

General product description

The unalloyed steel C45 can be optimized by Xtreme Performance Technology for construction, vehicle, and machine parts that place high demands on strength and toughness due to their load profile. In addition to machining, it is also suitable for chipless, cold-forming processing methods due to its good toughness.

International description

Steel number	EU/DE	ASTM	JIS	AFNOR	B.S.	SS
1.0503	C45	1046	S45CM	C45	C45 50CS/HS	C45

Chemical composition (cast analysis by mass-%)

Variant	C	Si	Mn	P	S	Cr	Mo	Ni	Cu
min.	0,42	0,10	0,50	–	–	–	–	–	–
max.	0,50	0,40	0,80	0,045	0,045	0,40	0,10	0,40	0,30

The analysis corresponds to C35 (1.0501) according to DIN EN ISO 683-1.
Customer-specific chemical analyses are possible after consultation.

Mechanical-technological properties

Variant	R _{p0,2} [MPa]	R _m [MPa]	A ₅ [%]	A _g [%]	Z [%]	KV _{RT} [J]	T ₂₇ [°C]
high strength, very good toughness	660	840	18	9	40	≥100	-30

Typical mechanical-technological properties:
R_{p0,2} = 0.2% yield strength, R_m = tensile strength, A₅ = elongation at fracture,
A_g = uniform elongation, Z = reduction of area,
KV = Charpy impact strength according to DIN EN ISO 148-1, RT = room temperature,
T = temperature, T₂₇ = transition temperature of the Charpy impact strength at 27 J.

Customized mechanical properties are possible after consultation.

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

The surface condition complies with the requirements of SN EN 10277. The bars are crack-tested according to surface quality class 3 as standard. In the standard version, the ends of the bars up to 50 mm are not tested.

Miscellaneous

Other agreements according to order.

Condition of delivery

- Bar steel, XTP® treated
- Dimension range 18 - 40 mm
- Delivery length up to 8,000 mm
- Tolerance h11 and bar straightness 0.5 mm/m according to DIN EN 10278

Fabrication and other recommendations

Very good weldability, relatively good machinability, thread rolling and cutting capability, very good cold formability, bendable.

Your benefits at a glance

Increased fatigue strength

- Higher load capacity and component safety
- Higher service life and lower maintenance costs
- Lightweight potential

Increased productivity

- Reduction of hardness distortion and increase in straightness
- Optimized diameter tolerance

Highest quality

- Single bar processing
- State-of-the-art process control
- Low decarburization and low scale formation

For further info on our product range of tool steel, stainless steel and Engineering steel please visit www.swisssteelgroup.com

Discover our Green Steel portfolio on www.swissgreensteel.com

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