



# HOT-DIP GALVANIZED STEEL STRIP

Range of supply  
April 2019

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 <sub>2</sub> min. [MPa]	Exposed
<b>Mild steels</b>									
<b>EN 10346 and voestalpine special grade</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_{90}$	$n_{10-20/Ag}$	BH <sub>2</sub>	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	-	✓
<b>VDA 239-100 and voestalpine special grade</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_{90}$	$n_{10-20/Ag}$	BH <sub>2</sub>	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	-	✓
<b>Structural steels</b>									
<b>EN 10346</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-20/Ag}$	BH <sub>2</sub>	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	-	-	-	-
<b>Micro-alloyed steels</b>									
<b>EN 10346</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_{90}$	$n_{10-20/Ag}$	BH <sub>2</sub>	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	-	-	-	-
<b>VDA 239-100</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-20/Ag}$	BH <sub>2</sub>	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	-	-

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 <sub>2</sub> min. [MPa]	Exposed
<b>Bake-hardening steels</b>									
<b>EN 10346</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_{90}$	$n_{10-20/Ag}$	BH <sub>2</sub>	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	✓
<b>VDA 239-100</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-20/Ag}$	BH <sub>2</sub>	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	✓
<b>High-strength IF steels</b>									
<b>EN 10346</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_{90}$	$n_{10-20/Ag}$	BH <sub>2</sub>	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	-	✓
<b>VDA 239-100</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-20/Ag}$	BH <sub>2</sub>	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	-	✓
<b>Carbon-manganese steels</b>									
<b>Special voestalpine grade</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_{90}$	$n_{10-20/Ag}$	BH <sub>2</sub>	E
HT440CMD	voestalpine	Trans.	280 - 380	≥ 440	25	-	-	-	-
HT590CMD	voestalpine	Trans.	420 - 570	≥ 590	14	-	-	-	-
<b>Dual-phase steels</b>									
<b>EN 10346</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-UE}$	BH <sub>2</sub>	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	-
<b>VDA 239-100 and voestalpine special grade</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-20/Ag}$	BH <sub>2</sub>	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	✓
CR360Y600T-DP	voestalpine	Long.	360 - 460	600 - 710	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	-

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 <sub>2</sub> min. [MPa]	Exposed
<b>Dual-phase high-ductility steels (cold rolled dual-phase steels with improved formability)</b>									
<b>VDA 239-100 and voestalpine special grade</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-20/Ag}$	BH <sub>2</sub>	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	-
<b>Complex-phase steels</b>									
<b>EN 10346</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-UE}$	BH <sub>2</sub>	E
HCT780C	EN 10346	Long.	570 - 720	≥ 780	10	-	-	30	-
HCT980C	EN 10346	Long.	780 - 950	≥ 980	6	-	-	30	-
<b>VDA 239-100 and voestalpine special grade</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-20/Ag}$	BH <sub>2</sub>	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	-
<b>TRIP steels</b>									
<b>EN 10346 and voestalpine special grade</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-UE}$	BH <sub>2</sub>	E
HCT600T	voestalpine	Long.	400 - 520	≥ 600	25	-	-	40	-
HCT690T	EN 10346	Long.	400 - 520	≥ 690	23	-	0.19	40	-
HCT780T	EN 10346	Long.	450 - 570	≥ 780	21	-	0.16	40	-
<b>VDA 239-100 and voestalpine special grade</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-20/Ag}$	BH <sub>2</sub>	E
CR400Y600T-TR	voestalpine	Long.	400 - 520	≥ 600	25	-	-	40	-
CR400Y690T-TR	VDA 239-100	Long.	400 - 520	690 - 800	24	-	0.19	40	-
CR450Y780T-TR	VDA 239-100	Long.	450 - 570	780 - 910	21	-	0.16	40	-

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 <sub>2</sub> min. [MPa]	Exposed
<b>Press-hardening steels</b>									
<b>Special voestalpine grade</b>			$R_{p0.2}$	$R_m$	A	$r_{90}$	$n_{10-20/Ag}$	BH <sub>2</sub>	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	-	-	-	-
<b>Hot-rolled low-alloyed or micro-alloyed steels</b>									
<b>VDA 239-100</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-20/Ag}$	BH <sub>2</sub>	E
HR380LA	VDA 239-100	Long.	380 - 480	450 - 570	20	-	-	-	-
HR420LA	VDA 239-100	Long.	420 - 520	480 - 600	19	-	-	-	-
HR460LA	VDA 239-100	Long.	460 - 560	520 - 640	17	-	-	-	-
HR500LA	VDA 239-100	Long.	500 - 620	560 - 700	14	-	-	-	-
HR700LA	VDA 239-100	Long.	700 - 850	750 - 950	10	-	-	-	-
<b>Hot-rolled ferritic-bainitic steels</b>									
<b>EN 10346</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-20/Ag}$	BH <sub>2</sub>	E
HDT580F	EN10346	Long.	460 - 620	≥ 580	15	-	-	-	-
<b>VDA 239-100 and voestalpine special grade</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-20/Ag}$	BH <sub>2</sub>	E
HR440Y560T-FB	voestalpine	Long.	440 - 600	560 - 680	15	-	-	-	-
HR440Y580T-FB	VDA 239-100	Long.	440 - 600	580 - 700	15	-	-	30	-
<b>Hot-rolled complex-phase steels</b>									
<b>EN 10346</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-20/Ag}$	BH <sub>2</sub>	E
HDT750C	EN 10346	Long.	620 - 760	≥ 750	10	-	-	-	-
HDT760C	EN 10346	Long.	660 - 830	≥ 760	10	-	-	-	-
<b>VDA 239-100</b>			$R_{p0.2}$	$R_m$	$A_{80}$	$r_0$	$n_{10-20/Ag}$	BH <sub>2</sub>	E
HR660Y760T-CP	VDA 239-100	Long.	660 - 820	760 - 960	10	-	-	30	-

\* 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

# 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

# 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](http://www.voestalpine.com/steel)

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ONE STEP AHEAD.