P R O D U C T D A T A S H E E T

434 STAINLESS STEEL

UNS S43400

AK Steel

AK Steel 434 is a modification of Type 430, one of the most widely used of the "non-hardenable" ferritic stainless steels. The addition of molybdenum increases this alloy's corrosion resistance and its attack from many deicing chemicals. It also provides good heat and oxidation resistance up to 1500°F (816°C) as well as good mechanical properties.

Typical consumer product applications include automotive trim and molding, furnace combustion chambers, dishwashers, range hoods, gas burners on heating units, gutters and down spouts, steam iron bases and flatware. Commercial and industrial applications range from interior architectural uses to nitric acid plant equipment, oil refinery equipment, roofing and siding and restaurant equipment.

COMPOSITION

	%
Carbon	0.08 max.
Manganese	1.00 max.
Silicon	0.60 max.
Chromium	16.00 - 18.00
Nickel	0.50 max.
Molybdenum	0.75 - 1.25

AVAILABLE FORMS

AK Steel 434 is available in thicknesses from 0.008" to 0.145" (0.20 mm to 3.68 mm) widths up to and including 48" (1219 mm).

PHYSICAL PROPERTIES

Density, lbs/in^3 (g/cm^3)	0.28 (7.74)
Electrical Resistivity 70°F (21°C) microhm-in (microhm-cm)	23.68 (60)
Specific Heat Btu/lb/ °F (32 - 212°F) kJ/kg•K (0 - 100°C)	0.11 (0.46)
Thermal Conductivity BTU/hr/ft^2/ft/°F	(W/m•K)
212°F (100°C)	15.1 (26.1)
932°F (500°C)	15.2 (26.3)
Mean Coefficient of Thermal Expansion in/in/°F (µm/m•K)	
32 - 212°F (0 - 100°C)	5.8 x 10^{-6} (10.4)
32 - 1000°F (0 - 538°C)	6.3 x 10^{-6} (11.4)
Modulus of Elasticity ksi (MPa)	29 x 10^3 (200 x 10^3)
Melting Range °F (°C)	2700 - 2790 (1482 - 1532)
Magnetic Characteristic	Ferro-magnetic

CORROSION RESISTANCE

AK Steel Type 434 stainless steel has excellent corrosion resistance, including high resistance to nitric acid as well as to sulfur gases and many organic and food acids. This alloy does not provide the resistance to pitting by dilute reducing acids that is provided by the chromium-nickel stainless steels, but does provide increased pitting resistance to deicing chemicals over Type 430.

Because of its relatively high chromium content, the material provides good resistance to oxidation. Its maximum scaling temperature is 1500°F (816°C) for continuous service.

FORMABILITY

AK Steel 434 is readily drawn and formed. Its drawing characteristics are similar to those of low-carbon steel, although it is stronger in the annealed condition and will require stronger tooling and increased power. It is also adaptable to most hot-forming operations. It does have a slightly increased tendency to "rope" during forming than Type 430.

AK STEEL 434 STAINLESS STEEL DATA SHEET

MECHANICAL PROPERTIES

Typical Mechanical Properties

UTS ksi (MPa)	0.2% YS ksi (MPa)	Elongation % in 2" (50.8 mm)	Hardness Rockwell
70 (483)	45 (310)	25	B85

WELDABILITY

The ferritic class of stainless steels is generally considered to be weldable by the common fusion and resistance welding techniques. Special consideration is required to avoid brittle weld fractures during fabrication by minimizing discontinuities, maintaining low weld heat input, and occasionally warming the part somewhat before forming. This particular alloy is generally considered to have poorer weldability than the most common alloy of this stainless class, type 409. Major differences are the higher carbon content and the lack of stabilizing elements for this alloy which require post-weld annealing to restore optimum corrosion and forming characteristics. When a weld filler is needed, AWS E/ER 308L and 430 are most often specified. Type 434 is well known in reference literature and more information can be obtained in this way.

METRIC CONVERSION

Data in this publication are presented in U. S. customary units. Approximate metric equivalents may be obtained by performing the following calculations:

Length (inches to millimeters) – Multiply by 25.4

Strength (ksi to megapascals or meganewtons per square meter) – Multiply by 6.8948

Temperature (Fahrenheit to Celsius) – (°Fahrenheit - 32) - Multiply by 0.5556

Density (pounds per cubic inch to kilograms per cubic meter) – Multiply by 27,670

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Stainless Steel The Value Option

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