

Hot roll ferrite-bainite steels

Data sheet

Grade availability

	Bare	HDG
HR 540 FB	U	
HR 590 FB	U	U
HR 780 FB	U	I

U – Unexposed, commercially available I – In development

Product characteristics

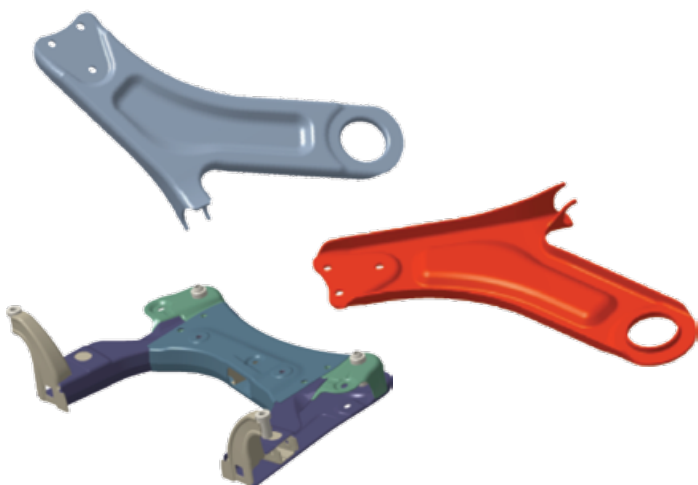
This family of hot roll steels includes products combining high tensile strength (UTS) with excellent formability and hole expansion (stretch flangeability) based on their largely ferrite-bainite microstructure. The primary advantage of ferrite-bainite steels over HSLA and Dual Phase steels is the improved stretchability of sheared edges as measured by the hole expansion test. Compared to HSLA steels with the same level of tensile strength, ferrite-bainite steels also have a higher strain hardening exponent (n-value) and increased total elongation.

Applications

These steels are suitable for cold drawing with edge stretch or hole expansion requirements.

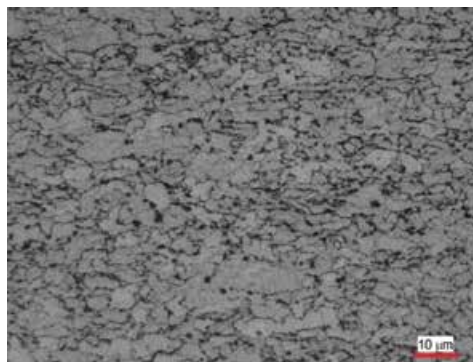
Main applications are:

- Structural parts (longitudinal beams, cross members, chassis and suspension systems components)
- Wheels
- Mechanical parts (suspension system components, gear box components, etc.)

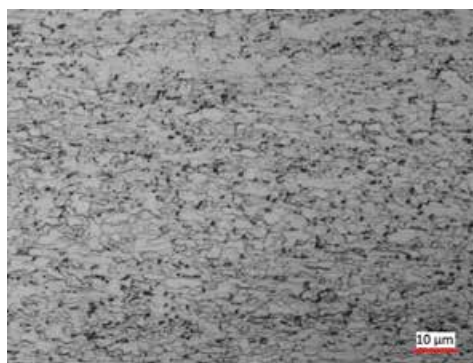


Metallography

HR 590 FB – approximately 85 percent ferrite and 15 percent bainite



HR 780 FB – predominantly bainite with finely dispersed martensite/austenite islands and small amounts of well distributed fine ferrite



Chemistry - Typical

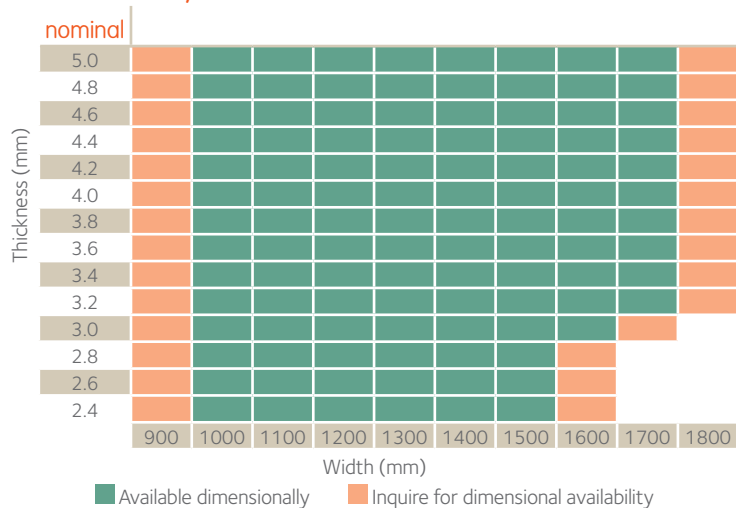
	C	Mn	Si	Other
HR 540 FB	0.04	1.5	0.20	Ti, Cb
HR 590 FB	0.05	1.8	0.30	Ti, Cb
HR 780 FB	0.04	1.5	0.60	Cr, Ti, Cb
HR 780 FB Bare	0.04	1.5	0.55	Cr, Nb, Ti
HR 780 FB HDG	0.05	1.5	0.20	Cr, Nb, Ti

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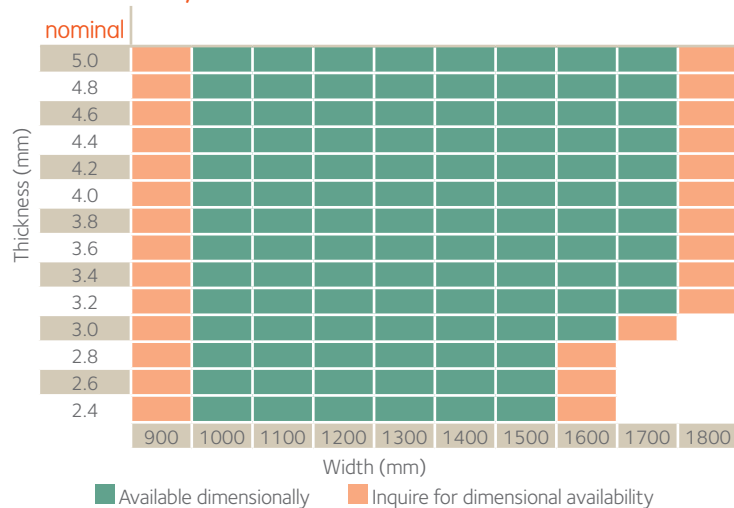
Mechanical properties - Typical

	Test - Direction	Yield strength (MPa)	Ultimate tensile strength (MPa)	Total elongation	Hole expansion
HR 540 FB	JIS-T	500	570	27 percent	80 percent min
HR 590 FB	ASTM-L	540	630	22 percent	75 percent min
HR 780 FB	ASTM-L	690	805	15 percent	50 percent min
	JIS-T	765	835	15 percent	50 percent min

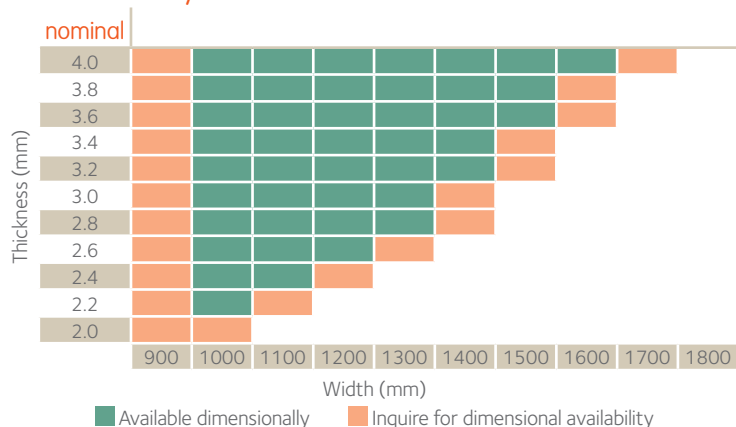
Size availability – HR 540 FB bare



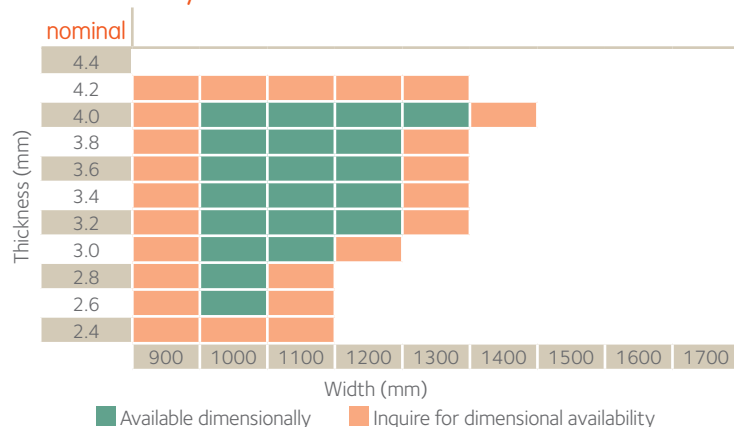
Size availability – HR 590 FB bare



Size availability – HR 590 FB HDG



Size availability – HR 780 FB bare



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