voestalpine	< 3.0 ≥ 3.0	240 - 320 230 - 310	350 - 420 350 - 410	32 -	- 36	0 s	-
S235JRmod.H	voestalpine	< 3.0 ≥ 3.0	275 - 365 260 - 350	400 - 460 390 - 450	25 -	- 28	0 s	-

CARBON STEELS

Steel grade	Standards and specifications	As-rolled condition (standard value) Yield strength $R_{p0.2}$ [MPa]	As-rolled condition (standard value) Tensile strength R_m [MPa]	Soft-annealed (max. value/standard value) Tensile strength R_m [MPa]	Chemical composition Ladle analysis in weight percent									
Case-hardening steels														
EN ISO 683-3 [1]		$R_{p0.2}$	R_m	R_m	C	Si max.	Mn	P max.	S max.	Cr	Ni max.	Mo max.	Cu max.	other
C10E	EN ISO 683-3	300	400	380	0.07 - 0.13	0.40	0.30 - 0.60	0.025	0.035	0.40	0.40	0.10	0.30	-
C15E	EN ISO 683-3	330	470	450	0.12 - 0.18	0.40	0.30 - 0.60	0.025	0.035	0.40	0.40	0.10	0.30	-
16MnCr5	EN ISO 683-3	400	600	480	0.14 - 0.19	0.40	1.00 - 1.30	0.025	0.035	0.80 - 1.10	-	-	0.40	-
Unalloyed heat-treatable steels														
EN ISO 683-1 and EN 10132-4 [1]		$R_{p0.2}$	R_m	R_m	C	Si	Mn	P max.	S max.	Cr. max.	Ni max.	Mo max.	Cu max.	other
C35E	EN ISO 683-1	450	680	500	0.32 - 0.39	0.40	0.50 - 0.80	0.025	0.035	0.40	0.40	0.10	0.30	-
C45E	EN ISO 683-1	460	750	600	0.42 - 0.50	0.40	0.50 - 0.80	0.025	0.035	0.40	0.40	0.10	0.30	-
C50E	EN ISO 683-1	490	830	600	0.47 - 0.55	0.40	0.60 - 0.90	0.025	0.035	0.40	0.40	0.10	0.30	-
C55E	EN ISO 683-1	500	840	600	0.52 - 0.60	0.40	0.60 - 0.90	0.025	0.035	0.40	0.40	0.10	0.30	-
C60E	EN ISO 683-1	520	860	650	0.57 - 0.65	0.40	0.60 - 0.90	0.025	0.035	0.40	0.40	0.10	0.30	-
C67S [2]	EN 10132-4	550	950	660	0.65 - 0.73	0.15 - 0.35	0.60 - 0.90	0.025	0.025	0.40	0.40	0.10	-	-
C75S [2]	EN 10132-4	550	950	680	0.70 - 0.80	0.15 - 0.35	0.60 - 0.90	0.025	0.025	0.40	0.40	0.10	-	-
Alloyed heat-treatable steels														
EN ISO 683-2 [1]		$R_{p0.2}$	R_m	R_m	C	Si max.	Mn	P max.	S max.	Cr	Ni max.	Mo	Cu max.	other
25CrMo4	EN ISO 683-2	650	850	550	0.22 - 0.29	0.40	0.60 - 0.90	0.025	0.035	0.90 - 1.20	-	0.15 - 0.30	0.40	-
34CrMo4	EN ISO 683-2	770	970	650	0.30 - 0.37	0.40	0.60 - 0.90	0.025	0.035	0.90 - 1.20	-	0.15 - 0.30	0.40	-
42CrMo4	EN ISO 683-2	790	990	660	0.38 - 0.45	0.40	0.60 - 0.90	0.025	0.035	0.90 - 1.20	-	0.15 - 0.30	0.40	-
51CrV4	EN ISO 683-2	850	1050	680	0.47 - 0.55	0.40	0.60 - 1.00	0.025	0.025	0.80 - 1.10	-	-	0.40	V=0.10 - 0.25
20MnB5	EN ISO 683-2	530	680	570	0.17 - 0.23	0.40	0.10 - 1.40	0.025	0.035	-	-	-	0.40	B=0.0008 - 0.0050
27MnCrB5-2	EN ISO 683-2	490	670	520	0.24 - 0.30	0.40	0.10 - 1.40	0.025	0.035	0.30 - 0.60	-	-	0.40	B=0.0008 - 0.0050
Spring steels														
EN 10089 [1]		$R_{p0.2}$	R_m	R_m	C	Si max.	Mn	P max.	S max.	Cr	Ni max.	Mo max.	V	
51CrV4	EN 10089	850	1050	680	0.47 - 0.55	0.40	0.70 - 1.10	0.025	0.025	0.90 - 1.20	-	-	0.10 - 0.25	

[1] Please inquire about any deviations from the indicated melt analyses or narrower limit values.
[2] Steel grade according to EN10132-4 (standard for cold-rolled strip)

CARBON STEELS

Steel grade	Standards and specifications	As-rolled condition (standard value) Yield strength $R_{p0.2}$ [MPa]	As-rolled condition (standard value) Tensile strength R_m [MPa]	Soft-annealed (max. value/standard value) Tensile strength R_m [MPa]	Chemical composition Ladle analysis in weight percent									
Alloyed heat-treatable steels and special steels														
EN 10132-4 (chemistry) and voestalpine special grade [1]		$R_{p0.2}$	R_m	R_m	C	Si	Mn	P max.	S max.	Cr	Ni	Mo	Cu max.	other
D6A	voestalpine	980	1250	650	0.42 - 0.49	0.15 - 0.35	0.70 - 1.00	0.025	0.01	0.80 - 1.20	0.40 - 0.70	0.80 - 1.20	0.25	V=0.10 - 0.15
58CrV4	voestalpine	870	1070	680	0.54 - 0.62	0.15 - 0.35	0.70 - 1.10	0.025	0.01	0.90 - 1.20	max. 0.25	max. 0.06	0.25	V=0.10 - 0.25
63NiNb4	voestalpine	700	1000	680	0.60 - 0.66	0.15 - 0.35	0.30 - 0.60	0.025	0.01	max. 0.15	0.85 - 1.10	max. 0.15	0.25	Nb=0.03-0.05
68NiCrMo3	voestalpine	700	1000	680	0.65 - 0.71	0.15 - 0.35	0.30 - 0.60	0.025	0.01	0.40 - 0.60	0.50 - 0.80	0.15 - 0.25	0.25	-
72NiCrMo4-2	voestalpine	700	1000	680	0.69 - 0.75	0.15 - 0.35	0.40 - 0.70	0.025	0.01	0.30 - 0.60	0.70 - 1.00	0.05 - 0.10	0.25	-
75Cr1	voestalpine	700	1000	680	0.70 - 0.80	0.25 - 0.50	0.60 - 0.80	0.025	0.01	0.30 - 0.40	max. 0.25	max. 0.06	0.25	-
75CrNiMo	voestalpine	840	1140	680	0.70 - 0.80	0.15 - 0.35	0.60 - 0.90	0.025	0.01	0.50 - 0.70	0.30 - 0.60	0.05 - 0.15	0.25	-
75Ni8 [2]	EN 10132-4	740	1100	680	0.72 - 0.78	0.15 - 0.35	0.30 - 0.50	0.025	0.01	max. 0.15	1.80 - 2.10	max. 0.06	0.25	-
80CrV2 [2]	EN 10132-4	990	1300	720	0.78 - 0.85	0.15 - 0.35	0.40 - 0.70	0.025	0.01	0.40 - 0.60	max. 0.25	max. 0.06	0.25	V=0.15 - 0.25
C100S [2]	EN 10132-4	700	1200	720	0.95 - 1.05	0.15 - 0.35	0.30 - 0.60	0.025	0.01	max. 0.40	max. 0.25	max. 0.06	0.25	-

[1] Please inquire about any deviations from the indicated melt analyses or narrower limit values.
[2] Steel grade according to EN10132-4 (standard for cold-rolled strip)

CARBON STEELS

Steel grade	Standards and specifications	As-rolled condition (standard value) Yield strength $R_{p0.2}$ [MPa]	As-rolled condition (standard value) Tensile strength R_m [MPa]	Soft-annealed (max. value/standard value) Tensile strength R_m [MPa]	Chemical composition Ladle analysis in weight percent								
Boron-containing heat-treatable steels													
EN ISO 683-2 and voestalpine special grade		$R_{p0.2}$	R_m	R_m	C	Si max.	Mn	P max.	S max.	Cr	Ni max.	V	Cu max.	other
durostat B2	voestalpine	< 550	< 700	-	0.24 - 0.30	0.40	1.10 - 1.40	0.020	0.010	0.30 - 0.50	0.25	-	0.25	B=0.0008 - 0.0050
durostat B4	voestalpine	< 600	< 800	-	0.38 - 0.42	0.40	1.10 - 1.40	0.025	0.025	0.30 - 0.50	0.25	-	0.25	B=0.0008 - 0.0050
20MnB5	EN ISO 683-2	500	650	550	0.18 - 0.23	0.40	1.10 - 1.40	0.020	0.010	0.10 - 0.40	0.25	-	0.25	B=0.0008 - 0.0050
20MnB9	voestalpine	600	750	580	0.18 - 0.23	0.40	2.00 - 2.30	0.020	0.010	0.10 - 0.40	0.25	-	0.25	B=0.0008 - 0.0050
26MnB5	voestalpine	500	700	540	0.24 - 0.28	0.40	1.10 -1.40	0.020	0.010	0.10 - 0.40	0.25	-	0.25	B=0.0008 - 0.0050
26MnB5+V	voestalpine	600	750	590	0.24 - 0.28	0.40	1.10 - 1.40	0.020	0.010	0.10 - 0.40	0.25	0.05 - 0.10	0.25	B=0.0008 - 0.0050
27MnCrB5-2	EN ISO 683-2	500	700	540	0.24 - 0.30	0.40	1.10 - 1.40	0.020	0.010	0.30 - 0.60	0.25	-	0.25	B=0.0008 - 0.0050
34MnB5	voestalpine	500	700	580	0.32 - 0.37	0.40	1.10 - 1.40	0.020	0.010	0.10 - 0.40	0.25	-	0.25	B=0.0008 - 0.0050
40MnB5	voestalpine	500	700	620	0.38 - 0.42	0.40	1.10 - 1.40	0.020	0.010	0.30 - 0.60	0.25	-	0.25	B=0.0008 - 0.0050

Steel grade	Standards and specifications	Standard values Hardness [1] [HB]	Standard values Yield strength $R_{p0.2}$ [MPa]	Standard values Tensile strength R_m [MPa]	Standard values Fracture elongation A_5 [%]	Edging radii Ri min. at 90° edging (Sheet thickness = s) Location of bending edge in direction of rolling Long.	Edging radii Ri min. at 90° edging (Sheet thickness = s) Location of bending edge in direction of rolling Trans.	Chemical composition Ladle analysis in weight percent											
Wear-resistant steel grades																			
Special voestalpine grade		HB	$R_{p0.2}$	R_m	A_5	Long.	Trans.	C max.	Si max.	Mn max.	P max.	S max.	Al min.	Cr max.	Mo max.	Ti max.	B max.	CEV max.	CET max.
durostat 400	voestalpine	360 - 440	1100	1250	10	4 s	3 s	0.15	0.60	2.30	0.025	0.010	0.020	0.50	0.20	0.050	0.005	0.59	0.38
durostat 450	voestalpine	410 - 490	1200	1400	9	4 s	3 s	0.20	0.60	2.30	0.025	0.010	0.020	0.50	0.20	0.050	0.005	0.62	0.42
durostat 500	voestalpine	460 - 540	1300	1550	8	5 s	4 s	0.24	0.60	2.30	0.025	0.010	0.020	0.50	0.20	0.050	0.005	0.66	0.46

CEV = C + Mn/6 + (Cr+Mo+V)/5 + (Ni+Cu)/15
CET = C + (Mn+Mo)/10 + (Cr+Cu)/20 +Ni/40

[1] Hardness measurements are conducted pursuant to EN ISO 6506. Test condition HBW2.5 | 187.5 is applied to plate thicknesses ≤ 3 mm

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MICRO-ALLOYED STRUCTURAL STEELS

Steel grade	Standards and specifications	Test direction	Yield strength R_{eH} [MPa]	Tensile strength R_m [MPa]	Total elongation min. [%]		Notch impact energy KV_2 [1] [Joule]		Edging radii Ri min. at 90° edging Sheet thickness = s		
					A_{80}	A_5	Test temperature -20 °C	Test temperature -40 °C	< 3 mm	3 - 6 mm	> 6 mm
Normalized rolled steels [2]											
Special voestalpine grade			R_{eH}	R_m	A_{80}	A_5	-20 °C / N	-40 °C / NE	< 3 mm	3 - 6 mm	> 6 mm
alform 180 N	voestalpine	Transverse	180 - 290	280 - 360	28	34	-	-	0.25 s	0.5 s	1 s
alform 200 N	voestalpine	Transverse	200 - 320	320 - 400	26	32	-	-	0.25 s	0.5 s	1 s
alform 240 N	voestalpine	Transverse	240 - 360	360 - 470	23	28	27	-	0.25 s	0.5 s	1 s
alform 280 N	voestalpine	Transverse	280 - 420	430 - 530	21	26	40	-	0.25 s	0.5 s	1 s
alform 340 N/NE	voestalpine	Transverse	340 - 485	460 - 470	20	25	40	27	0.25 s	0.5 s	1 s
alform 355 N/NE	voestalpine	Transverse	355 - 500	470 - 580	20	25	40	27	0.25 s	0.5 s	1 s
alform 380 N/NE	voestalpine	Transverse	380 - 520	510 - 610	19	24	40	27	0.25 s	0.5 s	1 s
Thermomechanically rolled steels [3]											
Special voestalpine grade			R_{eH}	R_m	A_{80}	A_5	-20 °C / M	-40 °C / ME	< 3 mm	3 - 6 mm	> 6 mm
alform 280 M	voestalpine	Longitudinal	280 - 400	370 - 470	24	28	40	-	0.25 s	0.5 s	0.8 s
alform 315 M	voestalpine	Longitudinal	315 - 440	390 - 490	22	26	40	-	0.25 s	0.5 s	0.8 s
alform 340 M	voestalpine	Longitudinal	340 - 470	420 - 520	20	24	40	-	0.25 s	0.5 s	0.8 s
alform 355 M/ME	voestalpine	Longitudinal	355 - 480	430 - 530	20	24	40	27	0.25 s	0.5 s	0.8 s
alform 380 M/ME	voestalpine	Longitudinal	380 - 510	450 - 550	20	24	40	27	0.25 s	0.5 s	0.8 s
alform 420 M/ME	voestalpine	Longitudinal	420 - 550	480 - 580	18	22	40	27	0.5 s	1.0 s	1.0 s
alform 460 M/ME	voestalpine	Longitudinal	460 - 590	520 - 640	16	19	40	27	0.5 s	1.0 s	1.4 s
alform 500 M/ME	voestalpine	Longitudinal	500 - 650	550 - 680	15	18	40	27	0.8 s	1.2 s	1.6 s
alform 550 M/ME	voestalpine	Longitudinal	≥ 550	600 - 740	14	17	40	27	0.8 s	1.2 s	1.6 s
alform 600 M/ME	voestalpine	Longitudinal	≥ 600	650 - 800	13	16	40	27	0.8 s	1.2 s	1.6 s
alform 650 M/ME	voestalpine	Longitudinal	≥ 650	700 - 850	12	15	40	27	0.8 s	1.2 s	1.6 s
alform 700 M/ME	voestalpine	Longitudinal	≥ 700	750 - 930	11	14	40	27	0.8 s	1.2 s	1.6 s

[1] KV_2 minimum mean value from three samples (ISO-V, longitudinal), full samples (10 x 10 mm)
[2] These steel grades comply with all requirements of comparable steels pursuant to EN 10025-2.
[3] These steel grades comply with all requirements of comparable steels pursuant to EN 10149-2.

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MICRO-ALLOYED STRUCTURAL STEELS

Steel grade	Standards and specifications	Yield strength R_{eH} [MPa]	Tensile strength R_m [MPa]	Total elongation min. [%]		Notch impact energy KV_2 [1] [Joule]		Edging radii [2] Ri min. at 90° edging Sheet thickness = s			Mandrel diameter BgD min. (transverse test specimens) Sheet thickness = s
				A_{80}	A_5	MU Test temperature -20 °C	MU Test temperature -40 °C	< 3 mm	3 - 6 mm	> 6 mm	
Thermomechanically rolled steels with improved formability											
Special voestalpine grade		**R_{eH}**	**R_m**	**A_{80}**	**A_5**	**-20 °C**	**-40 °C**	**< 3 mm**	**3 - 6 mm**	**> 6 mm**	**Mandrel diameter**
alform 355 MU	voestalpine	355 - 480	430 - 530	20	24	40	27	0.25 s	0.5 s	0.8 s	0 s
alform 380 MU	voestalpine	380 - 510	450 - 550	20	24	40	27	0.25 s	0.5 s	0.8 s	0.5 s
alform 420 MU	voestalpine	420 - 550	480 - 580	18	22	40	27	0.5 s	1.0 s	1.0 s	0.5 s
alform 460 MU [3]	voestalpine	460 - 590	520 - 640	16	19	40	27	0.5 s	1.0 s	1.4 s	1.0 s
alform 500 MU	voestalpine	500 - 650	550 - 680	15	18	40	27	0.8 s	1.2 s	1.6 s	1.0 s
alform 550 MU [3]	voestalpine	≥ 550	600 - 740	14	17	40	27	0.8 s	1.2 s	1.6 s	1.5 s

[1] KV_2 minimum mean value from three samples (ISO-V, longitudinal), full samples (10 x 10 mm)
[2] Smallest permissible inside radius at 90° edging, Ri min.
[3] Upon request

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HOT-ROLLED STEEL STRIP FOR THE AUTOMOTIVE INDUSTRY

Steel grade	Standards and specifications	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elongation min. [%]		n value min. $n_{10\text{ - }20/Ag}$	BH_2 value min. [MPa]
				A_{80}	A_5		
Hot-rolled steel strip for the automotive industry							
VDA239-100 and voestalpine special grade		$R_{p0.2}$	R_m	A_{80}	A_5	$n_{10\text{ - }20/Ag}$	BH_2
HR0	VDA239-100	240 - 350	310 - 460	22	28	0.12	-
HR2	VDA239-100	180 - 290	270 - 400	30	34	0.16	-
HR300LA / LAS	VDA239-100	300 - 380	380 - 500	24	28	0.14	-
HR340LA / LAS	VDA239-100	340 - 440	420 - 540	22	26	0.13	-
HR380LA / LAS	VDA239-100	380 - 480	450 - 570	20	24	-	-
HR420LA / LAS	VDA239-100	420 - 520	480 - 600	18	22	-	-
HR460LA / LAS	VDA239-100	460 - 560	520 - 640	16	20	-	-
HR500LA / LAS	VDA239-100	500 - 620	560 - 700	14	17	-	-
HR550LA / LAS	VDA239-100	550 - 670	610 - 750	12	16	-	-
HR700LA / LAS	VDA239-100	700 - 850	750 - 950	10	13	-	-
HR440Y580T-FB	VDA239-100	440 - 600	580 - 700	15	17	-	30
HR660Y760T-CP	VDA239-100	660 - 820	760 - 960	10	13	-	30
HR900Y1180T-MS	VDA239-100	900 - 1150	1180 - 1400	8	5	-	30
DP600LCT	voestalpine	> 300	580 - 670	18	22	0.13	30

Premium quality with reduced carbon footprint

hot-rolled drive

greentec steel

POLE SHEETS

Steel grade	Standards and specifications	Test direction	Yield strength $R_{p0.2}$ min. [MPa]	Tensile strength R_m min. [MPa]	Total elongation min. [%]		Magnetic polarization [Tesla] Minimum value at field intensity	
					A_{80}	A_5	5000 [A/m]	15000 [A/m]
Pole sheets								
EN 10265:1995			$R_{p0.2}$	R_m	A_{80}	A_5	5000 [A/m]	15000 [A/m]
250-TG-180	EN 10265:1995	Transverse	250	350	22	26	1.60	1.80
300-TG-180	EN 10265:1995	Transverse	300	400	20	24	1.60	1.80
350-TG-179	EN 10265:1995	Transverse	350	450	18	22	1.55	1.79
400-TG-179	EN 10265:1995	Transverse	400	500	16	19	1.55	1.79
450-TG-179	EN 10265:1995	Transverse	450	550	14	17	1.54	1.79
500-TG-179	EN 10265:1995	Transverse	500	600	12	14	1.53	1.79
550-TG-178	EN 10265:1995	Transverse	550	650	12	14	1.52	1.78
600-TG-178	EN 10265:1995	Transverse	600	700	10	12	1.50	1.78
650-TG-178	EN 10265:1995	Transverse	650	750	10	12	1.48	1.78
700-TG-178	EN 10265:1995	Transverse	700	800	10	12	1.46	1.78
Ultra-high-strength pole sheets								
Special voestalpine grade			$R_{p0.2}$	R_m	A_{80}	A_5	5000 [A/m]	15000 [A/m]
750-VA-175	voestalpine	Long. + Trans.	750	800	10	12	1.46	1.75
900-VA-175	voestalpine	Long. + Trans.	900	940	-	10	1.46	1.75

ENAMELING STEELS

Steel grade	Standards and specifications	Standard data in as-delivered condition				Minimum values according to simulation annealing at 830 °C			
		Yield strength $R_{p0.2}$ min. [MPa]	Tensile strength R_m [MPa]	Total elongation min. [%]		Yield strength $R_{p0.2}$ min. [MPa]	Tensile strength R_m [MPa]	Total elongation min. [%]	
				A_{80}	A_5			A_{80}	A_5
Enameling steels									
Special voestalpine grade		$R_{p0.2}$	R_m	A_{80}	A_5	$R_{p0.2}$	R_m	A_{80}	A_5
DD11CCE	voestalpine	200 - 300	300 - 400	25	30	170	250	25	30
DD15CCE	voestalpine	140 - 240	260 - 360	28	33	100	250	28	33
S240CCE	voestalpine	240 - 360	360 - 450	22	27	240	360	22	27
S355CCE	voestalpine	600 - 770	650 - 800	-	14	355	500	-	16
S380CCE	voestalpine	620 - 790	670 - 820	-	12	380	550	-	15

SURFACES AND SERVICES

Surface					
Produktvariante	Unoiled	Slightly oiled	Oiled	Oiled edges	Heavily oiled
Pickled (+ skin-passed)	✓	✓	✓	✓	✓
Unpickled	Unpickled material is only supplied in unoiled condition				

» Types of oil: Corrosion protection oil, rolling oil

Selected services			
Special coil labeling	Customer-specific special steels	Narrowest thickness tolerances	Test certificate pursuant to EN 10204

System solutions: alform® welding system

alform® welding system is the world's first custom-matched system of steels and consumables and allows optimized utilization of material potential.

Carbon footprint greentec steel product

greentec steel product	Maximum carbon footprint [kg CO_2e/kg steel] [1]
Hot-rolled steel strip	2.1

[1] The carbon footprint is calculated pursuant to worldsteel CML 2001-2016 (system expansion) on a cradle-to-gate basis.

All products, dimensions and steel grades listed in each voestalpine supply range are available as greentec steel.

DIMENSIONS

Available dimensions: wide strip (coil)			
Thickness [mm]	Width max. [mm]	Outside diameter max. [mm]	Inside diameter [mm]
1.50 - 20.00	900 - 1750	2200	500, 600, 720 - 780

» Non-slit in coils, with mill edge or cut edge

Available dimensions: slit (slit strip)			
Thickness [mm]	Strip width [mm]	Outside diameter [mm]	Inside diameter [mm]
1.50 - 12.00	50 - 1650	900 - 2020	500 [1] / 600 / 760

» Longitudinally slit in coils with cut edge

[1] Only up to 7 mm in thickness

Available dimensions: cut-to-length (sheet)			
Thickness [mm]	Width [mm]	Length [mm]	Package weight max. [t]
2.0 - 20.00	900 - 1750	1250 - 18000	10

» Cut-to-length sheet with mill edge or cut edge

Indicated references are standard values. The available combinations of widths and thicknesses and supply forms vary depending on the steel grade. Limitations are possible depending on thickness. Cut-to-length sheets in < 3.0 mm thickness and slit strip in < 4.5 mm thickness can be preprocessed upon request in the slitting and cut-to-length lines for cold-rolled materials.

All listed dimensions and grades are available as greentec steel.

This document provides an overview of the hot-rolled steel strip products supplied by the voestalpine Steel Division. Other grades are available upon request. Please find further information and downloads under the following link:
www.voestalpine.com/Produktinformationsportal

COLD-ROLLED STEEL STRIP

Range of supply
October 2021

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Mild steels									
EN 10130			R_e	R_m	A_{80}	r_{90}	n_{90}	BH_2	E
DC01	EN 10130	Trans.	140 - 280	270 - 410	28	-	-	-	√
DC03	EN 10130	Trans.	140 - 240	270 - 370	34	1.3	-	-	√
DC04	EN 10130	Trans.	140 - 210	270 - 350	38	1.6	0.18	-	√
DC05	EN 10130	Trans.	140 - 180	270 - 330	40	1.9	0.20	-	√
DC06	EN 10130	Trans.	120 - 170	270 - 330	41	2.1	0.22	-	√
DC07	EN 10130	Trans.	100 - 150	250 - 310	44	2.5	0.23	-	√
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
CR1	VDA 239-100	Trans.	140 - 300	270 - 410	28	-	-	-	√
CR2	VDA 239-100	Trans.	140 - 240	270 - 370	34	1.3	0.16	-	√
CR3	VDA 239-100	Trans.	140 - 210	270 - 350	38	1.8	0.18	-	√
CR4	VDA 239-100	Trans.	140 - 180	270 - 330	39	1.9	0.20	-	√
CR5	VDA 239-100	Trans.	110 - 170	260 - 330	41	2.1	0.22	-	√
CR6	voestalpine	Trans.	110 - 170	250 - 330	43	2.3	0.23	-	√
Structural steels									
DIN 1623			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
S215G	DIN 1623	Trans.	≥ 215	360 - 510	20	-	-	-	-
Enameling steels									
EN 10209 and voestalpine special grade			R_e	R_m	A_{80}	r	$n_{10-20/Ag}$	BH_2	E
DC01EK	EN 10209	Trans.	140 - 270	270 - 390	30	-	-	-	-
DC04EK	EN 10209	Trans.	140 - 220	270 - 350	36	-	-	-	-
DC05EK	EN 10209	Trans.	140 - 220	270 - 350	36	1.5	-	-	-
DC06EK	EN 10209	Trans.	120 - 190	270 - 350	38	1.6	-	-	-
DC03ED TiVac	voestalpine	Trans.	140 - 220	270 - 370	34	1.4	-	-	-
DC04ED TiVac	voestalpine	Trans.	140 - 200	270 - 350	38	-	-	-	-

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Micro-alloyed steels									
EN 10268 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	n_{90}	BH_2	E
HC260LA	EN 10268	Trans.	260 - 330	350 - 430	26	-	-	-	-
HC300LA	EN 10268	Trans.	300 - 380	380 - 480	23	-	-	-	-
HC340LA	EN 10268	Trans.	340 - 420	410 - 510	21	-	-	-	-
HC380LA	EN 10268	Trans.	380 - 480	440 - 580	19	-	-	-	-
HC420LA	EN 10268	Trans.	420 - 520	470 - 600	17	-	-	-	-
HC460LA	EN 10268	Trans.	460 - 580	510 - 660	13	-	-	-	-
HC500LA	EN 10268	Trans.	500 - 620	550 - 710	12	-	-	-	-
HX550LAD	voestalpine	Trans.	≥ 550	≥ 590	10	-	-	-	-
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
CR210LA	VDA 239-100	Long.	210 - 300	310 - 410	29	1.0	0.15	-	-
CR240LA	VDA 239-100	Long.	240 - 320	320 - 430	27	-	0.15	-	-
CR270LA	VDA 239-100	Long.	270 - 350	350 - 460	25	-	0.14	-	-
CR300LA	VDA 239-100	Long.	300 - 380	380 - 490	23	-	0.14	-	-
CR340LA	VDA 239-100	Long.	340 - 430	410 - 530	21	-	0.12	-	-
CR380LA	VDA 239-100	Long.	380 - 470	450 - 570	19	-	0.12	-	-
CR420LA	VDA 239-100	Long.	420 - 520	480 - 600	17	-	0.11	-	-
CR460LA	VDA 239-100	Long.	460 - 580	520 - 680	15	-	0.10	-	-
CR500LA	voestalpine	Long.	500 - 620	560 - 720	14	-	0.09	-	-

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Bake-hardening steels									
EN 10268			$R_{p0.2}$	R_m	A_{80}	r_{90}	n_{90}	BH_2	E
HC180B	EN 10268	Trans.	180 - 230	290 - 360	34	1.6	0.17	35	√
HC220B	EN 10268	Trans.	220 - 270	320 - 400	32	1.5	0.16	35	√
HC260B	EN 10268	Trans.	260 - 320	360 - 440	29	-	-	35	√
HC300B	EN 10268	Trans.	300 - 360	390 - 480	26	-	-	35	-
VDA 239-100			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10\text{-}20/Ag}$	BH_2	E
CR180BH	VDA 239-100	Long.	180 - 240	290 - 370	34	1.1	0.17	20/30	√
CR210BH	VDA 239-100	Long.	210 - 270	320 - 400	32	1.1	0.16	20/30	√
CR240BH	VDA 239-100	Long.	240 - 300	340 - 440	29	1.0	0.15	20/30	√
CR270BH	VDA 239-100	Long.	270 - 330	360 - 460	27	-	0.13	20/30	-
High-strength LC steels									
Special voestalpine grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10\text{-}20/Ag}$	BH_2	E
HC180LC	voestalpine	Trans.	180 - 270	300 - 390	32	-	-	-	√
HC200LC	voestalpine	Trans.	200 - 290	310 - 400	31	-	-	-	√
HC220LC	voestalpine	Trans.	220 - 310	320 - 410	30	-	-	-	√

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
High-strength IF steels									
EN 10268			$R_{p0.2}$	R_m	A_{80}	r_{90}	n_{90}	BH_2	E
HC180Y	EN 10268	Trans.	180 - 230	330 - 400	35	1.7	0.19	-	√
HC220Y	EN 10268	Trans.	220 - 270	340 - 420	33	1.6	0.18	-	√
HC260Y	EN 10268	Trans.	260 - 320	380 - 440	31	1.4	0.17	-	√
VDA 239-100			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10\text{-}20/Ag}$	BH_2	E
CR180IF	VDA 239-100	Long.	180 - 240	320 - 400	35	1.2	0.19	-	√
CR210IF	VDA 239-100	Long.	210 - 270	340 - 420	33	1.1	0.18	-	√
CR240IF	VDA 239-100	Long.	240 - 300	360 - 440	31	1.0	0.17	-	√
Carbon-manganese steels									
Special voestalpine grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10\text{-}20/Ag}$	BH_2	E
HT440CM	voestalpine	Trans.	280 - 380	≥ 440	25	-	-	-	-
HT590CM	voestalpine	Trans.	420 - 570	≥ 590	14	-	-	-	-

Steel grade	Norms and specifica-tions	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Dual-phase steels									
EN 10338			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10\text{-}UE}$	BH_2	E
HCT450X	EN 10338	Long.	260 - 340	≥ 450	27	-	0.16	30	√
HCT490X	EN 10338	Long.	290 - 380	≥ 490	24	-	0.15	30	√
HCT590X	EN 10338	Long.	330 - 430	≥ 590	20	-	0.14	30	√
HCT780X	EN 10338	Long.	440 - 550	≥ 780	14	-	-	30	-
HCT980X	EN 10338	Long.	590 - 740	≥ 980	10	-	-	30	-
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10\text{-}20/Ag}$	BH_2	E
CR260Y450T-DP	voestalpine	Long.	260 - 340	450 - 560	27	-	0.16	30	√
CR290Y490T-DP	VDA 239-100	Long.	290 - 380	490 - 600	24	-	0.15	30	√
CR330Y590T-DP	VDA 239-100	Long.	330 - 430	590 - 700	20	-	0.14	30	√
CR360Y590T-DP	voestalpine	Long.	360 - 460	590 - 700	19	-	0.14	30	√
CR440Y780T-DP	VDA 239-100	Long.	440 - 550	780 - 900	14	-	0.11	30	-
CR500Y780T-DP	voestalpine	Long.	500 - 620	780 - 900	13	-	-	30	-
CR550Y980T-DP	voestalpine	Long.	550 - 730	980 - 1130	10	-	-	30	-
CR590Y980T-DP	VDA 239-100	Long.	590 - 740	980 - 1130	10	-	-	30	-
CR660Y980T-DP	voestalpine	Trans.	660 - 810	980 - 1130	10	-	-	30	-
CR700Y980T-DP	VDA 239-100	Long.	700 - 850	980 - 1130	8	-	-	30	-
Dual-phase high-ductility steels (cold rolled dual-phase steels with improved formability)									
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10\text{-}20/Ag}$	BH_2	E
CR330Y590T-DH	voestalpine	Long.	330 - 430	590 - 700	26	-	0.16	30	-
CR440Y780T-DH	VDA 239-100	Long.	440 - 550	780 - 900	18	-	0.13	30	-
CR700Y980T-DH	VDA 239-100	Long.	700 - 850	980 - 1180	13	-	-	30	-
CR850Y1180T-DH	voestalpine	Long.	850 - 1050	1180 - 1350	13	-	-	30	-

Steel grade	Norms and specifica-tions	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Complex-phase steels									
EN 10338			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10\text{-}UE}$	BH_2	E
HCT780C	EN 10338	Long.	570 - 720	≥ 780	10	-	-	30	-
HCT980C	EN 10338	Long.	780 - 950	≥ 980	6	-	-	30	-
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10\text{-}20/Ag}$	BH_2	E
CR570Y780T-CP	VDA 239-100	Long.	570 - 720	780 - 920	10	-	-	30	-
CR660Y780T-CP	voestalpine	Long.	660 - 830	780 - 980	10	-	-	30	-
CR780Y980T-CP	VDA 239-100	Long.	780 - 950	980 - 1140	6	-	-	30	-
CR900Y1180T-CP	VDA 239-100	Long.	900 - 1100	1180 - 1350	5	-	-	30	-
CR950Y1180T-CP	voestalpine	Long.	950 - 1150	1180 - 1350	5	-	-	30	-
Complex-phase steels high-ductility (cold rolled complex-phase steels with improved formability)									
Special voestalpine grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10\text{-}UE}$	BH_2	E
CR780Y980T-CH	voestalpine	Long.	780 - 950	980 - 1140	10	-	-	30	-
CR900Y1180T-CH	voestalpine	Long.	900 - 1150	1180 - 1350	7	-	-	30	-
CR1000Y1370T-CH	voestalpine	Long.	1000 - 1250	1370 - 1550	5	-	-	30	-

Premium quality with reduced carbon footprint

ahss high-ductility

greentec steel

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Case-hardening, heat-treatable and spring steels in +LC condition (soft-annealed and lightly rerolled)									
EN 10132:2000			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
C10E	EN 10132-2	Long.	345	430	26	-	-	-	-
C15E	EN 10132-2	Long.	360	450	25	-	-	-	-
16MnCr5	EN 10132-2	Long.	420	550	21	-	-	-	-
C22E	EN 10132-2	Long.	400	500	22	-	-	-	-
C35E	EN 10132-2	Long.	430	540	19	-	-	-	-
C40E	EN 10132-3	Long.	440	550	18	-	-	-	-
C45E	EN 10132-3	Long.	455	570	18	-	-	-	-
C50E	EN 10132-3	Long.	465	580	17	-	-	-	-
C55E, C55S *	EN 10132-3, -4	Long.	480	600	17	-	-	-	-
C60E, C60S *	EN 10132-3, -4	Long.	495	620	17	-	-	-	-
C67S	EN 10132-4	Long.	510	640	16	-	-	-	-

* Difference between E and S: Si (≤ 0.4 % / 0.15-0.35 %), P (≤ 0.035 % / ≤ 0.025 %), S (≤ 0.035 % / ≤ 0.025 %)

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Case-hardening steels in +LC condition (soft-annealed and lightly rerolled)									
Special voestalpine grade (analysis based on standard/Stahlschlüssel [Key to Steel] material database)			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
22MnB5	voestalpine	Long.	450	650	18	-	-	-	-
27MnB5	voestalpine	Long.	450	650	18	-	-	-	-
34MnB5	voestalpine	Long.	450	650	16	-	-	-	-
Case-hardening steels in +CR condition (cold-rolled, as-rolled)									
Special voestalpine grade (analysis based on standard/Stahlschlüssel [Key to Steel] material database)			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
33Mn6	voestalpine	Long.	1200	-	-	-	-	-	-
Martensitic steels									
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	n_{10-UE}	BH_2	E
CR860Y1100T-MS	voestalpine	Long.	860 - 1120	1100 - 1320	3	-	-	30	-
CR1030Y1300T-MS	VDA 239-100	Long.	1030 - 1330	1300 - 1550	3	-	-	30	-
Hot-forming steels in +LC condition (soft-annealed and lightly rerolled)									
Special voestalpine grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
phs-uncoated 1500 CR	unhardened	Trans.	320 - 480	480 - 600	18	-	-	-	-
phs-uncoated 1500 HR	unhardened	Trans.	≥ 320	500 - 750	12	-	-	-	-
phs-uncoated 2000 CR [1)]	unhardened	Trans.	300 - 500	450 - 650	17	-	-	-	-
phs-uncoated 2000 HR [1)]	unhardened	Trans.	≥ 320	550 - 850	10	-	-	-	-

[1)] Indication of preliminary values

Premium quality with reduced carbon footprint

phs-uncoated
greentec steel

SURFACES AND SERVICES

Surfaces according to EN 10130 and VDA 239-100			
Product variant	**Norms and specifications**	**Normal surface**	**Best surface**
Uncoated cold-rolled strip	EN 10130 VDA 239-100	A U	B E

Subsequent surface treatment			
Product variant	**(Corrosion protection) oil**	**Deep-drawing oil**	**direct-e® Directly enamelable forming coating**
Uncoated cold-rolled strip	✓	✓	✓

Selected services			
Special coil labeling	Roughness deviation from standard	Reduced dimensional tolerance	Material testing according to EN 10204

Carbon footprint greentec steel product

greentec steel product	Maximum carbon footprint [kg CO_2e/kg steel] [1]
Cold-rolled steel strip	2.2

[1] The carbon footprint is calculated pursuant to worldsteel CML 2001-2016 (system expansion) on a cradle-to-gate basis.

All products, dimensions and steel grades listed in each voestalpine supply range are available as greentec steel.

DIMENSIONS

Available dimensions: wide strip (coil)			
Thickness [mm]	**Width max. [mm]**	**Outside diameter max. [mm]**	**Inside diameter [mm]**
0.40 - 3.00	1615	2000	500 / 600

Available dimensions: slit (slit strip)			
Thickness [mm]	**Strip width [mm]**	**Outside diameter [mm]**	**Inside diameter [mm]**
0.40 - 3.00	10 - 1615	700 - 2200	500 / 600

Available dimensions: cut-to-length (sheet)			
Thickness [mm]	**Width max. [mm]**	**Length [mm]**	**Package weight max. [t]**
0.40 - 3.00	210 - 1615	200 - 6700	6

Indicated references are standard values. The available combinations of widths and thicknesses and supply forms vary depending on the steel grade. Certain limitations possible depending on thickness.

This document provides an overview of the cold-rolled steel strip products supplied by the voestalpine Steel Division. Other grades are available upon request. Please find further information and downloads under the following link:
www.voestalpine.com/steel

ELECTRO-GALVANIZED STEEL STRIP

Range of supply
October 2021

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Mild steels									
EN 10152:2009			R_e	R_m	A_{80}	r_{90}	n_{90}	BH_2	E
DC01	EN 10152:2009	Trans.	140 - 280	270 - 410	28	-	-	-	√
DC03	EN 10152:2009	Trans.	140 - 240	270 - 370	34	1.3	-	-	√
DC04	EN 10152:2009	Trans.	140 - 220	270 - 350	37	1.6	0.17	-	√
DC05	EN 10152:2009	Trans.	140 - 200	270 - 330	39	1.9	0.19	-	√
DC06	EN 10152:2009	Trans.	130 - 180	270 - 350	41	2.1	0.21	-	√
DC07	EN 10152:2009	Trans.	110 - 160	250 - 310	43	2.5	0.22	-	√
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
CR1	VDA 239-100	Trans.	140 - 300	270 - 410	28	-	-	-	√
CR2	VDA 239-100	Trans.	140 - 240	270 - 370	34	1.3	0.16	-	√
CR3	VDA 239-100	Trans.	140 - 220	270 - 350	38	1.8	0.18	-	√
CR4	VDA 239-100	Trans.	140 - 190	270 - 330	39	1.9	0.20	-	√
CR5	VDA 239-100	Trans.	110 - 180	260 - 330	41	2.1	0.22	-	√
CR6	voestalpine	Trans.	110 - 160	250 - 310	43	2.5	0.22	-	√
Structural steels									
DIN 1623			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
S215G	DIN 1623	Trans.	≥ 215	360 - 510	20	-	-	-	-
Micro-alloyed steels									
EN 10268 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	n_{90}	BH_2	E
HC260LA	EN 10268	Trans.	260 - 330	350 - 430	26	-	-	-	-
HC300LA	EN 10268	Trans.	300 - 380	380 - 480	23	-	-	-	-
HC340LA	EN 10268	Trans.	340 - 420	410 - 510	21	-	-	-	-
HC380LA	EN 10268	Trans.	380 - 480	440 - 580	19	-	-	-	-
HC420LA	EN 10268	Trans.	420 - 520	470 - 600	17	-	-	-	-
HC460LA	EN 10268	Trans.	460 - 580	510 - 660	13	-	-	-	-
HC500LA	EN 10268	Trans.	500 - 620	550 - 710	12	-	-	-	-
HX550LAD	voestalpine	Trans.	≥ 550	≥ 590	10	-	-	-	-
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
CR210LA	VDA 239-100	Long.	210 - 300	310 - 410	29	1.0	0.15	-	-
CR240LA	VDA 239-100	Long.	240 - 320	320 - 430	27	-	0.15	-	-
CR270LA	VDA 239-100	Long.	270 - 350	350 - 460	25	-	0.14	-	-
CR300LA	VDA 239-100	Long.	300 - 380	380 - 490	23	-	0.14	-	-
CR340LA	VDA 239-100	Long.	340 - 430	410 - 530	21	-	0.12	-	-
CR380LA	VDA 239-100	Long.	380 - 470	450 - 570	19	-	0.12	-	-
CR420LA	VDA 239-100	Long.	420 - 520	480 - 600	17	-	0.11	-	-
CR460LA	VDA 239-100	Long.	460 - 580	520 - 680	15	-	0.10	-	-
CR500LA	voestalpine	Long.	500 - 620	560 - 720	14	-	0,09	-	-

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Bake-hardening steels									
EN 10268			$R_{p0.2}$	R_m	A_{80}	r_{90}	n_{90}	BH_2	E
HC180B	EN 10268	Trans.	180 - 230	290 - 360	34	1.6	0.17	35	√
HC220B	EN 10268	Trans.	220 - 270	320 - 400	32	1.5	0.16	35	√
HC260B	EN 10268	Trans.	260 - 320	360 - 440	29	-	-	35	√
HC300B	EN 10268	Trans.	300 - 360	390 - 480	26	-	-	35	-
VDA 239-100			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
CR180BH	VDA 239-100	Long.	180 - 240	290 - 370	34	1.1	0.17	20/30	√
CR210BH	VDA 239-100	Long.	210 - 270	320 - 400	32	1.1	0.16	20/30	√
CR240BH	VDA 239-100	Long.	240 - 300	340 - 440	29	1.0	0.15	20/30	√
CR270BH	VDA 239-100	Long.	270 - 330	360 - 460	27	-	0.13	20/30	-
High-strength IF steels									
EN 10268			$R_{p0.2}$	R_m	A_{80}	r_{90}	n_{90}	BH_2	E
HC180Y	EN 10268	Trans.	180 - 230	330 - 400	35	1.7	0.19	-	√
HC220Y	EN 10268	Trans.	220 - 270	340 - 420	33	1.6	0.18	-	√
HC260Y	EN 10268	Trans.	260 - 320	380 - 440	31	1.4	0.17	-	√
VDA 239-100			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
CR180IF	VDA 239-100	Long.	180 - 240	320 - 400	35	1.2	0.19	-	√
CR210IF	VDA 239-100	Long.	210 - 270	340 - 420	33	1.1	0.18	-	√
CR240IF	VDA 239-100	Long.	240 - 300	360 - 440	31	1.0	0.17	-	√
Carbon-manganese steels									
Special voestalpine grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
HT440CM	voestalpine	Trans.	280 - 380	≥ 440	25	-	-	-	-
HT590CM	voestalpine	Trans.	420 - 570	≥ 590	14	-	-	-	-

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Dual-phase steels									
EN 10338			$R_{p0.2}$	R_m	A_{80}	r_{90}	n_{10-UE}	BH_2	E
HCT450X	EN 10338	Long.	260 - 340	≥ 450	27	-	0.16	30	√
HCT490X	EN 10338	Long.	290 - 380	≥ 490	24	-	0.15	30	√
HCT590X	EN 10338	Long.	330 - 430	≥ 590	20	-	0.14	30	√
HCT780X	EN 10338	Long.	440 - 550	≥ 780	14	-	-	30	-
HCT980X	EN 10338	Long.	590 - 740	≥ 980	10	-	-	30	-
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
CR260Y450T-DP	voestalpine	Long.	260 - 340	450 - 560	27	-	0.16	30	√
CR290Y490T-DP	VDA 239-100	Long.	290 - 380	490 - 600	24	-	0.15	30	√
CR330Y590T-DP	VDA 239-100	Long.	330 - 430	590 - 700	20	-	0.14	30	√
CR360Y590T-DP	voestalpine	Long.	360 - 460	590 - 700	19	-	0.14	30	√
CR440Y780T-DP	VDA 239-100	Long.	440 - 550	780 - 900	14	-	0.11	30	-
CR500Y780T-DP	voestalpine	Long.	500 - 620	780 - 900	13	-	-	30	-
CR550Y980T-DP	voestalpine	Long.	550 - 730	980 - 1130	10	-	-	30	-
CR590Y980T-DP	VDA 239-100	Long.	590 - 740	980 - 1130	10	-	-	30	-
CR660Y980T-DP	voestalpine	Trans.	660 - 810	980 - 1130	10	-	-	30	-
CR700Y980T-DP	VDA 239-100	Long.	700 - 850	980 - 1130	8	-	-	30	-
Dual-phase high-ductility steels (cold rolled dual-phase steels with improved formability)									
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
CR330Y590T-DH	voestalpine	Long.	330 - 430	590 - 700	26	-	0.16	30	-
CR440Y780T-DH	VDA 239-100	Long.	440 - 550	780 - 900	18	-	0.13	30	-
CR700Y980T-DH	VDA 239-100	Long.	700 - 850	980 - 1180	13	-	-	30	-
CR850Y1180T-DH	voestalpine	Long.	850 - 1050	1180 - 1350	13	-	-	30	-

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Complex-phase steels									
EN 10338 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	n_{10-UE}	BH_2	E
HCT780C	EN 10338	Long.	570 - 720	≥ 780	10	-	-	30	-
HCT980C	EN 10338	Long.	780 - 950	≥ 980	6	-	-	30	-
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
CR570Y780T-CP	VDA 239-100	Long.	570 - 720	780 - 920	10	-	-	30	-
CR660Y780T-CP	voestalpine	Long.	660 - 830	780 - 980	10	-	-	30	-
CR780Y980T-CP	VDA 239-100	Long.	780 - 950	980 - 1140	6	-	-	30	-
CR900Y1180T-CP	VDA 239-100	Long.	900 - 1100	1180 - 1350	5	-	-	30	-
CR950Y1180T-CP	voestalpine	Long.	950 - 1150	1180 - 1350	5	-	-	30	-
Complex-phase steels high-ductility (cold rolled complex-phase steels with improved formability)									
Special voestalpine grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	n_{10-UE}	BH_2	E
CR780Y980T-CH	voestalpine	Long.	780 - 950	980 - 1140	10	-	-	30	-
CR900Y1180T-CH	voestalpine	Long.	900 - 1150	1180 - 1350	7	-	-	30	-
CR1000Y1370T-CH	voestalpine	Long.	1000 - 1250	1370 - 1550	5	-	-	30	-
Martensitic steels									
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	n_{10-UE}	BH_2	E
CR860Y1100T-MS	voestalpine	Long.	860 - 1120	1100 - 1320	3	-	-	30	-
CR1030Y1300T-MS	VDA 239-100	Long.	1030 - 1330	1300 - 1550	3	-	-	30	-

Premium quality with reduced carbon footprint

ahss high-ductility
greentec steel

SURFACES AND SERVICES

Surfaces according to EN 10130 and VDA 239-100

Product variant	Norms and specifications	Coatings	Normal surface	Best surface
Zinc coating on both sides	EN 10152 VDA 239-100	ZE 2.5 µ - 10 µ EG 12 - 65	A U	B E
Zinc coating on one side	EN 10152 VDA 239-100	ZE 2.5 µ - 10 µ EG 12 - 65	A U	B E

Subsequent surface treatment

Product variant	Oiled	Chemically passivated (and oiled)	Phosphated (and oiled)	Chemically passivated and phosphated (and oiled)	Dry forming aid
Zinc coating on both sides	√	√ (√)	√ (√)	√ (√)	√
Zinc coating on one side	√	√ (√)	- (-)	- (-)	√

Selected services

Differential galvanization	Special coil labeling	Roughness deviation from standard	Reduced dimensional tolerance	Material testing according to EN 10204

Carbon footprint greentec steel product

greentec steel product	Maximum carbon footprint [kg CO_2e/kg steel] [1)]
Electrogalvanized steel strip	2.4

[1)] The carbon footprint is calculated pursuant to worldsteel CML 2001-2016 (system expansion) on a cradle-to-gate basis.

All products, dimensions and steel grades listed in each voestalpine supply range are available as greentec steel.

DIMENSIONS

Available dimensions: wide strip (coil)

Thickness [mm]	Width max. [mm]	Outside diameter max. [mm]	Inside diameter [mm]
0.40 - 2.50	1615	2000	500 / 600

Available dimensions: slit (slit strip)

Thickness [mm]	Strip width [mm]	Outside diameter [mm]	Inside diameter [mm]
0.40 - 2.50	10 - 1615	700 - 2200	500 / 600

Available dimensions: cut-to-length (sheet)

Thickness [mm]	Width max. [mm]	Length [mm]	Package weight max. [t]
0.40 - 2.50	210 - 1615	200 - 6700	6

Indicated references are standard values. The available combinations of widths and thicknesses and supply forms vary depending on the steel grade. Certain limitations possible depending on thickness.

This document provides an overview of the electro-galvanized steel strip products supplied by the voestalpine Steel Division. Other grades are available upon request. Please find further information and downloads under the following link: www.voestalpine.com/steel

HOT-DIP GALVANIZED STEEL STRIP

Range of supply
October 2021

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Mild steels									
EN 10346 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
DX51D	EN 10346	Trans.	-	270 - 500	22	-	-	-	-
DX52D	EN 10346	Trans.	140 - 300	270 - 420	26	-	-	-	-
DX53D	EN 10346	Trans.	140 - 260	270 - 380	30	-	-	-	✓
DX54D	EN 10346	Trans.	120 - 220	260 - 350	36	1.6	0.18	-	✓
DX56D	EN 10346	Trans.	120 - 180	260 - 350	39	1.9	0.21	-	✓
DX57D	EN 10346	Trans.	120 - 170	260 - 350	41	2.1	0.22	-	✓
DX58D	voestalpine	Trans.	110 - 170	250 - 330	43	2.3	0.23	-	✓
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
CR1	VDA 239-100	Trans.	140 - 300	270 - 410	28	-	-	-	-
CR2	VDA 239-100	Trans.	140 - 240	270 - 370	34	1.3	0.16	-	✓
CR3	VDA 239-100	Trans.	140 - 210	270 - 350	38	1.8	0.18	-	✓
CR4	VDA 239-100	Trans.	140 - 180	270 - 330	39	1.9	0.20	-	✓
CR5	VDA 239-100	Trans.	110 - 170	260 - 330	41	2.1	0.22	-	✓
CR6	voestalpine	Trans.	110 - 170	250 - 330	43	2.3	0.23	-	✓
Structural steels									
EN 10346 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
S220GD	EN 10346	Long.	≥ 220	≥ 300	20	-	-	-	-
S250GD	EN 10346	Long.	≥ 250	≥ 330	19	-	-	-	-
S280GD	EN 10346	Long.	≥ 280	≥ 360	18	-	-	-	-
S320GD	EN 10346	Long.	≥ 320	≥ 390	17	-	-	-	-
S350GD	EN 10346	Long.	≥ 350	≥ 420	16	-	-	-	-
S390GD	EN 10346	Long.	≥ 390	≥ 460	16	-	-	-	-
S420GD	EN 10346	Long.	≥ 420	≥ 480	15	-	-	-	-
S450GD	EN 10346	Long.	≥ 450	≥ 510	14	-	-	-	-

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Micro-alloyed steels									
EN 10346 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
HX260LAD	EN 10346	Trans.	260 - 330	350 - 430	26	-	-	-	-
HX300LAD	EN 10346	Trans.	300 - 380	380 - 480	23	-	-	-	-
HX340LAD	EN 10346	Trans.	340 - 420	410 - 510	21	-	-	-	-
HX380LAD	EN 10346	Trans.	380 - 480	440 - 560	19	-	-	-	-
HX420LAD	EN 10346	Trans.	420 - 520	470 - 590	17	-	-	-	-
HX460LAD	EN 10346	Trans.	460 - 560	500 - 640	15	-	-	-	-
HX500LAD	EN 10346	Trans.	500 - 620	530 - 690	13	-	-	-	-
HX550LAD	voestalpine	Trans.	≥ 550	≥ 590	10	-	-	-	-
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
CR210LA	VDA 239-100	Long.	210 - 300	310 - 410	29	1.0	0.15	-	-
CR240LA	VDA 239-100	Long.	240 - 320	320 - 430	27	-	0.15	-	-
CR270LA	VDA 239-100	Long.	270 - 350	350 - 460	25	-	0.14	-	-
CR300LA	VDA 239-100	Long.	300 - 380	380 - 490	23	-	0.14	-	-
CR340LA	VDA 239-100	Long.	340 - 430	410 - 530	21	-	0.12	-	-
CR380LA	VDA 239-100	Long.	380 - 470	450 - 570	19	-	0.12	-	-
CR420LA	VDA 239-100	Long.	420 - 520	480 - 600	17	-	0.11	-	-
CR460LA	VDA 239-100	Long.	460 - 580	520 - 680	15	-	0.10	-	-
CR500LA	voestalpine	Long.	500 - 620	560 - 720	14	-	0.09	-	-

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Bake-hardening steels									
EN 10346			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
HX180BD	EN 10346	Trans.	180 - 240	290 - 360	34	1.5	0.16	30	√
HX220BD	EN 10346	Trans.	220 - 280	320 - 400	32	1.2	0.15	30	√
HX260BD	EN 10346	Trans.	260 - 320	360 - 440	28	-	-	30	√
HX300BD	EN 10346	Trans.	300 - 360	400 - 480	26	-	-	30	√
VDA 239-100			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
CR180BH	VDA 239-100	Long.	180 - 240	290 - 370	34	1.1	0.17	30	√
CR210BH	VDA 239-100	Long.	210 - 270	320 - 400	32	1.1	0.16	30	√
CR240BH	VDA 239-100	Long.	240 - 300	340 - 440	29	1.0	0.15	30	√
CR270BH	VDA 239-100	Long.	270 - 330	360 - 460	27	-	0.13	30	√
High-strength IF steels									
EN 10346			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
HX180YD	EN 10346	Trans.	180 - 240	330 - 390	34	1.7	0.18	-	√
HX220YD	EN 10346	Trans.	220 - 280	340 - 420	32	1.5	0.17	-	√
HX260YD	EN 10346	Trans.	260 - 320	380 - 440	30	1.4	0.16	-	√
VDA 239-100			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
CR180IF	VDA 239-100	Long.	180 - 240	320 - 400	35	1.2	0.19	-	√
CR210IF	VDA 239-100	Long.	210 - 270	340 - 420	33	1.1	0.18	-	√
CR240IF	VDA 239-100	Long.	240 - 300	360 - 440	31	1.0	0.17	-	√
Carbon-manganese steels									
Special voestalpine grade			$R_{p0.2}$	R_m	A_{80}	r_{90}	$n_{10-20/Ag}$	BH_2	E
HT440CMD	voestalpine	Trans.	280 - 380	≥ 440	25	-	-	-	-
HT590CMD	voestalpine	Trans.	420 - 570	≥ 590	14	-	-	-	-

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Dual-phase steels									
EN 10346			$R_{p0.2}$	R_m	A_{80}	r_0	n_{10-UE}	BH_2	E
HCT450X	EN 10346	Long.	260 - 340	≥ 450	27	-	0.16	30	√
HCT490X	EN 10346	Long.	290 - 380	≥ 490	24	-	0.15	30	√
HCT590X	EN 10346	Long.	330 - 430	≥ 590	20	-	0.14	30	√
HCT780X	EN 10346	Long.	440 - 550	≥ 780	14	-	-	30	-
HCT980X	EN 10346	Long.	590 - 740	≥ 980	10	-	-	30	-
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
CR260Y450T-DP	voestalpine	Long.	260 - 340	450 - 560	27	-	0.16	30	√
CR290Y490T-DP	VDA 239-100	Long.	290 - 380	490 - 600	24	-	0.15	30	√
CR330Y590T-DP	VDA 239-100	Long.	330 - 430	590 - 700	20	-	0.14	30	√
CR360Y590T-DP	voestalpine	Long.	360 - 460	590 - 700	19	-	0.14	30	√
CR440Y780T-DP	VDA 239-100	Long.	440 - 550	780 - 900	14	-	0.11	30	-
CR500Y780T-DP	voestalpine	Long.	500 - 620	780 - 900	13	-	-	30	-
CR550Y980T-DP	voestalpine	Long.	550 - 730	980 - 1130	10	-	-	30	-
CR590Y980T-DP	VDA 239-100	Long.	590 - 740	980 - 1130	10	-	-	30	-
CR660Y980T-DP	voestalpine	Trans.	660 - 810	980 - 1130	10	-	-	30	-
CR700Y980T-DP	VDA 239-100	Long.	700 - 850	980 - 1130	8	-	-	30	-
Dual-phase high-ductility steels (cold rolled dual-phase steels with improved formability)									
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
CR330Y590T-DH	voestalpine	Long.	330 - 430	590 - 700	26	-	0.16	30	-
CR440Y780T-DH	VDA 239-100	Long.	440 - 550	780 - 900	18	-	0.13	30	-
CR700Y980T-DH	VDA 239-100	Long.	700 - 850	980 - 1180	13	-	-	30	-

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Complex-phase steels									
EN 10346			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10\text{-}UE}$	BH_2	E
HCT780C	EN 10346	Long.	570 - 720	≥ 780	10	-	-	30	-
HCT980C	EN 10346	Long.	780 - 950	≥ 980	6	-	-	30	-
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10\text{-}20/Ag}$	BH_2	E
CR570Y780T-CP	VDA 239-100	Long.	570 - 720	780 - 920	10	-	-	30	-
CR660Y780T-CP	voestalpine	Long.	660 - 820	780 - 960	10	-	-	30	-
CR780Y980T-CP	VDA 239-100	Long.	780 - 950	980 - 1140	6	-	-	30	-
CR900Y1180T-CP	VDA 239-100	Long.	900 - 1100	1180 - 1350	5	-	-	30	-
Complex-phase steels high-ductility (cold rolled complex-phase steels with improved formability)									
voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10\text{-}20/Ag}$	BH_2	E
CR780Y980T-CH	voestalpine	Long.	780 - 950	980 - 1140	10	-	-	30	-
CR900Y1180T-CH	voestalpine	Long.	900 - 1150	1180 - 1350	7	-	-	30	-
TRIP steels									
EN 10346			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10\text{-}UE}$	BH_2	E
HCT690T	EN 10346	Long.	400 - 520	≥ 690	23	-	0.19	40	-
VDA 239-100			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10\text{-}20/Ag}$	BH_2	E
CR400Y690T-TR	VDA 239-100	Long.	400 - 520	690 - 800	24	-	0.19	40	-

Premium quality with reduced carbon footprint

ahss high-ductility

greentec steel

Steel grade	Norms and specifications	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Press-hardening steels									
Special voestalpine grade			$R_{p0.2}$	R_m	A	r_{90}	$n_{10\text{-}20/Ag}$	BH_2	E
phs-ultraform 490	unhardened	Trans.	340 - 420	410 - 510	21	-	-	-	-
phs-ultraform 490	hardened*	Trans.	340 - 470	460 - 700	12	-	-	-	-
phs-ultraform 1500	unhardened	Trans.	380 - 480	≥ 480	18	-	-	-	-
phs-ultraform 1500	hardened*	Trans.	950 - 1250	1300 - 1600	5	-	-	-	-
phs-ultraform 2000**	unhardened	Trans.	400 - 520	≥ 580	16	-	-	-	-
phs-ultraform 2000**	hardened*	Trans.	≥ 1100	≥ 1800	5	-	-	-	-
phs-directform 1500	unhardened	Trans.	300 - 600	600 - 900	12	-	-	-	-
phs-directform 1500	hardened*	Trans.	950 - 1250	1300 - 1650	5	-	-	-	-
phs-scalefree 490	unhardened	Trans.	280 - 500	380 - 540	21	-	-	-	-
phs-scalefree 490	hardened*	Trans.	400	490	16	-	-	-	-
phs-scalefree 1500	unhardened	Trans.	350 - 480	470 - 700	18	-	-	-	-
phs-scalefree 1500	hardened*	Trans.	1050	1500	6	-	-	-	-
phs-scalefree 2000	unhardened	Trans.	400 - 650	550 - 800	12	-	-	-	-
phs-scalefree 2000	hardened*	Trans.	1200	1900	5	-	-	-	-

* Mechanical parameters and coating properties in hardened condition are standard values achieved in professional processing of flat sheets. The indicated values are not guaranteed by voestalpine Stahl GmbH

** Steel grade being developed, indication of preliminary values

Premium quality with reduced carbon footprint

phs-scalefree®

greentec steel

Steel grade	Norms and specifica-tions	Test dir.	Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elong. A_{80} min. [%]	r value min. [-]	n value min. [-]	BH_2 min. [MPa]	Exposed
Hot-rolled low-alloyed or micro-alloyed steels									
VDA 239-100			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
HR380LA	VDA 239-100	Long.	380 - 480	450 - 570	20	-	-	-	-
HR420LA	VDA 239-100	Long.	420 - 520	480 - 600	18	-	-	-	-
HR460LA	VDA 239-100	Long.	460 - 560	520 - 640	16	-	-	-	-
HR500LA	VDA 239-100	Long.	500 - 620	560 - 700	14	-	-	-	-
HR700LA	VDA 239-100	Long.	700 - 850	750 - 950	10	-	-	-	-
Hot-rolled ferritic-bainitic steels									
EN 10346			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
HDT580F	EN10346	Long.	460 - 620	≥ 580	15	-	-	-	-
VDA 239-100 and voestalpine special grade			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
HR440Y560T-FB	voestalpine	Long.	440 - 600	560 - 680	15	-	-	-	-
HR440Y580T-FB	VDA 239-100	Long.	440 - 600	580 - 700	15	-	-	30	-
Hot-rolled complex-phase steels									
EN 10346			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
HDT750C	EN 10346	Long.	620 - 760	≥ 750	10	-	-	-	-
HDT760C	EN 10346	Long.	660 - 830	≥ 760	10	-	-	-	-
VDA 239-100			$R_{p0.2}$	R_m	A_{80}	r_0	$n_{10-20/Ag}$	BH_2	E
HR660Y760T-CP	VDA 239-100	Long.	660 - 820	760 - 960	10	-	-	30	-

SURFACES AND SERVICES

Surfaces according to EN 10346 and VDA 239-100

Product variant	Norms and specifications	Coatings	Normal surface	Improved surface	Best surface
Zinc coating	EN 10346 VDA 239-100	Z70 - Z450 GI40 - GI115	NA, MA -	MB U	MC* E*
Zinc-iron coating	EN 10346 VDA 239-100	ZF80 - ZF120 GA40 - GA50	RA -	RB U	RC E
corrender Zinc-magnesium coating	EN 10346 VDA 239-100	ZM70 - ZM350 ZM30 - ZM50	NA, MA -	MB U	MC* E*

* The zinc and zinc-magnesium coating variants are available in MC/E surface quality with reduced waviness, texplus®.

Subsequent surface treatment

Product variant	Oiled	Chemically passivated (and oiled)	Forming aid and oiled	dryform Dry forming aid	multiface® Anti-fingerprint
Zinc coating	√	√ (√)	√	√	√
Zinc-iron coating	√	√ (√)	√	-	-
corrender Zinc-magnesium coating	√	√ (√)	-	√	√

Selected services

Special coil labeling	Roughness deviation from standard	Reduced dimensional tolerance	Material testing according to EN 10204

Carbon footprint greentec steel product

greentec steel product	Maximum carbon footprint [kg CO_2e/kg steel] [1)]
Hot-dip galvanized steel strip	2.3

[1)] The carbon footprint is calculated pursuant to worldsteel CML 2001-2016 (system expansion) on a cradle-to-gate basis.

All products, dimensions and steel grades listed in each voestalpine supply range are available as greentec steel.

DIMENSIONS

Available dimensions: wide strip (coil)

Product variant	Thickness [mm]	Width max. [mm]	Outside diameter max. [mm]	Inside diameter [mm]
Zinc coating	0.45 - 4.00	1730	2000	500 / 600
Zinc-iron coating	0.45 - 2.30	1730	2000	500 / 600
corrender Zinc-magnesium coating	0.45 - 2.30	1730	2000	500 / 600

Available dimensions: slit (slit strip)

Product variant	Thickness [mm]	Strip width [mm]	Outside diameter [mm]	Inside diameter [mm]
Zinc coating	0.45 - 4.00	10 - 1730	700 - 2200	500 / 600
Zinc-iron coating	0.45 - 2.30	10 - 1730	700 - 2200	500 / 600
corrender Zinc-magnesium coating	0.45 - 2.30	10 - 1730	700 - 2200	500 / 600

Available dimensions: cut-to-length (sheet)

Product variant	Thickness [mm]	Width [mm]	Length [mm]	Package weight max. [t]
Zinc coating	0.45 - 4.00	210 - 1730	200 - 6700	6
Zinc-iron coating	0.45 - 2.30	210 - 1730	200 - 6700	6
corrender Zinc-magnesium coating	0.45 - 2.30	210 - 1730	200 - 6700	6

Indicated references are standard values. The available combinations of widths and thicknesses and supply forms vary depending on the steel grade and coating system. Limitations are possible depending on thickness.

This document provides an overview of the hot-dip galvanized steel strip products supplied by the voestalpine Steel Division. Other grades are available upon request. Please find further information and downloads under the following link:
www.voestalpine.com/steel

isovac®
isovac®
greentec steel

ELECTRICAL STEEL – isovac®

Range of supply
August 2021

FULLY PROCESSED ELECTRICAL STEEL

Steel grade	Magnetic sample direction	Specific total loss at 50 Hz		Magnetic polarization at 50 Hz			Mechanical sample direction	Yield strength	0.2 % yield strength	Tensile strength	Elongation	Hardness
		1.0 T P10 [W/kg]	1.5 T P15 [W/kg]	2500 A/m J25 [T]	5000 A/m J50 [T]	10000 A/m J100 [T]		R_{eH} [MPa]	$R_{p0.2}$ [MPa]	R_m [MPa]	A_{80} [%]	HV5 [-]
isovac® fully processed												
EN 10106 [1]		**P10**	**P15**	**J25**	**J50**	**J100**		**R_{eH}**	**$R_{p0.2}$**	**R_m**	**A_{80}**	**HV5**
isovac 235-35 A	Long. + Trans.	0.80	2.10	1.51	1.61	1.74	Transverse	455	445	550	15	210
isovac 250-35 A	Long. + Trans.	0.85	2.20	1.51	1.61	1.74	Transverse	475	470	580	17	210
isovac 270-35 A	Long. + Trans.	0.95	2.35	1.55	1.64	1.77	Transverse	365	355	490	25	165
isovac 300-35 A	Long. + Trans.	1.00	2.50	1.56	1.65	1.77	Transverse	375	365	505	27	165
isovac 330-35 A	Long. + Trans.	1.20	2.80	1.57	1.66	1.79	Transverse	350	335	490	30	150
isovac 270-50 A	Long. + Trans.	1.00	2.40	1.53	1.62	1.74	Transverse	490	470	600	22	220
isovac 290-50 A	Long. + Trans.	1.05	2.55	1.57	1.66	1.78	Transverse	355	350	485	25	185
isovac 310-50 A	Long. + Trans.	1.10	2.70	1.57	1.66	1.78	Transverse	360	355	490	26	185
isovac 330-50 A	Long. + Trans.	1.15	2.90	1.58	1.67	1.79	Transverse	370	365	505	28	185
isovac 350-50 A	Long. + Trans.	1.30	3.10	1.58	1.66	1.78	Transverse	325	310	470	32	165
isovac 400-50 A	Long. + Trans.	1.40	3.40	1.59	1.68	1.79	Transverse	350	330	490	32	170
isovac 470-50 A	Long. + Trans.	1.70	3.90	1.62	1.71	1.82	Transverse	330	315	470	33	150
isovac 530-50 A	Long. + Trans.	2.00	4.50	1.64	1.73	1.84	Transverse	330	305	445	35	135
isovac 600-50 A	Long. + Trans.	2.20	4.80	1.64	1.72	1.84	Transverse	335	310	450	35	135
isovac 700-50 A	Long. + Trans.	2.60	5.60	1.64	1.72	1.84	Transverse	335	285	400	37	115
isovac 800-50 A	Long. + Trans.	2.90	6.15	1.65	1.73	1.85	Transverse	360	300	410	36	120
isovac 940-50 A	Long. + Trans.	3.60	7.60	1.66	1.75	1.87	Transverse	370	305	380	38	125
isovac 310-65 A	Long. + Trans.	1.10	2.65	1.55	1.64	1.76	Transverse	455	450	580	15	215
isovac 330-65 A	Long. + Trans.	1.15	2.80	1.56	1.65	1.77	Transverse	475	470	590	15	215
isovac 350-65 A	Long. + Trans.	1.20	3.00	1.58	1.67	1.79	Transverse	365	360	505	30	185
isovac 400-65 A	Long. + Trans.	1.40	3.30	1.59	1.67	1.79	Transverse	390	375	520	31	185
isovac 470-65 A	Long. + Trans.	1.60	3.90	1.60	1.69	1.80	Transverse	350	330	490	33	170
isovac 530-65 A	Long. + Trans.	1.90	4.40	1.62	1.71	1.82	Transverse	320	300	455	33	155
isovac 600-65 A	Long. + Trans.	2.15	4.80	1.64	1.72	1.83	Transverse	350	320	470	34	155
isovac 700-65 A	Long. + Trans.	2.30	5.30	1.65	1.73	1.84	Transverse	340	310	440	36	145
isovac 800-65 A	Long. + Trans.	2.90	6.40	1.65	1.73	1.84	Transverse	335	280	400	37	125
isovac 1000-65 A	Long. + Trans.	3.90	8.60	1.68	1.77	1.88	Transverse	380	275	355	40	115
isovac 800-100 A	Long. + Trans.	2.80	6.80	1.64	1.72	1.83	Transverse	335	310	465	33	150 [2]
isovac 1000-100 A	Long. + Trans.	3.00	8.00	1.64	1.72	1.83	Transverse	345	310	440	34	135 [2]
isovac 1300-100 A	Long. + Trans.	3.80	8.90	1.65	1.73	1.84	Transverse	320	280	400	37	125 [2]
voestalpine special grade		**P10**	**P15**	**J25**	**J50**	**J100**		**R_{eH}**	**$R_{p0.2}$**	**R_m**	**A_{80}**	**HV5**
isovac 940-65 A	Long. + Trans.	2.95	6.40	1.65	1.73	1.85	Transverse	330	280	400	37	125

[1] Steel grade designation deviates from standard
[2] Hardness HV10 [-]

FULLY PROCESSED ELECTRICAL STEEL

Steel grade	Magnetic sample direction	Specific total loss at 50 Hz 1.0 T P10 [W/kg]	Specific total loss at 50 Hz 1.5 T P15 [W/kg]	Magnetic polarization at 50 Hz 2500 A/m J25 [T]	Magnetic polarization at 50 Hz 5000 A/m J50 [T]	Magnetic polarization at 50 Hz 10000 A/m J100 [T]	Mechanical sample direction	Yield strength R_{eH} [MPa]	0.2 % yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Elongation A_{80} [%]	Hardness HV5 [-]
isovac® fully processed high-perm												
voestalpine special grade		**P10**	**P15**	**J25**	**J50**	**J100**		**R_{eH}**	**$R_{p0.2}$**	**R_m**	**A_{80}**	**HV5**
isovac HP 210-35 A	Long. + Trans.	0.75	1.95	1.56	1.65	1.77	Transverse	435	430	540	15	200
isovac HP 235-35 A	Long. + Trans.	0.85	2.05	1.56	1.65	1.77	Transverse	445	440	560	19	210
isovac HP 250-35 A	Long. + Trans.	0.90	2.15	1.61	1.70	1.81	Transverse	355	350	485	24	165
isovac HP 270-35 A	Long. + Trans.	1.00	2.35	1.61	1.70	1.81	Transverse	370	355	500	29	160
isovac HP 330-35 A	Long. + Trans.	1.30	2.85	1.68	1.76	1.87	Transverse	300	280	440	32	130
isovac HP 230-50 A	Long. + Trans.	0.94 [1]	2.20 [1]	1.57 [1]	1.65 [1]	1.77 [1]	Transverse	470	460	590	25	225
isovac HP 250-50 A	Long. + Trans.	0.95	2.25	1.56	1.65	1.77	Transverse	445	440	560	18	220
isovac HP 270-50 A	Long. + Trans.	1.00	2.30	1.61	1.70	1.81	Transverse	345	340	470	25	185
isovac HP 290-50 A	Long. + Trans.	1.05	2.45	1.62	1.71	1.82	Transverse	360	355	490	30	180
isovac HP 310-50 A	Long. + Trans.	1.10	2.65	1.63	1.72	1.83	Transverse	370	355	500	31	180
isovac HP 330-50 A	Long. + Trans.	1.25	2.85	1.64	1.73	1.84	Transverse	320	310	465	30	165
isovac HP 350-50 A	Long. + Trans.	1.35	3.00	1.67	1.76	1.86	Transverse	280	270	430	33	150
isovac HP 400-50 A	Long. + Trans.	1.40	3.25	1.68	1.76	1.87	Transverse	290	275	440	34	150
isovac HP 470-50 A	Long. + Trans.	1.85	3.95	1.69	1.77	1.87	Transverse	290	275	400	37	135
isovac HP 600-50 A	Long. + Trans.	2.25	4.70	1.70	1.78	1.88	Transverse	250	230	370	26	115
isovac HP 290-65 A	Long. + Trans.	1.05	2.55	1.58	1.67	1.78	Transverse	440	435	560	20	210
isovac HP 310-65 A	Long. + Trans.	1.10	2.65	1.58	1.67	1.78	Transverse	445	440	565	22	210
isovac HP 330-65 A	Long. + Trans.	1.15	2.80	1.62	1.70	1.82	Transverse	365	345	480	29	185
isovac HP 350-65 A	Long. + Trans.	1.25	2.90	1.62	1.70	1.81	Transverse	350	335	480	29	180
isovac HP 470-65 A	Long. + Trans.	1.70	3.80	1.68	1.76	1.86	Transverse	300	280	445	35	155
isovac HP 800-65 A	Long. + Trans.	2.40	5.40	1.68	1.76	1.86	Transverse	250	240	385	25	120
isovac HP 1300-100 A	Long. + Trans.	3.60	8.50	1.67	1.75	1.86	Transverse	250	230	380	37	120 [2]

[1] Magnetic measurement pursuant to DIN IEC 60404-2, eroded edges
[2] Hardness HV10 [-]

FULLY PROCESSED ELECTRICAL STEEL

Steel grade	Magnetic sample direction	Specific total loss at 50 Hz		Magnetic polarization at 50 Hz			Mechanical sample direction	Yield strength	0.2 % yield strength	Tensile strength	Elongation	Hardness
		1.0 T P10 [W/kg]	1.5 T P15 [W/kg]	2500 A/m J25 [T]	5000 A/m J50 [T]	10000 A/m J100 [T]		R_{eH} [MPa]	$R_{p0.2}$ [MPa]	R_m [MPa]	A_{80} [%]	HV5 [-]
isovac® fully processed high-conductivity												
voestalpine special grade		**P10**	**P15**	**J25**	**J50**	**J100**		**R_{eH}**	**$R_{p0.2}$**	**R_m**	**A_{80}**	**HV5**
isovac HP 235-35 A HC	Long. + Trans.	0.80	2.00	1.60	1.69	1.81	Transverse	350	340	460	18	165
isovac 330-50 A HC	Long. + Trans.	1.20	2.85	1.58	1.67	1.79	Transverse	320	315	470	30	170
isovac HP 330-50 A HC	Long. + Trans.	1.30	2.85	1.67	1.76	1.86	Transverse	280	270	430	33	150
isovac 400-50 A HC	Long. + Trans.	1.45	3.35	1.61	1.70	1.82	Transverse	310	290	450	33	150
isovac 600-50 A HC	Long. + Trans.	2.45	5.30	1.64	1.72	1.83	Transverse	325	280	400	37	115
isovac 400-65 A HC	Long. + Trans.	1.50	3.50	1.60	1.68	1.80	Transverse	340	325	490	32	170
isovac 600-65 A HC	Long. + Trans.	2.20	5.00	1.65	1.73	1.84	Transverse	320	295	435	35	140

FULLY PROCESSED ELECTRICAL STEEL

Steel grade	Magnetic sample direction	Specific total loss at 50 Hz		Magnetic polarization at 50 Hz			Mechanical sample direction	Yield strength	0.2 % yield strength	Tensile strength	Elongation	Hardness
		1.0 T P10 [W/kg]	1.5 T P15 [W/kg]	2500 A/m J25 [T]	5000 A/m J50 [T]	10000 A/m J100 [T]		R_{eH} [MPa]	$R_{p0.2}$ [MPa]	R_m [MPa]	A_{80} [%]	HV5 [-]
isovac® fully processed high-frequency												
voestalpine special grade		**P10**	**P15**	**J25**	**J50**	**J100**		**R_{eH}**	**$R_{p0.2}$**	**R_m**	**A_{80}**	**HV5**
isovac 330-35 A HF	Long. + Trans.	1.20	2.80	1.56	1.65	1.77	Transverse	400	370	520	30	165
isovac HP 270-50 A HF	Long. + Trans.	0.95	2.25	1.58	1.67	1.79	Transverse	460	450	580	23	220
isovac 350-50 A HF	Long. + Trans.	1.30	3.00	1.58	1.66	1.78	Transverse	390	370	510	30	185
isovac 470-50 A HF	Long. + Trans.	1.60	3.80	1.60	1.69	1.81	Transverse	380	360	520	33	170
isovac 800-50 A HF	Long. + Trans.	2.40	5.20	1.64	1.72	1.84	Transverse	375	330	450	35	140
isovac 530-65 A HF	Long. + Trans.	1.65	4.00	1.60	1.69	1.80	Transverse	365	345	500	33	170
isovac 800-65 A HF	Long. + Trans.	2.50	5.50	1.65	1.73	1.85	Transverse	350	315	440	35	140
isovac® fully processed high-strength												
voestalpine special grade		**P10**	**P15**	**J25**	**J50**	**J100**		**R_{eH}**	**$R_{p0.2}$**	**R_m**	**A_{80}**	**HV5**
isovac 470-50 A HS	Long. + Trans.	1.70	3.70	1.55	1.64	1.76	Transverse	560	525	635	26	220
isovac 350-65 A HS	Long. + Trans.	1.30	3.00	1.55	1.64	1.76	Transverse	475	465	600	25	220
isovac 530-65 A HS	Long. + Trans.	2.00	4.50	1.56	1.64	1.76	Transverse	540	510	630	25	215

FULLY PROCESSED ELECTRICAL STEEL

Steel grade	Magnetic sample direction	Specific total loss at 400 Hz [1] 1.0 T P10 [W/kg]	Specific total loss at 400 Hz [1] 1.5 T P15 [W/kg]	Magnetic polarization at 50 Hz [1] 2500 A/m J25 [T]	Magnetic polarization at 50 Hz [1] 5000 A/m J50 [T]	Magnetic polarization at 50 Hz [1] 10000 A/m J100 [T]	Mechanical sample direction	Yield strength R_{eH} [MPa]	0.2 % yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Elongation A_{80} [%]	Hardness HV5 [-]
isovac® automotive grades												
EN 10303 [2]		**P10**	**P15**	**J25**	**J50**	**J100**		**R_{eH}**	**$R_{p0.2}$**	**R_m**	**A_{80}**	**HV5**
isovac HP NO25-13 Y420	Long. + Trans.	On request	On request	On request	On request	On request	Longitudinal	On request	On request	On request	On request	On request
isovac HP NO27-14 Y420	Long. + Trans.	13.50	33.00	1.54	1.64	1.76	Longitudinal	440	435	550	19	180
isovac HP NO27-18 Y320	Long. + Trans.	On request	On request	On request	On request	On request	Longitudinal	On request	On request	On request	On request	On request
isovac HP NO30-15 Y420	Long. + Trans.	14.15	34.90	1.54	1.64	1.76	Longitudinal	440	430	550	19	195
isovac HP NO30-19 Y320	Long. + Trans.	15.80	38.50	1.58	1.67	1.79	Longitudinal	335	330	445	20	145
isovac HP NO35-18 Y420	Long. + Trans.	16.50	40.00	1.55	1.64	1.76	Longitudinal	455	445	570	23	200
isovac HP NO35-19 Y370	Long. + Trans.	17.00	41.30	1.59	1.68	1.80	Longitudinal	380	375	500	21	180
isovac NO35-22 Y460	Long. + Trans.	21.40	51.00	1.51	1.60	1.72	Longitudinal	500	470	600	25	205
isovac NO35-26 Y500	Long. + Trans.	24.50	56.40	1.51	1.60	1.72	Longitudinal	560	530	630	27	210

Further NO grades are available upon request.

Indicated steel grades are excerpts from the isovac® product range.

[1] Magnetic measurement pursuant to DIN IEC 60404-2

[2] Steel grade designation deviates from standard

SEMI-PROCESSED ELECTRICAL STEEL

Steel grade	Magnetic sample direction	Magnetic values after final annealing according to EN 10341: Specific total loss at 50 Hz 1.0 T P10 [W/kg]	Specific total loss at 50 Hz 1.5 T P15 [W/kg]	Magnetic polarization at 50 Hz 2500 A/m J25 [T]	Magnetic polarization at 50 Hz 5000 A/m J50 [T]	Magnetic polarization at 50 Hz 10000 A/m J100 [T]	Relative permeability 1.5 T μ_r [-]	Mechanical sample direction	0.2 % yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Elongation A_{80} [%]	Hardness HV5 [-]
isovac® semi-processed												
EN 10341 [1]		**P10**	**P15**	**J25**	**J50**	**J100**	μ_r		$R_{p0.2}$	R_m	A_{80}	**HV5**
isovac 560-50 K	Long. + Trans.	1.80	4.10	1.64	1.72	1.84	2100	Transverse	440	490	18	180
isovac 660-50 K	Long. + Trans.	2.10	4.90	1.65	1.73	1.85	2400	Transverse	410	455	23	165
isovac 800-65 K	Long. + Trans.	2.70	6.50	1.65	1.74	1.85	2600	Transverse	410	450	22	170
isovac 1000-65 K	Long. + Trans.	3.00	7.40	1.66	1.74	1.86	3000	Transverse	315	365	33	135
isovac 1800-100 K	Long. + Trans.	5.20	14.00	1.66	1.74	1.86	2000	Transverse	315	360	34	130
isovac® semi-processed high-perm												
voestalpine special grade		**P10**	**P15**	**J25**	**J50**	**J100**	μ_r		$R_{p0.2}$	R_m	A_{80}	**HV5**
isovac HP 290-50 K HE	Long. + Trans.	1.10	2.85	1.60	1.68	1.80	1600	Transverse	420	470	22	185
isovac HP 310-50 K HE	Long. + Trans.	1.20	2.90	1.60	1.68	1.80	1500	Transverse	445	490	18	185
isovac® semi-processed high-efficiency												
EN 10341 [1]		**P10**	**P15**	**J25**	**J50**	**J100**	μ_r		$R_{p0.2}$	R_m	A_{80}	**HV5**
isovac 340-50 K HE	Long. + Trans.	1.25	3.15	1.57	1.66	1.78	1100	Transverse	455	500	17	190
isovac 390-50 K HE	Long. + Trans.	1.45	3.50	1.61	1.70	1.82	1750	Transverse	400	450	23	170
isovac 450-50 K HE	Long. + Trans.	1.55	3.80	1.61	1.70	1.82	1750	Transverse	400	450	23	170
isovac 520-65 K HE	Long. + Trans.	1.80	4.40	1.62	1.70	1.82	2100	Transverse	390	450	23	170
voestalpine special grade		**P10**	**P15**	**J25**	**J50**	**J100**	μ_r		$R_{p0.2}$	R_m	A_{80}	**HV5**
isovac 420-50 K HE	Long. + Trans.	1.50	3.60	1.61	1.70	1.82	1750	Transverse	400	450	23	170

[1] Steel grade designation deviates from standard

SEMI-PROCESSED ELECTRICAL STEEL

Steel grade	Magnetic sample direction	Magnetic values after final annealing according to EN 10341: Specific total loss at 60 Hz 1.0 T P10 [W/lb]	Specific total loss at 60 Hz 1.5 T P15 [W/lb]	Magnetic polarization at 60 Hz 2500 A/m J25 [T]	Magnetic polarization at 60 Hz 5000 A/m J50 [T]	Magnetic polarization at 60 Hz 10000 A/m J100 [T]	Relative permeability 1.5 T μ_r [-]	Mechanical sample direction	0.2 % yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Elongation A_{80} [%]	Hardness HV5 [-]
isovac® CRML (Cold Rolled Motor Lamination)												
ASTM A726-05 [1]		**P10**	**P15**	**J25**	**J50**	**J100**	**μ_r**		**$R_{p0.2}$**	**R_m**	**A_{80}**	**HV5**
isovac 47D175	Long. + Trans.	0.66	1.65	1.60	1.68	1.80	1600	Transverse	420	470	22	185
isovac 64D430	Long. + Trans.	1.53	3.78	1.65	1.74	1.85	2600	Transverse	410	450	22	170
voestalpine special grade		**P10**	**P15**	**J25**	**J50**	**J100**	**μ_r**		**$R_{p0.2}$**	**R_m**	**A_{80}**	**HV5**
isovac 47D165	Long. + Trans.	0.63	1.57	1.60	1.68	1.80	1600	Transverse	420	470	22	185

Indicated steel grades are excerpts from the isovac® product range.
Additional CRML grades (Cold Rolled Motor Lamination) are available based on the ASTM A683 and ASTM A726-05 standard.

[1] Steel grade designation deviates from standard

Premium quality with reduced carbon footprint

isovac®
greentec steel

COLD-ROLLED POLE SHEETS

Steel grade	Sample direction	0.2 % yield strength $R_{p0.2}$ min. [MPa]	Tensile strength R_m min. [MPa]	Elongation A_{80} min. [%]	Magnetic polarization Minimum value at [1] 5000 A/m J50 [T]	Magnetic polarization Minimum value at [1] 15000 A/m J150 [T]
Cold-rolled pole sheets						
Standard grades according to EN 10265		$R_{p0.2}$	R_m	A_{80}	J50	J150
250-TF-183	Transverse	250	325	16	1.60	1.83
300-TF-182	Transverse	300	375	15	1.55	1.82
350-TF-181	Transverse	350	425	13	1.52	1.81
400-TF-180	Transverse	400	450	10	1.50	1.80
voestalpine special grade		$R_{p0.2}$	R_m	A_{80}	J50	J150
450-TF-179	Transverse	450	500	10	1.48	1.79
500-TF-178	Transverse	500	530	10	1.46	1.78

The values indicated in the table are guaranteed.

[1] DC (Direct current)

HOT-ROLLED POLE SHEETS

Steel grade	Sample direction	0.2 % yield strength $R_{p0.2}$ min. [MPa]	Tensile strength R_m min. [MPa]	Elongation min. [%] A_{80}	Elongation min. [%] A_5	Magnetic polarization Minimum value at [1] 5000 A/m J50 [T]	Magnetic polarization Minimum value at [1] 15000 A/m J150 [T]
Hot-rolled pole sheets							
Standard grades according to EN 10265		$R_{p0.2}$	R_m	A_{80}	A_5	J50	J150
250-TG-180	Transverse	250	350	22	26	1.60	1.80
300-TG-180	Transverse	300	400	20	24	1.60	1.80
350-TG-179	Transverse	350	450	18	22	1.55	1.79
400-TG-179	Transverse	400	500	16	19	1.55	1.79
450-TG-179	Transverse	450	550	14	17	1.54	1.79
500-TG-179	Transverse	500	600	12	14	1.53	1.79
550-TG-178	Transverse	550	650	12	14	1.52	1.78
600-TG-178	Transverse	600	700	10	12	1.50	1.78
650-TG-178	Transverse	650	750	10	12	1.48	1.78
700-TG-178	Transverse	700	800	10	12	1.46	1.78
Ultra-high-strength voestalpine special grade		$R_{p0.2}$	R_m	A_{80}	A_5	J50	J150
750-VA-175	Long. + Trans.	750	800	10	12	1.46	1.75
900-VA-175	Long. + Trans.	900	940	-	10	1.46	1.75

Measurement of fracture elongation: A_{80} for thicknesses < 3 mm
A_5 for thicknesses ≥ 3 mm

[1] DC (Direct current)

INSULATING VARNISH SYSTEMS AND SERVICES

Deliverable insulating varnish systems					
Product variant	Uncoated	C-3	Backlack	C-5	C-6
isovac®	✓	✓	✓	✓	✓
Cold-rolled pole sheets	✓	✓	On request	✓	✓

Range of properties for available insulating varnish systems						
Requirements	C-3		Backlack	C-5		C-6
Layer thickness	1 µm	2-4 µm	2-8 µm	1 µm	2-3 µm	3-10 µm
Layer thickness tolerance	± 0.5 µm	± 1.0 µm	± 1.0 µm	± 0.5 µm	± 1.0 µm	± 1.5 µm
Insulation resistance	+	++	+++	++	+++	+++
Corrosion resistance	+	++	++	++	+++	+++
Punchability	+++	+++	+++	++	++	++
Al die casting	++	+	+	+++	++	++
Weldability	+	+	+	+++	++	+
Resistance to annealing	+	+	+	+++	++	++
Pressure resistance	+	+	+	+++	++	+++
Abrasion resistance	+++	+++	+++	+++	++	+++
Burn-off repair	+	+	+	+++	++	+++
AISI	C-3	C-3	C-3	C-5	C-5	C-6

+ Not recommended ++ Recommended +++ Highly recommended

Selected services			
Inside coil diameter of 500 mm	Cost-saving advisory services	Material selection and innovation advisory services	Logistics advisory services to effectively reduce lead times

Indicated references are standard values. Limitations are possible depending on thickness. Available insulating varnish systems and combinations of widths and thicknesses vary depending on the steel grade.

Carbon footprint greentec steel product

greentec steel product	Maximum carbon footprint [kg CO_2e/kg steel] [1]
isovac® – electrical steel strip	2.4

[1] The carbon footprint is calculated pursuant to worldsteel CML 2001-2016 (system expansion) on a cradle-to-gate basis.

All products, dimensions and steel grades listed in each voestalpine supply range are available as greentec steel.

DIMENSIONS

Available dimensions: wide strip (coil)				
Product variant	Thickness [mm]	Width [1] max. [mm]	Outside diameter max. [mm]	Inside diameter [mm]
isovac®	0.25 - 1.00	1600	2000	600
Cold-rolled pole sheets	0.70 - 1.00	1600	2000	600
Hot-rolled pole sheets	2.00 - 12.00	1620 (1750)	2000	600

Available dimensions: slit (slit strip)				
Product variant	Thickness [mm]	Strip width [1] [mm]	Outside diameter max. [mm]	Inside diameter [mm]
isovac®	0.25 - 1.00	19 - 1600	850 - 2000	500 / 600
Cold-rolled pole sheets	0.70 - 1.00	19 - 1600	850 - 2000	500 / 600

Available dimensions: cut-to-length (sheet)				
Product variant	Thickness [mm]	Width [mm]	Length [mm]	Package weight max. [t]
isovac®	0.25 - 1.00	300 - 1550	300 - 5000	6
Cold-rolled pole sheets	0.70 - 1.00	300 - 1550	300 - 5000	6
Hot-rolled pole sheets	2.00 - 12.00	900 - 1620 (1750)	1250 - 14000	10

[1] Indicated references are standard values. The available combinations of widths and thicknesses and supply forms vary depending on the steel grade and insulating varnish system. Limitations are possible depending on thickness.

Customized thicknesses can be supplied for individual solutions.

This document provides an overview of the electrical steel products supplied by the voestalpine Steel Division. Other grades are available upon request. Please find further information and downloads under the following link: www.voestalpine.com/isovac

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ONE STEP AHEAD.