

## Bake-hardening steels

### High-strength steels for excellent dent resistance

Bake-hardening steels belong to the product family of conventional high-strength steels. The characteristic property of these steels is an increase in yield strength through heat treatment (bake-hardening effect), which is commonly seen in automotive painting processes. This increase is achieved by adjusting the right amount of dissolved carbon in the steel. Bake-hardening steels are characterized by excellent forming properties, high strength, high buckling resistance in the finished part. This excellent profile of properties makes bake-hardening steels predestined for exposed-panel applications.

#### Convincing advantages

- » Higher yield strength in the finished part following the paint-baking process
- » Excellent deep-drawing properties
- » High dent resistance
- » Excellent weldability
- » Corrosion resistance based on ZE, Z, ZF, EG, GI, GA or ZM coatings
- » Best quality in exposed panels

## 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.
<b>Pursuant to EN 10346</b>								
HX180BD	0.06	0.50	0.70	0.060	0.025	0.015	0.09	0.12
HX220BD	0.08	0.50	0.70	0.085	0.025	0.015	0.09	0.12
HX260BD	0.10	0.50	1.00	0.10	0.030	0.010	0.09	0.12
HX300BD	0.11	0.50	0.80	0.12	0.025	0.010	0.09	0.12

Steel grade	C max.	Si max.	Mn max.	P max.	S max.	Al min.
<b>Pursuant to EN 10268</b>						
HC180B	0.06	0.5	0.7	0.06	0.030	0.015
HC220B	0.08	0.5	0.7	0.085	0.030	0.015
HC260B	0.1	0.5	1.0	0.1	0.030	0.015
HC300B	0.1	0.5	1.0	0.12	0.030	0.015

Steel grade	C max.	Si max.	Mn max.	P max.	S max.	Al min.	Cu max.
<b>Pursuant to VDA 239-100</b>							
CR180BH	0.06	0.50	0.70	0.060	0.025	0.015	0.20
CR210BH	0.08	0.50	0.70	0.085	0.025	0.015	0.20
CR240BH	0.10	0.50	1.00	0.100	0.030	0.015	0.20
CR270BH	0.11	0.50	1.00	0.110	0.030	0.015	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 $n_{10-20/A9}^{1)}$ min.	BH <sub>2</sub> -value BH <sub>2</sub> min. [MPa]
<b>Pursuant to EN 10346</b>							
HX180BD	transverse	180 – 240	290 – 360	34	1.5	0.16	30
HX220BD	transverse	220 – 280	320 – 400	32	1.2	0.15	30
HX260BD	transverse	260 – 320	360 – 440	28	-	-	30
HX300BD	transverse	300 – 360	400 – 480	26	-	-	30

<b>Pursuant to EN 10268</b>							
HC180B	transverse	180 – 230	290 – 360	34	1.6	0.17	35
HC220B	transverse	220 – 270	320 – 400	32	1.5	0.16	35
HC260B	transverse	260 – 320	360 – 440	29	-	-	35
HC300B	transverse	300 – 360	390 – 480	26	-	-	35

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 $r_0^{1)}$ min.	n-value $n_{10-20/A9}^{1)}$ min.	BH <sub>2</sub> -value BH <sub>2</sub> min. [MPa]
<b>Pursuant to VDA 239-00</b>							
CR180BH	longitudinal	180 – 240	290 – 370	34	1.1	0.17	30
CR210BH	longitudinal	210 – 270	320 – 400	32	1.1	0.16	30
CR240BH	longitudinal	240 – 300	340 – 440	29	1.0	0.15	30
CR270BH	longitudinal	270 – 330	360 – 460	27	-	0.13	30

<sup>1)</sup> 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					
HX180BD	HC180B	CR180BH	0.5 – 1.6	0.5 – 1.6	0.6 – 2.5	0.6 – 2.0	0.6 – 2.0
HX220BD	HC220B	CR210BH	0.5 – 1.6	0.5 – 1.6	0.6 – 2.5	0.6 – 2.0	0.6 – 2.0
HX260BD	HC260B	CR240BH	0.5 – 2.0	0.5 – 2.0	0.6 – 2.5	0.6 – 2.0	0.6 – 2.0
HX300BD	HC300B	CR270BH	0.5 – 2.0	0.5 – 2.0	0.6 – 2.5	0.6 – 1.5	0.6 – 1.8

Please find available dimensions at [www.voestalpine.com/Produktinformationsportal](http://www.voestalpine.com/Produktinformationsportal) or contact us directly.

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