

ATI Allegheny Ludlum 410 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-410-Martensitic-Stainless-Steel.php

Physical Properties	Metric	English	Comments
Specific Gravity	7.65 g/cc	7.65 g/cc	
Density	7.64 g/cc	0.276 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell B	82	82	
	98	98	Hardened+Tempered 1200°F
Hardness, Rockwell C	35	35	Hardened+Tempered 1000°F
	40	40	Hardened+Tempered 550°F
	40	40	Hardened+Tempered 600°F
	41	41	Hardened+Tempered 800°F
	41	41	Hardened+Tempered 900°F
Tensile Strength, Ultimate	43	43	Hardened+Tempered 400°F
	510 MPa	74000 psi	Annealed
	767 MPa	111000 psi	Hardened 1800°F, Tempered 1200°F
	1063 MPa	154200 psi	Hardened 1800°F, Tempered 1000°F
	1283 MPa	186100 psi	Hardened 1800°F, Tempered 600°F
	1289 MPa	187000 psi	Hardened 1800°F, Tempered 550°F
Tensile Strength, Yield	1298 MPa	188300 psi	Hardened 1800°F, Tempered 900°F
	1300 MPa	189000 psi	Hardened 1800°F, Tempered 800°F
	1399 MPa	202900 psi	Hardened 1800°F, Tempered 400°F
	589 MPa	85400 psi	Hardened 1800°F, Tempered 1200°F

Mechanical Properties	Metric ^{MPa}	English ^{psi}	Comments
	882 MPa	128000 psi	Hardened 1800°F, Tempered 1000°F
	916 MPa	133000 psi	Hardened 1800°F, Tempered 800°F
	1022 MPa	148200 psi	Hardened 1800°F, Tempered 550°F
	1026 MPa	148800 psi	Hardened 1800°F, Tempered 600°F
	1076 MPa	156100 psi	Hardened 1800°F, Tempered 400°F
	290 MPa	42100 psi	Annealed
	@Strain 0.200 %	@Strain 0.200 %	
Elongation at Break	34 %	34 %	Annealed

Thermal Properties	Metric	English	Comments
CTE, linear	10.5 $\mu\text{m}/\text{m}\cdot\text{°C}$	5.83 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 20.0 - 200 °C	@Temperature 68.0 - 392 °F	
	11.6 $\mu\text{m}/\text{m}\cdot\text{°C}$	6.44 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 20.0 - 600 °C	@Temperature 68.0 - 1110 °F	
Specific Heat Capacity	0.460 J/g-°C	0.110 BTU/lb-°F	
Thermal Conductivity	24.9 W/m-K	173 BTU-in/hr-ft ² -°F	
	@Temperature 100 °C	@Temperature 212 °F	
Melting Point	1482 - 1532 °C	2700 - 2790 °F	
Solidus	1482 °C	2700 °F	
Liquidus	1532 °C	2790 °F	

Component Elements Properties	Metric	English	Comments
Carbon, C	<= 0.15 %	<= 0.15 %	
Chromium, Cr	11.5 - 13.5 %	11.5 - 13.5 %	
Iron, Fe	83.8 - 88.5 %	83.8 - 88.5 %	as balance
Manganese, Mn	<= 1.0 %	<= 1.0 %	
Nickel, Ni	<= 0.50 %	<= 0.50 %	
Phosphorous, P	<= 0.040 %	<= 0.040 %	

Component Elements Properties	Metric %	English	Comments
Sulfur, S	<= 0.030 %	<= 0.030 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000560 ohm-cm	0.0000560 ohm-cm	

Descriptive Properties	Value	Comments
Corrosion Rate mils per year	0.062 (5% Phosphoric Acid at 49°C)	Hardened martensitic grades were tested after tempering at 204°C
	0.079 (5% Acetic Acid at 49°C)	Hardened martensitic grades were tested after tempering at 204°C.
Pitting Potential, Volts vs. Sat. Calomel Electrode	0.502	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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