



Micro-alloyed steels

High-strength steels with yield strengths up to 550 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 550 MPa
- » High ratio of yield to tensile strength
- » Very good cold formability
- » Good weldability
- » Corrosion resistance based on ZE, Z, ZF, EG, GI, GA or ZM coatings

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 and voestalpine special grade								
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
HX550LAD ¹⁾	0.15	0.60	1.8	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 and voestalpine special grade								
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
HC550LA ¹⁾	0.15	0.6	1.8	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.	Cu max.
Pursuant to VDA 239-100 and voestalpine special grade									
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 ¹⁾	0.15	0.6	1.80	0.030	0.025	0.015	0.10	0.15	0.20

¹⁾ voestalpine special grade

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 $n_{10-20/Ag}$ min.
Pursuant to EN 10346 and voestalpine special grade						
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	-	-
HX550LAD ¹⁾	transverse	min. 550	min. 590	10	-	-

Pursuant to EN 10268 and voestalpine special grade						
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	-	-
HC550LA ¹⁾	transverse	min. 550	min. 590	10	-	-

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 $n_{10-20/Ag}$ min.
Pursuant to VDA 239-100 and voestalpine special grade						
CR210LA	longitudinal	210 – 300	310 – 410	29	1.0	0.15
CR240LA	longitudinal	240 – 320	320 – 420	27	-	0.15
CR270LA	longitudinal	270 – 350	350 – 450	25	-	0.14
CR300LA	longitudinal	300 – 380	370 – 470	23	-	0.14
CR340LA	longitudinal	340 – 430	410 – 520	21	-	0.12
CR380LA	longitudinal	380 – 470	450 – 560	19	-	0.12
CR420LA	longitudinal	420 – 520	480 – 590	17	-	0.11
CR460LA	longitudinal	460 – 580	520 – 680	15	-	0.10
CR500LA ¹⁾	longitudinal	500 – 620	560 – 720	14	-	0.09

¹⁾ voestalpine special grade

¹⁾ Thickness and coating limitations pursuant to EN 10346, EN 10268, VDA 239-100 and voestalpine special grades.

Coatings and available dimensions

Available thicknesses [mm] based on coating

EN 10346	Steel grade pursuant to		Uncoated / UC	ZE / EG	Z / GI	ZF / GA	ZM / ZM
	EN 10268 and voestalpine special grade	VDA 239-100 and voestalpine special grade					
-	-	CR210LA	0.5 – 1.6	0.4 – 1.6	0.6 – 2.5	0.6 – 2.0	0.5 – 1.8
HX260LAD	HC260LA	CR240LA	0.5 – 2.5	0.5 – 2.0	0.5 – 2.5	0.5 – 2.0	0.5 – 2.0
HX300LAD	HC300LA	CR270LA	0.5 – 2.5	0.5 – 2.5	0.5 – 2.5	0.5 – 2.0	0.5 – 2.0
HX340LAD	HC340LA	CR300LA	0.6 – 2.5	0.6 – 2.5	0.5 – 2.5	0.5 – 2.0	0.5 – 2.0
HX380LAD	HC380LA	CR340LA	0.6 – 2.5	0.6 – 2.5	0.5 – 2.5	0.5 – 2.0	0.5 – 2.0
HX420LAD	HC420LA	CR380LA	0.7 – 2.5	0.7 – 2.5	0.6 – 2.5	0.6 – 2.0	0.6 – 2.0
HX460LAD	HC460LA	CR420LA	0.9 – 1.6	0.9 – 1.6	0.6 – 2.0	0.6 – 2.0	0.6 – 2.0
HX500LAD	HC500LA	CR460LA	0.6 – 1.6	0.6 – 1.6	0.6 – 2.1	On request	On request
HX550LAD ¹⁾	HC550LA ¹⁾	CR500LA ¹⁾	0.9 – 1.5	0.9 – 1.5	On request	Under development	Under development

¹⁾ voestalpine special grade

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

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