

# EN8 (080M40)

## UNALLOYED MEDIUM CARBON STEEL

### PRODUCT OVERVIEW

EN8 (080M40) is a general engineering steel which offers customers good all-round performance. Supplied in bright condition, the unalloyed medium carbon steel is typically used in applications where a higher quality steel is required when compared to standard mild steel but where costs prohibit the use of an alloy steel. EN8 also offers good corrosion resistance.

EN8 is an improved material grade when compared to EN3B although EN3B's aesthetic appearance is slightly better after polishing. EN8 (080M40) is an ideal product for loading applications but is not suitable in shock resistant applications as the material can shear under extreme conditions.

EN8 (080M40) offers superior tensile strength when compared to normal bright mild steel which is achieved during the thermo mechanical rolling process. Extra strength can also be achieved by heat treatment – EN8 can be flame or induction hardened but is normally supplied in the untreated or normalised condition.

In certain countries EN8 is referred to as 'axle steel' which is one of the steel's main applications.

### MACHINABILITY

EN8 is readily machinable although ripping can be an issue in the machining process. It is therefore recommended that a suitable oil lubricant is used as this is essential to protect the integrity of the material. Ripping of the steel is even more evident during pitch dry screw cutting. It is advised to allow 6% of the outside diameter for the removal of defects in the material's surface. EN8 does 'chip' during the machining process which makes machining easier overall.

### MATERIAL SPECIFICATIONS

BS970: 1955	EN8
BS970/PD970: 1970 onwards	080M40
European	C40, C45, Ck40, Ck45, CM40, Cm45
Werkstoff No.	1.0511, 1.1186, 1.1189
US SAE (AISI)	1039, 1040, 1042, 1043, 1045



### WELDABILITY

EN8 (080M40) can be easily welded to form a strong joint and because the current product contains much less carbon than in previous versions, material up to 18mm in thickness can be welded. It is possible to weld EN8 at greater thicknesses than 18mm, but it would require a pre-heat treatment to prevent cracking.

Annealing after welding is also recommended to reduce the risk of breaking. Tig and Mig welding is advised.

Like all bright drawn engineering steels, EN8 is produced to much tighter sectional tolerances when compared to standard mild steel. This means that the product is supplied straighter and flatter than its mild steel counterparts which means it is much more cost-effective to machine.

### PRODUCT AVAILABILITY

Round bar, square bar, hexagon and plate

FOR CHEMICAL AND MECHANICAL PROPERTIES, PLEASE REFER TO THE REVERSE SIDE OF THIS TECHNICAL DATASHEET

## PRODUCT BENEFITS

- A good all-round performer
- Used when a better quality steel is required
- Ideal for load bearing applications
- Offers good corrosion resistance
- Superior tensile strength
- Readily machinable
- Can be flame or induction hardened

## APPLICATIONS

EN8 (080M40) is a general engineering steel and therefore has a wide range of commercial applications. Examples include:

- Axles, shafts, connecting rods and spindles
- Hydraulic rams
- Automotive components
- Studs, bolts, screws
- General engineering components

## CHEMICAL COMPOSITION (weight %)

	C	Si	Mn	P	S
Min	0.36	0.10	0.60		
Max	0.44	0.40	1.00	0.05	0.05

## MECHANICAL PROPERTIES (in "R" condition)

Max Stress	700-850 n/mm <sup>2</sup>	
Yield Stress	465 n/mm <sup>2</sup> Min	(up to 19mm LRS)
0.2% Proof Stress	450 n/mm <sup>2</sup> Min	(up to 19mm LRS)
Elongation	16% Min	(12% if cold drawn)
Impact KCV	28 Joules Min	(up to 19mm LRS)
Hardness	201-255 Brinell	

## ABOUT THAMES STOCKHOLDERS

Thames Stockholders is a stockholder and one of the UK's leading suppliers of engineering steels. We stock EN8 (080M40) in round bar, square bar, hexagon bar and plate and offer our products to both UK and International customers. We can also process your products internally and cut your material to your exact size requirements. With ideal proximity to the UK's main motorway network and ports, our location is ideal for the supply and distribution of high-quality engineering steels.

To discover more about our products and to receive a competitive quotation, please call Thames Stockholders today to speak to a member of our technical team on +44 (0)20 8805 3282.