

Quality	PMHS 6-5-3-8	Supply conditions:	<i>Technical card</i>
According to standards	Stahlschlüssel	Annealed HB max 300	Lucefin Group
Number	1.3294		rev. 2018

Chemical composition

C%	Si%	Mn%	P%	S%	Cr%	Mo%	V%	W%	Co%
	max	max	max	max					
1,23-1,32	0,70	0,40	0,030	0,030	3,80-4,50	4,70-5,30	2,70-3,20	5,90-6,70	8,00-8,80

Temperature °C

Hot-forming	Stress-relieving after machining and before quenching	Pre-heating	Quenching +Q	1° 2° Tempering +T	3° Tempering +T		
1100-960	620-700 raffr. furnace cooling to 500, then air	450-500 pause then 850-900, pause, then ▲	heatings must be carried out in controlled atmosphere furnace ▲ 1050-1180 salt bath 550 °C inert gas, forced air	560 calm air	540 calm air		
Soft annealing +A				Pre-heating welding	Stress-relieving after welding		
870-900 cooling 10 °C/h to 700 then air (HB max 300)		All high-speed steels must be annealed after hot-forming			not recommended		
				Ac1	Ac3	Ms	Mf
				825	845	175	25

The symbol ▲ indicates temperature rise up to°C ▲

Mechanical properties

HRC hardness at different temperatures Hardening and Tempering

Hardening °C	980	1000	1040	1060	1080	1100	1120	1140	1160	1180
Tempering 520 °C	-	-	-	-	-	66	-	66.5	-	67
Tempering 540 °C	-	-	-	-	-	64.5	-	67	-	68
Tempering 560 °C	59	60	61	62	63	64	65	65.5	66	67
Tempering 580 °C	-	-	-	-	-	62	-	64	-	65
Tempering 600 °C	-	-	-	-	-	60	-	63.5	-	64
Tempering 620 °C	-	-	-	-	-	58	-	59	-	62
Toughness J		20	40	44	46	44	42	38	36	30

The toughness values were determined on longitudinal unnotched speci. (7x10x55 mm) after hardening and 3 tempering at 560 °C

Hardness HRC as a function of holding time at different working temperature. Hardened material at 1130 °C and 3 tempering at 560 °C

h time	working temperature 600 °C	working temperature 650 °C
0,1	66	66
1	65	58
10	61	47
100	52	40

Thermal Expansion	10 ⁻⁶ .K ⁻¹ ►	11.8	12.3
M. of Elasticity long..	GPa	240	214
Sp.Heat Capacity	J/(Kg.K)	420	510
Thermal Conductivity	W/(m.K)	22.0	26
Density	Kg/dm ³	8.04	7.93
Electric Resist.	Ohm.mm ² /m	0.53	
Electrical Cond.	Siemens.m/mm ²	1.88	
°C		20	200
		300	400
		500	600

The symbol ► indicates temperature between 20°C and 400 °C, 20 °C and 600 °C

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