

Quality	C45U	Supply conditions:
According to standards	UNI EN ISO 4957: 2002	Annealed
Number	1.1730	Normalization

Chemical composition

C%	Si%	Mn%	P% max	S% max	Cr%	Mo%	Ni%	Deviations allowed for analysis product
0,42-0,50 ± 0.03	0,15-0,40 ± 0.03	0,60-0,80 ± 0.04	0,030 + 0.005	0,030 + 0.005				
Products deviations are allowed								

Temperature °C

Hot-forming	State of employment	Quenching and Tempering		Normalizing			
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		Pre-heating welding		Stress-relieving after welding	
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	250 Ac1 Ac3		550 furnace cooling Ms Mf	
				720	780	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				normal
max	62	61	61	60	57	51	44	37	34	33	32	31	30	29	28	27	

Temperature Testing at °C	Mod. of elasticity GPa		Thermal expansion
	E long.	G tang.	10 ⁻⁶ · K ⁻¹
20	210	80	
100	205	78	11.1
200	195	74	12.1
300	185	71	12.9
400	175	67	13.5
500			13.9
600	155000	59000	14.1

Specific heat capacity J/(Kg·K)	Density Kg/dm ³	Thermal conductivity W/(m·K)	Specific electric resist. Ohm·mm ² /m	Electrical conductivity Siemens·m/mm ²
460	7.85	50	0.12	8.33

Cold-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*