

HOT-ROLLED STEEL STRIP FOR THE AUTOMOTIVE INDUSTRY

A wide range of high-strength hot-rolled steels developed for complex component geometries with demanding forming operations

Hot-rolled steel grades developed for applications in the automotive industry have been combined in the "hot-rolled drive" steel product family. In order to meet the requirements of lightweight automotive design, "hot-rolled drive" grades feature above-average processing properties in addition to the properties specified in VDA 239-100. Microalloyed steels are characterized by a very fine-grained and largely single-phase microstructure. The steels of the LAS series are particularly suitable for the most demanding forming operations along punched edges.

Complex-phase steels, ferritic-bainitic steels and dual-phase steels feature a more pronounced transformation-hardened microstructure with a higher proportion of secondary phases. This leads to a customized balance between total elongation and hole expansion in order to implement complex forming operations. The hardened microstructure of martensitic steels feature maximum tensile strength while maintaining good formability, especially for bending applications.

Convincing advantages

- » Excellent suitability for bending and deep drawing
- » Best cutting and punching properties
- » Excellent formability of punched edges and high resistance to edge cracking
- » Excellent weldability



Premium quality with reduced carbon footprint

hot-rolled drive



Chemical composition

Heat analysis in % by mass

Steel grade	Standard	C max.	Si max.	Mn max.	P max.	S max.	Al min.	Nb max.	Ti max.	Cu max.
Hot-rolled micro-	-alloyed steels									
HR300LA	VDA239-100	0.12	0.50	1.30	0.030	0.025	0.015	0.10	0.15	0.20
HR340LA	VDA239-100	0.12	0.50	1.50	0.030	0.025	0.015	0.10	0.15	0.20
HR380LA	VDA239-100	0.12	0.50	1.50	0.030	0.025	0.015	0.10	0.15	0.20
HR420LA	VDA239-100	0.12	0.50	1.60	0.030	0.025	0.015	0.10	0.15	0.20
HR460LA	VDA239-100	0.12	0.50	1.65	0.030	0.025	0.015	0.10	0.15	0.20
HR500LA	VDA239-100	0.12	0.50	1.70	0.030	0.025	0.015	0.10	0.15	0.20
HR550LA	VDA239-100	0.12	0.60	1.80	0.030	0.025	0.015	0.10	0.15	0.20
HR600LA ¹⁾	voestalpine	0.12	0.60	1.90	0.030	0.025	0.015	0.10	0.20	0.20
HR700LA	VDA239-100	0.12	0.60	2.10	0.030	0.025	0.015	0.10	0.20	0.20

¹⁾Steel grade being developed

Hot-rolled and micro-alloyed steels with improved formability of punched edges LAS stands for hot-rolled, micro-alloyed steels with adapted hot-rolling parameters

and a significantly	reduced sulfur co	ntent as com	pared to stand	dard grades.							
HR300LAS	VDA239-100	0.12	0.50	1.30	0.030	0	.010 0	.015	0.10	0.15	0.20
HR340LAS	VDA239-100	0.12	0.50	1.50	0.030	0	.010 0	.015	0.10	0.15	0.20
HR380LAS	VDA239-100	0.12	0.50	1.50	0.030	0	.010 0	.015	0.10	0.15	0.20
HR420LAS	VDA239-100	0.12	0.50	1.60	0.030	0	.010 0	.015	0.10	0.15	0.20
HR460LAS	VDA239-100	0.12	0.50	1.65	0.030	0	.008 0	.015	0.10	0.15	0.20
HR500LAS	VDA239-100	0.12	0.50	1.70	0.030	0	.005 0	.015	0.10	0.15	0.20
HR550LAS	VDA239-100	0.12	0.60	1.80	0.030	0	.005 0	.015	0.10	0.15	0.20
HR700LAS	VDA239-100	0.12	0.60	2.10	0.030	0	.005 0	.015	0.10	0.20	0.20
Steel grade	Standard	C max.	Si max.	Mn max.	P max.	S max.	AI	Ti+Nb max.	Cr+Mo max.	B max.	Cu max.
Hot-rolled comple	•										
HR660Y760T-CP	VDA239-100	0.18	1.00	2.20	0.050	0.010	0.015 - 1.2	0.25	1.00	0.005	0.20
Hot-rolled ferritic-	bainitic steels										
HR440Y580T-FB	VDA239-100	0.18	0.50	2.00	0.050	0.010	0.015 - 2.0	0.15	1.00	0.010	0.20
Hot-rolled dual-ph	nase steels										
DP600LCT	voestalpine	0.12	1.20	1.60	0.085	0.006	0.02 - 0.06	0.15	1.40	0.005	0.20
Hot-rolled marten	sitic steels										
HR900Y1180T-MS	VDA239-100	0.25	0.80	2.50	0.050	0.010	0.015 - 2.0	0.25	1.20	0.005	0.20



Mechanical properties: Tensile test

Test direction: longitudinal

$A_{\scriptscriptstyle 80\,mm}$ for thicknesses < 3 mm

 A_5 for thicknesses $\ge 3 \text{ mm}$

		0.2 %-yield strength R _{p0.2}	Tensile strength R_m	Total elong A _{80 mm}	gation min. A5	n value min. n _{10 - 20/Ag}
Steel grade	Standard	[MPa]	[MPa]	[%]	[%]	10 - 20/Ag
Hot-rolled micro-	-alloyed steels					
HR300LA	VDA239-100	300 - 380	380 - 500	24	28	0.14
HR340LA	VDA239-100	340 - 440	420 - 540	22	26	0.13
HR380LA	VDA239-100	380 - 480	450 - 570	20	24	-
HR420LA	VDA239-100	420 - 520	480 - 600	18	22	-
HR460LA	VDA239-100	460 - 560	520 - 640	16	20	-
HR500LA	VDA239-100	500 - 620	560 - 700	14	17	-
HR550LA	VDA239-100	550 - 670	610 – 750	12	16	-
HR600LA ¹⁾	voestalpine	600 - 750	650 - 820	11	15	-
HR700LA	VDA239-100	700 - 850	750 - 950	10	13	-

¹⁾Steel grade being developed

Hot-rolled and micro-alloyed steels with improved formability of punched edges

The hot-rolled microalloyed steels of the LAS series are characterized by enhanced formability, especially with respect to the formability of punched edges.

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HR300LAS	VDA239-100	300 - 380	380 - 500	24	28	0.14
HR340LAS	VDA239-100	340 - 440	420 - 540	22	26	0.13
HR380LAS	VDA239-100	380 - 480	450 - 570	20	24	-
HR420LAS	VDA239-100	420 - 520	480 - 600	18	22	-
HR460LAS	VDA239-100	460 - 560	520 - 640	16	20	-
HR500LAS	VDA239-100	500 - 620	560 - 700	14	17	-
HR550LAS	VDA239-100	550 - 670	610 – 750	12	16	-
HR700LAS	VDA239-100	700 - 850	750 – 950	10	13	-
-						

		0.2 %-yield strength	Tensile strength	Total elong		BH ₂ value min.
Steel grade	Standard	R _{p0.2} [MPa]	R _m [MPa]	A _{80 mm} [%]	A₅ [%]	[MPa]
Hot-rolled comple	x-phase steels					
HR660Y760T-CP	VDA239-100	660 - 820	760 - 960	10	13	30
Hot-rolled ferritic-	bainitic steels					
HR440Y580T-FB	VDA239-100	440 - 600	580 - 700	15	17	30
Hot-rolled dual-ph	nase steels					
DP600LCT	voestalpine	> 300	580 - 670	18	22	30
Hot-rolled marten	sitic steels					
HR900Y1180T-MS	VDA 239-100	900 - 1150	1180 - 1400	5	8	30



Coatings and available dimensions

Available thicknesses [mm] based on surface finish

Steel grade	UC (uncoated)	GI (hot-dip galvanized)
Hot-rolled micro-alloyed steels		
HR300LA	2.0 - 6.02)	-
HR340LA	2.0 - 6.0	
HR380LA	2.0 - 6.02)	2.0 - 4.0
HR420LA	2.0 - 6.0	2.0 - 4.0
HR460LA	2.0 - 6.02)	2.0 - 3.5
HR500LA	2.0 - 6.0	2.0 - 3.02)
HR550LA	2.0 - 6.0	2.0 - 3.0 ²⁾
HR600LA ¹⁾	-	-
HR700LA	2.0 - 6.0	2.0 - 3.5
Thermomechanically rolled and	micro-alloyed steels with improved formability	
HR300LAS	2.0 - 6.02)	-
HR340LAS	2.0 - 6.02)	-
HR380LAS	2.0 - 6.02)	-
HR420LAS	2.0 - 6.02)	-
HR460LAS	2.0 - 6.02)	
HR500LAS	2.0 - 6.02)	2.0 - 3.02)
HR550LAS	2.0 - 6.02)	-
HR700LAS	2.0 - 4.03)	-
Hot-rolled complex-phase steel	s.	
HR660Y760T-CP	2.0 - 5.02)	2.0 - 3.5
Hot-rolled ferritic-bainitic steels		
HR440Y580T-FB	2.0 - 5.0	2.0 - 3.52)
Hot-rolled dual-phase steels		
not rolled dudi-plidae ateels		-
DP600LCT	$2.8 - 6.5^{3}$	
DP600LCT	2.8 - 6.5 ³)	-
DP600LCT Hot-rolled martensitic steels	2.8 - 6.5 ³	-

¹⁾Steel grade being developed ²⁾After consultation with quality department

³⁾The production possibilities for other thicknesses can be determined upon request

Please find further information at www.voestalpine.com/Produktinformationsportal or contact us directly.



OUR PATH TO A GREENER FUTURE

Premium products in the greentec steel Edition

With greentec steel, voestalpine is pursuing an ambitious step-by-step plan in the long-term decarbonization of steel production. The declared objective is to achieve carbon-neutral production by 2050, and the initial steps have already been taken. Process-optimized production operations already prevent up to 10% of the direct CO_2 emissions at the Linz site. The material and processing properties of the steel are not affected in any way in this production route. Each voestalpine steel strip product is available in premium quality in the greentec steel Edition with a reduced carbon footprint and unique benefits.



Premium quality with reduced carbon footprint

hot-rolled drive

Hot-rolled steel strip – greentec steel Edition Max. carbon footprint 1.95 kg CO₂e per kg of steel ¹⁾ Hot-dip galvanized steel strip – greentec steel Edition Max. carbon footprint 2.13 kg CO₂e 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.

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