

**C45E (Ck45)**
**Steel grade correspondence**

EN 10083	Werkstoff Nr.	DIN	STAS 500	AFNOR A36101 A35501	BS 1449 4360	UNI 7070	JIS G3106	GOST 380 19281	AISI SAE ASTM
C45E	1.1191 1.1201	Ck45	OLC45X	2C45 XC42H1 XC45 XC48H1	080M46 060A47	C43 C46	S45C S48C	45	1045

**Standard parameters**

<b>Steel grade</b>	C45E (+N) (EN 10083)
<b>Diameter range (metric)</b>	6 - 200 mm
<b>Diameter range (imperial)</b>	1/4" - 8"
<b>Tolerance</b>	ISO f7 (upon request: h7) (EN ISO 286-2)
<b>Roundness</b>	IT / 2
<b>Standard length</b>	- for $\varnothing < 60$ mm: 5600 - 6200 mm - for $\varnothing \geq 60$ mm: 6500 - 7200 mm Upon request: special lengths on all diameters
<b>Surface roughness</b>	Ra max. 0.20 $\mu\text{m}$ (statistic average: 0.05 - 0.15 $\mu\text{m}$ ) (EN ISO 4287)
<b>Surface hardness</b>	min. 55 HRC
<b>Hardened layer depth</b>	from 0.5 to 3.5 mm
<b>Chrome layer thickness</b>	< $\varnothing 20$ mm: min. 15 $\mu\text{m}$ $\geq \varnothing 20$ mm: min. 20 $\mu\text{m}$
<b>Chrome layer hardness</b>	min. 900 HV(0.1)
<b>Straightness</b>	$\leq \varnothing 16$ mm: max. 0.3 mm : 1000 mm > $\varnothing 16$ mm: max. 0.2 mm : 1000 mm

**Chemical composition acc. to EN 10083 - 2**  
(% of weight)

C	Si max	Mn	P max
0.42 - 0.50	0.40	0.50 - 0.80	0.030
S max	Cr	Mo	Ni
0.035	max 0.4	max 0.1	max 0.4

**Mechanical properties acc. to EN 10083 - 2**
**at room temperature  
in the normalized condition (+N)**

$\varnothing$ (mm)	Re min (MPa)	Rm min (MPa)	A min (%)
$\varnothing \leq 16$	340	620	14
$16 < \varnothing \leq 100$	305	580	16
$100 < \varnothing \leq 200$	275	560	16

**Mechanical properties acc. to EN 10083 - 2**
**at room temperature in the quenched  
and tempered condition (+QT)**

$\varnothing$ (mm)	Re min (MPa)	Rm (MPa)	A min (%)
$\varnothing \leq 16$	490	700 - 850	14
$16 < \varnothing \leq 40$	430	650 - 800	16
$40 < \varnothing \leq 100$	370	630 - 780	17

1 MPa = 1 N/mm<sup>2</sup>  
1 KSI = 6.8947 N/mm<sup>2</sup>

**ISO tolerances for diameter range**

$\varnothing$	> 3 mm $\leq 6$ mm	> 6 mm $\leq 10$ mm	> 10 mm $\leq 18$ mm	> 18 mm $\leq 30$ mm	> 30 mm $\leq 50$ mm	> 50 mm $\leq 80$ mm	> 80 mm $\leq 120$ mm	> 120 mm $\leq 180$ mm	> 180 mm $\leq 200$ mm
f7	-10 $\mu\text{m}$ -22 $\mu\text{m}$	-13 $\mu\text{m}$ -28 $\mu\text{m}$	-16 $\mu\text{m}$ -34 $\mu\text{m}$	-20 $\mu\text{m}$ -41 $\mu\text{m}$	-25 $\mu\text{m}$ -50 $\mu\text{m}$	-30 $\mu\text{m}$ -60 $\mu\text{m}$	-36 $\mu\text{m}$ -71 $\mu\text{m}$	-43 $\mu\text{m}$ -83 $\mu\text{m}$	-50 $\mu\text{m}$ -96 $\mu\text{m}$
h7	0 $\mu\text{m}$ -12 $\mu\text{m}$	0 $\mu\text{m}$ -15 $\mu\text{m}$	0 $\mu\text{m}$ -18 $\mu\text{m}$	0 $\mu\text{m}$ -21 $\mu\text{m}$	0 $\mu\text{m}$ -25 $\mu\text{m}$	0 $\mu\text{m}$ -30 $\mu\text{m}$	0 $\mu\text{m}$ -35 $\mu\text{m}$	0 $\mu\text{m}$ -40 $\mu\text{m}$	0 $\mu\text{m}$ -46 $\mu\text{m}$

**Hardening depth**

$\varnothing$ (mm)	Rht (mm)	$\varnothing$ (mm)	Rht (mm)
6	0.5 - 0.8	25	1.5 - 1.7
8	0.6 - 0.9	28	1.5 - 1.8
10	0.7 - 1.0	30 - 35	1.5 - 1.9
12 - 14	0.8 - 1.2	40 - 45	1.6 - 2.0
14	0.9 - 1.3	50 - 85	2.2 - 2.6
15	1.0 - 1.4	90 - 100	2.2 - 3.2
16 - 18	1.1 - 1.5	105 - 140	2.4 - 3.4
20 - 22	1.2 - 1.5		
24	1.4 - 1.6	150 - 203.2	2.5 - 3.5

**Corrosion resistance properties NSS**

BATC in standard execution
For $\varnothing < 20$ mm: Rating 9 after 120 h
For $\varnothing \geq 20$ mm: Rating 9 after 200 h
BATC with "Cromsteel-500" corrosion protection enhancement
Rating 9 after 500 h

*The corrosion resistance is tested in our own internal salt spray laboratory according to ISO 10289 / ISO 9227.*

## Diameter range

∅ (mm)	∅ (inch)	weight (Kg/m)	∅ (mm)	∅ (inch)	weight (Kg/m)	∅ (mm)	∅ (inch)	weight (Kg/m)
6		0.22	32		6.31	82.55	3" 1/4	41.99
6.35	1/4"	0.25	34.925	1" 3/8	7.52	85		44.52
8		0.39	35		7.55	88.9	3" 1/2	48.70
9.525	3/8"	0.56	36		7.99	90		49.91
10		0.62	38		8.90	95		55.61
12		0.89	38.1	1" 1/2	8.94	100		61.62
12.7	1/2"	0.99	40		9.86	101.6	4"	63.61
13		1.04	42		10.87	105		67.94
14		1.21	44.45	1" 3/4	12.17	110		74.56
15		1.39	45		12.48	115		81.49
15.88	5/8"	1.55	50		15.41	120		88.73
16		1.58	50.8	2"	15.90	125		96.28
18		2.00	55		18.64	127	5"	99.39
19.05	3/4"	2.24	56		19.32	130		104.14
20		2.46	57.15	2" 1/4	20.13	140		120.78
22		2.98	60		22.18	150		138.65
22.225	7/8"	3.04	63		24.46	152.4	6"	143.12
24		3.55	63.5	2" 1/2	24.85	160		157.75
25		3.85	65		26.03	170		178.08
25.4	1"	3.98	65		26.03	177.8	7"	194.80
28		4.93	69.85	2" 3/4	30.06	180		199.65
28.575	1" 1/8	5.03	70		30.19	190		222.45
30		5.55	75		34.66	200		246.48
			76.2	3"	35.78	203.2	8"	254.43

More diameters can be supplied upon request.

## Packaging options

Each bar is individually packed in high-quality plastic extrusion sleeve (food industry grade polyethylene). The plastic sleeve is marked for full traceability with the following information:

- Cromsteel trademark
- product code
- outside diameter
- tolerance
- heat number
- date of production
- shift and operator code

The bars are then packed together in bundles and/or in wooden boxes.

Other packaging options are available, like:

- pallets for cut and machined parts
- plastic rings (instead of plastic extrusion sleeve)
- cardboard tubes (instead of plastic extrusion sleeve)
- aluminium vacuum bags (for sea freight)
- special protection oiling

