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

439 STAINLESS STEEL

AK Steel

AK Steel 439 is a ferritic stainless steel that outperforms Type 409 in both oxidation resistance and corrosion resistance. Special attention to chemical composition combined with special processing give this alloy optimum formability that is reproducible, coil after coil and heat after heat. This provides special advantages when producing difficult-to-form exhaust systems components.

Oxidation and corrosion resistance superior to Type 409 makes AK Steel 439 Stainless Steel attractive for numerous automotive exhaust applications. Typical uses include tubular manifolds and other exhaust system components where temperatures may exceed the oxidation limit of Type 409, or where wet corrosion resistance, particularly to chlorides, is needed.

COMPOSITION

	%
Carbon	0.025 max.
Manganese	0.50 max.
Silicon	0.75 max.
Chromium	17.00 - 19.00
Nickel	0.50 max.
Titanium	$\geq 0.20+4(C+N)$ min. - 0.50 max.

AVAILABLE FORMS

AK Steel 439 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.

MECHANICAL PROPERTIES

Typical Mechanical Properties

UTS ksi (MPa)	0.2% YS ksi (MPa)	Elongation % in 2" (50.8 mm)	Hardness Rockwell
66 - 70 (455 - 483)	43 - 48 (296 - 331)	32 - 36	B74 - 78

AK STEEL 439 STAINLESS STEEL DATA SHEET

CORROSION RESISTANCE

AK Steel 439 Stainless Steel exhibits better corrosion resistance in synthetic muffler condensate than Type 409.

OXIDATION RESISTANCE

AK Steel 439 exhibits considerably better oxidation resistance than Type 409 at 1700°F (927°C) after 1022 hours of cyclic testing.

FORMABILITY

AK Steel 439 provides good formability. Olsen Cup heights of 0.490" (12.4 mm) were obtained while flat bends of 180° were possible with material 0.080" (2 mm) thick. The Limiting Draw Ratio (LDR) for this alloy is 2.13.

WELDABILITY

The ferritic class of stainless steels is generally considered to be weldable by the common fusion and resistance 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 comparable weldability to the most common alloy of the stainless class, Type 409. A major difference is the lower carbon content. When a weld filler is needed, AWS E/ER 439 is most often specified, but W18Cb is suggested for high temperature service and E/ER 308L will develop better ductility if it will be used in ambient temperature conditions. Type 439 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

AK Steel

Customer Service 800-331-5050

AK Steel Corporation
9227 Centre Pointe Drive
West Chester, OH 45069

www.aksteel.com

Stainless Steel The Value Option

7100-0096 7/07