

1.2311 40 CrMnMo 7

1.2312 40 CrMnMoS 8-7

AISI P 20

Plastic mold steel for medium and large molds. Since this material is pre-hardened to 950–1,150 MPa in its delivery condition, it is also suitable for parts in general mechanical engineering. Compared to 1.2312, 1.2311 is easier to machine due to its sulfur content but is not suitable for polishing. 1.2311 is polishable and etchable. Both materials are gas and salt bath nitriding-compatible and suitable for case hardening.

Color code:
Yellow (1.2311)



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VarioPlan®	253
Raw material	255
Steel glossary	256

Orange/Purple(1.2312)



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PräziPlan – Precision flat steel	252
VarioPlan	253
VarioRond – Round bars, ground	254
Raw material	255
Steel lexicon	256

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GEBRÜDER
RECKNAGEL
Präzision in Stahl  251

1.2312 40 CrMnMoS 8-7

PräziPlan® Precision flat steel
(according to DIN 59350)

Executed:

Compensated at 280–325 HBW,
Thickness ground with Ra = 6 µm, width
finely machined,
machined free from decarburization on all
sides

Tolerances:

Width: +0.40 / -0 mm
Thickness: +0.25 / -0 mm
Length: +40.00 / -0 mm

**Toolox® is the superior material
alternative to 1.2311 and 1.2312.**

Toolox® 33 completely replaces 1.2312.
Toolox® 33 is superior or at least equivalent
to 1.2312 in all technical properties. It
exhibits less distortion, better machinability,
and greater toughness. Nitriding and PVD
coating are easily achievable. Additional heat
treatment is unnecessary and not
recommended. If higher hardness/strength is
desired, we recommend Toolox® 44.

length: 1,000 mm price per piece

width [mm]	thickness [mm]																		
	4.2	5.2	6.2	8.2	10.4	12.4	15.4	16.4	20.4	25.4	30.4	32.4	40.4	50.4	60.4	70.4	80.4	90.4	100.4
20.3			22	23	24	28	32												
25.3			23	24	25	30	35	38	40										
30.3			25	26	27	31	36	40	42	52									
32.3			27	28	29	34	39	42	45	58									
40.3	25	27	28	30	33	38	42	45	48	61	68								
50.3	29	30	32	35	40	44	48	51	58	65	76	80	92						
60.3	33	35	37	39	46	50	53	59	64	69	82	87	96	115					
63.3	36	37	39	42	47	52	56	63	68	76	89	89	99	119					
70.3	38	40	43	46	51	55	63	64	73	83	94	101	105	128	146				
80.3	42	43	47	49	58	65	68	76	78	90	104	109	118	159	175	204			
100.3	56	58	61	65	69	76	81	86	95	107	123	131	155	180	208	219	257		
125.3			72	80	92	98	115	126	141	148	158	169	182	205	215	246	326		
150.3			98	104	113	119	127	141	148	160	183	191	221	251	297	342	409	474	527
175.3			111	121	129	136	147	160	173	202	223	244	276	339	371	403	445	511	558
180.3			112	123	130	138	151	169	180	198	226	256	274	340	381	449	480	511	563
200.3			130	134	141	147	164	173	193	217	246	263	305	365	428	490	526	563	594
220.3				157	173	198	204	230	244	267	276	324	378	480	511	542	605	662	
250.3				169	200	225	237	241	261	301	331	342	413	516	563	638			
300.3				196	233	251	261	269	297	342	367	391	475	553	620	678			
400.3				261	308	334	360	359	407	454	504	521	626	730					
500.3				324	386	417	451	449	495	569	626	647	740	917					

square, length: 1,000 mm price per piece

	10.4	12.4	15.4	16.4	20.4	25.4	30.4	32.4	40.4	50.4	60.4	70.4	80.4	100.4	120.4	150.4
	30	32	34	35	40	52	68	70	82	110	136	159	225	324	475	699

We provide special configurations quickly and affordably!

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VarioPlan®

Finely milled semi-finished products in customizable dimensions.

- Customizable in width, thickness, and length
- Sawed or milled edges
- Optional chamfers and/or corner radii
- Production in 2 to 3 days
- Easy cost estimation

Use our online cost estimation tool on our webshop at www.varioplan.de.

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GEBRÜDER RECKNAGEL
Präzision in Stahl 253

1.2312 40 CrMnMoS 8-7

VarioRond®

Round material sections with customizable length at a unit price.

Execution and Tolerances:

length, sawed: + 3.0 / -0 mm
diameter: +3.0 / -1 mm
diameter range: 20 - 250 mm

Flexible online cost estimation:

www.variorond.de

- Customizable desired length
- Unit prices for your desired length
- Sawing costs included
- No additional surcharges

		Durchmesser [mm]													
		20	25	30	35	40	45	50	55	60	70	80	90	100	110
Länge [mm]	1.000.0	17,70 €	22,40 €	30,00 €	36,30 €	43,80 €	52,10 €	61,50 €	70,80 €	84,70 €	96,70 €	113,20 €	142,10 €	187,30 €	243,10 €
	1.000.0	294,80 €	317,00 €	363,50 €	413,80 €	468,80 €	523,90 €	583,90 €	647,50 €	684,90 €	752,20 €	822,80 €	898,70 €	974,20 €	1.054,80 €

Round bars, grinded

Tolerances:

diameter: h8
length: +30.0 / -0 mm

length: 1,000 mm price per piece

	diameter [mm]									
	6.0	8.0	10.0	12.0	14.0	15.0	16.0	18.0	20.0	
	5	6	8	11	13	15	16	19	22	

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1.2311
1.2312

1.2312

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Raw material

Sheets or cut parts thereof, rolled according to EN 10029 Class C.

thickness [mm]										
20	25	30	35	40	45	50	55	60	65	
70	75	80	85	90	95	100	110	120	130	
140	150	160	175	185	195	205	235			

thickness [mm]										
20	25	30	35	40	45	50	55	60	65	
70	75	80	85	90	95	100	110	120	130	
140	150	160	175	185	195	205	235			

Select affordable raw materials online, including custom cutting options.

www.ResteShop.de

Fast, clear, and transparent:

Offcut shop and Quick finder at www.stahlnetz.de

Larger dimensions than forged bars available upon request.

- We cut the parts according to your specifications.
- Pre-machined as VarioPlan® available.
- Flat bars are available for quick delivery.
- Round material is available as VarioRond®.

We recommend Toolox® 33 as the superior material alternative!

Offcut shop

- All materials
- With cutting service
- Available immediately from stock
- Affordable special prices for remnants
- While supplies last

Quick finder

- All products compared
- Your custom parts fully calculated
- Easy selection of the optimal solution

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GEBRÜDER RECKNAGEL
Präzision in Stahl 255

1.2311 40 CrMnMo 7

1.2312 40 CrMnMoS 8-7

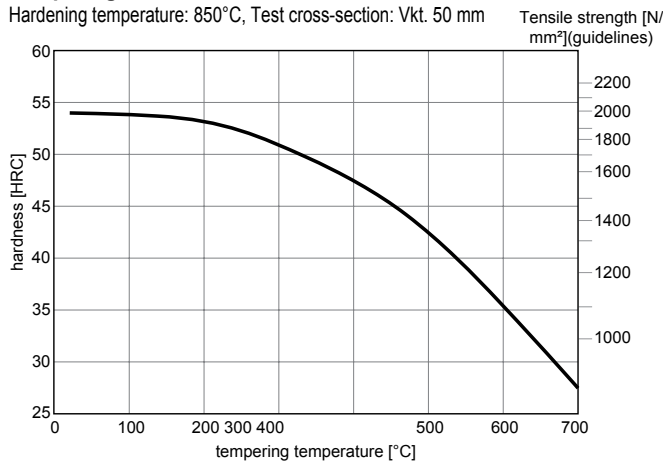
Plastic mold steel for medium and large molds. Since this material is pre-hardened in its delivered state at 950–1,100 MPa, it is also suitable for components in general mechanical engineering.

In comparison, 1.2312 is easier to machine due to its sulfur content, but it is not polishable. On the other hand, 1.2311 can be polished and subjected to photoetching. Both materials are suitable for gas and salt bath nitriding and can be used for case hardening.

You can obtain 1.2311 from us as precision flat steel (standard and custom dimensions), as VarioPlan®, and as raw material cuttings.

Tempering chart

Hardening temperature: 850°C, Test cross-section: Vkt. 50 mm



You can obtain 1.2312 from us as precision flat steel in custom dimensions, as VarioRond®, and as raw material cuttings. Both materials are also available as fully machined drawing parts, customized to your specifications.

Color coding:

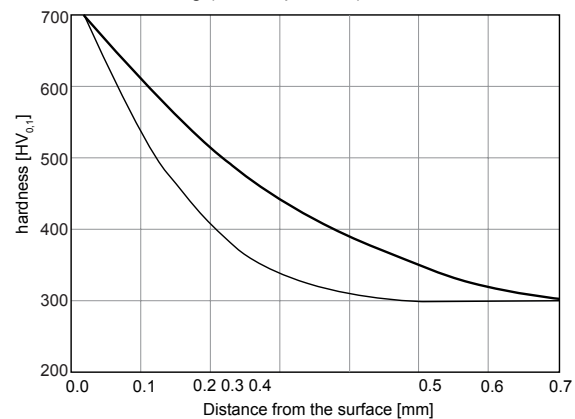
1.2311: Yellow
1.2312: Orange/Purple

Surface treatment: Nitriding

Hardness profile in the nitrided layer

— Gas nitriding in an ammonia stream for 50 hours at 520°C

— Salt bath nitriding (Tenifer process) for 2 hours at 570°C



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GEBRÜDER RECKNAGEL
Präzision in Stahl

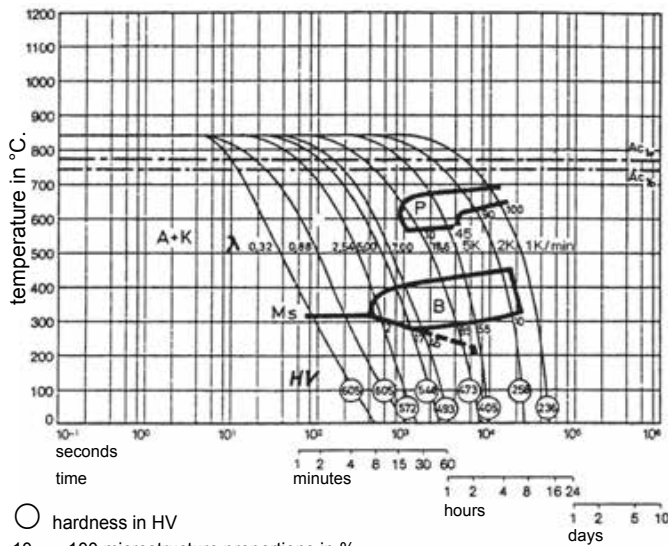
1.2312 40 CrMnMoS 8-7

chemical composition [%]

	C	Si	Mn	P	S	Cr	Mo	Ni	Cu
max.	0.45	0.5	1.6	0.03	0.10	2.0	0.25	0.16	0.11
min.	0.35	0.3	1.4		0.05	1.8	0.15		

CCT diagram for continuous cooling

Austenitization temperature: 840°C, Holding time: 15 minutes



○ hardness in HV
 10 ... 100 microstructure proportions in %
 0.32 ... 18.6 cooling parameters,
 In other words, cooling duration from 800–500°C in $s \times 10^{-2}$
 5 ... 1K/min cooling rate in K/min in the range from 800°C to 500°C.

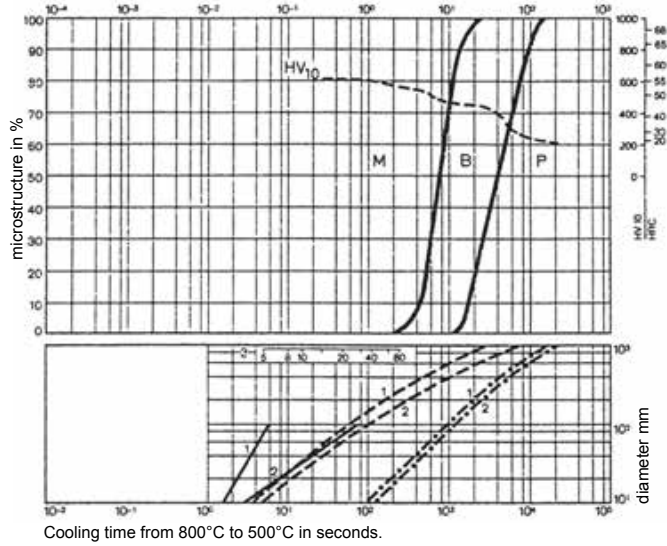
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Microstructure quantity chart

Cooling parameters λ



— water cooling
 - - - cooling
 - · - air cooling

1. Workpiece edge
2. Workpiece center
3. jomny test:
distance from the end face

 **RECKNAGEL**
 Präzision in Stahl 257

