

EOS PH1 Precipitation Hardening Stainless Steel for DMLS 3D Printing

Category : Metal , Ferrous Metal , Stainless Steel , Precipitation Hardening Stainless

Material Notes:

EOS Stainless Steel PH1 is a stainless steel powder which has been optimized especially for processing on EOSINT M 270 systems. This stainless steel prototyping material is tough and resistant to heat and oxidization. It is used in medical and aerospace applications and for complex applications such as tooling inserts with conformal cooling channels. PH1 can be tempered for improved finished part properties. EOS®, EOSINT®, DirectPart®, and DMLS® are registered trademarks of EOS GmbH. Information provided by Axis Prototyping.

Order this product through the following link:

http://www.lookpolymers.com/polymer_EOS-PH1-Precipitation-Hardening-Stainless-Steel-for-DMLS-3D-Printing.php

Physical Properties	Metric	English	Comments
Density	7.8 g/cc	0.28 lb/in³	
Porosity	0.0 %	0.0 %	with standard parameters

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell C	30 - 35	30 - 35	as built
	>= 40	>= 40	after modified H900 heat treatment
Tensile Strength, Ultimate	1000 - 1100 MPa	145000 - 160000 psi	as built, Z direction
	1100 - 1200 MPa	160000 - 174000 psi	as built, XY direction
	1350 - 1550 MPa	196000 - 225000 psi	after modified H900 heat treatment, XY direction
	1350 - 1550 MPa	196000 - 225000 psi	after modified H900 heat treatment, Z direction
Tensile Strength, Yield	950 - 1050 MPa	138000 - 152000 psi	as built, Z direction
	@Strain 0.2 %	@Strain 0.2 %	
	1000 - 1100 MPa	145000 - 160000 psi	as built, XY direction
	@Strain 0.2 %	@Strain 0.2 %	
	1200 - 1400 MPa	174000 - 203000 psi	after modified H900 heat treatment, XY direction
	@Strain 0.2 %	@Strain 0.2 %	
	1200 - 1400 MPa	174000 - 203000 psi	after modified H900 heat treatment, Z direction
	@Strain 0.2 %	@Strain 0.2 %	
Elongation at Break	10 - 14 %	10 - 14 %	after modified H900 heat treatment, Z direction
	10 - 14 %	10 - 14 %	after modified H900 heat treatment, XY direction

Mechanical Properties	Metric %	English %	Comments direction
	13 - 21 %	13 - 21 %	as built, Z direction
Modulus of Elasticity	160 - 200 GPa	23200 - 29000 ksi	

Thermal Properties	Metric	English	Comments
Specific Heat Capacity	0.440 - 0.480 J/g-°C	0.105 - 0.115 BTU/lb-°F	as built
	0.450 - 0.490 J/g-°C	0.108 - 0.117 BTU/lb-°F	after modified H900 heat treatment
Thermal Conductivity	12.9 - 14.5 W/m-K	89.5 - 101 BTU-in/hr-ft²-°F	Z (vertical) direction, as manufactured
	13.0 - 14.6 W/m-K	90.2 - 101 BTU-in/hr-ft²-°F	as built, XY direction
	14.9 - 16.5 W/m-K	103 - 115 BTU-in/hr-ft²-°F	after modified H900 heat treatment, XY direction
	15.0 - 16.6 W/m-K	104 - 115 BTU-in/hr-ft²-°F	Z (vertical) direction, after mod H900 heat treat
Maximum Service Temperature, Air	400 °C	752 °F	

Component Elements Properties	Metric	English	Comments
Carbon, C	<= 0.07 %	<= 0.07 %	
Chromium, Cr	14 - 15.5 %	14 - 15.5 %	
Copper, Cu	2.5 - 4.5 %	2.5 - 4.5 %	
Iron, Fe	71.48 - 79.85 %	71.48 - 79.85 %	as balance
Manganese, Mn	<= 1 %	<= 1 %	
Molybdenum, Mo	<= 0.5 %	<= 0.5 %	
Nickel, Ni	3.5 - 5.5 %	3.5 - 5.5 %	
Niobium, Nb (Columbium, Cb)	0.15 - 0.45 %	0.15 - 0.45 %	
Silicon, Si	<= 1 %	<= 1 %	

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