

# EN36 (655M13)

## CARBURISING ENGINEERING STEEL

### PRODUCT DESCRIPTION

EN36 (655M13) is a nickel-chromium-molybdenum based case hardening engineering steel which is specifically designed for carburising. The addition of nickel increases shock resistance and toughness whilst the chromium increases the material's hardenability giving it a uniformed hardness. Once hardened and carburised, EN36 can achieve a core strength of up to 1230 N/mm<sup>2</sup>.

EN36 (655M13) is used specifically in heavy duty and highly stressed applications due to its hardenability, toughness and high core strength. EN36 also offers excellent fatigue resistance.

### CARBURISED vs NON-CARBURISED

Following the carburising process, EN36 maintains a strong core whilst offering good toughness and can be easily processed. EN36 is an adaptable material which offers excellent fatigue resistance and toughness. The material is usually supplied in the annealed condition which results in a hardness up to 255HB. It can be also be supplied in the un-carburised condition as an alternative.

This results in a high tensile steel and if suitably hardened and tempered EN36 can be utilised in applications requiring good strength and toughness. EN36 can be nitrided in the un-carburised state for increased surface hardening but flame and induction hardening is not an option due to the material's low carbon content. In certain cases, it may be necessary to soften EN36 (655M13) after carburising and before heat treatment.

### MATERIAL SPECIFICATIONS

AUSTRALIA	AS 1444-1996-X3312/X3312H
GERMANY	W.Nr 1.5752 DIN 14NiCr14
GREAT BRITAIN	BS970: PART 3: 1991 655 M13 BS970: 1955 - EN36A
JAPAN	JISG 4052 SNC815H JISG 4102 SNC815
USA	SAE 3310 9310



### MACHINABILITY

EN36 offers very good machinability and weldability when supplied in the annealed condition, although when welded the material should be stress relieved after cooling. Welding is not however recommended in the heat treated or carburised condition.

Machinability options including turning, milling, drilling and tapping are all suitable as long as the tool type, feeds and speeds are used in accordance with the machine manufacturer's recommendations.

### PRODUCT AVAILABILITY

Bar products

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

### PRODUCT BENEFITS

- Designed specifically for carburising
- Increased shock resistance and toughness
- Increased hardenability
- For highly stressed & heavy duty applications
- Excellent fatigue resistance
- Supplied in the annealed condition
- Good machinability

### APPLICATIONS

EN36 (655M13) offers engineers a multitude of performance options based on the material's delivery condition. Application examples include:

- Aircraft and automotive crankshafts
- Ball and roller bearings
- Highly stressed gears, collets and gudgeon pins
- Connecting rods with case hardened ends
- Heavy duty gears, ring gears
- Heavy duty bushes
- Couplings and shafts

### CHEMICAL COMPOSITION (weight %)

	C	Mn	Si	Cr	Ni	P	S
Min	0.12	0.30	0.10	0.60	3.00		
Max	0.18	0.60	0.35	1.10	3.75	0.05	0.05

### MECHANICAL PROPERTIES \*

Tensile Strength N/mm <sup>2</sup>	Elongation %	Impact Izod J	Impact KVC J	Hardness HB	Reduction of Area %
1100	15	40	35	341	50

\* blank case hardened. 19mm test piece.

### ABOUT THAMES STOCKHOLDERS

Thames Stockholders is one of the UK's leading suppliers of engineering steels. We stock EN36 (655M13) in bar products. We offer our stock products to both domestic 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.