Quality	**20CrMo5**	**Case-hardening Steel**	*Technical card*
According to standards	**Werkstoff**		***Lucefin Group***
Number	**1.7264**		*rev. 2018*

Chemical composition

C%	Si%	Mn%	P% max	S% max	Cr%	Mo%
0,18-0,23	0,15-0,35	0,90-1,20	0,035	0,035	1,10-1,40	0,20-0,30

Temperature °C

Hot-forming	Core hardening	Tempering +T	Carburizing	Hardening carburizing surface	Tempering
1050-850	850 water, oil, polymer (HRC 45)	450-600	860-900	810-830 oil, polymer, s.b.	180-200

Soft anealing +A	Transformation annealing +FP	Intermediate annealing	End quench Hardenability	Pre-heating welding	Stress-relieving after welding
680-700 cooling 15 °C/h to 600 then air	900-1000	650-680	860 water	200-300	500 furnace cooling
				welding must be carried out on the annealed state and before carburizing	
(HB max 217)	(HB 150-205 ~)				

Ac1	Ac3	Ms	Mf
740	820	390	180

s.b. = salt bath 580-600 °C

Mechanical properties

20CrMo5 1.7264 **Hot-rolled** mechanical properties after case hardening, in core Stahlschlüssel 2010

size mm		Testing at room temperature (longitudinal)					
		R	**Rp** 0.2	**A**%	**Z**%	**Kv**	***HB***
from	to	N/mm²	N/mm² min.	min.	min.	J min.	*only information*
	11	1080-1370	735	7	30	24	*327-394*
	30	980-1270	685	8	35	24	*295-373*
	63	780-1080	540	10	35	-	*232-327*

Table of tempering approximate values obtained at room temperature after quenching at 850 °C in water

HB		353	353	319	279	258	237	231
HRC		38	38	34	29	24	21	20
R	N/mm²	1180	1180	1050	930	860	790	770
Tempering at **°C**		**100**	**200**	**300**	**400**	**500**	**550**	**600**

Cold-drawn +C

size mm		Testing at room temperature (longitudinal)			
		R	**Rp** 0.2	**A**%	**HB**
from	to	N/mm²	N/mm² min	min	

No indications are shown in the reference standards

End quench Hardenability HRC

mm distance from quenched end

	1.5	**3**	**5**	**7**	**9**	**11**	**13**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**
min	42	41	39	37	35	34	33	31	29	28	27	25	24	-	-
max	49	49	48	48	47	46	45	44	42	41	40	39	38	-	-

Thermal Expansion	$10^{-6} \cdot K^{-1}$ ►		11.1	12.1	12.7	12.9	13.5	
Mod. of Elasticity long.	GPa	210						
Mod. of Elasticity tang.	GPa	80						
Density	Kg/dm³	7.80						
°C		**20**	**100**	**200**	**300**	**400**	**500**	

The symbol ► indicates temperature between 20 °C and 100 °C, 20 °C and 200 °C …

EUROPE	ITALY	CHINA	GERMANY	FRANCE	U.K.	RUSSIA	USA
EN	UNI	GB	DIN	AFNOR	B.S.	GOST	AISI/SAE
		20CrMnMo	1.7264				