

Quality	40CrMnMo7	Supply conditions:	<i>Technical card</i>
According to standards	Werkstoff	Annealed HB max 230	Lucefin Group
Number	1.2311	Quenched and Tempered HB 280-330	<i>rev. 2018</i>

Chemical composition

C%	Si%	Mn%	P% max	S% max	Cr%	Mo%
0,35-0,45	0,20-0,40	1,30-1,60	0,035	0,035	1,80-2,10	0,15-0,25
± 0.03	± 0.03	± 0.04	+ 0.005	+ 0.005	± 0.05	± 0.03

Products deviations are allowed

Temperature °C

Hot-forming	Quenching ¹⁾ +Q	Tempering ¹⁾ +T	Quenching ²⁾ +Q	Tempering ²⁾ +T
1050-850	840-870 oil or polymer s.b. 180-210°C (HRC 52)	650-670 calm air minimum 2 cycles	860-880 calm or forced air (HRC 46)	180-220 calm air
Soft annealing +A	Stress-relieving +SR	Normalizing +N	Pre-heating welding	Stress-relieving after welding
720-780 furnace cooling (HB max 230)	50° under the temperature of tempering	850-900 air	250-300	650 furnace cooling
			Ac1 Ac3	Ms Mf
			760 800	260 140

s.b. = salt bath

Mechanical properties

Heat treatment: quenching at 860 °C in oil, tempering at 600 °C *for information*

Means values to ½ tickness on Ø 400 mm

R	N/mm ²	1000	890	Kv longitudinal J							HB at the depth mm							
				8	20	30	40	50	60	75	294	286	264	min				
Rp 0.2	N/mm ²	880	750															
Test at °C		20	200	0	20	40	60	80	100	120								

Tempering table after quenching at 860 °C in oil

HB	496	496	489	482	468	455	442	432	409	390	353	336	271	240
HRC	51	51	50.5	50	49	48	47	46	44	42	38	36	28	21
R N/mm ²	1820	1820	1790	1760	1700	1640	1580	1520	1430	1340	1180	1110	900	800
Kv J	-	-	-	-	-	8	8	8	7	9	14	20	30	-
Tempering °C	50	100	150	200	250	300	350	400	450	500	550	600	650	700

Thermal expansion	10 ⁻⁶ • K ⁻¹	▶	12.8	13.0	13.4	13.8	14.0	14.2	14.4	14.5	
Modulus of elasticity	long. GPa		210			196			177		
Modulus of elasticity	tang. GPa		81			75			68		
Specific heat capacity	J/(Kg•K)		460								
Thermal conductivity	W/(m•K)		34.0			33.4			33.0		
Density	Kg/dm ³		7.83								
Specific electric resist.	Ohm•mm ² /m		0.19								
Electrical conductivity	Siemens•m/mm ²		5.26								
°C			20	100	200	250	300	400	500	600	700

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
	40CrMnMo7	5CrMnMo ~					

Cold-work and Hot-work Tool steel; also for plastic moulding and extrusion

- it is obtained through a special production process which allows a high level of micro-purity and microstructural homogeneity
- excellent suitability for photo-engraving, polishing, nitriding, excellent wear resistance and weldability
- applications: *small and medium-sized moulds for the automotive and food industry, moulds for rubber pressing, pressure moulds for thermosetting compounds (SMC Sheet Moulding Compound, BMC Bulk Moulding Compound), bolsters*
- extrusion: *dies and gauges for PVC, mechanical parts for extrusion presses*