

## Material specification sheet

### Saarstahl - C45

Material No.:	Former brand name:	International steel grades:
1.0503		<b>BS:</b> C45, 50CS, 080M46 <b>AFNOR:</b> C45, AF65C45, 1C45 <b>SAE:</b> 1045

**Material group:** Steel for quenching and tempering according to DIN EN 10083

Chemical composition: (Typical analysis in %)	C	Si	Mn	P	S	Cr	Mo	Ni	Cr+Mo+Ni
	0,42 0,50	<0,40	0,50 0,80	<0,045	<0,045	<0,40	<0,10	0,40	<0,63

**Application:** Plain carbon steel for mechanical engineering and automotive components

<b>Hot forming and heat treatment:</b>	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

<b>Mechanical Properties:</b>	Treated for cold shearability +S:	max. 255 HB
	Soft annealed +A:	max. 207 HB

Quenched and tempered, +QT:

	< 16	>16 – 40	>40 – 100	>100 – 160	>160 – 250
<b>Diameter d [mm]</b>	< 16	>16 – 40	>40 – 100	>100 – 160	>160 – 250
<b>Thickness t [mm]</b>	< 8	8<t<20	20<t<60	60<t<100	100<t<160
<b>0,2% proof stress R<sub>p0,2</sub> [N/mm<sup>2</sup>]</b>	min. 490	min. 430	min. 370	-	-
<b>Tensile strength R<sub>m</sub> [N/mm<sup>2</sup>]</b>	700 - 850	650 - 800	630 - 780	-	-
<b>Fracture elongation A<sub>5</sub> [%]</b>	min. 14	min. 16	min. 17	-	-
<b>Reduction of area Z [%]</b>	min. 35	min. 40	min. 45	-	-

Normalised, +N:

<b>Diameter d [mm]</b>	< 16	>16 – 100	>100 – 250		
<b>Thickness t [mm]</b>	< 16	16<t<100	100<t<250		
<b>0,2% proof stress R<sub>p0,2</sub> [N/mm<sup>2</sup>]</b>	min. 340	min. 305	min. 275		
<b>Tensile strength R<sub>m</sub> [N/mm<sup>2</sup>]</b>	min. 620	min. 580	min. 560		
<b>Fracture elongation A<sub>5</sub> [%]</b>	min. 14	min. 16	min. 16		