

400 STAINLESS STEEL



AK Steel 400 is one of the most economical chromium ferritic stainless steels. It combines low cost, corrosion and oxidation resistance comparable to Type 410 stainless steel with good fabricating characteristics. Because of its unique properties, AK Steel 400 Stainless Steel is an economical answer for many materials problems where improved corrosion or oxidation resistance is desired. For example, it is particularly useful where metallic-coated steels or other types of coatings provide only marginal corrosion protection.

AK Steel 400 Stainless Steel contains no titanium, so its surface is free of titanium streaks. This provides two important advantages over titanium-stabilized chromium stainless steels. First, the surface finish is improved to the extent that AK Steel 400 can be more readily used in applications where good appearance is a concern. Second, it alleviates die wear that may be caused by titanium-stabilized chromium stainless steels.

AK Steel 400 also provides improved deep drawing properties and higher impact properties at low temperatures

than Type 409 stainless. It is non-hardenable by heat treatment because of its low carbon content which also minimizes hardening during welding.

Although it represents a significant improvement over titanium-stabilized chromium stainless steels, the surface quality and uniformity of AK Steel 400 Stainless Steel is not intended to be competitive with standard AISI grade finishes such as 2D or 2B. Before selecting this material for applications where surface finish is of prime concern, AK Steel 400 Stainless Steel quality standards should be reviewed.

AK Steel 400 Stainless Steel is useful for a wide variety of applications requiring the corrosion resistance of a low-cost stainless steel plus improved surface quality over titanium-stabilized chromium stainless steels.

Typical applications include heat exchangers, display racks, gas range burner rings, office furniture and other uses where corrosion resistance at minimum cost is important.

COMPOSITION

	%
Carbon	0.05 max.
Manganese	1.00 max.
Phosphorus	0.03 max.
Sulfur	0.03 max.
Silicon	1.00 max.
Chromium	12.00 - 13.00
Aluminum	.25 max.
Iron	Balance

AVAILABLE FORMS

AK Steel 400 is available in thicknesses from 0.015" to 0.100" (0.38 to 2.54 mm), in widths up to 48" (1219 mm). For other sizes, inquire.

PHYSICAL PROPERTIES

Density, 0.27 lb/in³
7.47 g/cm³

Electrical Resistivity, microhm-in (microhm-cm) 237 (60)

Specific Heat, BTU/lb/°F (kJ/k•K)
32 - 212°F (0 - 100°C) – 0.11 (0.46)

Thermal Conductivity, BTU/hr/ft²/ft/°F (W/m•K)
212°F (100°C) 14.4 (24.9)
932°F (500°C) 16.5 (28.6)

Mean Coefficient of Thermal Expansion, in/in/°F (µm/m•K)
75 - 212°F (24 - 100°C) 6.00 x 10⁻⁶ (10.8)
75 - 600°F (24 - 316°C) 6.24 x 10⁻⁶ (11.2)
75 - 900°F (24 - 482°C) 6.53 x 10⁻⁶ (11.6)
75 - 1200°F (24 - 649°C) 6.80 x 10⁻⁶ (12.2)
75 - 1500°F (24 - 816°C) 7.06 x 10⁻⁶ (12.7)
75 - 1600°F (24 - 871°C) 7.11 x 10⁻⁶ (12.8)

Modulus of Elasticity, ksi (MPa)
29 x 10³ (200 x 10³)

CORROSION RESISTANCE

The corrosion resistance of AK Steel 400 is the same as Type 410 as demonstrated by laboratory and service tests. Corrosion resistance of welds and weld areas is comparable to that of the base metal.

