

Fortiform[®], FortiformS[®] and GEN 3 grades

Data sheet

Grade availability

ArcelorMittal offers the following strength levels of Fortiform[®]/FortiformS[®]/GEN 3 grades with tensile strength levels ranging from 980 to 1470 MPa.

	CR	Galvanize	Galvanneal
980 HF	U	U	U
1180 HF	U	I	U
1470 HSHF	I	I	I

U – Unexposed, commercially available I – In development

Product characteristics

The Fortiform[®]/FortiformS[®]/GEN 3 grades extend ArcelorMittal's range of advanced and ultra high strength steels. In comparison to first-generation dual-phase steels, these steels exhibit higher formability at equivalent strength levels. In comparison to first-generation TRIP steels, these steels have higher strength at equivalent formability. They maintain a high level of bake-hardenability, which in combination with high strain hardening, results in a substantial increase in the yield stress, useful for improved part performance. These characteristics allow the realization of lightweight structural elements by cold forming methods such as stamping and roll forming.

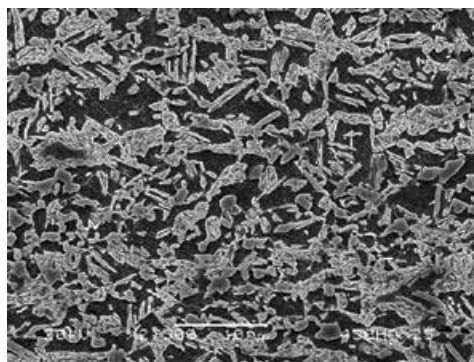
Applications

The Fortiform[®]/FortiformS[®]/GEN 3 grades are cold-stampable equivalents to the first-generation press-hardenable grades. These materials are particularly suitable for automotive safety parts with requirements for energy absorption at high strength levels. They can be used for front and rear rails, shotguns, sled runners and various cross-members that require shapes too complex for higher strength dual-phase grades and at strength levels lower than or comparable to press-hardenable steels. In particular, the hole expansion characteristics supported by these grades make them suitable for applications with higher local formability (edge stretch) than can be typically supported by dual phase or TRIP grades.

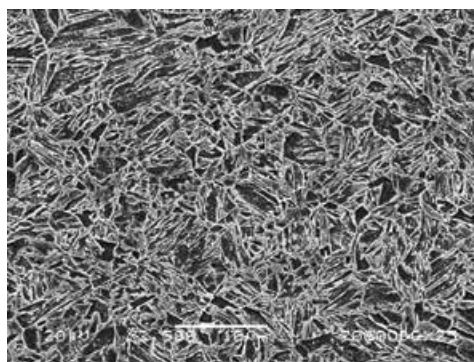
Metallography - 980 HF and 1180 HF

Ferrite, bainite, Retained austenite

Magnification – 2500X



Microstructure of 980 HF



Microstructure of 1180 HF

Chemistry - Typical

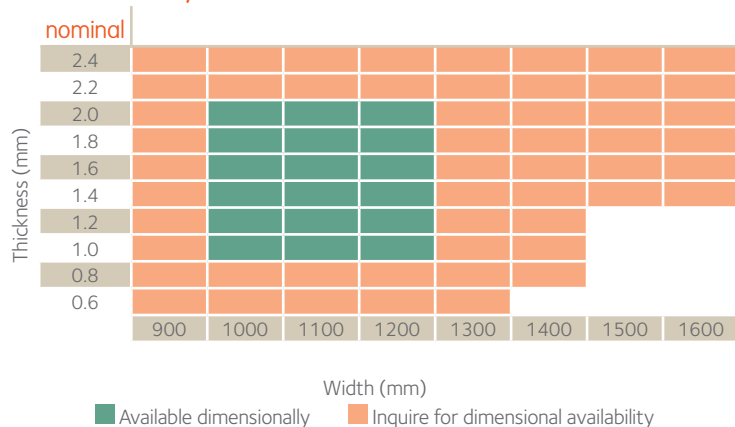
	C	Mn	Other
Cold roll			
980H F	0.21	2.1	Si
1180 HF	0.18	2.7	Si
Galvanneal			
980 HF	0.23	2.0	Si, other microalloying elements
1180 HF	0.20	2.2	Si, other microalloying elements
Galvanize			
980 HF	0.21	2.3	Si, other microalloying elements

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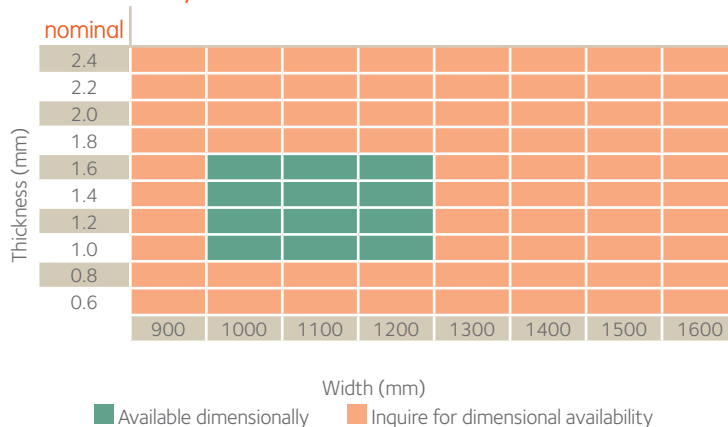
Mechanical properties - Typical

	Test – Direction	Yield strength (MPa)	Ultimate tensile strength (MPa)	Total elongation (percent)	Hole expansion (percent)
Cold roll					
980 HF	JIS-T	600	980	21	20
1180 HF	JIS-T	850	1180	14	30
1470 HSHF	ASTM-L	1000	1470	20	20
Galvanneal					
980 HF	JIS-T	600	980	19	20
1180 HF	JIS-T	850	1180	13	25
Galvanize					
980 HF	ASTM-L	600	980	20	20

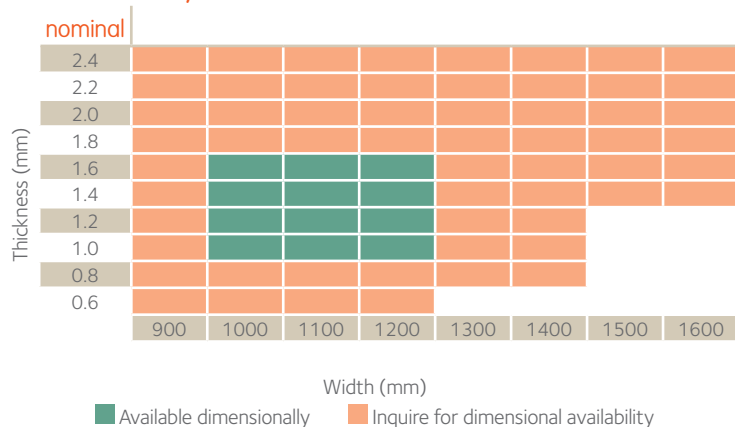
Size availability – CR 980 HF



Size availability – HDG CR 980 HF



Size availability – CR 1180 HF



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March 2019