

Technical Datasheet

Unalloyed Steel C45 XTP

General product description:

Xtreme Performance Technology enables the properties of the unalloyed steel C45 to be optimised for the fabrication of components used in the construction, mechanical engineering and automotive industries whose load profiles require a material with the right combination of strength and toughness. In addition to its suitability for machining operations, the moderately good toughness exhibited by C45 XTP means that the material is well suited for use in noncutting, cold-forming processes.

Mechanical-technological properties

Variant	R _{p0.2} [MPa]	R _m [MPa]	A ₅ [%]	A _g [%]	Z [%]	KV _{RT} [J]	T ₂₇ [°C]
high strength, high toughness	580	800	19	8	55	≥ 120	-40

Typical mechanical-technological values

R_{p0.2} = yield strength (at 0.2% offset), R_m = tensile strength, A₅ = elongation after fracture, A_g = uniform elongation, Z = reduction of area at fracture, KV = notch impact energy as per DIN EN ISO 148-1:2017-05, RT = room temperature, T = temperature, T₂₇ = transition temperature at 27 J

Chemical composition (cast analysis by mass-%)

Variant	C	Si	Mn	P	S	Cr	Mo	Ni	Ti
min.	0.42	-	0.50	-	-	-	-	-	-
max.	0.50	0.40	0.80	0.045	0.045	0.40	0.10	0.40	-

The chemical analysis corresponds to C45 (1.0503).

Maximum carbon equivalent:

Max. CET (CEV) 0.63 (0.77)

Typ. CET (CEV) 0.55 (0.64)

$$\text{CET} = \text{C} + \frac{\text{Mn} + \text{Mo}}{10} + \frac{\text{Cr} + \text{Cu}}{20} + \frac{\text{Ni}}{40}$$

$$\text{CEV} = \text{C} + \frac{\text{Mn}}{6} + \frac{\text{Cr} + \text{Mo} + \text{V}}{5} + \frac{\text{Cu} + \text{Ni}}{15}$$

Surface properties:

Bars are 100 % eddy current tested acc. to surface quality class 3 of EN 10277-1. Bar ends untested on both sides with a length of 50 mm if not otherwise requested by customer.

Miscellaneous:

Other agreements acc. to order.

Condition of delivery:

Bars, XTP-treated

Diameter range 18 – 40 mm, tolerance h11

Bar straightness 0.5 mm/m

Fabrication and other recommendations:

Moderately good machinability, good cold workability.