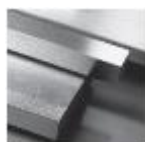


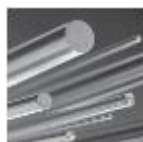
Steel grade

Material No. / Werkstoff-Nr.	PREMIUM 1.1730
Description	C45U
AISI/SAE	1045
Search for alternatives in the ABRAMS STEEL GUIDE®	www.steel-guide.eu/alternatives/1045

Specifications



Precision flat steel without machining allowance [PFS]
L: 500 mm
L: 1.000 mm



Precision round steel without machining allowance [PRS]
bright drawn / ground, ISO h9
L: 1.000 mm



Round steel [RS]
black
L: 500 mm
L: 1.000 mm

Chemical composition AISI/SAE 1045 (reference value %)

C	Si	Mn	P	S
0,42 - 0,5	0,15 - 0,4	0,6 - 0,8	0 - 0,03	0 - 0,03

Physical properties

Hardness (delivery condition)	max. 190 HB			
Tensile strength R_m (as received condition)	approx. 650 N/mm ²			
Working hardness	max. 54 HRC (surface hardness)			
Thermal expansion coefficient $10^{-6}m/(m \cdot K)$	20 - 100°C	20 - 200°C	20 - 300°C	20 - 400°C
	12,5	13,0	13,6	14,1
Thermal conductivity $W/(m \cdot K)$	20°C		350°C	
	44,9	41,6		

Technical properties

Unalloyed tool steel with excellent machining properties for unhardened parts (e.g. fixture construction), due to its carbon proportion (0,45 %) it can be hardened, but has a low depth of hardening. Shallow depth case-hardening steel with a hard surface and a tough core.

Applications

Machine construction, construction materials, jigs, base plates, moulding frames, small dies, hand tools, simple knives, sledges, pliers, forks, hatchets, axes, shears, screwdrivers, chisels.

Heat treatment

	Temperature	Cooling	Hardness	
Soft annealing	680 - 710°C	Furnace	max. 190 HB	
	Temperature	Cooling		
Stress relief annealing	approx. 600 - 650°C	Furnace		
	Temperature	Quenching in	Hardness after quenching	
Hardening	800 - 830°	Water	57 HRC	
	100°C	200°C	300°C	350°C
Tempering	57 HRC	54 HRC	49 HRC	42 HRC

ABRAMS PREMIUM STEEL

is a registered trademark of
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Managing Director: Dipl.-Wi.-Ing. Dr. Juergen Abrams

Amtsgericht Osnabrueck / Germany, HRA 6865
VAT-No.: DE 221940667
General Partner: Abrams Engineering Verwaltungs GmbH
Amtsgericht Osnabrueck / Germany, HRB 20019

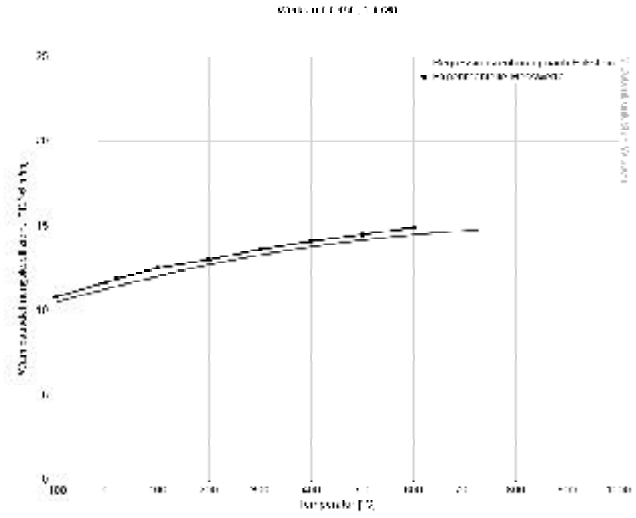
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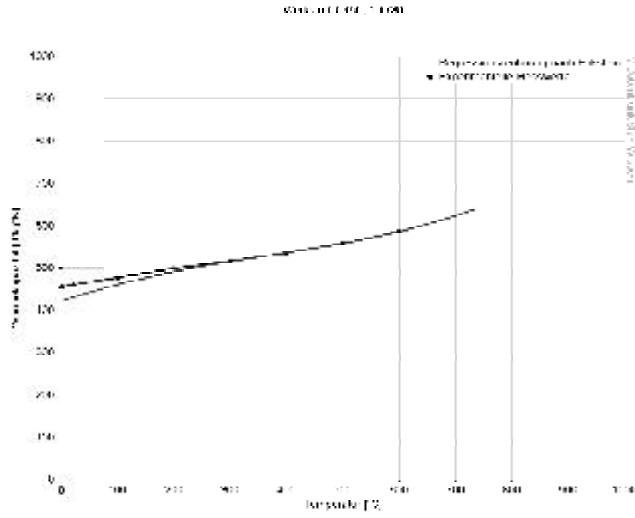
Thermal expansion coefficient diagram



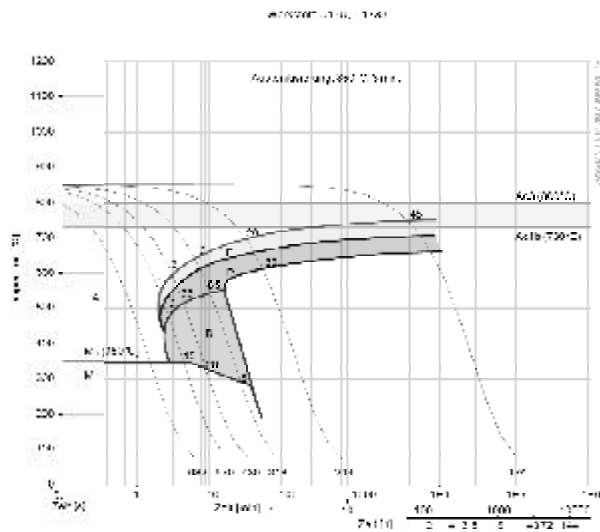
Thermal conductivity diagram



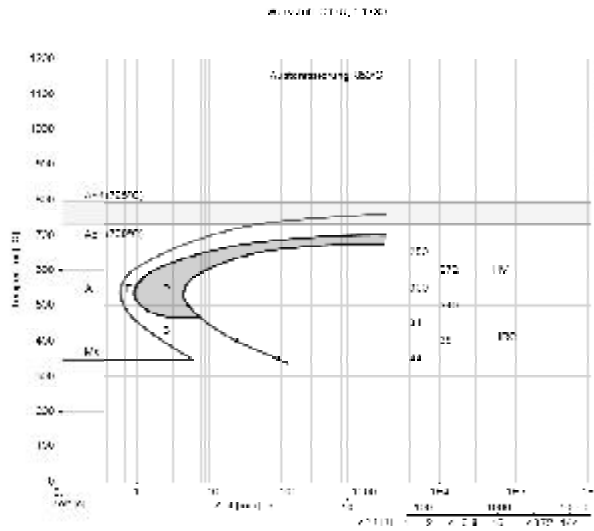
Thermal capacity diagram



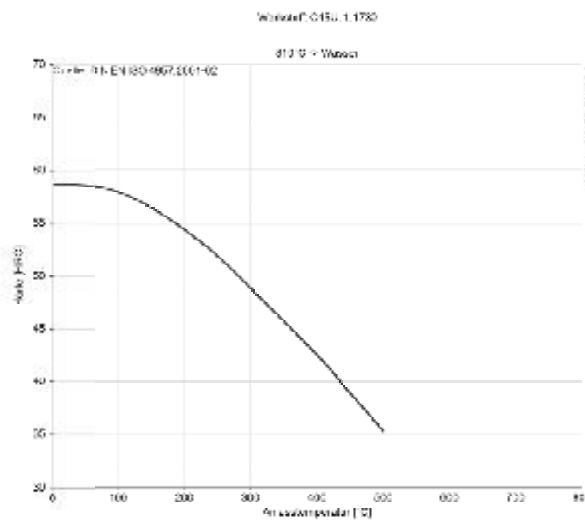
Continuous ZTU-diagram



Isothermal ZTU-diagram



Tempering diagram



The data shown here is to be used only as an indication of the statistics, thus we accept no liability.
Diagrams are taken from Datenbank StahlWissen Dr. Sommer Werkstofftechnik
Issued: 2012

