Steel grade

Material No.	PREMIUM 431
AISI	431
Search for alternatives in the ABRAMS STEEL GUIDE	**www.abrams-steelguide.com/alternatives/431**

Shapes

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

$mart Flat Stock Metric [$martM]
Standardized Precision Blanks Metric
L: 300 mm
L: 600 mm

Cold Finished Rounds [CF]
Precision Round Bars
L: 18"
L: 36"

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

Chemical composition AISI 431 (reference value %)

C	Si	Mn	P	S	Cr	Ni
0.12 - 0.22	0 - 1.0	0 - 1.5	0 - 0.04	0 - 0.03	15.0 - 17.0	1.5 - 2.5

Physical properties

Hardness (delivery condition)	max. 331 HB, tempered			
Tensile strength R_m (as received condition)	approx. 152.2 KSI			
Working hardness	max. 47 HRC			
Thermal expansion coefficient 10^{-6}m/(m • K)	68 - 212°F	68 - 392°F	68 - 572°F	68 - 752°F
	10.0	10.5	10.5	10.6
Thermal conductivity W/(m • K)	68°C			
	25.0			

Technical properties

Martensitic chromium steel with high strength (tempered condition) and good corrosion resistance (added nickel). It is easy to weld and is conditionally acid resistant. The material has poor forgeability.

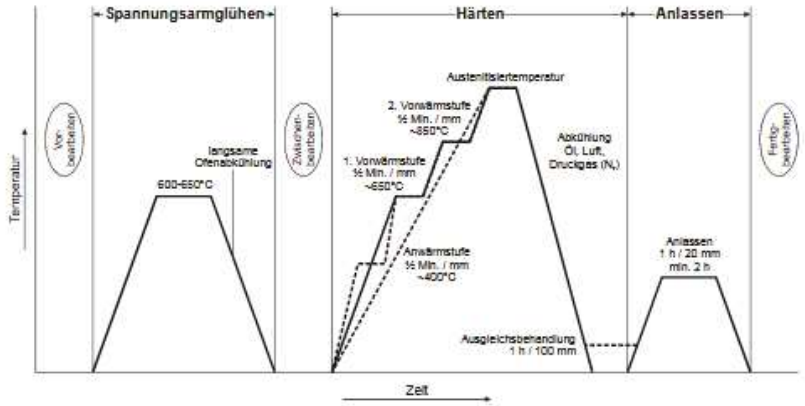
Applications

Mechanical engineering, automotive industry, oil and petrochemical industry, aviation, food industry, soap industry, acetic acid industry, shafts, pump parts, perforated plates, spindles, piston rods, valve cones, turbine blades.

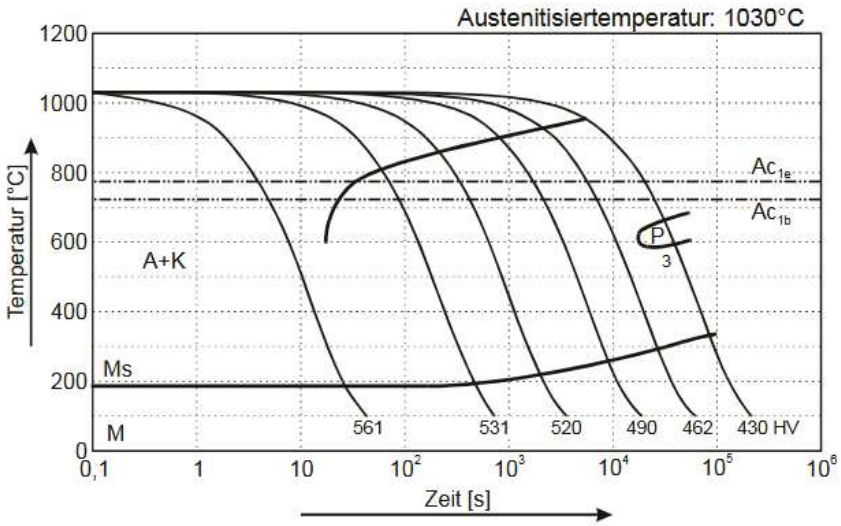
Heat treatment

	Temperature	Cooling	Hardness
Soft annealing	1256 - 1472°F	Furnace, air	max. 295 HB
Hardening	**Temperature**	**Quenching in**	
	1742 - 1922°F	Air, oil, compressed gas (N_2)	

Heat treatment scheme



Continuous ZTU-diagram



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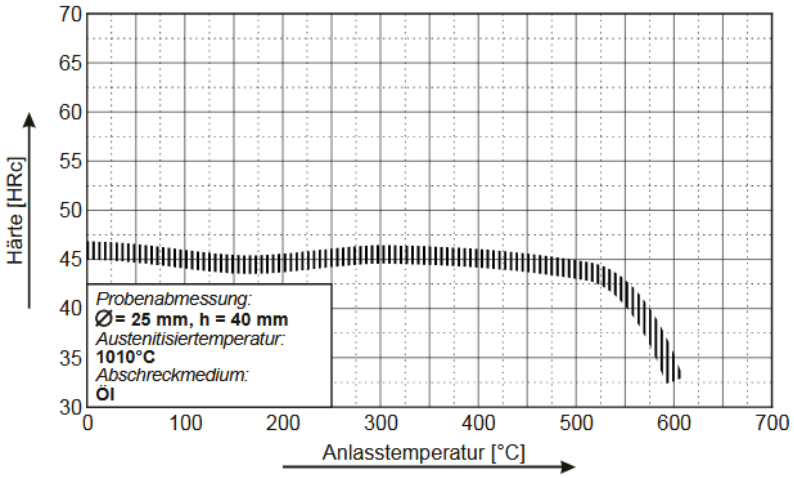
Tempering diagram



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