Steel grade

Material No.	PREMIUM 420 ESR
AISI	420 ESR
Search for alternatives in the ABRAMS STEEL GUIDE	**www.abrams-steelguide.com/alternatives/420ESR**

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

Chemical composition AISI 420 ESR (reference value %)

C	Si	Mn	P	S	Cr
0.36 - 0.42	0 - 1.0	0 - 1.0	0 - 0.03	0 - 0.03	12.5 - 14.5

Physical properties

Hardness (delivery condition)	max. 241 HB, annealed						
Tensile strength R_m (as received condition)	approx. 118.2 KSI						
Working hardness	max. 55 HRC						
Thermal expansion coefficient 10^{-6}m/(m • K)	68 - 212°F	68 - 392°F	68 - 572°F	68 - 662°F	68 - 752°F	68 - 842°F	68 - 932°F
	11.1	11.6	12.0	12.3	12.4	12.5	12.6
Thermal conductivity W/(m • K)	73.4°F	302°F	572°F	662°F	752°F	932°F	
	22.6	24.0	24.6	24.9	24.4	23.7	

Technical properties

Corrosion-resistant cold work steel and plastic mold steel, good machinability, good hardenability and excellent polishing properties. Low distortion through-hardening steel with high hardness and high wear resistance. For maximum required polishability use the ESR (Electro Slag Remelted Steel) production.

Applications

Mechanical engineering, medical technology, plastic molds, synthetic resin mold tools, die casting tools, light metal die casting, cutting tools, machine knives, kitchen knives, razors, shears, scraper blades, surgical instruments, measuring tools, roller bearings, ball bearings, ice-skates, pump parts, valves.

Heat treatment

Soft annealing	**Temperature**		**Cooling**		**Hardness**	
	1400 - 1472°F		Furnace		max. 241 HB	
Stress relief annealing	**Temperature**		**Cooling**			
	1112 - 1202°F		Furnace			
Hardening	**Temperature**		**Quenching in**		**Hardness after quenching**	
	1832 - 1922°F		Oil, basin (932 - 1022°F)		56 HRC	
Tempering	212°F	392°F	572°F	752°F	932°F	1112°F
	56 HRC	55 HRC	52 HRC	51 HRC	52 HRC	40 HRC

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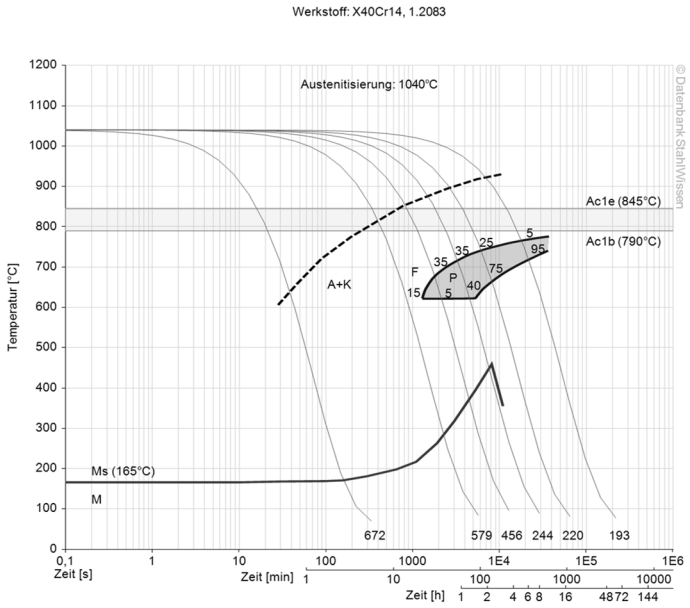
Continuous ZTU-diagram



Tempering diagrams