

Steel grade

Material No.	PREMIUM 6F7 ESR
AISI	6F7 ESR
Search for alternatives in the ABRAMS STEEL GUIDE	www.abrams-steelguide.com/alternatives/6F7ESR

Shapes



Smart Flat Stock [Smart]
Standardized Precision Blanks
L: 12"
L: 24"



Smart Flat Stock Metric [SmartM]
Standardized Precision Blanks Metric
L: 300 mm
L: 600 mm

Chemical composition AISI 6F7 ESR (reference value %)

C	Si	Mn	P	S	Cr	Mo	Ni
0.4 - 0.5	0.1 - 0.4	0.2 - 0.5	0 - 0.03	0 - 0.03	1.2 - 1.5	0.15 - 0.35	3.8 - 4.3

Physical properties

Hardness (delivery condition)	max. 260 HB, annealed						
Tensile strength R_m (as received condition)	approx. 127.6 KSI						
Working hardness	max. 54 HRC						
Thermal expansion coefficient $10^{-6}m/(m \cdot K)$	68 - 212°F	68 - 392°F	68 - 572°F	68 - 662°F	68 - 752°F	68 - 842°F	68 - 932°F
	11.3	11.9	12.5	12.2	12.0	12.1	12.4
Thermal conductivity $W/(m \cdot K)$	73.4°F	302°F	572°F	662°F	752°F	932°F	
	31.0	34.0	33.9	34.1	33.2	31.2	

Technical properties

Steel grade with focus on cold work, high toughness (nickel content), good through-hardenability (even for large cross-sections), as well as high impact strength and pressure resistance. Polishable, etchable and erodible. For very special purity and homogeneity we recommend AISI 6F7 ESR.

Applications

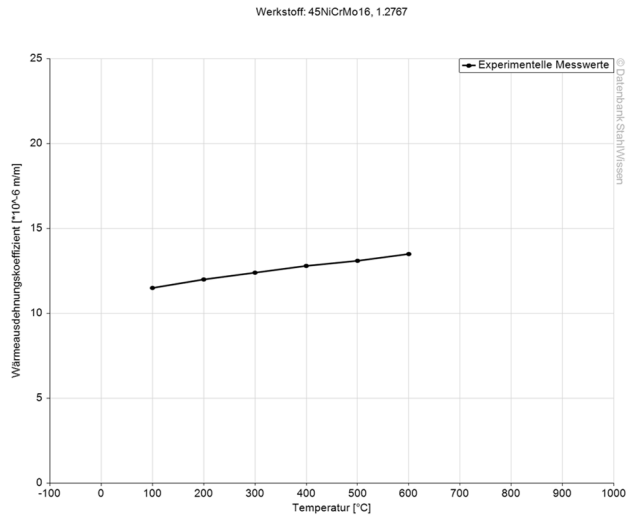
Cutting tools, cutlery punches, embossing tools, bending tools, cold hobbing tools, pressure bars, billet shear knives, cold shear knives, plastic molds, hot press tools, light metal processing, heavy metal processing, drawing jaws, reinforcements.

Heat treatment

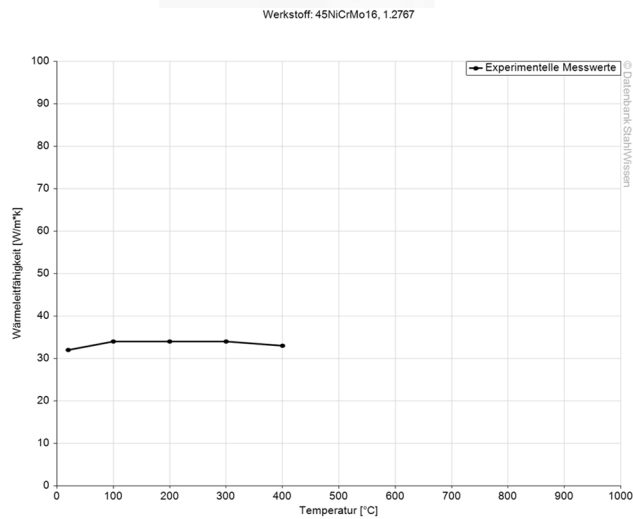
	Temperature	Cooling	Hardness			
Soft annealing	1148 – 1202°F	Furnace	max. 260 HB			
	Temperature	Cooling				
Stress relief annealing	approx. 1112 – 1202°F	Furnace				
	Temperature	Quenching in	Hardness after quenching			
Hardening	1544 – 1598°F	Air, oil, hot basin (356 - 428°F)	56 HRC			
	212°F	392°F	572°F	752°F	932°F	1112°F
Tempering	56 HRC	54 HRC	50 HRC	46 HRC	42 HRC	38 HRC



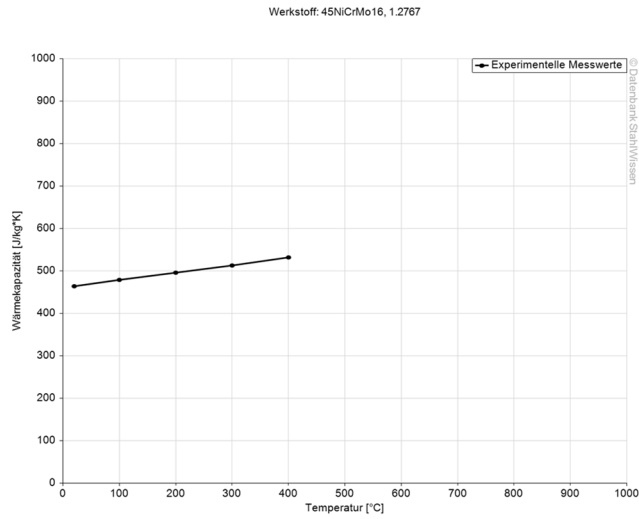
Thermal expansion coefficient diagram



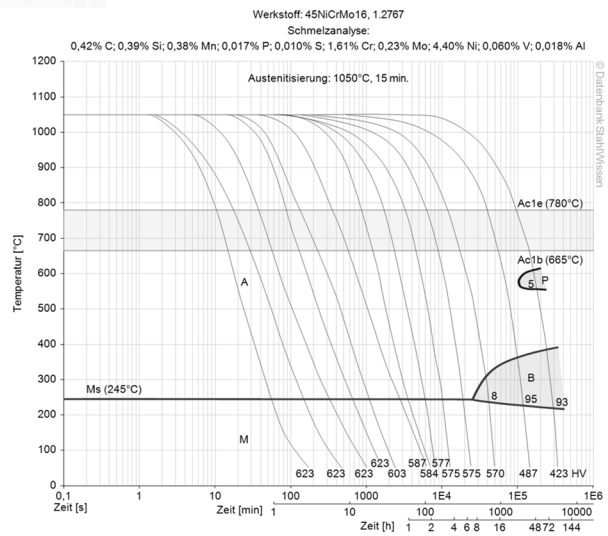
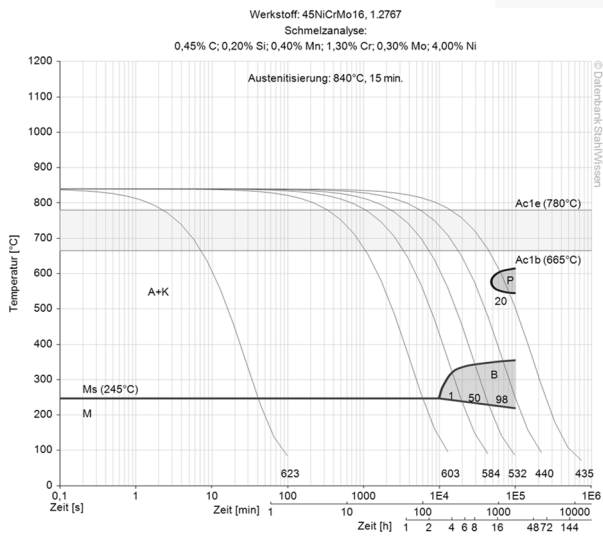
Thermal conductivity diagram



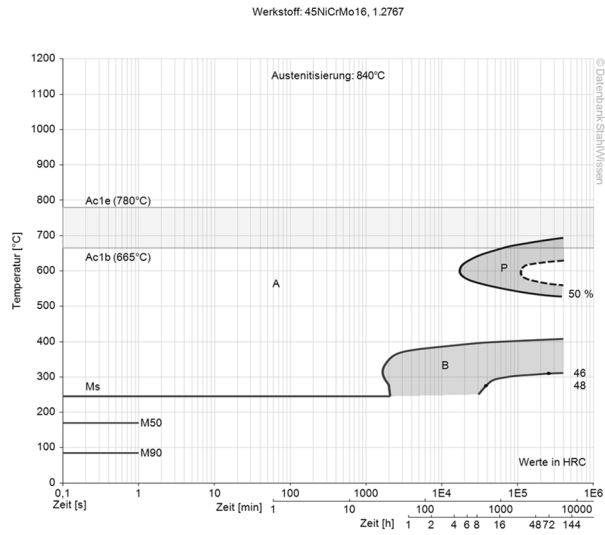
Thermal capacity diagram



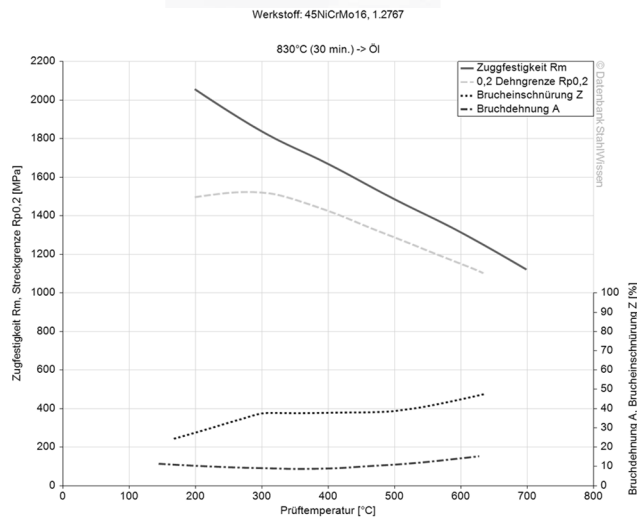
Continuous ZTU-diagrams



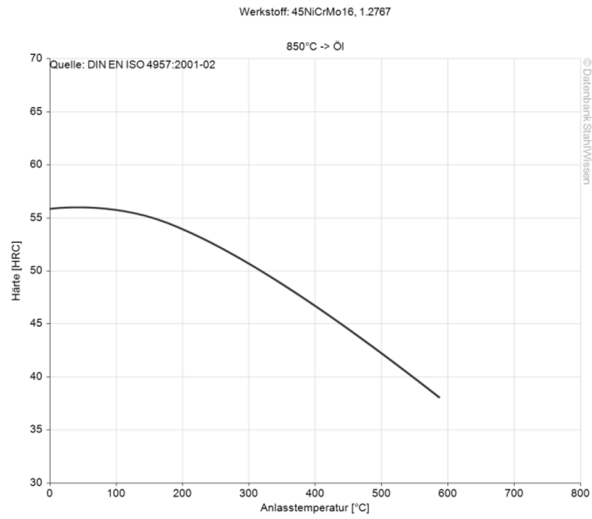
Isothermal ZTU-diagram



Hardening and tempering diagram



Tempering diagram



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