

Tool steel description

L %	C	Si	Mn	Cr	Ni	Mo	W	V	S
1.2312	0,40	0,40	1,50	1,90		0,20			0,10
1.2311	0,35	0,35	1,40	2,00		0,20			
1.7225	0,35	0,35	1,40	2,00		0,20			
1.2738	0,40	0,30	1,50	1,90	1,00	0,20			

P20 / 1.2312

40 Cr Mn Mo S 8-6

Pre-hardened to 1100N/mm²

★★★

Pre-heat treated (re-sulphurised) Plastic Mold Steel

Special steel in for plastic forms is supplied in hardened and tempered condition with a tensile strengths of approx. 1000N/mm² (approx. 100 Kg/mm²) (45.000 psi; 65tsi). Owing to the chemical composition, the steel is considerably better and machineable in hardened and tempered condition than any other steel of the same tensile strength. On account of its superior capability of being polished. P20+S is also suitable for the manufacture of forms with superior surface qualities. In order to improve the properties of surface, P20 can be nitrided, chromium plated or hard-nickel plated. No further heat treatment by the consumer is necessary. No problems with regard to change dimension or distortion by heat treatment, in particular with large forms, are to be anticipated. Apart from manufacture of plastic forms the steel can also be used for light metal and zinc printing forms. P20 +S is supplied in heat treated bars or forged blocks.

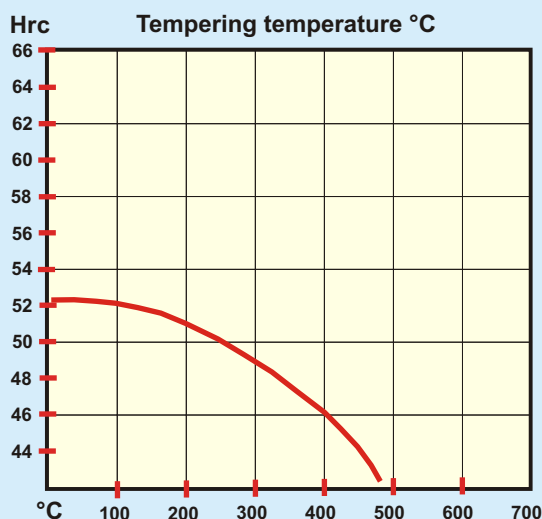
Some typical Applications: Transfer-, Injection-, Compression MOLDS. All types of dies. Backers and Holders. No further heat treatment is required.

EDM: Normally not used for park erosion, but can be performed. After hardening and tempering stress relieving at 550°C (1020°F)

Nitriding: To increase wear resistance nitride in ammonia at 520°C (970°F) for a surface hardness of 56-64Hrc.

Machinability: Due to the sulfur (S) content P20 can easily be machined with HSS and carbide tools. Vc=110m/min.

HEAT treatment and HARDENING instructions



Forging.....	1050 - 850 °C (1.920 - 1560°F) cool slowly
Soft annealing	710 - 740 °C max. 235 HB, max. 790 N/mm 4 - 6 hrs. Cool slowly.
Stress Relieving.....	650 - 680 °C (1200 - 1260°F) in pre-hardened condition below the last tempering temperature. Cool slowly.
Pre-heating.....	350 °C depending on size.
Hardening.....	840 - 870 °C (1540-1600°F) (51 HRC)
Tempering.....	450 - 650 °C (840-1200°F)
Quenching.....	Oil, Warmbath 180 - 220°C (355-430°F)
Thermal expansion.....	(Mm/m °C): 11.1 -14,9 10-6 at 25 °C- 700 °C
Thermal conductivity.....	(j/cm s °C): 0.345 - 0.320
Extending limit.....	Rp 0,2 Mpa 800 at 20°C Stab 25mm Ø / 300HB
Tensile strength Rm MPa..	1020 at 20°C
Data sheet	D/04

100 °C = 51 +/- 1Hrc 200 °C = 50 +/- 1Hrc 300 °C = 48 +/- 1Hrc 400 °C = 46 +/- 1Hrc 500 °C = 42 +/- 1Hrc

Offer and prices for P20 S (1.2312)

	Length mm	Page
Material description and hardening instructions		33 i
Pre-machined (oversize)	1030	34 Prices
Pre-machined universal plates	various	35 Prices
Universal bar and plate	505 / 1030	36 Prices
Universal plates 508 x 1030, Thickness	8,2 to 100,4	55 Prices

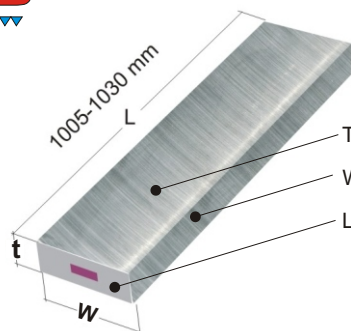
Delivery condition: pre-hardened 1050 N/mm²

Colour code for P20 S **LILAC**

Usually used as delivered

P20+S / 1.2312

40 CrMnMoS 8-6



Thickness:	+ 0,2/0 mm	N8	Segmental ground, fine milled (Ra 3,2)
Width:	+0,2/0 mm	N8	Segmental ground, fine milled (Ra 3,2)
Length:	+5/0 mm	N11	Sawn only (Ra 25)

**PRE-MACHINED (over size)****Delivery: EX STOCK****PRICELIST EUR/pc**

Length: 1005 - 1030 mm

t →	8,2	10,4	12,4	15,4	16,4	20,4	22,4	25,4	27,4	30,4	32,4	36,4	40,4	46,4	50,4	56,4	60,4	70,4	76,4	80,4	100,4	120,4	150,4
20,4	22	23	26	32		38																	
25,4	23	24	28	33		37		49															
30,4	25	24,5	29	34		39		48		63													
32,4	26	26	32	37		42				64	67												
40,4	27	28	36	40		44		54		65			70										
50,4	32	38	41	44		50		58		67	71		75		94								
60,4	37	45	47	50		56		62		72			87		100		128						
63,4																							
70,4			49	54		63		70		81			92,5		114		135	148					
80,4	46	51	53	60		67		77		91			99		125		156	181		210			
90,4						83		92		108													
100,4	62	65	71	76	81	88		93		106	120		128		155		175	186		219	276		
110,4						111		113		137													
120,4				99		111		113		137			149		174		208	215		289		360	
130,4						124		129		159													
140,4						135		139		174			179										
150,4		105	112	120	135	135		139		169	178		179		200		224	256		311	390		560
156,4			122				149		175			189		209		239			300				
160,4						148		159		191													
180,4				138		148		159		191			209		235		281	333					
196,4			138				173		197			212		244		295			355				
200,4		131	138	150	161	156		179		209	232		229		261		320	334		377	529		
220,4						205		209		249													
246,4			166				224		250			281		308		340			395				
250,4		159	189	213		223		232		265			279		310								
296,4			209				262		299			315		356		383			438				
300,4		183	209	230		237		263		298	314		318		364		392	410					
350,4				260		269		299		345			389										
396,4							344		363			406		440		523			639				
*405																							
*505	292	310	368	400		456		516		590			556		656		748	812		989	1156		

* Plates: Thickness ground. Width and Length sawn

SQUARES

€	8,2	10,4	12,4	15,4	16,4	20,4	22,4	25,4	27,4	30,4	32,4	36,4	40,4	46,4	50,4	56,4	60,4	70,4	76,4	80,4	100,4	120,4	150,4
						38		49		63			70		94		128	148		210	274	360	560

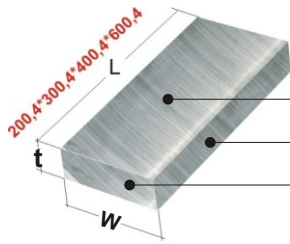
Tol: +0,4/0 mm

NON STANDARD SIZES UPON REQUEST**Hardening and Machining instructions see page 33 or our data sheet D/04**Delivery condition: pre-hardened 1050 N/mm²Colour code for P20 S **LILAC**

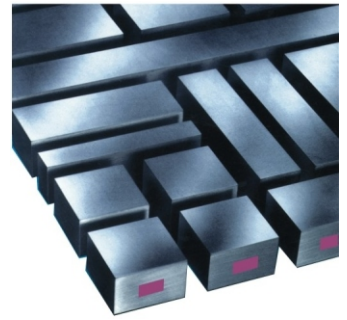
Usually used as delivered

P20 / 1.2312

40 CrMnMoS 8-6



	Tolerance	Surface
Thickness:	+ 0,2/0 mm	N8 Segmental ground, fine milled (Ra 3,2)
Width:	+0,2/0 mm	N8 Segmental ground, fine milled (Ra 3,2)
Length:	+0,40/0 mm	N8 Segmental ground, fine milled (Ra 3,2)

**UNIVERSAL PLATES****PRE-MACHINED**

(Over size)

Delivery: EX STOCK**PRICELIST EUR/pc**

Length: 200,4 * 300,4 * 400,4 * 600,4 mm

Length: 200,4 mm

w t	15,4	20,4	25,4	30,4	40,4	50,4	60,4
100,4	19,60	24,20	30,50	37,00	45,50	53,80	56,80
150,4	28,20	33,40	43,00	49,20	53,40	71,60	83,20
200,4	38,40	45,20	54,00	63,00	81,00	92,00	106

Length: 300,4 mm

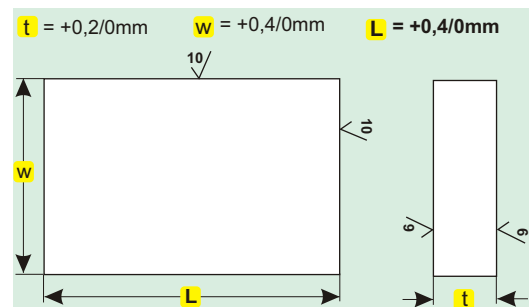
	15,4	20,4	25,4	30,4	40,4	50,4	60,4
100,4	26,20	34,60	42,00	49,00	62,00	76,00	82,00
150,4	40,00	44,60	57,00	76,00	83,00	107	118
200,4	53,00	58,00	74,00	98,00	108	140	153
250,4	62,00	70,00	89,00	118	130	168	184
300,4	75,00	84,00	106	131	142	192	210

Length: 400,4 mm

	15,4	20,4	25,4	30,4	40,4	50,4	60,4
100,4	34,80	46,20	55,20	60,00	77,00	94,00	102
150,4	51,60	56,00	72,40	96,00	105	136	151
200,4	68,40	74,20	93,40	128	140	172	202
250,4	82,00	96,00	118	152	170	216	240
300,4	96,00	118	140	176	200	240	278
400,4	126	137	178	236	258	336	373

Length: 600,4 mm

	15,4	20,4	25,4	30,4	40,4	50,4	60,4
100,4	48,00	65,00	77,00	84,00	107	130	141
150,4	72,00	79,00	100	134	146	186	210
200,4	96,00	104	130	170	196	254	284
250,4	115	134	165	212	238	299	334
300,4	134	165	196	246	280	336	388
400,4	170	188	245	325	356	436	514
500,4	204	225	294	390	427	523	618



UNIVERSAL PLATES: the thickness is fine milled or segmental ground. Width and length fine milled.

These prices are used to calculate the price of **NON STANDARD** Sizes as shown below.

Price example:

Your size = 192 x 48 x 378 mm = Euro 172,--

Price of 200,4 x 50,4 x 400,4 mm = Euro 172,--

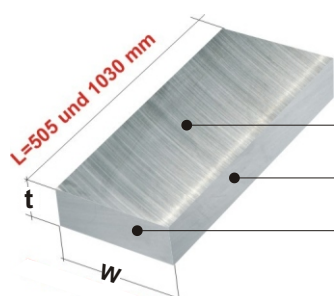
We charge the price of the nearest larger standard size.

MINIMUM order value for non standard sizes

Euro 120,-- per size

NON STANDARD SIZES UPON REQUEST

Hardening and Machining instructions see page 33 or our data sheet D/04



	Tolerance	Surface
Thickn.: + 0,2/0 mm	N8 pre-machined (Ra 3,2)	
Width : ±2 mm	N11 sawn (Ra 25)	
Length : ±2 mm	N11 sawn (Ra 25)	

DECARB FREE



**Any width between
53 and 505 mm
available**

UNIVERSAL BAR and PLATE

PRICELIST EUR/pc.

For length **505** mm. For length 1030 mm Prices **x2**

t	8,2	10,4	12,4	15,4	20,4	25,4	30,4	40,4	50,4	60,4	70,4	80,4	100,4
23					19								
33					20	23	28						
43					21	24	29	31					
53	18	19	20	21	22	25	30	33	44				
63	19	20	22	23	26	29	33	41	47	59			
73	20	21	23	25	28	32	37	43	53	63	68		
83	21	23	24	28	32	36	42	46	28	71	84	97	
93	28	30	32	34	38	42	47	56	69	77	85	100	
103	29	31	33	35	39	43	49	59	72	80	86	102	132
113	34	36	40	43	47	50	59	67	76	90	97	124	162
123	35	37	42	45	50	52	63	68	79	94	100	130	173
133	40	44	47	53	57	59	73	82	85	97	108	136	186
143	48	49	50	55	62	63	79	84	87	100	115	140	192
153	48	51	52	56	64	64	81	87	94	112	128	161	200
163	52	54	57	61	67	72	89	94	105	121	144	172	218
183	58	60	62	64	69	78	94	104	117	139	165	182	249
203	60	62	64	68	74	85	104	114	129	155	178	200	262
223	66	68	76	84	90	96	114	126	142	168	189	211	279
253	72	73	88	98	102	106	123	136	156	179	207	251	300
303	80	83	95	104	107	119	138	168	186	196	216	286	373
353	88	89	103	118	128	138	156	176	197	243	308	352	429
403	99	109	121	138	149	162	196	221	256	296	372	396	509
505	108	115	136	148	169	189	220	278	328	374	406	494	578

NON STANDARD SIZES UPON REQUEST

Hardening and Machining instructions see page 33 or our data sheet D/04