

18 SR STAINLESS STEEL



AK Steel 18 SR™ Stainless Steel provides excellent resistance to high-temperature scaling — far superior to that of Type 446 stainless steel. In addition, this material is readily welded by conventional methods. It is not subject to troublesome embrittlement or loss of corrosion resistance in the heat-affected zones that affects many other straight chromium alloys.

AK Steel 18 SR Stainless Steel is a Recognized Component Steel by Underwriters' Laboratories, carrying a temperature rating of 1730°F (943°C) maximum temperature rise for normal operation and 1930°F (1054°C) maximum temperature rise for peak conditions.

This alloy is especially valuable for applications requiring high-temperature scaling resistance superior to Types 409, 430 and 304 stainless steels, and for those applications where Types 442 and 446 give only marginal protection. In addition, it is more economical than many of the higher-temperature stainless steels. Typical uses include industrial ovens, blowers, exhaust systems, furnace equipment, heaters, induction

furnaces and furnace tubes, annealing boxes, baffle plates, heat exchangers, resistor grids, kiln liners and pyrometer tubes.

TYPICAL COMPOSITION

	%
Carbon	0.015
Manganese	0.30
Chromium	17.30
Nickel	0.25
Aluminum	1.7
Titanium	0.25

AVAILABLE FORMS

AK Steel produces 18 SR Stainless Steel in coils and cut lengths in thicknesses from 0.018" to 0.100" (0.046 to 2.54 mm) and widths up to and including 48" (1219 mm). For thicknesses from 0.101" to 0.25" (2.57 to 6.35 mm), inquire.

MECHANICAL PROPERTIES

Typical Room Temperature Properties

Property	
UTS, ksi (MPa)	78 (538)
0.2% YS, ksi (MPa)	56 (386)
Elongation, % in 2" (50.8 mm)	30
Hardness, Rockwell B	84
n value	0.18
r value	1.3 - 1.5

Elevated Temperature Tensile Properties

Temperature °F (°C)	UTS ksi (MPa)	0.2% YS ksi (MPa)
Room	78 (538)	56 (386)
1000 (538)	49 (338)	34 (234)
1100 (593)	36 (248)	28 (193)
1200 (649)	26 (179)	22 (152)
1300 (704)	16 (110)	14 (97)
1400 (760)	13 (90)	7 (48)
1500 (816)	11 (76)	5 (34)
1600 (871)	5 (34)	3 (21)

PHYSICAL PROPERTIES

Density, 7.45 g/cm³
.27 lbs/in³

Electrical Resistivity, 37.40-41.34 microhm-in (95-105 microhm-cm) at room temperature

OXIDATION RESISTANCE

Laboratory tests indicate an upper limit of 2000°F (1093°C) on AK Steel 18 SR Stainless Steel (based on 100-hour tests in still air in which the alloy tested at as high as 2220°F (1204°C) exhibited weight gains of 33 mg/in²). Data available in the literature indicate a weight gain of over 800 mg/in² for Type 446. At 2000°F (1093°C), these rates were 25 mg/in² for 18 SR Stainless Steel and 50 mg/in² for Type 446. In very thin thicknesses (<.018" { .45 mm }), the upper oxidation limit is lower.

