



LIBERTY

STEEL

Narrow Strip Boron Steel

Boron steels have been developed to improve hardenability during heat treatment by the deliberate addition of boron to a range of medium carbon steels. They possess hardenability equivalent to that of much higher carbon steels and more expensive low alloy steels.

Typical applications include shovels, spades, plough shares, harrow discs, mower blades, agricultural knives, beet knives and chain side plates.

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Boron steel grades

Steel Grade	C	Si	Mn	P	S	Al	Cr	B
Boron 922	0.260 0.300	0.200 0.350	1.100 1.300	Max. 0.020	Max. 0.005	0.025 0.040	0.400 0.600	0.0015 0.004
Boron 920	0.340 0.390	0.200 0.300	0.750 0.900	Max. 0.020	Max. 0.005	0.025 0.040	0.200 0.300	0.001 0.004
Boron 921	0.380 0.420	0.200 0.300	0.750 0.900	Max. 0.020	Max. 0.005	0.025 0.040	0.250 0.350	0.0015 0.004
Boron 924	0.430 0.470	0.200 0.300	0.750 0.900	Max. 0.025	Max. 0.015	0.025 0.040	0.250 0.350	0.0015 0.004

The selection of a suitable grade of Boron steel is based on achieving a balance between formability and hardenability requirements.

The addition of only .001-.004% soluble boron to a suitably protected base steel can produce an increase in hardenability comparable to that obtained by additions of around 0.5% Mn, Cr or Mo, but with little effect on the 'as rolled' or annealed strength.

Boron treated steels thus offer the distinct advantage of providing the required strength in the hardened condition but with enhanced ductility in the as delivered condition.

Size range*

Mill Edge		Sheared Edge	
Width (mm)	Thickness (mm)	Width (mm)	Thickness (mm)
200 - 350	1.6 - 13.5	26 - 340	1.6 - 3.5
351 - 430	2.0 - 10.0	26 - 390	2.0 - 3.5
431 - 460	3.0 - 10.0	26 - 420	3.0 - 3.5
		50 - 450	3.5 - 8.0

Conditions of supply

- Black or pickled & oiled
- Annealed
- Mill or sheared edge
- Cut lengths: from 1000mm to 6000mm
- Coil dimensions:
- Inside diameter 508mm
- Outside diameter 1350mm (max.)
- Coil weight: up to 9.5kg/mm of strip width
- Tolerances: width and thickness to EN10048: 1997

Typical mechanical properties

Steel Grade	Condition	Re N/mm ²	Rm N/mm ²	El %	Hv10	Rc
Boron 920	As Rolled Water Quenched Oil Quenched	350		26	200	- 55 54
Boron 921	As Rolled Water Quenched Oil Quenched	350	650	25	205	- 56 55
Boron 922	As Rolled Water Quenched Oil Quenched	360	650	25	200	- 52 49
Boron 924	As Rolled Water Quenched Oil Quenched	370	650	24	210	- 57 56

Technical support

Our highly qualified technical team will provide advice on the most appropriate grade and product to your specific requirement. Customer Technical Support provide specialist advice and help with day-to-day problem solving.

Works based metallurgists and the full resources of our Steel Research and Development Laboratories are available to assist with longer-term developments.

For further information, enquiries or any technical guidance on our range of Narrow Strip products please contact the Commercial Department at the address below.

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Characteristics of Boron steels

- Increased toughness for equivalent hardness compared to traditional carbon steels.
- Improved weldability through low carbon equivalent.
- Lower as-delivered hardness giving improved blanking tool life.
- Inclusion control for good cold formability.
- Water or oil quenching can be used with minimal distortion of components when heat treated.
- Lower tempering temperatures yield energy savings and can incorporate into other processes.
- Good case hardening with reproducible hardenability response ensures consistency of the end product.