

ATI Allegheny Ludlum 425 Mod Martensitic Stainless Steel

Category : Metal , Ferrous Metal , Martensitic , Stainless Steel , T 400 Series Stainless Steel

Material Notes:

Characteristics: superior wear resistance, hardenable, excellent corrosion resistance. Applications: cutlery, dental and surgical instruments, nozzles, valve parts, hardened steel ball and seats for oil well pumps, separating screens and strainers, springs, shears, and wear surfaces.

Information provided by Allegheny Ludlum

Order this product through the following link:

http://www.lookpolymers.com/polymer_ATI-Allegheny-Ludlum-425-Mod-Martensitic-Stainless-Steel.php

Physical Properties	Metric	English	Comments
Specific Gravity	7.72 g/cc	7.72 g/cc	
Density	7.68 g/cc	0.277 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell B	93	93	
Hardness, Rockwell C	29	29	Hardened+Tempered 1200°F
	43	43	Hardened+Tempered 1000°F
	50	50	Hardened+Tempered 550°F
	52	52	Hardened+Tempered 900°F
	53	53	Hardened+Tempered 600°F
	53	53	Hardened+Tempered 800°F
	53	53	Hardened+Tempered 400°F
Tensile Strength, Ultimate	593 MPa	86000 psi	Annealed, Fine blanking quality
	648 MPa	94000 psi	Annealed
	936 MPa	136000 psi	Hardened 1900°F, Tempered 1200°F
	1434 MPa	208000 psi	Hardened 1900°F, Tempered 1000°F
	1619 MPa	234800 psi	Hardened 1900°F, Tempered 900°F
	1690 MPa	245000 psi	Hardened 1900°F, Tempered 600°F
	1729 MPa	250800 psi	Hardened 1900°F, Tempered 550°F
	1759 MPa	255100 psi	Hardened 1900°F, Tempered 800°F
	1868 MPa	270900 psi	Hardened 1900°F, Tempered 400°F

Mechanical Properties	Metric	English	Comments
	1218 MPa	176700 psi	Hardened 1900°F, Tempered 1000°F
	1351 MPa	195900 psi	Hardened 1900°F, Tempered 600°F
	1360 MPa	197000 psi	Hardened 1900°F, Tempered 550°F
	1368 MPa	198400 psi	Hardened 1900°F, Tempered 900°F
	1385 MPa	200900 psi	Hardened 1900°F, Tempered 400°F
	1452 MPa	210600 psi	Hardened 1900°F, Tempered 800°F
	310 MPa	45000 psi	Annealed, fine blanking quality
	@Strain 0.200 %	@Strain 0.200 %	
	379 MPa	55000 psi	Annealed
	@Strain 0.200 %	@Strain 0.200 %	
Elongation at Break	24 %	24 %	Annealed
	25 %	25 %	Annealed, Fine blanking quality

Thermal Properties	Metric	English	Comments
CTE, linear	11.6 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	6.44 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 20.0 - 200 $^{\circ}\text{C}$	@Temperature 68.0 - 392 $^{\circ}\text{F}$	
	12.8 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	7.11 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 20.0 - 600 $^{\circ}\text{C}$	@Temperature 68.0 - 1110 $^{\circ}\text{F}$	
Specific Heat Capacity	0.460 J/g- $^{\circ}\text{C}$	0.110 BTU/lb- $^{\circ}\text{F}$	
Thermal Conductivity	24.2 W/m-K	168 BTU-in/hr-ft ² - $^{\circ}\text{F}$	
	@Temperature 100 $^{\circ}\text{C}$	@Temperature 212 $^{\circ}\text{F}$	
Melting Point	1427 - 1510 $^{\circ}\text{C}$	2601 - 2750 $^{\circ}\text{F}$	
Solidus	1427 $^{\circ}\text{C}$	2601 $^{\circ}\text{F}$	
Liquidus	1510 $^{\circ}\text{C}$	2750 $^{\circ}\text{F}$	

Component Elements Properties	Metric	English	Comments
Carbon, C	0.50 - 0.55 %	0.50 - 0.55 %	
Chromium, Cr	13 - 14 %	13 - 14 %	

Component Elements Properties	Metric	English	Comments
Manganese, Mn	<= 1.0 %	<= 1.0 %	
Molybdenum, Mo	0.80 - 1.2 %	0.80 - 1.2 %	
Nickel, Ni	<= 0.50 %	<= 0.50 %	
Phosphorous, P	<= 0.040 %	<= 0.040 %	
Silicon, Si	<= 1.0 %	<= 1.0 %	
Sulfur, S	<= 0.030 %	<= 0.030 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000610 ohm-cm	0.0000610 ohm-cm	

Descriptive Properties	Value	Comments
Corrosion Rate mils per year	0.593 (5% Phosphoric Acid at 49°C)	Hardened martensitic grades were tested after tempering at 204°C
	4.79 (5% Acetic Acid at 49°C)	Hardened martensitic grades were tested after tempering at 204°C
Pitting Potential, Volts vs. Sat. Calomel Electrode	0.619	100 ppm Chloride solution at 24°C, pH5. Samples had ground surface. Hardened martensitic grades were tested after tempering at 204°C.

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