Data sheet: A4.2

SUPRAFORM® HR 190 - 290

Hot Rolled Structural Steel coil with Improved Formability

General description

SUPRAFORM® HR is a range of hot rolled structural steels with improved formability and good weldability.

The SUPRAFORM® HR range consists of four grades where the HR designations relate to the minimum respective yield strengths of each grade.

SUPRAFORM® HR has been developed mainly for applications where pressing, stamping or forming has to be carried out on structural steel to produce a final product. Although the SUPRAFORM® HR grades are essentially structural steel grades they perform very well in drawing and forming applications. For example SUPRAFORM® HR 190 has mechanical and forming properties similar to EN 10111 DD14, a drawing steel.

SUPRAFORM® HR can be welded using any of the standard arc and resistance welding processes, usually without any special precautions.

Some typical applications are:

- Body and chassis components for the automotive industry, bumper brackets, engine mounting brackets and wheel centres.
- Any cold formed sections requiring sharp bends.
- Container internal structures.

Chemical composition

Table 1: Chemical composition specification (ladle analysis, percent) for the thickness range 2,0 - 13,0 mm

Grade	C max	Mn max	P max	S max
HR 190	0,08	0,40	0,020	0,020
HR 220	0,10	0,90	0,020	0,020
HR 250	0,16	1,00	0,020	0,020
HR 290 (S,010) [1]	0,21	1,50	0,020	0,010

Note:

1. Maximum thickness is 6,0mm.

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In order to assist end-users in determining fabrication parameters, the typical chemical compositions used to achieve the desired mechanical properties are given in Table 2:

Table 2: Typical chemical composition (ladle analysis, percent)

Grade	C	Mn	Si	Al	P	S
HR 190	0,04	0,20	0,03	0,04	0,015	0,015
HR 220	0,05	0,25	0,03	0,04	0,015	0,015
HR 250	0,12	0,55	0,03	0,04	0,015	0,015
HR 290 (S,010)	0.15	0.92	0.02	0.04	0.014	0.004

Mechanical properties

Table 3a: Mechanical properties

Grade	Yield strength (MPa)	Minimum tensile strength[1] (MPa)	Minimum elongation[2] (%) for thickness *t* (mm)		Mandrel diameter for 180° bend test[3] for strip thickness *t* (mm)	
			$2 \leq t \leq 4$	$4 < t \leq 13$	$t \leq 4$	$t > 4$
HR 190	190 - 270	290	35	37	0*t*	0*t*
HR 220	220 - 300	320	32	34	0*t*	0*t*
HR 250	250 - 330	370	30	33	0*t*	1*t*

Table 3b: Mechanical properties

Grade	Yield strength (MPa)	Minimum tensile strength[1] (MPa)	Elongation 50mm gauge length (%)			
			2.0-2.49mm	2.5-3.19mm	3.20-3.99mm	4.00-6.00mm
HR 290 (S,010)[4]	290 – 390	440	30	32	33	34

Notes:
1. Tensile test to EN ISO 6892-1
2. Gauge length 50mm.
3. The sample specimens will be free of cracks on the outside of the bend when tested to EN ISO 7438.
4. Maximum thickness is 6,0mm.

Dimensions

SUPRAFORM® HR is available in the dimensions indicated in the data sheet: Hot Strip Mill Product Dimensions (file reference A1.1).

In order to possess good drawing, forming and pressing properties, hot rolled strip must have a homogeneous microstructure which can be achieved only if the strip temperature is accurately controlled during hot rolling. This becomes difficult when the thickness is less than 2,0mm. Therefore, if thinner material is required, cold rolled strip should be used.

Dimensional tolerances

For dimensional tolerances, refer to the data sheet: Hot Strip Mill Product Tolerances (file reference A1.2).

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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 123 and ArcelorMittal South Africa's General Conditions of Sale.

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