Dual-phase steels

The classical steel with tensile strengths of up to 1000 MPa and superb drawing properties

Dual-phase steels are part of the ahss classic product line of voestalpine in the field of ultralights and are characterized by excellent physical properties, including low yield strength, high work hardening, high tensile strength as well as high uniform and fracture elongation. The finely tuned microstructure achieves a balance between deep-drawing capacity and resistance to edge cracking. These steels are ideal for applications in complex structural components. Galvanized surfaces provide the best corrosion protection, and selected grades are also available for exposed applications. The balance between strength, formability and weldability of dual-phase steels leads to enormous potential in light-weight design while also achieving improved crash performance.

Convincing advantages

- Customized levels of yield strength with minimum tensile strengths of 450, 490, 590, 780 and 980 MPa
- Excellent cold workability with respect to ductility
- Balanced relationship between drawing properties and resistance to edge cracking
- Excellent crash behavior
- Corrosion resistance based on ZE/EG, Z/GI or ZF/GA coatings
- Selected grades also available in exposed-panel quality

greentec steel

Premium quality
with reduced carbon footprint

ahss classic
greentec steel

Chemical composition

Heat analysis in % by mass

Steel grade	C max.	Si max.	Mn max.	P max.	S max.	Al total	Cr + Mo max.	Ti + Nb max.	V max.	B max.
Pursuant to EN 10346 and EN 10338										
HCT450X	0.14	0.75	2.00	0.080	0.015	0.015 – 1.0	1.00	0.15	0.20	0.005
HCT490X	0.14	0.75	2.00	0.080	0.015	0.015 – 1.0	1.00	0.15	0.20	0.005
HCT590X	0.15	0.75	2.50	0.040	0.015	0.015 – 1.5	1.40	0.15	0.20	0.005
HCT780X	0.18	0.80	2.50	0.080	0.015	0.015 – 2.0	1.40	0.15	0.20	0.005
HCT980X	0.20	1.00	2.90	0.080	0.015	0.015 – 2.0	1.40	0.15	0.20	0.005

Steel grade	Norm	C max.	Si max.	Mn max.	P max.	S max.	Al	Cr + Mo max.	Ti + Nb max.	B max.	Cu max.
Pursuant to VDA 239-100 and voestalpine special grades											
CR260Y450T-DP	voestalpine	0.14	0.50	1.80	0.050	0.010	0.015 – 1.0	1.00	0.15	0.005	0.20
CR290Y490T-DP	VDA 239-100	0.14	0.50	1.80	0.050	0.010	0.015 – 1.0	1.00	0.15	0.005	0.20
CR330Y590T-DP	VDA 239-100	0.15	0.80	2.50	0.050	0.010	0.015 – 1.5	1.40	0.15	0.005	0.20
CR360Y590T-DP	voestalpine	0.15	0.80	2.50	0.050	0.010	0.015 – 1.5	1.40	0.15	0.005	0.20
CR440Y780T-DP	VDA 239-100	0.18	0.80	2.50	0.050	0.010	0.015 – 1.0	1.40	0.15	0.005	0.20
CR500Y780T-DP	VDA 239-100	0.18	0.80	2.50	0.050	0.010	0.015 – 1.0	1.40	0.15	0.005	0.20
CR550Y980T-DP	voestalpine	0.20	1.00	2.90	0.050	0.010	0.015 – 1.0	1.40	0.15	0.005	0.20
CR590Y980T-DP	VDA 239-100	0.20	1.00	2.90	0.050	0.010	0.015 – 1.0	1.40	0.15	0.005	0.20
CR660Y980T-DP	voestalpine	0.23	1.00	2.90	0.050	0.010	0.015 – 1.0	1.40	0.15	0.005	0.20
CR700Y980T-DP	VDA 239-100	0.23	1.00	2.90	0.050	0.010	0.015 – 1.0	1.40	0.15	0.005	0.20

Mechanical properties: Tensile test

Steel grade	Test direction	0.2 % yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m min. [MPa]	Total elongation A_{80} min. [1] [%]	n-value $n_{10\text{-}UE}$ min.	BH_2 min. [MPa]
Pursuant to EN 10346 and EN 10338						
HCT450X	Longitudinal	260 – 340	450	27	0.16	30
HCT490X	Longitudinal	290 – 380	490	24	0.15	30
HCT590X	Longitudinal	330 – 430	590	20	0.14	30
HCT780X	Longitudinal	440 – 550	780	14	-	30
HCT980X	Longitudinal	590 – 740	980	10	-	30

Steel grade	Standard	Test direction	0.2 % yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Total elongation A_{80} min. [1] [%]	n-value $n_{10\text{-}20/UE}$ min.	BH_2 min. [MPa]
Pursuant to VDA 239-100 and voestalpine special grades							
CR260Y450T-DP	voestalpine	Longitudinal	260 – 340	450 – 560	27	0.16	30
CR290Y490T-DP	VDA 239-100	Longitudinal	290 – 380	490 – 600	24	0.15	30
CR330Y590T-DP	VDA 239-100	Longitudinal	330 – 430	590 – 700	20	0.14	30
CR360Y590T-DP	voestalpine	Longitudinal	360 – 460	590 – 700	19	0.14	30
CR440Y780T-DP	VDA 239-100	Longitudinal	440 – 550	780 – 900	14	0.11	30
CR500Y780T-DP	VDA 239-100	Longitudinal	500 – 620	780 – 900	12	-	30
CR550Y980T-DP	voestalpine	Longitudinal	550 – 730	980 – 1130	10	-	- [2]
CR590Y980T-DP	VDA 239-100	Longitudinal	590 – 740	980 – 1130	10	-	- [2]
CR660Y980T-DP	voestalpine	Transverse	660 – 810	980 – 1130	10	-	- [2]
CR700Y980T-DP	VDA 239-100	Longitudinal	700 – 850	980 – 1130	8	-	- [2]

[1] Restrictions based on thicknesses and coatings pursuant to EN 10346, EN 10338, VDA 239-100 and special voestalpine grades

[2] The BH_2 value cannot be determined using the specified method for grades with tensile strengths ≥ 950 MPa

Coatings and available dimensions

Available thicknesses [mm] per coating

Steel grade	Uncoated	ZE	Z	ZF
Pursuant to EN 10346 and EN 10338				
HCT450X	0.6 – 1.8	0.6 – 1.8	0.5 – 2.25	0.5 – 2.1
HCT490X	0.6 – 1.8	0.6 – 1.8	0.6 – 2.25	0.6 – 2.1
HCT590X	0.7 – 1.8	0.7 – 1.8	0.6 – 2.25	0.6 – 2.1
HCT780X	0.7 – 1.6	0.7 – 1.6	0.7 – 2.10	0.7 – 2.1
HCT980X	0.8 – 1.2	0.8 – 1.2	0.8 – 2.00	0.8 – 2.0

Steel grade	Standard	UC	EG	GI	GA
Pursuant to VDA 239-100 and voestalpine special grades					
CR260Y450T-DP	voestalpine	0.6 – 1.8	0.6 – 1.8	0.50 – 2.25	0.50 – 2.10
CR290Y490T-DP	VDA 239-100	0.6 – 1.8	0.6 – 1.8	0.60 – 2.25	0.60 – 2.10
CR330Y590T-DP	VDA 239-100	0.7 – 1.8	0.7 – 1.8	0.65 – 2.50	0.65 – 2.30
CR360Y590T-DP	voestalpine	0.7 – 1.8	0.7 – 1.8	0.65 – 2.25	Not available
CR440Y780T-DP	VDA 239-100	0.7 – 1.6	0.7 – 1.6	0.70 – 2.30	0.70 – 2.30
CR500Y780T-DP	VDA 239-100	0.7 – 1.6	0.7 – 1.6	0.70 – 2.30	0.70 – 2.30
CR550Y980T-DP	voestalpine	0.8 – 1.4	Not available	0.80 – 2.30	Upon request
CR590Y980T-DP	VDA 239-100	0.8 – 1.4	0.8 – 1.2	0.80 – 2.30	0.80 – 2.30
CR660Y980T-DP	voestalpine	0.8 – 1.6	0.8 – 1.6	0.80 – 2.10	0.80 – 2.10
CR700Y980T-DP	VDA 239-100	0.8 – 1.6	0.8 – 1.6	0.80 – 2.10	0.80 – 2.10

The above named ahss steel grades are not available with MA, NA or RA surface finishes.

Please find available dimensions 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

ahss classic

greentec steel

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/ultralights

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voestalpine
ONE STEP AHEAD.