



## **B20** - HSLA-High Strength Low Alloy steels

*HSLA steels are particularly suitable for structural parts that do not require severe forming, such as industrial shelving systems or furniture and also radiators and racks.*

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## Properties

These high strength steels are characterised by their low content of both carbon and micro-alloying elements. This gives HSLA steels outstanding functional properties, such as weldability and coatability. The hardening achieved by controlled internal purity and fine grain size structure ensures excellent mechanical strength. The grades available are in compliance with EN 10268:2006+A1:2013 and are obtained after either batch or continuous annealing. Steel grades with yield strength  $\geq 460$  MPa are only produced by the continuous annealing process.

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## Advantages

They combine improved weldability with good formability. The narrow variation margins for their mechanical properties make it easy to shape the steel (presses or automated lines). They also have good fatigue and impact resistance.

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## Applications

They are particularly suitable for structural parts that do not require severe forming (profiling, bending or light drawing): automotive structures and reinforcements, industrial shelving systems, radiators, racking systems, furniture, mechanical engineering applications etc.

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## Formability

The deep drawing performance of the HC260LA AM FCE grade is equivalent to that of mild steel. Drawability decreases as the yield strength increases.

Forming limit curves can be used to define the maximum strains not to be exceeded when forming steel by various methods, so as to avoid the risk of incipient necking. These curves are available on request.

Please contact us for other forming data on HSLA products for particular sheet thicknesses.

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## Weldability

HSLA AM FCE steel grades have good weldability in all welding processes.

Based on many years' practical experience in arc and resistance spot welding of its products, ArcelorMittal can provide valuable technical assistance in defining the welding parameters for all products in the HSLA range.

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## Fatigue resistance

Fatigue resistance is generally expressed as an endurance limit, corresponding to the maximum stress resisted for a given number of cycles before failure. The table below gives some examples of 5 million cycle endurance limits under fluctuating tension with a stress ratio  $R_s = 0.1$ .

	Thickness	5 million cycle endurance limit (MPa)
HC300LA AM FCE	1 mm	362
HC380LA AM FCE	0.8 mm	403

A complete database of fatigue resistance data on this range of common steels is available on request.

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## Surface quality

### Surface cleanliness

If improved surface cleanliness is required, ArcelorMittal also offers this range of steel grades with compulsory use of continuous annealing or hydrogen annealing.

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# Brand correspondence

	EN 10268:2006+A1:2013	EN 10268:1998	ASTM 607:1993	Old brand names
HC260LA EN 10268	HC260LA	H240LA		
HC260LA AM FCE	HC260LA	H240LA		Profilar 260
HC300LA EN 10268	HC300LA	H280LA		
HC300LA AM FCE	HC300LA	H280LA		Profilar 300/Sidca M-300/Soldur 280
HC340LA EN 10268	HC340LA	H320LA		
HC340LA AM FCE	HC340LA	H320LA	Grade 607-45	Profilar 340/Sidca M-340/Soldur 320
HC380LA EN 10268	HC380LA	H360LA		
HC380LA AM FCE	HC380LA	H360LA	Grade 607-50	Profilar 380/Soldur 360
HC420LA EN 10268	HC420LA	H400LA		
HC420LA AM FCE	HC420LA	H400LA	Grade 607-55	Profilar 420
HC460LA EN 10268	HC460LA			
HC460LA AM FCE	HC460LA			
HC500LA EN 10268	HC500LA			
HC500LA AM FCE	HC500LA			

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## Dimensions

Thickness (mm)	HC260LA EN 10268, HC260LA AM FCE		HC300LA EN 10268, HC300LA AM FCE		HC340LA EN 10268, HC340LA AM FCE		HC380LA EN 10268, HC380LA AM FCE		HC420LA EN 10268, HC420LA AM FCE		HC460LA EN 10268, HC460LA AM FCE		HC500LA EN 10268, HC500LA AM FCE	
	Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width
0.30 ≤ th < 0.40		1200		1200		1210		-						
0.40 ≤ th < 0.50		1360		1360		1380	800	1030		800		-		
0.50 ≤ th < 0.60		1540		1540		1540		1270		1010		1150		-
0.60 ≤ th < 0.70		1700		1620		1620		1340		1110		1270		
0.70 ≤ th < 0.80		1810		1670		1670		1440		1220		1340		
0.80 ≤ th < 0.90				1720				1570		1290		1400		1350
0.90 ≤ th < 1.00										1350		1450		1400
1.00 ≤ th < 1.10				1820						1400		1500		1450
1.10 ≤ th < 1.20						1820		1650		1460		1540		1500
1.20 ≤ th < 1.30		1860								1510		1590		1550
1.30 ≤ th < 1.40										1560		1630		1590
1.40 ≤ th < 1.50	600		600		600			1700		1610	800			
1.50 ≤ th < 1.60				1840			600	1750		1670		1680		1650
1.60 ≤ th < 1.70									600	1610		1650		
1.70 ≤ th < 1.80														1340
1.80 ≤ th < 1.90		1890						1800		1580		1480		
1.90 ≤ th < 2.00		1950								1560		1400		
2.00 ≤ th < 2.10		1980		1890		1800				1540				
2.10 ≤ th < 2.30		1940		1850				1790		1510				-
2.30 ≤ th < 2.40								1770		1500		-		
2.40 ≤ th < 2.50		1900		1840				1730		1480				
2.50 ≤ th < 2.60								1690		1470				

Thickness (mm)	HC260LA EN 10268, HC260LA AM FCE		HC300LA EN 10268, HC300LA AM FCE		HC340LA EN 10268, HC340LA AM FCE		HC380LA EN 10268, HC380LA AM FCE		HC420LA EN 10268, HC420LA AM FCE		HC460LA EN 10268, HC460LA AM FCE		HC500LA EN 10268, HC500LA AM FCE	
	Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width
2.60 ≤ th < 2.70	600	1870	600	1840	600	1800	600	1650	600	1450	800	-	800	-
2.70 ≤ th < 2.80						1780		1610		1410				
2.80 ≤ th < 2.90		1740		1600		1370								
2.90 ≤ th < 3.00		1860		1800		1700		1330						
3.00 ≤ th < 3.10		1760		1660		1490		1290						

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# Mechanical properties

	Direction	Thickness (mm)	R <sub>e</sub> (MPa)	R <sub>m</sub> (MPa)	A <sub>80</sub> (%)	Bending ratio (th)
HC260LA EN 10268	L	0.5 - 0.7	240 - 310	340 - 420	≥ 25	-
		0.7 - 3			≥ 27	
	T	0.5 - 0.7	260 - 330	350 - 430	≥ 24	-
		0.7 - 3			≥ 26	
HC260LA AM FCE	L	0.5 - 0.7	240 - 310	340 - 420	≥ 25	-
		0.7 - 3			≥ 27	
	T	0.5 - 0.7	260 - 330	350 - 430	≥ 24	≥ 0
		0.7 - 3			≥ 26	
HC300LA EN 10268	L	0.5 - 0.7	280 - 360	370 - 470	≥ 22	-
		0.7 - 3			≥ 24	
	T	0.5 - 0.7	300 - 380	380 - 480	≥ 21	-
		0.7 - 3			≥ 23	
HC300LA AM FCE	L	0.5 - 0.7	280 - 360	370 - 470	≥ 22	-
		0.7 - 3			≥ 24	
	T	0.5 - 0.7	300 - 380	380 - 480	≥ 21	≥ 0
		0.7 - 3			≥ 23	
HC340LA EN 10268	L	0.5 - 0.7	320 - 410	400 - 500	≥ 20	-
		0.7 - 3			≥ 22	
	T	0.5 - 0.7	340 - 420	410 - 510	≥ 19	-
		0.7 - 3			≥ 21	
HC340LA AM FCE	L	0.5 - 0.7	320 - 410	400 - 500	≥ 20	-
		0.7 - 3			≥ 22	
	T	0.5 - 0.7	340 - 420	410 - 510	≥ 19	≥ 0
		0.7 - 3			≥ 21	
HC380LA EN 10268	L	0.5 - 0.7	350 - 450	430 - 550	≥ 18	-
		0.7 - 3			≥ 20	
	T	0.5 - 0.7	380 - 480	440 - 580	≥ 17	-
		0.7 - 3			≥ 19	
HC380LA AM FCE	L	0.5 - 0.7	<b>360</b> - 450	<b>450</b> - 550	≥ 18	-
		0.7 - 3			≥ 20	
	T	0.5 - 0.7	380 - 480	<b>460</b> - 560	≥ 17	≥ 0.5
		0.7 - 3			≥ 19	

Values in bold: tighter than the standard



	Direction	Thickness (mm)	R <sub>e</sub> (MPa)	R <sub>m</sub> (MPa)	A <sub>80</sub> (%)	Bending ratio (th)
HC420LA EN 10268	L	0.5 - 0.7	390 - 500	460 - 580	≥ 16	-
		0.7 - 3			≥ 18	
	T	0.5 - 0.7	420 - 520	470 - 600	≥ 15	-
		0.7 - 3			≥ 17	
HC420LA AM FCE	L	0.5 - 0.7	<b>400</b> - 500	<b>470</b> - 580	≥ 16	-
		0.7 - 3			≥ 18	
	T	0.5 - 0.7	420 - 520	<b>480 - 590</b>	≥ 15	≥ 0.5
		0.7 - 3			≥ 17	
HC460LA EN 10268	T	0.5 - 0.7	460 - 580	510 - 660	≥ 11	-
		0.7 - 2			≥ 13	
HC460LA AM FCE	T	0.5 - 0.7	460 - <b>560</b>	<b>550 - 650</b>	≥ 13	-
		0.7 - 2			≥ 15	
HC500LA EN 10268	T	0.5 - 0.7	500 - 620	550 - 710	≥ 10	-
		0.7 - 2			≥ 12	
HC500LA AM FCE	T	0.5 - 0.7	500 - 620	<b>570</b> - 710	≥ 12	≥ 0.5
		0.7 - 2			≥ 14	
Values in bold: tighter than the standard						

The choice of direction for the mechanical properties should be specified when ordering.

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# Chemical composition

	C (%)	Mn (%)	P (%)	S (%)	Si (%)	Al (%)	Nb (%)	Ti (%)	Galvanisation
HC260LA EN 10268	≤ 0.10	≤ 1.0	≤ 0.030	≤ 0.025	≤ 0.5	≥ 0.015	≤ 0.09	≤ 0.15	-
HC260LA AM FCE	≤ <b>0.080</b>	≤ <b>0.60</b>	≤ <b>0.025</b>	≤ <b>0.020</b>	≤ <b>0.03</b>	≥ 0.015	≤ 0.090	≤ 0.150	Class 1
HC300LA EN 10268	≤ 0.12	≤ 1.4	≤ 0.030	≤ 0.025	≤ 0.5	≥ 0.015	≤ 0.09	≤ 0.15	-
HC300LA AM FCE	≤ <b>0.090</b>	≤ <b>0.70</b>	≤ <b>0.025</b>	≤ <b>0.020</b>	≤ <b>0.03</b>	≥ 0.015	≤ 0.090	≤ 0.150	Class 1
HC340LA EN 10268	≤ 0.12	≤ 1.5	≤ 0.030	≤ 0.025	≤ 0.5	≥ 0.015	≤ 0.09	≤ 0.15	-
HC340LA AM FCE	≤ 0.100	≤ <b>0.90</b>	≤ <b>0.025</b>	≤ <b>0.020</b>	≤ <b>0.03</b>	≥ 0.015	≤ 0.090	≤ 0.150	Class 1
HC380LA EN 10268	≤ 0.12	≤ 1.6	≤ 0.030	≤ 0.025	≤ 0.5	≥ 0.015	≤ 0.09	≤ 0.15	-
HC380LA AM FCE	≤ 0.100	≤ <b>1.00</b>	≤ <b>0.025</b>	≤ <b>0.020</b>	≤ <b>0.35</b>	≥ 0.015	≤ 0.090	≤ 0.150	No
HC420LA EN 10268	≤ 0.14	≤ 1.6	≤ 0.030	≤ 0.025	≤ 0.5	≥ 0.015	≤ 0.09	≤ 0.15	-
HC420LA AM FCE	≤ 0.100	≤ <b>1.20</b>	≤ <b>0.025</b>	≤ <b>0.020</b>	≤ <b>0.15</b>	≥ 0.015	≤ 0.090	≤ 0.150	No
HC460LA EN 10268	≤ 0.14	≤ 1.8	≤ 0.030	≤ 0.025	≤ 0.6	≥ 0.015	≤ 0.09	≤ 0.15	-
HC460LA AM FCE	≤ <b>0.100</b>	≤ <b>1.60</b>	≤ <b>0.025</b>	≤ <b>0.020</b>	≤ <b>0.15</b>	≥ 0.015	≤ 0.090	≤ 0.150	No
HC500LA EN 10268	≤ 0.14	≤ 1.8	≤ 0.030	≤ 0.025	≤ 0.6	≥ 0.015	≤ 0.09	≤ 0.15	-
HC500LA AM FCE	≤ <b>0.100</b>	≤ <b>1.60</b>	≤ <b>0.025</b>	≤ <b>0.020</b>	≤ <b>0.15</b>	≥ 0.015	≤ 0.090	≤ 0.150	No

Values in bold: tighter than the standard

V+Nb+Ti ≤ 0.22%

**Any questions?**Ask them via our contact form on <https://industry.arcelormittal.com/getintouch>

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