

EN353 / 815M17 Case-Hardening Steel

Nickel-chromium-molybdenum case-hardening steel

[MATERIAL DATASHEET](#)

EN353 is a nickel-chromium-molybdenum case-hardening steel. Carburised and hardened, it gives a hard, wear-resistant surface over a strong, shock-absorbing core, the classic choice for gears, pinions and transmission shafts that see both wear and impact.

EQUIVALENT GRADES

BS 970	815M17
EN / DIN	17NiCrMo6-4 (nearest)
Material no.	1.6566
IS (India)	15Ni5Cr4Mo1
AISI / SAE	no direct equivalent

Indian mills make EN353 to the range shown below, as printed on their mill certificates. It differs slightly from the strict BS 970 815M17 limits.

READY STOCK IN MUMBAI

Round bar **Ø16–205 mm**

Every dispatch comes with the mill test certificate for its heat. Minimum order 100 kg.

CHEMICAL COMPOSITION, %

	C	Si	Mn	P	S	Cr	Ni	Mo
As supplied: Indian mill range	max 0.20	max 0.35	0.50–1.00	max 0.050	max 0.050	0.75–1.25	1.00–1.50	0.08–0.15
Standard: 815M17, BS 970	0.14–0.20	0.10–0.35	0.60–0.90	n/s	n/s	0.80–1.20	1.20–1.70	0.10–0.20

Balance iron. Indian mills still make EN 353 to the original BS 970 En353 range, shown on the left. The later 815M17 grade asks for more nickel (1.20–1.70%) and molybdenum (0.10–0.20%). If your drawing calls for the strict standard, mention it in your enquiry. The mill test certificate with each dispatch gives the actual result for that heat. n/s = not stated in our source.

CARBURISED, HARDENED AND TEMPERED (TYPICAL)

PROPERTY	TYPICAL VALUE
Case hardness (surface)	58–62 HRC
Core hardness	30–42 HRC
Core tensile strength	800–1100 MPa
Core elongation A	9–12 %
Supply hardness, as-rolled (example)	about 180 HB

Case and core properties depend on case depth, section size and the carburising cycle. As-rolled hardness example from a Ø125 mm mill certificate.

HEAT TREATMENT

TREATMENT	TEMPERATURE	COOLING / QUENCH
Normalising	870–900 °C	Still air
Carburising	900–925 °C	Case depth as required
Core refining	860–890 °C	Oil
Hardening	820–850 °C	Oil
Tempering	150–200 °C	Air
Soft annealing	650–680 °C	Furnace cool

TRANSFORMATION TEMPERATURES

Ac1	725 °C
Ac3	810 °C
Ms (core)	380 °C

PHYSICAL PROPERTIES

Density	7,850 kg/m ³
Young's modulus	205 GPa
Thermal expansion 20–300 °C	12 µm/m·K
Thermal conductivity	42 W/m·K

TYPICAL APPLICATIONS

Gears, pinions, camshafts, gudgeon pins, shafts, worm gears.

ORDERING

Minimum order	100 kg
Cutting	Available when the balance piece is also taken; cutting charged extra
Documents	Mill test certificate with every dispatch
Delivery	Ex-Darukhana, Mumbai; transport and loading extra at actuals

Read more: [Hardness of alloy steels in HRC](#) · [EN353 sizes and stock](#) · [Round bar weight calculator](#)

ASK FOR SIZES AND PRICE

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