

# C45

Steel for quenching and tempering according to DIN EN 10083

International steel grades: **BS:** C45,50CS,080M46 **AFNOR:** C45,AF65C45, 1C45 **SAE:** 1045

## Chemical composition ( typical analysis in %)

C	Cr	Mn	Si	P	S	Mo	Ni	Cr+Mo+Ni
0,42-0,50	<0,40	0,50-0,80	<0,40	<0,045	<0,045	<0,10	0,40	<0,63

## Application

Plain carbon Steel for mechanical engineering and automotive components, agriculture, construction and mould construction.

## Hot forming and heat treatment

Forging or hot rolling: 1100-850°C  
Normalising: 840-880°C/air  
Soft annealing: 680-710°C/furnace  
Hardening: 820-860°C/water, oil  
Tempering: 550-660°C/air

## Mechanical properties

Treated for cold shearability +S: max.255 HB  
Soft annealed +A: max. 207 HB

## Quenched and tempered, +QT

Diameter d [mm]	< 16	> 16-40	> 40-100	> 100-160	> 160-250
Thickness t [mm]	< 8	8<t<20	20<t<60	60<t<100	100<t<160
0,2% proof stress R <sub>p0,2</sub> [N/mm <sup>2</sup> ]	Min. 490	Min. 430	Min. 370	-	-
Tensile strength R <sub>m</sub> [N/mm <sup>2</sup> ]	700-850	650-800	630-780	-	-
Fracture elongation A <sub>5</sub> [%]	Min. 15	Min. 16	Min. 17	-	-
Redution of area Z [%]	Min .35	Min. 40	Min. 45	-	-

## Normalised, +N

Diameter d [mm]	< 16	> 16-100	> 100-250		
Thickness t [mm]	< 16	16<t<100	100<t<250		
0,2% proof stress R <sub>p0,2</sub> [N/mm <sup>2</sup> ]	Min. 340	Min. 350	Min. 275		
Tensile strength R <sub>m</sub> [N/mm <sup>2</sup> ]	Min. 620	Min. 580	Min. 560		
Fracture elongation A <sub>5</sub> [%]	Min. 14	Min. 16	Min. 16		