

High-strength IF steels

High-strength steels with best formability

High-strength IF (interstitial-free) steels belong to the product family of conventional high-strength steels. They feature the best formability of conventional high-strength steels as a result of their r-values, high work hardening and high fracture elongation. The base material is designed using a basic vacuum-decarburized IF analysis stabilized with Ti and/or Nb. The individual strength classes are achieved by adding solid-solution-strengthening alloys. Their excellent property profile makes high-strength IF steels predestined for complex component applications with high demands on deep-drawing suitability and strength.

Convincing advantages

- » Best formability in the group of conventional high-strength steels
- » Excellent deep-drawing properties
- » Excellent weldability
- » Corrosion resistance based on ZE, Z, ZF, EG, GI, GA or ZM coatings
- » Available in exposed-panel quality

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								
HX180YD	0.01	0.30	0.70	0.060	0.025	0.010	0.09	0.12
HX220YD	0.01	0.30	0.90	0.080	0.025	0.010	0.09	0.12
HX260YD	0.01	0.30	1.60	0.100	0.025	0.010	0.09	0.12

Steel grade	C max.	Si max.	Mn max.	P max.	S max.	Al min.	Nb max.	Ti max.
Pursuant to EN 10268								
HC180Y	0.01	0.3	0.7	0.06	0.025	0.01	0.09	0.12
HC220Y	0.01	0.3	0.9	0.08	0.025	0.01	0.09	0.12
HC260Y	0.01	0.3	1.6	0.10	0.025	0.01	0.09	0.12

Steel grade	C max.	Si max.	Mn max.	P max.	S max.	Al min.	Ti max.	Nb max.	Cu max.
Pursuant to VDA 239-100									
CR180IF	0.01	0.30	0.70	0.060	0.025	0.010	0.12	0.09	0.20
CR210IF	0.01	0.30	0.90	0.080	0.025	0.010	0.12	0.09	0.20
CR240IF	0.01	0.30	1.60	0.100	0.025	0.010	0.12	0.09	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 $A_{80}^{1)}$ min. [%]	r-value $r_{90}^{1)}$ min.	n-value $n_{10-20/A_0}^{1)}$ min.	BH ₂ -value BH ₂ min. [MPa]
Pursuant to EN 10346							
HX180YD	transverse	180 – 240	330 – 390	34	1.7	0.18	-
HX220YD	transverse	220 – 280	340 – 420	32	1.5	0.17	-
HX260YD	transverse	260 – 320	380 – 440	30	1.4	0.16	-
Pursuant to EN 10268							
HC180Y	transverse	180 – 230	330 – 400	35	1.7	0.19	-
HC220Y	transverse	220 – 270	340 – 420	33	1.6	0.18	-
HC260Y	transverse	260 – 320	380 – 440	31	1.4	0.17	-
Pursuant to VDA 239-100							
CR180IF	longitudinal	180 – 240	320 – 400	35	1.2	0.19	-
CR210IF	longitudinal	210 – 270	340 – 420	33	1.1	0.18	-
CR240IF	longitudinal	240 – 300	360 – 440	31	1.0	0.17	-

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

Coatings and available dimensions

Available thicknesses [mm] based on coating

Steel grade pursuant to			Uncoated / UC	ZE / EG	Z / GI	ZF / GA	ZM / ZM
EN 10346	EN 10268	VDA 239-100					
HX180YD	HC180Y	CR180IF	0.6 – 1.6	0.6 – 1.6	0.6 – 2.5	0.6 – 2.0	0.6 – 1.8
HX220YD	HC220Y	CR210IF	0.6 – 1.6	0.6 – 1.6	0.6 – 2.5	0.6 – 2.0	0.6 – 1.8
HX260YD	HC260Y	CR240IF	0.6 – 1.6	0.6 – 1.6	0.6 – 2.5	0.6 – 2.0	0.6 – 1.8

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

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