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

greentec steel

Premium quality
with reduced carbon footprint

hot-rolled drive
greentec steel

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	VDA239-100	0.12	0.60	2.00	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
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 content as compared to standard 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
HR600LAS[2)]	voestalpine	0.12	0.60	2.00	0.030	**0.005**	0.015	0.10	0.20	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.	Al	Ti+Nb max.	Cr+Mo max.	B max.	Cu max.
Hot-rolled complex-phase steels											
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
HR750Y950T-CP[2)]	VDA239-100	0.23	1.00	2.70	0.050	0.010	0.015 – 1.2	0.25	1.20	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-phase steels											
DP600LCT[2)]	voestalpine	0.12	1.2	1.6	0.085	0.006	0.02 – 0.06	0.15	1.4	0.005	0.2
Hot-rolled martensitic 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

[1)] Steel grade being developed
[2)] After consultation with quality department
[3)] The production possibilities for other thicknesses can be determined upon request

Mechanical properties: Tensile test

Test direction: longitudinal

$A_{80\ mm}$ for thicknesses < 3 mm
A_5 for thicknesses ≥ 3 mm

Steel grade	Standard	0.2 %-yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elongation min. $A_{80\ mm}$ [%]	Total elongation min. A_5 [%]	n value min. $n_{10-20/Ag}$
Hot-rolled micro-alloyed steels						
HR300LA	VDA239-100	300 – 400	380 – 500	24	28	0.12
HR340LA	VDA239-100	340 – 440	420 – 540	22	26	0.10
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	VDA239-100	600 – 730	650 – 800	11	15	-
HR700LA	VDA239-100	700 – 850	750 – 950	10	13	-
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.						
HR300LAS	VDA239-100	300 – 400	380 – 500	24	28	0.12
HR340LAS	VDA239-100	340 – 440	420 – 540	22	26	0.10
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	-
HR600LAS[2]	voestalpine	600 – 730	650 – 800	10	14	-
HR700LAS	VDA239-100	700 – 850	750 – 950	10	13	-

Steel grade	Standard	0.2 %-yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elongation min. $A_{80\ mm}$ [%]	Total elongation min. A_5 [%]	BH_2 value min. [MPa]
Hot-rolled complex-phase steels						
HR660Y760T-CP	VDA239-100	660 – 820	760 – 960	10	13	30
HR750Y950T-CP[2]	VDA239-100	750 – 950	950 – 1150	7	9	-
Hot-rolled ferritic-bainitic steels						
HR440Y580T-FB	VDA239-100	440 – 600	580 – 700	15	16	30
Hot-rolled dual-phase steels						
DP600LCT[2]	voestalpine	≥ 300	580 – 670	18	22	30
Hot-rolled martensitic steels						
HR900Y1180T-MS	VDA 239-100	900 – 1150	1180 – 1400	5	8	-

[1] Steel grade being developed
[2] After consultation with quality department
[3] The production possibilities for other thicknesses can be determined upon request

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 – 6.5	2.0 – 4.0[1)]
HR340LA	2.0 – 6.5	2.0 – 4.0[1)]
HR380LA	2.0 – 6.5	2.0 – 4.0
HR420LA	2.0 – 6.5	2.0 – 4.0
HR460LA	2.0 – 6.5	2.0 – 3.5
HR500LA	2.0 – 6.5	2.0 – 3.0[2)]
HR550LA	2.0 – 6.5	2.0 – 3.0[2)]
HR600LA	2.0 – 6.5	-
HR700LA	2.0 – 6.5	2.0 – 3.5
Thermomechanically rolled and micro-alloyed steels with improved formability		
HR300LAS	2.0 – 6.0	-
HR340LAS	2.0 – 6.0	-
HR380LAS	2.0 – 6.0	-
HR420LAS	2.0 – 6.0[2)]	-
HR460LAS	2.0 – 6.0	-
HR500LAS	2.0 – 6.0[2)]	2.0 – 3.0[2)]
HR550LAS	2.0 – 6.0	-
HR600LAS	2.0 – 6.0[2)]	-
HR700LAS	2.0 – 4.0[3)]	-
Hot-rolled complex-phase steels		
HR660Y760T-CP	2.0 – 5.0	2.0 – 3.5
HR750Y950T-CP	-[2)]	-
Hot-rolled ferritic-bainitic steels		
HR440Y580T-FB	2.0 – 5.0	2.0 – 3.5
Hot-rolled dual-phase steels		
DP600LCT[2)]	2.8 – 6.5[2)]	-
Hot-rolled martensitic steels		
HR900Y1180T-MS	3.0 – 4.1[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.

greentec steel

Premium quality with reduced carbon footprint

hot-rolled drive

greentec steel

Hot-rolled steel strip – greentec steel Edition
Max. carbon footprint 1.95 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]

[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/ultralights

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

voestalpine
ONE STEP AHEAD.