MEDIUM CARBON ENGINEERING STEEL

AISI 1045 C45 / 1.0503 / S45C

Medium carbon engineering steel

0.42–0.50 C	Ø600 mm	55–60 HRC	EN 10204 3.1
Medium carbon	Max forged bar	Induction hardened	Every lot

GRADE AND STANDARDS

Item	Detail
Designations	AISI 1045 / UNS G10450 / C45 / 1.0503 / S45C / 080M46
Standards	ASTM A29, A108; EN 10083-2
Delivery condition	As rolled, normalised, or annealed max 197 HB
Melt route	EAF + ladle refining; vacuum degassing on request
Typical use	Shafts, axles, studs, gears, crankshafts, induction-hardened rods
Certificate	EN 10204 3.1 with chemistry and mechanical results

CHEMICAL COMPOSITION (% BY MASS)

C	Si	Mn	P	S	Cr	Ni	Cu
0.42–0.50	0.10–0.35	0.60–0.90	≤0.030	≤0.050	≤0.25	≤0.40	≤0.30

MECHANICAL PROPERTIES

Condition	Tensile MPa	0.2 % proof MPa	Elongation %	Hardness
As rolled	565–700	≥310	16	170–210 HB
Normalised	600–750	≥340	14	179–229 HB
Annealed	≤600	≥275	18	≤197 HB
Q+T, 28–32 HRC	850–1000	≥600	12	285–320 HB

SUPPLY RANGE

Form	Size range	Condition
Rolled round bar	Ø10–200 mm	As rolled / annealed / Q+T
Forged round bar	Ø80–1200 mm	Annealed / Q+T
Forged flat bar	Thickness 100–600 mm × width 300–2000 mm	Annealed
Rolled wire rod	Ø5.5–20 mm	As rolled / annealed

INSPECTION AND CERTIFICATION

- EN 10204 3.1 mill certificate - chemistry, mechanical properties and the heat number
- Ultrasonic inspection to SEP 1921 / ASTM A388 on request
- Hardness survey across the section on request
- Grain size to ASTM E112 on request
- ESR or remelt route where the application needs it

ORDERING INFORMATION

- Grade and standard
- Form and size - thickness x width x length, or diameter and cut length
- Quantity in pieces or kilograms
- Delivery condition and hardness window
- Certificate and inspection requirements

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EN 10204 3.1 mill certificate with every shipment
Chemistry · mechanical properties · test results · heat number

Hardness map and ultrasonic inspection on request.
Values are typical for the grade; the certificate of the actual heat governs.