North American Automotive

ArcelorMittal

Fortiform® and GEN 3 Grades

Grade Availability

ArcelorMittal offers the following strength levels of Fortiform®/ GEN 3 grades with tensile strength levels ranging from 980 to 1180 M Pa.

	CR	Galvanize	Galvanneal
980 HF	U		U
Fortiform® 980		U	I
1180HF	U		U
Fortiform® 1180		U	

U Unexposed, commercially available
I In development

Chemistry - Typical

	C	Mn	Other
COLD ROLL			
980 HF	0.21	2.1	Si
1180 HF	0.18	2.6	Si, other microalloying elements
GALVANNEAL			
980 HF	0.20	2.2	Si
Fortiform®980	0.24	2.0	Low Si, other microalloying elements
1180 HF	0.20	2.6	Si, other microalloying elements
Fortiform®1180	0.23	2.3	Low Si, other microalloying elements
GALVANIZE			
Fortiform®980	0.24	2.0	Low Si, other microalloying elements
Fortiform®1180	0.23	2.3	Low Si, other microalloying elements

Product Characteristics

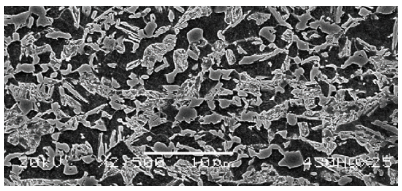
The Fortiform® /GEN 3 grades extend ArcelorMittal's range of advanced and ultra high strength steels. In comparison to first-generation dual-phase steels, these steels exhibit higher formability at equivalent strength levels. In comparison to first-generation TRIP steels, these steels have higher strength at equivalent formability. They maintain a high level of bakehardenability, 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

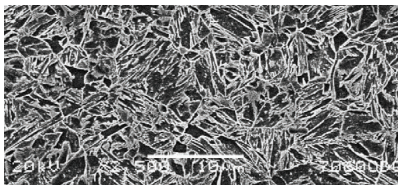
The Fortiform® /GEN 3 grades are cold-stampable equivalents to the first-generation press-hardenable grades. These materials are particularly suitable for automotive safety parts with requirements for energy absorption at high strength levels. They can be used for front and rear rails, shotguns, sled 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 - Fortiform® 980 and 1180

Ferrite, bainite, fresh/tempered martensite and retained austenite - Magnification – 2500X



Microstructure of 980 Gen3



Microstructure of 1180 Gen3

Mechanical properties - Typical

	Test Direction	Yield Strength (MPa)	Ultimate Tensile Strength (MPa)	Total Elongation (percent)	Hole Expansion (percent)
Cold roll					
980 HF	JIS-T	655	1040	23	20 min
	ASTM - L	700	1040	21	20 min
1180 HF	JIS-T	895	1230	17	30 min
	ASTM - L	905	1240	17	30 min
Galvanneal					
980 HF	JIS-T	630	1000	22	20 min
Fortiform® 980	JIS-T	625	1030	21	-
1180 HF	JIS T	960	1200	16	30 min
Fortiform® 1180	JIS T	950	1205	15	30 min
Galvanize					
Fortiform® 980	ASTM-L	635	1015	21	-
Fortiform® 1180	ASTM L	1005	1220	16	30 min

Size Availability

980 and 1180 HF Uncoated/GA

THICKNESS (MM) nominal	900	1000	1100	1200	1300	1400	1500	1600
2.4								
2.2								
2.0								
1.8								
1.6		GA	GA	GA				
1.4		GA	GA	GA				
1.2		GA	GA	GA				
1.0		GA	GA	GA				
0.8								
0.6								

WIDTH (MM)

Available dimensionally

Inquire for dimensional availability

GA 980 HF CR/GA

GA 1180 HF CR/GA

Fortiform® 980 and 1180 GI/GA

THICKNESS (MM) nominal	900	1000	1100	1200	1300	1400	1500	1600
2.4								
2.2								
2.0								
1.8		GA	GA					
1.6		GA	GA					
1.4		GA	GA					
1.2		GA	GA					
1.0		GA	GA					
0.9								

WIDTH (MM)

Available dimensionally

Inquire for dimensional availability

GA Fortiform®980 GI/GA

GA Fortiform®1180 GI/GA

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