



ArcelorMittal

Data Sheet: A4.4

SUPRAFORM[®] S315-700 MC / EN10149-2 S315-700 MC Hot Rolled High Strength Low Alloy Structural Steel Coil

General description

SUPRAFORM[®] MC is a range of high strength low alloy structural steels with improved formability. This is achieved by means of reduced perlite i.e. low carbon content, which also imparts excellent weldability and toughness to the steel. The high strength is derived from precipitation hardening by micro alloying elements (mainly niobium) and carefully controlling the processing parameters during hot rolling.

The SUPRAFORM[®] MC range consists of four grades where the MC designations relate to the minimum respective yield strengths of each grade. The specifications for the SUPRAFORM[®] MC range are similar to those in EN 10149 and the equivalent Domex steels.

During steel making, the steel is calcium treated to reduce the sulphur content to very low values and also to effect inclusion shape control. The heat is processed to a high standard of steel cleanliness, which results in excellent notch toughness properties.

SUPRAFORM[®] MC grades can usually be welded using any of the standard arc and resistance welding processes without any special precautions.

Some typical applications for SUPRAFORM[®] MC grades are as follows:

- Body and chassis components for the automotive and truck industry, bumper brackets, engine mounting brackets and wheel centres.
- Crane jibs and booms.
- Steel pipes for high-pressure applications.
- A wide variety of uses for mining equipment, rolling stock, cold formed sections, etc.

Chemical composition

Table 1. Supraform MC/EN 10149 Chemical composition specification (ladle analysis, percent)

Grade	C	Mn	P	S	Si	Al	V	Ti	Nb
	max	max	max	max	max	min	max	max	max
S315 MC	0,12	1,30	0,025	0,020	0,50	0,015	0,200	0,150	0,090
S355 MC	0,12	1,50	0,025	0,020	0,50	0,015	0,200	0,150	0,090
S420 MC	0,12	1,60	0,025	0,015	0,50	0,015	0,200	0,150	0,090
S550 MC	0,12	1,80	0,025	0,015	0,50	0,015	0,200	0,150	0,090
S700 MC	0,12	2,10	0,025	0,015	0,60	0,015	0,200	0,220	0,090

Mechanical properties

The high strength of the SUPRAFORM[®] MC grades is achieved by grain refinement and precipitation hardening of the ferritic microstructure. In order to ensure that the mechanical properties are met, the ferritic grain size is carefully controlled and is finer than ASTM E112, plate No 1, grain size 8.

In order to maintain this microstructure, heating or hot forming above 450 °C should be avoided during fabrication or repair operations as the yield and tensile properties may be impaired and cannot be restored by subsequent heat treatment.

Table 2. Mechanical properties; Supraform MC/EN 10149

Grade	Minimum Yield strength (MPa)	Tensile strength ¹ (MPa)	Minimum elongation (%)		Mandrel diameter for 180 ° bend test ³ , t = strip thickness
			<3mm Lo = 80mm	A5 (%) Lo=5,56/50	
S315 MC	315	390 - 510	20	24	0t
S355 MC	355	430 - 550	19	23	0,5t
S420 MC	420	480 - 620	16	19	0,5t
S550 MC	550	600 - 760	12	14	1,0t
S700 MC	700	750 - 950		12	2,0t

Notes:

1. The test is performed in accordance with BS EN ISO 6892-1: 2009
2. Tests are done longitudinal to the rolling direction.
3. The sample will be free of cracks on the outside of the bend when tested to BS 1639.

Dimensions

SUPRAFORM[®] MC is available in the dimensions indicated in the applicable Price Lists.

Dimensional tolerances

The SUPRAFORM[®] MC range is produced with dimensional tolerances in accordance with EN10051

Certification

All material described in this data sheet is supplied with test and analysis certificates.

Supply conditions

All material described in this data sheet is supplied in terms of Price Lists 120 and 121 and ArcelorMittal South Africa's General Conditions of Sale.