Micro-alloyed steels

High-strength steels with yield strengths up to 800 MPa

Microalloyed steels (HSLA = high strength low alloyed) are members of the product family of conventional high-strength steels. They feature a wide variety of yield strength levels and cover the upper strength range of conventional high-strength steels. They are characterized by a high ratio of yield to tensile strength, good cold formability and good weldability. The individual strength classes are adjusted essentially by adding microalloying elements such as niobium, titanium and vanadium. These alloying elements can be added individually or in combination and lead to increased strength through grain refinement and precipitation hardening. Carbon additions and solid-solution strengthening are also used to increase the strength. As a result of their wide range of strength levels, microalloyed steels offer the possibility of optimally selecting the materials to conform to component requirements and are thus very well suited to the manufacture of structural and chassis parts.

Convincing advantages

- Wide range of strength levels with yield strengths up to 800 MPa
- High ratio of yield to tensile strength
- Very good cold formability
- Good weldability
- Corrosion resistance based on ZE/EG, Z/GI, ZF/GA or ZM coatings

greentec steel

PREMIUM QUALITY
WITH REDUCED
CARBON FOOTPRINT

Chemical composition

Heat analysis in % by mass

Steel grade	C max.	Si max.	Mn max.	P max.	S max.	Al_{total} min.	Nb max.	Ti max.
Pursuant to EN 10346								
HX260LAD	0.11	0.50	1.0	0.030	0.025	0.015	0.09	0.15
HX300LAD	0.12	0.50	1.4	0.030	0.025	0.015	0.09	0.15
HX340LAD	0.12	0.50	1.4	0.030	0.025	0.015	0.10	0.15
HX380LAD	0.12	0.50	1.5	0.030	0.025	0.015	0.10	0.15
HX420LAD	0.12	0.50	1.6	0.030	0.025	0.015	0.10	0.15
HX460LAD	0.15	0.50	1.7	0.030	0.025	0.015	0.10	0.15
HX500LAD	0.15	0.50	1.7	0.030	0.025	0.015	0.10	0.15

Steel grade	C max.	Si max.	Mn max.	P max.	S max.	Al min.	Nb max.	Ti max.
Pursuant to EN 10268								
HC260LA	0.10	0.5	1.0	0.030	0.025	0.015	0.09	0.15
HC300LA	0.12	0.5	1.4	0.030	0.025	0.015	0.09	0.15
HC340LA	0.12	0.5	1.5	0.030	0.025	0.015	0.09	0.15
HC380LA	0.12	0.5	1.6	0.030	0.025	0.015	0.09	0.15
HC420LA	0.14	0.5	1.6	0.030	0.025	0.015	0.09	0.15
HC460LA	0.14	0.6	1.8	0.030	0.025	0.015	0.09	0.15
HC500LA	0.14	0.6	1.8	0.030	0.025	0.015	0.09	0.15

Steel grade	C max.	Si max.	Mn max.	P max.	S max.	Al min.	Nb max.	Ti max.	Cu max.
Pursuant to VDA 239-100									
CR210LA	0.10	0.5	1.00	0.080	0.030	0.015	0.10	0.15	0.20
CR240LA	0.10	0.5	1.00	0.030	0.025	0.015	0.09	0.15	0.20
CR270LA	0.12	0.5	1.00	0.030	0.025	0.015	0.09	0.15	0.20
CR300LA	0.12	0.5	1.40	0.030	0.025	0.015	0.09	0.15	0.20
CR340LA	0.12	0.5	1.50	0.030	0.025	0.015	0.09	0.15	0.20
CR380LA	0.12	0.5	1.60	0.030	0.025	0.015	0.09	0.15	0.20
CR420LA	0.12	0.5	1.65	0.030	0.025	0.015	0.09	0.15	0.20
CR460LA	0.13	0.6	1.70	0.030	0.025	0.015	0.10	0.15	0.20
CR500LA	0.14	0.6	1.70	0.030	0.025	0.015	0.10	0.15	0.20
voestalpine special grade									
CR800LA	0.12	0.5	1.60	0.025	0.010	0.015	0.10	0.15	0.20

Mechanical properties: Tensile test

Steel grade	Test direction	0.2 % yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elongation A_{80} min. [1] [%]	r-value r_{90} [1] min.	n-value $n_{10\text{-}20/Ag}$ min.
Pursuant to EN 10346						
HX260LAD	Transverse	260 – 330	350 – 430	26	-	-
HX300LAD	Transverse	300 – 380	380 – 480	23	-	-
HX340LAD	Transverse	340 – 420	410 – 510	21	-	-
HX380LAD	Transverse	380 – 480	440 – 560	19	-	-
HX420LAD	Transverse	420 – 520	470 – 590	17	-	-
HX460LAD	Transverse	460 – 560	500 – 640	15	-	-
HX500LAD	Transverse	500 – 620	530 – 690	13	-	-
Pursuant to EN 10268						
HC260LA	Transverse	260 – 330	350 – 430	26	-	-
HC300LA	Transverse	300 – 380	380 – 480	23	-	-
HC340LA	Transverse	340 – 420	410 – 510	21	-	-
HC380LA	Transverse	380 – 480	440 – 580	19	-	-
HC420LA	Transverse	420 – 520	470 – 600	17	-	-
HC460LA	Transverse	460 – 580	510 – 660	13	-	-
HC500LA	Transverse	500 – 620	550 – 710	12	-	-

Steel grade	Test direction	0.2 % yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elongation A_{80} min. [1] [%]	r-value r_0 [1] min.	n-value $n_{10\text{-}20/Ag}$ min.
Pursuant to VDA 239-100						
CR210LA	Longitudinal	210 – 300	310 – 410	29	1.0	0.15
CR240LA	Longitudinal	240 – 320	320 – 430	27	-	0.14
CR270LA	Longitudinal	270 – 350	350 – 460	25	-	0.13
CR300LA	Longitudinal	300 – 380	380 – 490	23	-	0.12
CR340LA	Longitudinal	340 – 430	410 – 530	21	-	0.10
CR380LA	Longitudinal	380 – 470	450 – 570	19	-	-
CR420LA	Longitudinal	420 – 520	480 – 600	17	-	-
CR460LA	Longitudinal	460 – 580	520 – 680	15	-	-
CR500LA	Longitudinal	500 – 620	560 – 740	13	-	-
voestalpine special grade						
CR800LA	Longitudinal	800 – 950	830 – 1030	9	-	-

[1] Thickness and coating limitations pursuant to EN 10346 and VDA 239-100.

Coatings and available dimensions

Available thicknesses [mm] based on coating

Steel grade pursuant to							
EN 10346	EN 10268	VDA 239-100	Uncoated/UC	ZE/EG	Z/GI	ZF/GA	ZM/ZM
-	-	CR210LA	0.40 – 1.75	0.40 – 1.75	0.50 – 2.50	0.60 – 2.00	0.50 – 2.00
HX260LAD	HC260LA	CR240LA	0.50 – 2.50	0.50 – 2.00	0.50 – 2.50	0.50 – 2.30	0.50 – 2.00
HX300LAD	HC300LA	CR270LA	0.50 – 2.50	0.50 – 2.50	0.50 – 2.50	0.50 – 2.30	0.50 – 2.00
HX340LAD	HC340LA	CR300LA	0.60 – 2.50	0.60 – 2.50	0.50 – 2.50	0.50 – 2.30	0.50 – 2.00
HX380LAD	HC380LA	CR340LA	0.60 – 2.50	0.60 – 2.50	0.50 – 2.50	0.50 – 2.30	0.50 – 2.00
HX420LAD	HC420LA	CR380LA	0.70 – 2.50	0.70 – 2.50	0.60 – 2.50	0.60 – 2.00	0.60 – 2.00
HX460LAD	HC460LA	CR420LA	0.60 – 1.60	0.90 – 1.60	0.50 – 2.00	On request	0.60 – 2.00
HX500LAD	HC500LA	CR460LA	0.50 – 1.60	On request	0.50 – 2.00	On request	0.60 – 2.00
HX550LAD	HC550LA	CR500LA	0.90 – 1.60	On request	1.00 – 2.00	-	On request

voestalpine special grade			Uncoated/UC	ZE/EG	Z/GI	ZF/GA	ZM/ZM
-	-	CR800LA	1.40 – 1.80	-	-	-	-

Please find available dimensions at www.voestalpine.com/Produktinformationsportal or contact us directly.

greentec steel

Premium quality with reduced carbon footprint

Cold-rolled steel strip – greentec steel Edition

Max. carbon footprint 1.97 kg CO_2e per kg of steel [1)]

Hot-dip galvanized steel strip – greentec steel Edition

Max. carbon footprint 2.13 kg CO_2e per kg of steel [1)]

Electrogalvanized steel strip – greentec steel Edition

Max. carbon footprint 2.19 kg CO_2e per kg of steel [1)]

[1)] per EN 15804+A2 (EPD methodology) cradle to gate

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

Please find further information and downloadable files at **www.voestalpine.com/steel**

voestalpine Stahl GmbH
voestalpine-Straße 3
4020 Linz, Austria
produktmanagement@voestalpine.com
www.voestalpine.com/steel

voestalpine
ONE STEP AHEAD.