

EN31 – ALLOY STEEL – BRIGHT BAR

EN31 – BRIGHT BAR Grade Introduction:

We are EN31 Bright Round Bar manufacturers and we are only manufacturing from prime quality billets and blooms. The range of EN31 Bright Round Bars which we manufacture for our customers are of high quality and these round bars are used for making machineries and OEM Auto components. These products have been made keeping in mind the quality parameters which have been set by the industry in the market. EN31 Round Bars are always supplied with the test certificates and can be supplied in bulk quantity as well as retail quantity as per customers requirements. EN31 alloy Steel round bars are supplied by us to various industries.

EN31 Steel bright bar is a very high strength steel alloy which is hardened and tempered before supplying and has nickel, chromium, molybdenum making it high tensile steel strength, with good ductility and wear resistance. With relatively good impact properties at low temperatures, EN31 is also suitable for a variety of elevated temperature applications. EN31 round bars have good internal strength and high external strength, which makes it highly wear resistant. EN31 steel round bars offer good combination of ductility, strength and wear resistance. EN31 is a very high strength alloy engineering steel.

EN31 – BRIGHT BAR Grade Application:

Typical applications for EN31 steel include taps, gauges, swaging dies, ejector pins, ball and roller bearings. It is a good quality steel for wear resisting machine parts and for press tools which do not merit a more complex quality.

EN31 – BRIGHT BAR Equivalent grades:

- BRITISH BS 970:1991 535A99
- BRITISH BS 970:1955 EN31
- GERMAN DIN 100CR6
- FRENCH AFNOR 100C6
- SWEDISH SS 2258
- AMERICAN SAE 52100

Our Supply Range:

EN31 – BRIGHT BAR Chemical composition:

The following table shows the chemical composition of EN31 steel:

Element	C	Si	Mn	P	S	Cr
Content (%)	0.95-1.10	0.10-0.35	0.40-0.70	0.040 Max	0.050 Max	1.20-1.60

EN31 – BRIGHT BAR Mechanical Properties:

ELEMENT	OBJECTIVE
Tensile Strength	750 N/mm²
Yield Stress	450 N/mm²
Reduction of Area	45%
Elongation	30%
Modulus of elasticity	215 000 N/mm²
Density	7.8 Kg/m³
Hardness	63 HRC

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EN31 – BRIGHT BAR Heat treatment:

Heat treatment temperatures, including rate of heating, cooling and soaking times will vary due to factors such as the shape and size of each EN31 component. Other considerations during the heat treatment process including the type of furnace, quenching medium and work piece transfer facilities.

EN31 – BRIGHT BAR Hardening:

Heat slowly to the hardening temperature of 800-820°C. Maintain until thoroughly soaked through. Plenty of time must be given for this soaking and then quench in oil.

EN31 – BRIGHT BAR Tempering:

Temper according to the purpose for which the tools are required, generally between 150°C and 300°C. Soak well at the selected temperature and soak for at least one hour per 25mm of total thickness. Cool slowly in air.

Temperature [°C]	150	200	250	300
Hardness [HRC]	63-62	62-61	60-59	57-56

EN31 – BRIGHT BAR Physical Properties:

NAME OF MATERIAL	COMPOSITION IN % OF WEIGHT		THERMAL CONDUCTIVITY W/M-K	DENSITY KG/M ³	MELTING POINT
	C	Mn Si Cr S P Mg			
En-31 IS-103 Cr1	1.5	0.52 0.22 1.3 0.05 0.05 –	46.6	7810	1540

EN31 – BRIGHT BAR Thermal Properties:

EN31 – BRIGHT BAR Forging Properties:

Heat slowly and begin forging at 1000-1050°C. Allow sufficient time at the forging temperature for the steel to be thoroughly soaked through. Re heat as necessary and do not forge below 850°C. After forging EN31 steel, cool slowly preferably in a furnace.

EN31 – BRIGHT BAR Stress Reliving:

When parts are to be heavily machined, stress relieving will be beneficial prior to hardening. Heat the EN31 carefully to 700°C, soak well and allow to cool in air.

EN31 -BRIGHT BAR Normalizing:

EN31 -BRIGHT BAR Annealing:

EN31 is usually supplied in the annealed and machinable condition. Re-annealing will only be necessary if the steel has been forged or hardened. To anneal, heat the EN31 steel slowly to 800-810°C, soak well and allow to cool in the furnace.

EN31 – BRIGHT BAR Density:

EN31 – BRIGHT BAR Machinability:

EN31 steel is a potential member in automobile industry, and achieving dimensional accuracy with outstanding surface characteristics is a challenging task while machining this alloy. The current investigations deal with wire electrical discharge machining (WEDM) of EN31 die steel and establish a fundamental understanding of the process parameters on micro-scale machined surface characteristics. WEDM parameters such as pulse on-time, servo voltage, wire feed and wire tension are grouped in an efficient way to understand the influence of these parameters on edge roughness, kerf width and cutting rate. The current study revealed that low pulse on-time and servo voltage decreased kerf width and edge roughness. However, cutting rate decreased with pulse on-time but increased with servo voltage. Wire tension and wire feed were found to have diverse effects on the response parameters. While edge roughness varied inversely, kerf width was directly proportional to the wire feed corresponding to lower wire tension.