

## 665M17 – 2% Ni – Mo Case Hardening Steel

### Related Specifications

BS970-1955 EN34  
DIN 15NiMo8

665M17 is a 2% Nickel – Molybdenum case hardening steel, characterised by high core strength, good toughness and fatigue resistance, with case hardnesses up to 60HRC when carburised, hardened and Tempered.

Material is usually supplied in the annealed/Normalised condition upto 207HB

General applications include all industry sectors for applications requiring high surface wear resistance, high shock resistance, high core strength & impact properties. Typical uses include transmission components, steering mechanisms, shafts etc

### Typical Chemical composition

Carbon	0.17%
Silicon	0.25%
Manganese	0.50%
Phosphorous	<0.040%
Sulphur	<0.040%
Nickel	1.75%
Molybdenum	0.25%

### Mechanical Property Requirements – On Blank Carburised Test Piece – BS970 Part 3 1991 665M17

Test Bar Diameter	Tensile Strength Mpa	Elongation %	Charpy Impact J	Izod Impact Ftlbs	Hardness HB
19mm	770 min	12	35	40	207

### Forging

Forging temperature for this material should be 850 – 1150oC.

Soaking times should be kept to a minimum to avoid heavy scale and excessive grain growth, suggest 15minutes per inch (25mm) of ruling section

### Heat Treatment

**Annealing** – Heat to 830 – 850oC ensuring sufficient time is allowed for the centre to achieve furnace temperature and hold for a time commensurate with the ruling section, followed by furnace cooling.

**Carburizing** – Pack, salt or gas carburizing at 900 – 950oC, hold for time commensurate with required case depth, followed by suitable hardening and tempering to optimise core properties.

**Hardening** – Heat to 830 – 880oC and hold for time commensurate with the ruling section, quench as required in Water, Oil or Air.

**Note: This treatment is used for core refinement and should be followed by Tempering**

**Case Hardening** – Following core refining above, re-heat to 760 – 800oC, hold for time commensurate with ruling section and quench in oil.

**Note: Material should be tempered immediately whilst still hand warm.**

**Tempering** – Heat to 150 – 200oC for sufficient time to allow centre to achieve furnace temperature, and hold for 2hrs minimum, cool in still air.

### Machining

Material in the annealed condition is readily machinable by milling, drilling, turning, tapping etc as required

### Welding

In the annealed condition the material is readily weldable using low hydrogen electrodes, however following cooling the material should be stress relieved at 600-650oC

**Note: Welding in the carburized or Heat Treated condition is not recommended.**