Technical Data Sheet

ATI 410S™

Stainless Steel: Ferritic

(UNS S41008)

INTRODUCTION

ATI 410S™ stainless steel is a low-carbon modification of Type 410 stainless steel. Low carbon and optionally a small addition of titanium and/or columbium minimize austenite formation at high temperatures, thereby restricting the alloy's ability to harden. The material remains soft and ductile even when the material is rapidly cooled from above the critical temperature. This low hardening characteristic helps to prevent cracking when the steel is welded or exposed to high temperatures. The alloy is completely ferritic in the annealed condition.

POTENTIAL APPLICATIONS

ATI 410S™ stainless is typically used for tower packing, distillation trays, automotive exhaust components, and other high-temperature applications.

SPECIFICATIONS & CERTIFICATES

ATI 410S™ material is produced to the requirements of ASTM A240.

TYPICAL COMPOSITION

Element	Weight%
Carbon	0.08 max.
Manganese	1.00 max.
Phosphorus	0.04 max.
Sulfur	0.03 max.
Silicon	1.00 max.
Chromium	11.5 - 13.50
Nickel	0.60 max.
Iron	balance

PRODUCT FORMS

ATI 410S™ stainless is available as sheet and strip product in thicknesses from 0.003" to 0.187" (0.076 to 4.75 mm) in widths up to 48" (1220 mm). Plate is available in thicknesses from 3/16 to 5/8 inches thick in widths up to 96 inches and lengths up to 360 inches. Other sizes are available on inquiry from ATI.

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MECHANICAL PROPERTIES

Room Temperature Mechanical Properties

Basis	Elongation % in 2"	Hardness Rockwell B	Cold Bend	UTS ksi (MPa)	0.2% YS ksi (MPa)
ASTM A240 (minimal)	22*	89	180	60.0 (415)	30.0 (205)
Typical	33	75	Pass	64.4 (444)	42.0 (290)

*Material 0.050 inches (1.27 mm) and under in thickness shall have a minimum elongation of 20%.

Like all other ferritic and martensitic stainless steels, ATI 410S™ stainless steel exhibits a ductile-to-brittle transition as temperature is reduced. The ductile to brittle transition temperature (DBTT) varies with thickness, heat treatment condition, configuration, loading mode and loading rate. Thick sections may exhibit brittleness at room temperature.

PHYSICAL PROPERTIES

Density	0.280 lbs/in³	7.73 g/cm³
Electrical Resistivity 68°F (20°C)	23.7 microhm-in	89†
Specific Heat, 68°F (20°C)	0.11 Btu/lb•°F	0.46 kJ/kg•K
Thermal Conductivity 212°F (100°C)	187 Btu•in/hr•ft²•°F	26.9 W/m•K
Coefficient of Linear Thermal Expansion	in/in/°F	µm/m•K
32 - 212°F (0 - 100°C)	6.0 x 10-6	10.8
32 - 600°F (0 - 315°C)	6.4 x 10 -6	11.5
32 - 1000°F (0 - 538°C)	6.7 x 10-6	12.2
32 - 1200°F (0 - 649°C)	7.5 x 10-6	13.5
Modulus of Elasticity	29 x 106 psi	200 GPa
Melting Range	2700 - 2790 °F	1480-1530°C
Magnetic Permeability	Ferromagnetic	

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