

ATI Allegheny Ludlum AL 453™ Stainless Steel

Category : Metal , Ferrous Metal , Ferritic , Stainless Steel

Material Notes:

Single phase iron-chromium ferritic stainless steel alloy. Should be annealed between 1450 and 1600°F and quickly cooled. Information provided by Allegheny Ludlum

Order this product through the following link:

http://www.lookpolymers.com/polymer_ATI-Allegheny-Ludlum-AL-453-Stainless-Steel.php

Physical Properties	Metric	English	Comments
Density	7.61 g/cc	0.275 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell B	78	78	
Tensile Strength, Ultimate	470 MPa	68200 psi	
	20.0 MPa	2900 psi	
	@Temperature 1093 °C	@Temperature 1999 °F	
	33.0 MPa	4790 psi	
	@Temperature 871 °C	@Temperature 1600 °F	
	60.0 MPa	8700 psi	
	@Temperature 760 °C	@Temperature 1400 °F	
	120 MPa	17400 psi	
	@Temperature 649 °C	@Temperature 1200 °F	
	251 MPa	36400 psi	
@Temperature 538 °C	@Temperature 1000 °F		
345 MPa	50000 psi		
@Temperature 427 °C	@Temperature 801 °F		
409 MPa	59300 psi		
@Temperature 204 °C	@Temperature 399 °F		
Tensile Strength, Yield	23.0 MPa	3340 psi	
	@Temperature 871 °C	@Temperature 1600 °F	
	39.0 MPa	5660 psi	
@Temperature 760 °C	@Temperature 1400 °F		

Mechanical Properties	82.0 MPa Metric	11900 psi English	Comments
	@Temperature 649 °C	@Temperature 1200 °F	
	173 MPa	25100 psi	
	@Temperature 538 °C	@Temperature 1000 °F	
	183 MPa	26500 psi	
	@Temperature 427 °C	@Temperature 801 °F	
	218 MPa	31600 psi	
	@Temperature 204 °C	@Temperature 399 °F	
	310 MPa	45000 psi	
	@Strain 0.200 %	@Strain 0.200 %	
Elongation at Break	35 %	35 %	in 2"
	21.5 %	21.5 %	
	@Temperature 427 °C	@Temperature 801 °F	
	25.8 %	25.8 %	
	@Temperature 538 °C	@Temperature 1000 °F	
	26.8 %	26.8 %	
	@Temperature 204 °C	@Temperature 399 °F	
	76.6 %	76.6 %	
	@Temperature 649 °C	@Temperature 1200 °F	
	95 %	95 %	
	@Temperature 760 °C	@Temperature 1400 °F	
	95.5 %	95.5 %	
	@Temperature 982 °C	@Temperature 1800 °F	
	98.1 %	98.1 %	
	@Temperature 871 °C	@Temperature 1600 °F	

Thermal Properties	Metric	English	Comments
CTE, linear	10.2 µm/m-°C	5.67 µin/in-°F	
	@Temperature 20.0 - 100 °C	@Temperature 68.0 - 212 °F	
	11.4 µm/m-°C	6.33 µin/in-°F	
	@Temperature 20.0 -	@Temperature 68.0 -	

Thermal Properties	538 °C Metric	1000 °F English	Comments
	14.0 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	7.78 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 20.0 - 1093 °C	@Temperature 68.0 - 1999 °F	
Thermal Conductivity	19.2 W/m-K	133 BTU-in/hr-ft ² -°F	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	0.60 %	0.60 %	
Carbon, C	0.030 %	0.030 %	
Chromium, Cr	22 %	22 %	
Iron, Fe	>= 76.3 %	>= 76.3 %	As Remainder
Manganese, Mn	0.30 %	0.30 %	
Nickel, Ni	0.30 %	0.30 %	
Phosphorous, P	0.020 %	0.020 %	
Rare Earths	<= 0.10 %	<= 0.10 %	
Silicon, Si	0.30 %	0.30 %	
Sulfur, S	<= 0.030 %	<= 0.030 %	
Titanium, Ti	0.020 %	0.020 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000733 ohm-cm	0.0000733 ohm-cm	

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