

## ATI Allegheny Ludlum AL 409HP™ Ferritic Stainless Steel, UNS S40930

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

### Material Notes:

Type 409 ferritic stainless steel was introduced by Allegheny Ludlum in 1961 to provide improved oxidation and corrosion resistance for automotive exhaust systems in comparison to carbon automotive exhaust systems in comparison to carbon steel. This alloy was designated MF-1 indicating its end use: automotive mufflers. The good fabricability of this alloy, combined with its basic corrosion resistance and economy have significantly broadened the utility of Type 409. Since its introduction, the Type 409 alloy has been widely used in automotive exhaust systems for manifolds, exhaust pipes, catalytic converters, mufflers, tail pipes and other components. Type 409 stainless steel sheet has also found many other applications such as in culverts, home heating systems, automotive thermostats and fuel filters, electrical transformer cases, caskets, heat exchanger tubing, and various farm equipment components. Plate has been used as blades and vanes in standby power generation turbines and as jet engine sound-deadening devices at airports. The performance of Type 409 ferritic stainless steel in most applications has been excellent. However, some industry application have resulted in intergranular corrosion of weld heat-affected zones. The result of Allegheny Ludlum's research to investigate and redefine the balance of stabilizing elements is the AL 409HP stainless steel amounts of titanium and columbium which provide resistance to sensitization and intergranular corrosion which might occur in the heat affected zones of welds or in base metal following other thermal exposures. A low incidence of titanium nitride surface imperfections is also a characteristic of this alloy. The balance of stabilizing elements is designed to optimize weldability without need for post-weld annealing to restore ductility. Formability and toughness are also improved in comparison to the standard Type 409 alloy. This AL 409HP alloy is a proprietary stainless steel composition. Like all Type 409 alloys, the AL 409HP stainless steel contains nominally 11 percent chromium for greatly enhanced corrosion resistance in comparison to carbon steel. It is an excellent choice for all automotive exhaust system applications where 11 percent chromium provides sufficient resistance to oxidation and corrosion. Hot end exhaust applications may require an 18 percent chromium alloy. Information provided by Allegheny Ludlum

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_ATI-Allegheny-Ludlum-AL-409HP-Ferritic-Stainless-Steel-UNS-S40930.php](http://www.lookpolymers.com/polymer_ATI-Allegheny-Ludlum-AL-409HP-Ferritic-Stainless-Steel-UNS-S40930.php)

Physical Properties	Metric	English	Comments
Density	7.76 g/cc	0.280 lb/in <sup>3</sup>	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell B	71	71	typical annealed
Tensile Strength, Ultimate	434 MPa	62900 psi	typical annealed
Tensile Strength, Yield	241 MPa @Strain 0.200 %	35000 psi @Strain 0.200 %	typical annealed
Elongation at Break	33 % @Thickness 50.8 mm	33 % @Thickness 2.00 in	typical anneal
Modulus of Elasticity	200 GPa	29000 ksi	

Thermal Properties	Metric	English	Comments
CTE, linear	10.52 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	5.844 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 20.0 - 100 $^\circ\text{C}$	@Temperature 68.0 - 212 $^\circ\text{F}$	
	11.11 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	6.172 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 20.0 - 260 $^\circ\text{C}$	@Temperature 68.0 - 500 $^\circ\text{F}$	
	11.88 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	6.600 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 20.0 - 482 $^\circ\text{C}$	@Temperature 68.0 - 900 $^\circ\text{F}$	
Specific Heat Capacity	0.477 J/g- $^\circ\text{C}$	0.114 BTU/lb- $^\circ\text{F}$	
Thermal Conductivity	25.0 W/m-K	174 BTU-in/hr-ft <sup>2</sup> - $^\circ\text{F}$	
Maximum Service Temperature, Air	760 $^\circ\text{C}$	1400 $^\circ\text{F}$	Significant oxidation resistance to this temp.

Component Elements Properties	Metric	English	Comments
Carbon, C	0.010 %	0.010 %	
Chromium, Cr	11 %	11 %	
Iron, Fe	88 %	88 %	as balance
Manganese, Mn	0.30 %	0.30 %	
Nickel, Ni	0.25 %	0.25 %	
Niobium, Nb (Columbium, Cb)	0.15 %	0.15 %	
Nitrogen, N	0.012 %	0.012 %	
Phosphorous, P	0.023 %	0.023 %	
Silicon, Si	0.41 %	0.41 %	
Sulfur, S	0.0010 %	0.0010 %	
Titanium, Ti	0.17 %	0.17 %	(Ti + Nb) = 0.08 + 8 * (C+N) min.

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000600 ohm-cm	0.0000600 ohm-cm	
Curie Temperature	732 $^\circ\text{C}$	1350 $^\circ\text{F}$	

## **Contact Songhan Plastic Technology Co.,Ltd.**

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