

SAE 8620 Carburising Steel

Low-alloy nickel-chromium-molybdenum carburising steel · 1.6523

MATERIAL DATASHEET

SAE 8620 is a versatile low-alloy carburising steel. After carburising, hardening and tempering it develops a hard, wear-resistant case (58–63 HRC) over a tough core, making it one of the most widely used case-hardening grades in general engineering and automotive work.

EQUIVALENT GRADES

AISI / SAE	8620
EN / DIN	20NiCrMo2-2 (21NiCrMo2)
Material no.	1.6523
BS 970	805M20
JIS	SNCM220

READY STOCK IN MUMBAI

Round bar	Ø14–315 mm
Rolled	up to Ø220 mm
Forged	from Ø160 mm

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

Rolled bar is available up to Ø220 mm and forged bar from Ø160 mm, so 160–220 mm comes either way.

CHEMICAL COMPOSITION, %

	C	Si	Mn	P	S	Cr	Ni	Mo
As supplied: Indian mill range	0.18–0.23	0.15–0.35	0.70–0.90	max 0.045	max 0.045	0.40–0.60	0.40–0.70	0.15–0.25
Standard: SAE J404 8620	0.18–0.23	0.15–0.35	0.70–0.90	max 0.030	max 0.040	0.40–0.60	0.40–0.70	0.15–0.25

Balance iron. The alloying elements match SAE 8620 exactly. The mill range allows more phosphorus and sulphur (up to 0.045%) than SAE J404 (0.030% and 0.040%). 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.

CARBURISED, HARDENED AND TEMPERED (TYPICAL)

PROPERTY	TYPICAL VALUE
Case hardness (surface)	58–63 HRC
Core hardness	30–45 HRC
Core tensile strength	650–950 MPa
Core yield strength	400–700 MPa
Core elongation A	10–15 %
Supply hardness, annealed	197 HB max

Case and core properties depend on case depth, section size and the carburising cycle.

HEAT TREATMENT

TREATMENT	TEMPERATURE	COOLING / QUENCH
Normalising	870–900 °C	Still air
Carburising	880–930 °C	Case depth as required
Core refining	870–900 °C	Oil
Hardening	780–820 °C	Oil
Tempering	150–200 °C	Air
Soft annealing	680–710 °C	Furnace cool

TRANSFORMATION TEMPERATURES

Ac1	720 °C
Ac3	840 °C
Ms (core)	400 °C

PHYSICAL PROPERTIES

Density	7,850 kg/m ³
Young's modulus	205 GPa
Thermal expansion 20–300 °C	11.6 µm/m·K
Thermal conductivity	46 W/m·K

TYPICAL APPLICATIONS

Gears, camshafts, gudgeon pins, bushings, bearings, sprockets, king pins.

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: [Alloy steel equivalent grades chart \(India\)](#) · [SAE 8620 sizes and stock](#) · [Round bar weight calculator](#)

ASK FOR SIZES AND PRICE

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