

Quality	C45U	Supply conditions:	<i>Technical card</i>
According to standards	UNI EN ISO 4957: 2002	Natural state HB max 245	Lucefin Group
Number	1.1730	Annealed HB max 207 – Normalized HB min. 160	<i>rev. 2018</i>

Chemical composition

C%	Si%	Mn%	P%	S%	Cr%	Mo%	Ni%
0,42-0,50	0,15-0,40	0,60-0,80	max 0,030	max 0,030	-	-	-
± 0.03	± 0.03	± 0.04	+ 0.005	+ 0.005			

Products deviations are allowed

Temperature °C

Hot-forming	State of employment +U	Quenching and Tempering +QT	Normalizing +N
1100-850	normally, natural state	830 oil, tempering 450 air R 650 N/mm ² Rp 0.2 560 N/mm ²	860-870
Soft annealing +A	Soft annealing +A+C	Hardenability test	
690 air cooling (HB max 207)	Max. hardness value of annealed and cold drawn material: HB 227 max	quenching	tempering
		810 ± 10 water	180 ± 10 HRC min 54
		Pre-heating welding	
		250	550 furnace cooling
		Ac1	Ac3
		720	780
		Ms	Mf
		320	20

Mechanical and physical properties

Table of tempering values at room temperature on thickness 10 mm after quenching at 810 °C in water

HB	624	615	577	543	512	455	432	390	362	327
HRC	58.5	58	56	54	52	48	46	42	39	35
R N/mm ²	2375	2330	2160	2010	1880	1640	1520	1340	1220	1080
Tempering at °C	50	100	150	200	250	300	350	400	450	500

EN 10083-2: 2006 **Jominy test HRC** grain size 5 min.

distance in mm from quenched end

	1	2	3	4	5	6	7	8	9	10	11	13	15	20	25	30	H
min	55	51	37	30	28	27	26	25	24	23	22	21	20	-	-	-	
max	62	61	61	60	57	51	44	37	34	33	32	31	30	29	28	27	

Thermal expansion	10 ⁻⁶ • K ⁻¹	▶	11.1	12.1	12.9	13.5	13.9	14.1	
Mod. of elasticity long.	GPa		210	205	195	185	175	155	
Mod. of elasticity tang.	GPa		80	78	74	71	67	59	
Specific heat capacity	J/(Kg•K)		460						
Thermal conductivity	W/(m•K)		50.0						
Density	Kg/dm ³		7.85						
Specific electric resist.	Ohm•mm ² /m		0.12						
Electrical conductivity	Siemens•m/mm ²								
°C			20	100	200	300	400	500	600

The symbol ▶ indicates temperature between 20 °C and 100 °C, 20 °C and 200 °C ...

Europe	Germany	China	Japan	India	R. of Korea	Russia	USA
EN	DIN	GB	JIS	IS	KS	GOST	AISI/SAE
C45U	C 45 W	45 ~		TC1		45 ~	1045 ~

Cold-work and Hot-work tool steel

- especially suitable for surface hardening, though maintaining a tough core.
- applications: *bolsters for plastic materials in die casting; hand tools such as pliers and agricultural tools*