

Crucible Steel XM-19 Stainless Steel

Category : Metal , Ferrous Metal , Stainless Steel , T 300 Series Stainless Steel

Material Notes:

Crucible XM-19 Stainless is a nitrogen strengthened, low carbon, austenitic, stainless steel that provides good corrosion resistance in combination with high strength. The alloy has better corrosion resistance than Type 316 with approximately twice the yield strength. It can be welded, machined and cold worked using the same equipment and methods used for the conventional 300 series stainless steels. It is nonmagnetic as annealed and after severe cold work. Mechanical properties reported for annealed one inch round bar. Information provided by Crucible Industries

Order this product through the following link:

http://www.lookpolymers.com/polymer_Crucible-Steel-XM-19-Stainless-Steel.php

Physical Properties	Metric	English	Comments
Density	7.889 g/cc	0.2850 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell B	96	96	
Tensile Strength, Ultimate	350 MPa	50800 psi	
	@Temperature 816 °C	@Temperature 1500 °F	
	600 MPa	87000 psi	
	@Temperature 593 °C	@Temperature 1100 °F	
	750 MPa	109000 psi	
	@Temperature 260 °C	@Temperature 500 °F	
	827 MPa	120000 psi	
	@Temperature 21.1 °C	@Temperature 70.0 °F	
Tensile Strength, Yield	240 MPa	34800 psi	
	@Temperature 816 °C	@Temperature 1500 °F	
	300 MPa	43500 psi	
	@Temperature 538 °C	@Temperature 1000 °F	
	340 MPa	49300 psi	
	@Temperature 260 °C	@Temperature 500 °F	
	448 MPa	65000 psi	0.002
	@Temperature 21.1 °C	@Temperature 70.0 °F	
Elongation at Break	32 %	32 %	in 2"

Mechanical Properties	@Temperature 427 °C Metric	@Temperature 800 °F English	Comments
	35 %	35 %	in 2"
	@Temperature 204 °C	@Temperature 400 °F	
	36 %	36 %	in 2"
	@Temperature 649 °C	@Temperature 1200 °F	
	40 %	40 %	in 2"
	@Temperature 816 °C	@Temperature 1500 °F	
	45 %	45 %	in 2"
	@Temperature 21.1 °C	@Temperature 70.0 °F	
Reduction of Area	65 %	65 %	
	@Temperature 21.1 °C	@Temperature 70.0 °F	
	65 %	65 %	
	@Temperature 260 °C	@Temperature 500 °F	
	65 %	65 %	
	@Temperature 538 °C	@Temperature 1000 °F	
	70 %	70 %	
	@Temperature 816 °C	@Temperature 1500 °F	
Charpy Impact	217 J	160 ft-lb	V-Notch

Thermal Properties	Metric	English	Comments
CTE, linear	16.2 $\mu\text{m}/\text{m}\cdot\text{°C}$	9.00 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 21.0 - 93.0 °C	@Temperature 69.8 - 199 °F	
	17.8 $\mu\text{m}/\text{m}\cdot\text{°C}$	9.89 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 21.0 - 427 °C	@Temperature 69.8 - 801 °F	
	20.0 $\mu\text{m}/\text{m}\cdot\text{°C}$	11.1 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 21.0 - 871 °C	@Temperature 69.8 - 1600 °F	
Thermal Conductivity	15.6 W/m-K	108 BTU-in/hr-ft ² -°F	
	@Temperature 149 °C	@Temperature 300 °F	
	20.3 W/m-K	141 BTU-in/hr-ft ² -°F	
	@Temperature 482 °C	@Temperature 900 °F	

Thermal Properties	25.2 W/m-K Metric	175 BTU-in/hr-ft ² -°F English	Comments
	@Temperature 816 °C	@Temperature 1500 °F	

Component Elements Properties	Metric	English	Comments
Carbon, C	<= 0.030 %	<= 0.030 %	
Chromium, Cr	20.5 - 23.5 %	20.5 - 23.5 %	
Iron, Fe	>= 48.9 %	>= 48.9 %	as balance
Manganese, Mn	4.0 - 6.0 %	4.0 - 6.0 %	
Molybdenum, Mo	1.5 - 3.0 %	1.5 - 3.0 %	
Nickel, Ni	11.5 - 13.5 %	11.5 - 13.5 %	
Niobium, Nb (Columbium, Cb)	0.10 - 0.30 %	0.10 - 0.30 %	
Nitrogen, N	0.20 - 0.40 %	0.20 - 0.40 %	
Phosphorous, P	<= 0.040 %	<= 0.040 %	
Silicon, Si	<= 1.0 %	<= 1.0 %	
Sulfur, S	<= 0.030 %	<= 0.030 %	
Vanadium, V	0.10 - 0.30 %	0.10 - 0.30 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000820 ohm-cm	0.0000820 ohm-cm	
Magnetic Permeability	1.004	1.004	
	@Magnetic Field 0.0200 T	@Magnetic Field 0.0200 T	

Descriptive Properties	Value	Comments
Corrosion Rate	0.1 mils/year	50% Acetic Acid (Boiling)
	0.2 mils/year	5% H ₂ SO ₄ (176°F)
	0.3 mils/year	20% HNO ₃ (200°F)
	15 mils/year	10% H ₂ SO ₄ (176°F)
	2.3 mils/year	10% Formic Acid (Boiling)

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