

AK Steel 430 ULTRA FORM® Stainless Steel

Category : Metal , Ferrous Metal , Stainless Steel

Material Notes:

430 ULTRA FORM® Stainless Steel was developed as a more formable version of Type 430 stainless steel. It is particularly suited for parts requiring more complex shapes. 430 ULTRA FORM Stainless Steel combines good corrosion resistance with heat and oxidation resistance up to 1500 °F (816 °C) while having improved mechanical properties over regular Type 430. 430 ULTRA FORM Stainless Steel has a more equiaxed grain microstructure and contains a small addition of titanium that stabilizes the alloy and improves weldability. The alloy can be supplied with a dull pickled, temper passed finish or a directional polished finish. Information provided by AK Steel.

Order this product through the following link:

http://www.lookpolymers.com/polymer_AK-Steel-430-ULTRA-FORM-Stainless-Steel.php

Physical Properties	Metric	English	Comments
Density	7.74 g/cc	0.280 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell B	77.5	77.5	
	@Thickness 0.508 - 1.27 mm	@Thickness 0.0200 - 0.0500 in	
	80.5	80.5	
	@Thickness >=1.27 mm	@Thickness >=0.0500 in	
Tensile Strength, Ultimate	494 MPa	71600 psi	Longitudinal to Sheet Rolling Direction, Tensile Hardness Test (ASTM E8, E694, E18, A370)
	494 MPa	71600 psi	Transverse to Sheet Rolling Direction, Tensile Hardness Test (ASTM E8, E694, E18, A370)
	506 MPa	73400 psi	Rolling Direction, Tensile Hardness Test (ASTM E8, E694, E18, A370)
	491 MPa	71200 psi	
	@Thickness >=1.27 mm	@Thickness >=0.0500 in	
Tensile Strength, Yield	503 MPa	73000 psi	
	@Thickness 0.508 - 1.27 mm	@Thickness 0.0200 - 0.0500 in	
	42.4 MPa	6150 psi	Longitudinal to Sheet Rolling Direction, Tensile Hardness Test (ASTM E8, E694, E18, A370)
	@Strain 0.200 %	@Strain 0.200 %	
	44.6 MPa	6470 psi	Transverse to Sheet Rolling Direction, Tensile Hardness Test (ASTM E8,

Mechanical Properties	@Strain 0.200 % Metric	@Strain 0.200 % English	E694, E18, A370) Comments
	45.2 MPa @Strain 0.200 %	6560 psi @Strain 0.200 %	Rolling Direction, Tensile Hardness Test (ASTM E8, E694, E18, A370)
	343 MPa @Strain 0.200 %	49700 psi @Strain 0.200 %	0.02"-0.05"
	354 MPa @Strain 0.200 %	51300 psi @Strain 0.200 %	>0.05"
Elongation at Break	27.2 %	27.2 %	In 2", Rolling Direction, Tensile Hardness Test (ASTM E8, E694, E18, A370)
	29.2 %	29.2 %	In 2", Transverse to Sheet Rolling Direction, Tensile Hardness Test (ASTM E8, E694, E18, A370)
	29.7 %	29.7 %	In 2", Longitudinal to Sheet Rolling Direction, Tensile Hardness Test (ASTM E8, E694, E18, A370)
	29.5 % @Thickness 0.508 - 1.27 mm	29.5 % @Thickness 0.0200 - 0.0500 in	In 2"
	31.2 % @Thickness >=1.27 mm	31.2 % @Thickness >=0.0500 in	In 2"
Modulus of Elasticity	200 GPa	29000 ksi	

Thermal Properties	Metric	English	Comments
CTE, linear	10.4 $\mu\text{m}/\text{m}\cdot\text{°C}$ @Temperature -17.8 - 37.8 $^{\circ}\text{C}$	5.80 $\mu\text{in}/\text{in}\cdot\text{°F}$ @Temperature 0.000 - 100 $^{\circ}\text{F}$	
	11.3 $\mu\text{m}/\text{m}\cdot\text{°C}$ @Temperature -17.8 - 281 $^{\circ}\text{C}$	6.30 $\mu\text{in}/\text{in}\cdot\text{°F}$ @Temperature 0.000 - 538 $^{\circ}\text{F}$	
Specific Heat Capacity	0.460 J/g- $^{\circ}\text{C}$	0.110 BTU/lb- $^{\circ}\text{F}$	
Thermal Conductivity	26.1 W/m-K @Temperature 100 $^{\circ}\text{C}$	181 BTU-in/hr-ft 2 - $^{\circ}\text{F}$ @Temperature 212 $^{\circ}\text{F}$	
	26.3 W/m-K @Temperature 500 $^{\circ}\text{C}$	183 BTU-in/hr-ft 2 - $^{\circ}\text{F}$ @Temperature 932 $^{\circ}\text{F}$	

Component Elements Properties	Metric	English	Comments
Carbon, C	0.035 %	0.035 %	
Chromium, Cr	17 %	17 %	
Iron, Fe	82.113 %	82.113 %	Balance
Manganese, Mn	0.30 %	0.30 %	
Phosphorous, P	0.030 %	0.030 %	
Silicon, Si	0.35 %	0.35 %	
Sulfur, S	0.0020 %	0.0020 %	
Titanium, Ti	0.17 %	0.17 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000600 ohm-cm	0.0000600 ohm-cm	

Descriptive Properties	Value	Comments
Chemical Immersion Testing (mm/yr)	<2	20% Sodium Hydroxide
	<2	60% Acetic Acid
	<2	10% Citric Acid
	13	1% Hydrochloric Acid
	2	Household Bleach
	38	5% Sulfuric Acid
delta r	0.48	Plastic strain ratio 18%, ASTM E517
delta r (Max-Min)	0.9	Plastic strain ratio 18%, ASTM E517
n Value (10% -Ult)	0.192	Transverse to Sheet Rolling Direction, Tensile Hardness Test (ASTM E8, E694, E18, A370)
	0.194	Rolling Direction, Tensile Hardness Test (ASTM E8, E694, E18, A370)
	0.2	Longitudinal to Sheet Rolling Direction, Tensile Hardness Test (ASTM E8, E694, E18, A370)
Olsen Cup Height (in)	0.319	
Ridging No.	2	Plastic strain ratio 18%, ASTM E517
r-Value	1.24	Rolling Direction, Plastic strain ratio 18%, ASTM E517

Descriptive Properties	Value	Comments
	2.14	Transverse to Sheet Rolling Direction, Plastic strain ratio 18%, ASTM E517
Strength Coefficient (ksi)	119.6	Transverse to Sheet Rolling Direction, Plastic strain ratio 18%, ASTM E517
	121	Longitudinal to Sheet Rolling Direction, Plastic strain ratio at 18%, ASTM E517
	123.3	Rolling Direction, Plastic strain ratio 18%, ASTM E517
Typical rm value	1.48	Plastic strain ratio 18%, ASTM E517

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