

Special Metals INCOLOY® alloy 803 Fe-Ni-Cr Alloy

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

Material Notes:

INCOLOY® alloy 803 (UNS S35045), an iron-nickel-chromium alloy, is designed for use in petrochemical, chemical and thermal processing applications. The nickel and chromium contents of alloy 803 are higher than those of INCOLOY alloys 800H and 800HT®. Alloy 803 is a cost-effective material which provides an exceptional level of high-temperature corrosion resistance in oxidation, sulfidation and carburization environments. INCOLOY alloy 803 exhibits excellent stress-rupture strengths at elevated temperatures. These characteristics, along with a high resistance to carburization and cyclic oxidation, make INCOLOY alloy 803 the material of choice for many severe applications including ID-finned pyrolysis tubing in high-severity ethylene furnaces. INCOLOY alloy 803 is produced in all major product forms in a wide variety of sizes, finishes and tempers. One unique product form is internally finned, either straight or spiralled fins, cold finished tubing. Strict process controls ensure complete material traceability and structure consistency throughout the manufacture of all INCOLOY alloy 803 products. Information Provided by Special Metals Corporation

Order this product through the following link:

http://www.lookpolymers.com/polymer_Special-Metals-INCOLOY-alloy-803-Fe-Ni-Cr-Alloy.php

Physical Properties	Metric	English	Comments
Density	7.86 g/cc	0.284 lb/in ³	

Mechanical Properties	Metric	English	Comments
Tensile Strength at Break	552 - 621 MPa	80100 - 90100 psi	Sheet, Cold-rolled & Solution Annealed
	572 - 607 MPa	83000 - 88000 psi	Rod, Hot-finished & Solution Annealed
	572 - 607 MPa	83000 - 88000 psi	Plate, Hot-rolled & Solution Annealed
	586 - 627 MPa	85000 - 90900 psi	Tubing, Cold-drawn & Solution Annealed
	55.0 MPa @Temperature 1093 °C	7980 psi @Temperature 1999 °F	Solution Annealed Tubing
	96.0 MPa @Temperature 982 °C	13900 psi @Temperature 1800 °F	Solution Annealed Tubing
	186 MPa @Temperature 871 °C	27000 psi @Temperature 1600 °F	Solution Annealed Tubing
	290 MPa @Temperature 760 °C	42100 psi @Temperature 1400 °F	Solution Annealed Tubing
	448 MPa @Temperature 649 °C	65000 psi @Temperature 1200 °F	Solution Annealed Tubing

Mechanical Properties	MetricMPa	Englishpsi	Comments
	@Temperature 23.0 °C	@Temperature 73.4 °F	
	627 MPa	90900 psi	Solution Annealed Tubing
	@Temperature 20.0 °C	@Temperature 68.0 °F	
	640 MPa	92800 psi	Room Temperature properties after Isothermal Exposure
	@Temperature 870 °C, Time 3.60e+6 sec	@Temperature 1600 °F, Time 1000 hour	
	645 MPa	93500 psi	Room Temperature properties after Isothermal Exposure
	@Temperature 870 °C, Time 1.80e+6 sec	@Temperature 1600 °F, Time 500 hour	
	703 MPa	102000 psi	Room Temperature properties after Isothermal Exposure
	@Temperature 760 °C, Time 7.20e+6 sec	@Temperature 1400 °F, Time 2000 hour	
	718 MPa	104000 psi	Room Temperature properties after Isothermal Exposure
	@Temperature 760 °C, Time 3.60e+6 sec	@Temperature 1400 °F, Time 1000 hour	
	726 MPa	105000 psi	Room Temperature properties after Isothermal Exposure
	@Temperature 760 °C, Time 1.80e+6 sec	@Temperature 1400 °F, Time 500 hour	
	874 MPa	127000 psi	Room Temperature properties after Isothermal Exposure
	@Temperature 650 °C, Time 3.60e+6 sec	@Temperature 1200 °F, Time 1000 hour	
	887 MPa	129000 psi	Room Temperature properties after Isothermal Exposure
	@Temperature 650 °C, Time 1.80e+6 sec	@Temperature 1200 °F, Time 500 hour	
Tensile Strength, Yield	207 - 255 MPa	30000 - 37000 psi	Rod, Hot-finished & Solution Annealed
	@Strain 0.200 %	@Strain 0.200 %	
	275 - 296 MPa	39900 - 42900 psi	Plate, Hot-rolled & Solution Annealed
	@Strain 0.200 %	@Strain 0.200 %	
	275 - 310 MPa	39900 - 45000 psi	Tubing, Cold-drawn & Solution Annealed
	@Strain 0.200 %	@Strain 0.200 %	
	275 - 331 MPa	39900 - 48000 psi	Sheet, Cold-rolled & Solution Annealed
	@Strain 0.200 %	@Strain 0.200 %	
	48.0 MPa	6960 psi	Solution Annealed Tubing
	@Strain 0.200 %,	@Strain 0.200 %,	

Mechanical Properties	Temperature 1093 °C Metric	Temperature 1999 °F English	Comments
	55.0 MPa	7980 psi	
	@Strain 0.200 %, Temperature 982 °C	@Strain 0.200 %, Temperature 1800 °F	Solution Annealed Tubing
	124 MPa	18000 psi	
	@Strain 0.200 %, Temperature 871 °C	@Strain 0.200 %, Temperature 1600 °F	Solution Annealed Tubing
	193 MPa	28000 psi	
	@Strain 0.200 %, Temperature 649 °C	@Strain 0.200 %, Temperature 1200 °F	Solution Annealed Tubing
	193 MPa	28000 psi	
	@Strain 0.200 %, Temperature 760 °C	@Strain 0.200 %, Temperature 1400 °F	Solution Annealed Tubing
	247 MPa	35800 psi	
	@Strain 0.200 %, Temperature 20.0 °C	@Strain 0.200 %, Temperature 68.0 °F	after Isothermal Exposure; Solution Annealed
	310 MPa	45000 psi	
	@Strain 0.200 %, Temperature 20.0 °C	@Strain 0.200 %, Temperature 68.0 °F	Solution Annealed Tubing
	259 MPa	37600 psi	
	@Strain 0.200 %, Time 3.60e+6 sec	@Strain 0.200 %, Time 1000 hour	Room Temperature properties after Isothermal Exposure
	266 MPa	38600 psi	
	@Strain 0.200 %, Time 1.80e+6 sec	@Strain 0.200 %, Time 500 hour	Room Temperature properties after Isothermal Exposure
	289 MPa	41900 psi	
	@Strain 0.200 %, Time 7.20e+6 sec	@Strain 0.200 %, Time 2000 hour	Room Temperature properties after Isothermal Exposure
	303 MPa	43900 psi	
	@Strain 0.200 %, Time 3.60e+6 sec	@Strain 0.200 %, Time 1000 hour	Room Temperature properties after Isothermal Exposure
	316 MPa	45800 psi	
	@Strain 0.200 %, Time 1.80e+6 sec	@Strain 0.200 %, Time 500 hour	Room Temperature properties after Isothermal Exposure
	498 MPa	72200 psi	
	@Strain 0.200 %, Time 3.60e+6 sec	@Strain 0.200 %, Time 1000 hour	Room Temperature properties after Isothermal Exposure
	500 MPa	72500 psi	

Mechanical Properties	Metric @Strain 0.200 %, Time 1.80e+6 sec	English @Strain 0.200 %, Time 500 hour	Room Temperature properties after Isothermal Exposure Comments
	259 MPa	37600 psi	
	@Strain 0.200 %, Treatment Temp. 870 °C	@Strain 0.200 %, Treatment Temp. 1600 °F	Room Temperature properties after Isothermal Exposure
	266 MPa	38600 psi	
	@Strain 0.200 %, Treatment Temp. 870 °C	@Strain 0.200 %, Treatment Temp. 1600 °F	Room Temperature properties after Isothermal Exposure
	289 MPa	41900 psi	
	@Strain 0.200 %, Treatment Temp. 760 °C	@Strain 0.200 %, Treatment Temp. 1400 °F	Room Temperature properties after Isothermal Exposure
	303 MPa	43900 psi	
	@Strain 0.200 %, Treatment Temp. 760 °C	@Strain 0.200 %, Treatment Temp. 1400 °F	Room Temperature properties after Isothermal Exposure
	316 MPa	45800 psi	
	@Strain 0.200 %, Treatment Temp. 760 °C	@Strain 0.200 %, Treatment Temp. 1400 °F	Room Temperature properties after Isothermal Exposure
	498 MPa	72200 psi	
	@Strain 0.200 %, Treatment Temp. 650 °C	@Strain 0.200 %, Treatment Temp. 1200 °F	Room Temperature properties after Isothermal Exposure
	500 MPa	72500 psi	
	@Strain 0.200 %, Treatment Temp. 650 °C	@Strain 0.200 %, Treatment Temp. 1200 °F	Room Temperature properties after Isothermal Exposure
Elongation at Break	40 - 45 %	40 - 45 %	Sheet, Cold-rolled & Solution Annealed
	43 - 47 %	43 - 47 %	Plate, Hot-rolled & Solution Annealed
	45 - 50 %	45 - 50 %	Tubing, Cold-drawn & Solution Annealed
	45 - 50 %	45 - 50 %	Rod, Hot-finished & Solution Annealed
	49 %	49 %	
	@Temperature 20.0 °C	@Temperature 68.0 °F	Solution Annealed Tubing
	49 %	49 %	
			Solution Annealed Tubing

Mechanical Properties	Metric @Temperature 649 °C 49.3 %	English @Temperature 1200 °F 49.3 %	Comments
	@Temperature 23.0 °C	@Temperature 73.4 °F	
	66 %	66 %	Solution Annealed Tubing
	@Temperature 760 °C	@Temperature 1400 °F	
	80 %	80 %	Solution Annealed Tubing
	@Temperature 982 °C	@Temperature 1800 °F	
	80 %	80 %	Solution Annealed Tubing
	@Temperature 1093 °C	@Temperature 1999 °F	
	88 %	88 %	Solution Annealed Tubing
	@Temperature 871 °C	@Temperature 1600 °F	
	25.6 %	25.6 %	Room Temperature properties after Isothermal Exposure
	@Treatment Temp. 650 °C, Time 3.60e+6 sec	@Treatment Temp. 1200 °F, Time 1000 hour	
	27.5 %	27.5 %	Room Temperature properties after Isothermal Exposure
	@Treatment Temp. 650 °C, Time 1.80e+6 sec	@Treatment Temp. 1200 °F, Time 500 hour	
	32.9 %	32.9 %	Room Temperature properties after Isothermal Exposure
	@Treatment Temp. 760 °C, Time 7.20e+6 sec	@Treatment Temp. 1400 °F, Time 2000 hour	
	33.9 %	33.9 %	Room Temperature properties after Isothermal Exposure
	@Treatment Temp. 760 °C, Time 1.80e+6 sec	@Treatment Temp. 1400 °F, Time 500 hour	
	34.4 %	34.4 %	Room Temperature properties after Isothermal Exposure
	@Treatment Temp. 760 °C, Time 3.60e+6 sec	@Treatment Temp. 1400 °F, Time 1000 hour	
	38.1 %	38.1 %	Room Temperature properties after Isothermal Exposure
	@Treatment Temp. 870 °C, Time 1.80e+6 sec	@Treatment Temp. 1600 °F, Time 500 hour	
	38.5 %	38.5 %	Room Temperature properties after Isothermal Exposure
	@Treatment Temp. 870 °C, Time 3.60e+6 sec	@Treatment Temp. 1600 °F, Time 1000 hour	

Mechanical Properties Reduction of Area	54 % Metric	54 % English	Comments Solution Annealed Tubing
	@Temperature 760 °C	@Temperature 1400 °F	
	55 %	55 %	Solution Annealed Tubing
	@Temperature 649 °C	@Temperature 1200 °F	
	66 %	66 %	Solution Annealed Tubing
	@Temperature 871 °C	@Temperature 1600 °F	
	67 %	67 %	Solution Annealed Tubing
	@Temperature 20.0 °C	@Temperature 68.0 °F	
	75 %	75 %	Solution Annealed Tubing
	@Temperature 982 °C	@Temperature 1800 °F	
	77 %	77 %	Solution Annealed Tubing
	@Temperature 1093 °C	@Temperature 1999 °F	

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