

K1045 Medium carbon steel

Typical Analysis (Ave. values %)	C	Si	Mn	Ni	Cr	Mo	S	P
	0.45	0.30	0.70	-	-	-	0.035	0.035
NEAREST STANDARD	UNS		DIN		JIS		AISI	
	G10430		1.1191/1.0501 Ck45		S45C		1045	

DESCRIPTION	Fully-killed medium carbon steel.
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APPLICATIONS	Suitable for medium stressed parts in machinery and industrial tools. Components of small cross section requiring strength and wear properties better than low carbon unalloyed steel. Heavy forgings in the normalised condition for automotive and general engineering, such as axles, clutch members, shafts, pressed and punched parts, piston rods and gear racks. Can also be used as holder block in plastic moulds.
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HEAT TREATMENT	Forge	800-1100°C. Cool in furnace.
	Normalize	850°C. Air cool.
	Anneal	680-710°C. Cool slowly in controlled furnace.
	Stress relieve	600-650°C. Furnace or Air cool
	Flame or induction harden	820-860°C. Water or oil quench.
	Harden	800-830°C Water quench. Ave surface hardness 57 RC
	Temper	150-200°C air cool
	Annealed hardness	190 HB max

MECHANICAL PROPERTIES as tempered (40 mm)	Tensile Strength MPa	Yield Strength MPa	Elong. %	Impact Strength J
	620-770	375	17	27

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PHYSICAL PROPERTIES	Density (kg/dm ³)	7.85
	Modulus of elasticity 10 ³ N/mm ²	210
	Thermal conductivity W/(m.K)	45
	Electric resistivity Ohm.mm ² /m	0.20
	Specific heat capacity J/(kg.K)	460
	Thermal expansion 10 ⁶ m/(m.K) (Room temp.)	11.1

WELDING	Limited for repair, use Bohler EV-63. Refer to Bohler welding literature.
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SIZE RANGE	Round	16-650 mm
	Square	25-200 mm
	Flat	40 x 5 to 1230 x 605

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