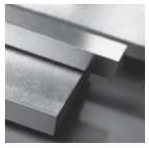
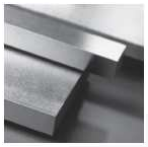
Steel grade

Material No.	PREMIUM O1
AISI	O1; T31501
Search for alternatives in the ABRAMS STEEL GUIDE	**www.abrams-steelguide.com/alternatives/O1**

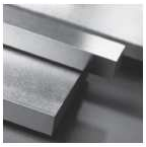
Shapes



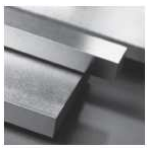
Precision Ground Flat Stock
regular [GFS reg]
L: 18"
L: 36"



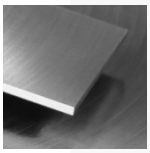
Precision Ground Flat Stock Metric
regular – acc. To DIN* 59350 [GFSM reg]
L: 500 mm
L: 1,000 mm



Precision Ground Flat Stock
oversize [GFS O/S]
L: 18"
L: 36"



Precision Ground Flat Stock Metric
oversize [GFSM O/S]
L: 500 mm
L: 1,000 mm



Hard Flat Metric® [HardM]
Hardened Standardized Blanks Metric
L: 250 mm
L: 500 mm

Drill Rod [DR]
Precision Round Bars
L: 36"

Drill Rod Metric [DRM]
Precision Round Bars Metric
L: 914 mm (36")

Decarb Free Rounds [DCF]
Oversize Round Bars
L: 18"
L: 36"

*DIN: Deutsche Industrie Norm (German Industry Standard)

Chemical composition AISI O1 (reference value %)

C	Si	Mn	P	S	Cr	V	W
0.9 - 1.05	0.15 - 0.35	1.0 - 1.2	0 - 0.035	0 - 0.035	0.5 - 0.7	0.05 - 0.15	0.5 - 0.7

Physical properties

Hardness (delivery condition)	max. 229 HB, annealed						
Tensile strength R_m (as received condition)	approx. 111.6 KSI						
Working hardness	max. 62 HRC						
Thermal expansion coefficient 10^{-6}m/(m • K)	68 - 212°F	68 - 392°F	68 - 572°F	68 - 752°F	68 - 932°F	68 - 1112°F	68 - 1292°F
	12.2	13.2	13.8	14.3	14.7	15.0	15.3
Thermal conductivity W/(m • K)	68°F	662°F	1292°F				
	33.0	32.0	31.3				

Technical properties

Alloyed oil hardener with focus on cold work; can be used for a wide range of applications: full hardenability, high degree of dimensional stability, good cutting power and good toughness.

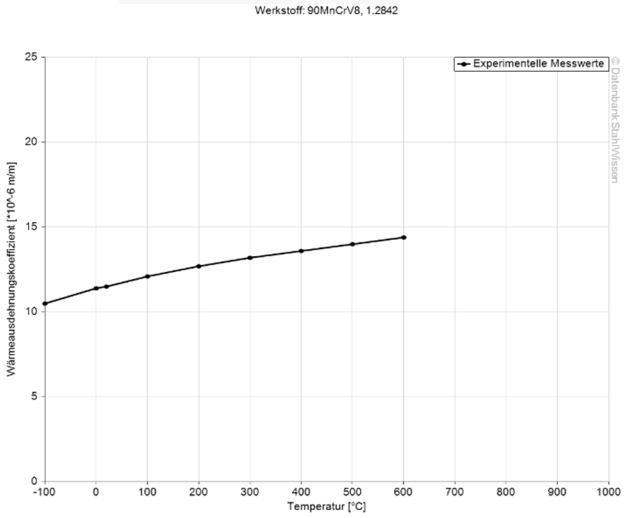
Applications

Blanking tools and stamping tools (up to 0.2362" thickness), shear knives, threading tools, threading dies, reamers, chasers, measuring tools, plastic molds, rubber molds, calibres, guide rails, dies, punches, woodworking tools, machine knives.

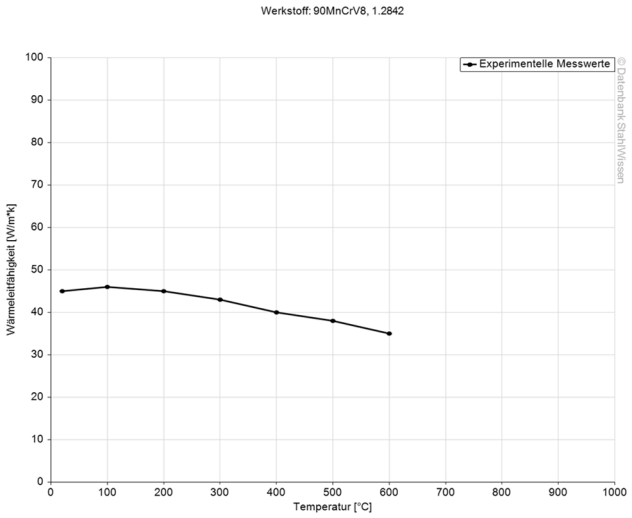
Heat treatment

Soft annealing	**Temperature**		**Cooling**		**Hardness**	
	1253 - 1292°F		Furnace		max. 229 HB	
Stress relief annealing	**Temperature**		**Cooling**			
	approx. 1202°F		Furnace			
Hardening	**Temperature**		**Quenching in**		**Hardness after quenching**	
	1454 - 1508°F		Oil, hotbasin (356 - 428°F)		64 HRC	
Tempering	212°F	392°F	572°F	752°F	932°F	1112°F
	63 HRC	60 HRC	56 HRC	50 HRC	42 HRC	38 HRC

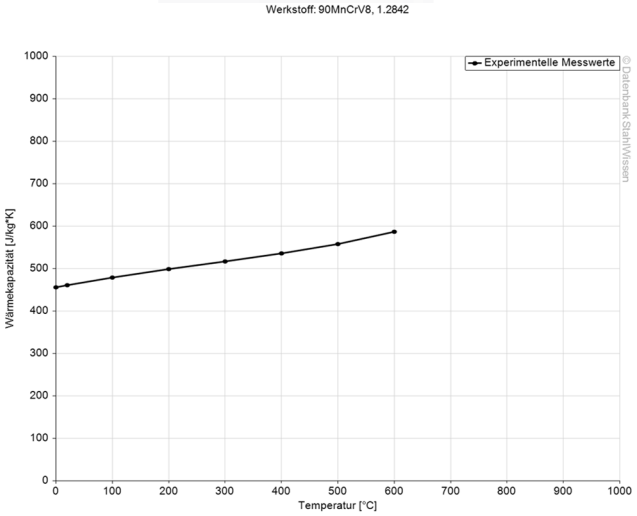
Thermal expansion coefficient diagram



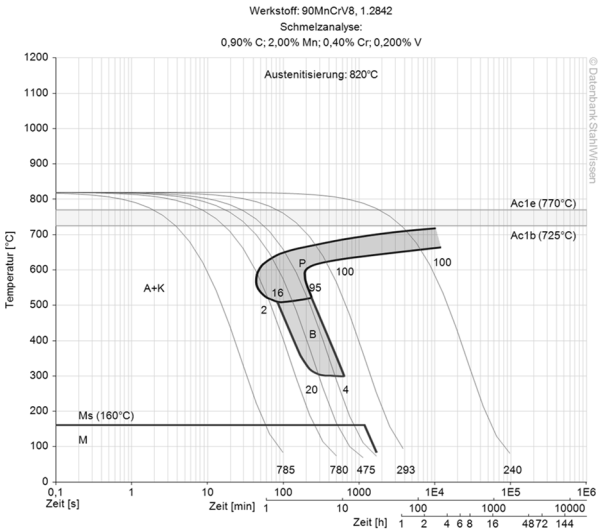
Thermal conductivity diagram



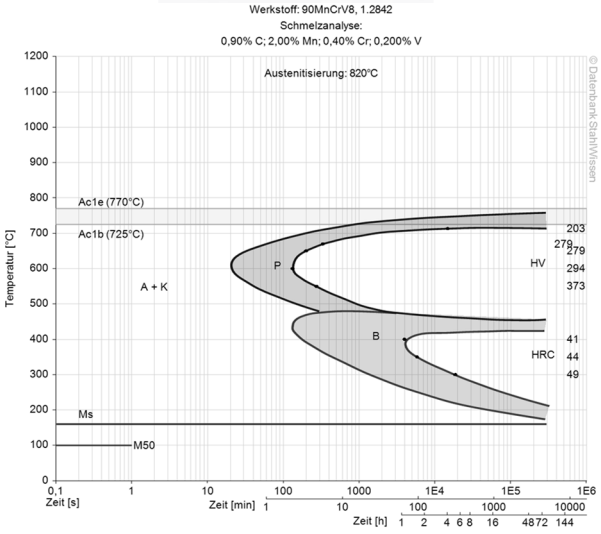
Thermal capacity diagram



Continuous ZTU-diagram



Isothermical ZTU-diagram



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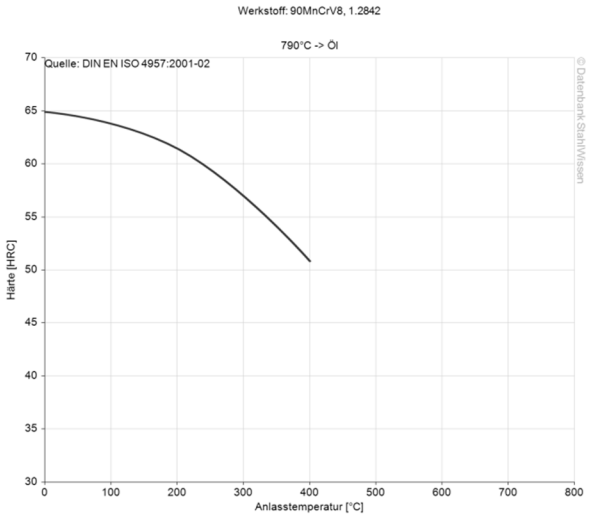
Tempering diagram



The data shown here is to be used only as an indication of the statistics, thus we accept no liability.
Diagramsaretakenfrom Datenbank StahlWissen Dr. Sommer Werkstofftechnik
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