



Technical Data Sheet

ATI 255™

Stainless Steel: Duplex

(UNS S32550)

INTRODUCTION

ATI 255™ alloy is a 25% chromium ferritic-austenitic duplex stainless steel designed to provide a superior combination of high strength and excellent corrosion resistance for a wide variety of applications.

The alloy possesses a microstructure which is a balanced mixture of austenite and ferrite. The combination of these phases develops the unique combination of strength and chloride stress-corrosion cracking resistance of this alloy.

The alloy finds application in marine corrosion areas, equipment for phosphoric acid and fertilizer industry, pollution control equipment, the pulp and paper industry and the petrochemical industry.

COMPOSITION

Chemical Composition - Range in Weight Percent per ASTM A-240

Element	Minimum	Maximum
Carbon		0.04
Manganese		1.50
Phosphorus		0.040
Sulfur		0.030
Silicon		1.00
Chromium	24.00	27.00
Nickel	4.50	6.50
Copper	1.50	2.50
Molybdenum	2.90	3.90
Nitrogen	0.10	0.25
Iron	Balance	Balance

MECHANICAL PROPERTIES

Room Temperature Mechanical Properties (minimum)	
Tensile Strength, ksi (Mpa)	110.0 (758)
Yield Strength (0.2% offset), ksi (Mpa)	80.0 (332)
Elongation in 2", %	15.0
Hardness, Max	302 BHN (32 HRC)

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Typical Charpy V-Notch Values

Room Temperature	141-156 ft.-lbs. (191-211 J)
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Typical Corrosion Data

ASTM G28 Method A	0.0010 IPM (0.025 mm/M)
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PHYSICAL PROPERTIES

Density: 0.279 lb/in³ (7.728 g/cm³)

Specific Heat

°F	°C	Btu/lb•°F	J/g•K
126	52	0.115	0.481
216	102	0.118	0.496
396	202	0.125	0.525
575	302	0.132	0.554
756	402	0.139	0.583
966	502	0.159	0.665

Thermal Conductivity

Temperature		Btu•in/ft ² •h•°F	W/cm•K
°F	°C		
73	23	92	0.133
212	100	102	0.147
392	200	113	0.163
572	300	126	0.182
752	400	137	0.198
932	500	159	0.229
1112	600	162	0.233

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Electrical Resistivity			
Temperature		microhm-in	microhm-cm
°F	°C		
73	22	32.3	82.1
120	49	33.0	83.7
212	100	34.1	86.7
390	199	36.4	92.4
572	300	38.5	97.7
748	398	40.3	102.3
927	497	42.0	106.7
1105	596	43.4	110.2

Coefficient Of Linear Thermal Expansion			
Temperature Range		Coefficient	
°F	°C	in/in°F	m/m•K
73 - 218	23 - 100	6.73×10^{-6}	12.1×10^{-6}
73 - 302	23 - 150	6.92×10^{-6}	12.5×10^{-6}
73 - 392	23 - 200	7.05×10^{-6}	12.7×10^{-6}
73 - 482	23 - 250	7.18×10^{-6}	12.9×10^{-6}
73 - 572	23 - 300	7.31×10^{-6}	13.2×10^{-6}
73 - 662	23 - 350	7.41×10^{-6}	13.3×10^{-6}
73 - 752	23 - 400	7.51×10^{-6}	13.5×10^{-6}
73 - 932	23 - 500	7.69×10^{-6}	13.8×10^{-6}

Availability	
Plate	3/16"-1/4" - 72" x 240" random length 3/8" and thicker - 96" x 300" max.
Plate Shapes	Variety of plate shapes available, including abrasive cut bar

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