

Corus Construction and Industrial,

Low alloy heat treatable steels

Corus Construction & Industrial supplies three types of low alloy heat treatable steels for engineering applications as part of the range of semi finished products.

Direct hardening

Steels in the carbon range 0.3% to 0.6% are produced as direct hardening steels. The properties of the final manufactured item are obtained through quench and tempering heat treatments. The actual properties will depend on the steel compositions, the size of the item and the heat treatment employed.

Case carburising

Plain carbon or alloy steels with carbon levels below 0.25% are supplied for case hardening applications. After forming and/or machining, the components are surface hardened using carburising techniques.

Microalloy

Microalloy medium carbon steels are produced for forging applications. The final product properties are obtained through controlled cooling subsequent to the forging operation and no further heat treatment is required.

Direct Forging applications

Heat treatable low alloy grades are available for direct forging applications. Chemistry is tightly controlled and, in conjunction with the highest grades of surface quality, produces a consistent product for demanding further processing operations. Secondary steelmaking ensures low levels of hydrogen and other detrimental elements.

Specifications

Steels are produced to a wide range of national and international specifications as well as to your individual requirements.

Direct hardening steels

Type	Related grades
1.5%Mn	28Mn6, 40M6, SAE 1541, BS970:150M36
1%Cr	41Cr4, 42C4, SAE 5120
1%Cr, 0.2%Mo	42CrMo4, 42CD4, SAE 4142, BS970:708M40
1%Ni, 0.8%Cr, 0.2%Mo	40NiCrMo4, 40NCD3

Case carburising steels

Type	Related grades
1.2%Mn, 1%Cr	16MnCr5, 16MC5
1.3%Mn, 1.2%Cr	20MnCr5, 20MC5
1%Cr, 1%Ni	16CrNi4, 19CrNi5
1.4%Ni, 0.8%Cr, 0.2%Mo	18NiCrMo5, 18NCD6
0.5%Ni, 0.5%Cr, 0.2%Mo	20NiCrMo2, 20NCD2, SAE 8620

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Microalloy steels

Type	Related Grades
1%Cr, 0.2%V	51CrV4, 50CV4
0.5%Cr, 0.1%V	31CrV3

Individual requirements can be discussed on request (contact [CC&I](#)).

Controlled hardenability

Steels are supplied to controlled hardenability limits, specified by national and international specifications. Where required, steels are supplied to narrower restrictions down to two thirds of a standard band width. Close compositional control and quality manufacturing procedures ensure within and between cast variability is kept to very low levels. This delivers long term product performance through consistent heat treatment response.

Figures 1 and 2 show the typical performance achieved in practice for direct hardening and case carburising steels, compared with the wider standard specification limits for Jominy hardenability (BS EN 10083 and UNI 7846 respectively). Levels of hardenability can be modified to suit your individual requirements.

Individual steel quality casts can be supplied to a predicted hardenability, using a sophisticated database prediction based on a historical record of past compositions and Jominy hardenability results.

Figure 1 Direct hardening steels (42CrMo4)

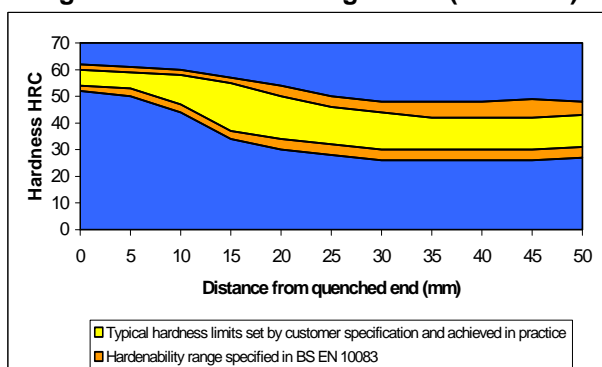
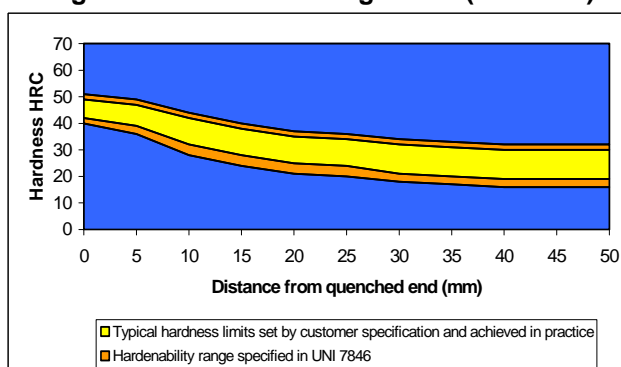


Figure 2 Case carburising steels (18CrMo5)



Typical composition (wt%) of steels shown in Figures 1 and 2

	C	Si	Mn	P	S	Cr	Mo	Ni	Al	N
42CrMo4	0.42	0.26	0.80	0.012	0.027	1.10	0.20	0.026	0.034	0.005
18NiCrMo5	0.19	0.25	0.74	0.012	0.027	0.90	0.21	1.34	0.035	0.005