

Amperprint 0233 HAYNES 282

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Material & Process Capability

Amperprint® 0233 HAYNES® 282® powder is produced by Höganäs under license from Haynes International, Inc. It is a vacuum induction melted, argon gas atomized, spherical powder for additive manufacturing. Velo3D has qualified this powder, produced by Höganäs AB, a world leader in metal powder production, under license from Haynes International, for use in the Sapphire® family of printers. The Velo3D end-to-end metal AM solution uniquely enables companies to build the parts they need without compromising design or quality - resulting in complex parts higher in performance than casting or other methods.

This alloy is a gamma-prime strengthened nickel-chromium-cobalt superalloy for high temperature applications and shows a good balance of creep strength at high temperatures, thermal stability, weldability, and fabricability.

General Process

In addition to its strength, the alloy is characterized by its superb fatigue, creep, and corrosion resistance under extreme conditions; it is ideal for high temperature applications such as gas turbine and power/process industry parts.

This data sheet specifies the expected mechanical properties and characteristics of this alloy when manufactured on a Velo3D Sapphire System. All data is based on parts built using Velo3D standard 50 µm layer thickness parameters, using Amperprint 0233 HAYNES 282. Parts built with this alloy on a Sapphire System can be heat treated like those manufactured by other methods. Haynes 282 is a registered trademark of Haynes International, Inc.



Typical Volume Rate ¹ , cc/hr	60
Density, g/cc (lbs/cubic inch)	8.28 (0.299)
Relative Density, percent	99.9+
Surface Finish ² , S _a , µm (µin)	<15 (590) for angles >25° from horizontal

Mechanical Properties at Room Temperature

Property ³	As Printed		After Heat Treatment & HIP ⁴	
	Mean -3σ	Mean	Mean -3σ	Mean
Modulus of Elasticity, GPa (msi)	126 (18.3)	152 (22.0)	186 (27.0)	201 (29.2)
Ultimate Tensile Strength, MPa (ksi)	850 (123)	862 (125)	1141 (165.5)	1158 (168.0)
Yield (0.2% Offset), MPa (ksi)	547 (79.3)	573 (83.1)	711 (103)	743 (108)
Elongation At Break, percent	44.9	47.3	29.3	34.5

1. Geometry-dependent. **2.** Depends on orientation and process selected. **3.** Mechanical & test samples printed in vertical orientation. **4.** Hot Isostatic Pressing at 1175°C (2150°F) for 4 hours, rapid cool. Vacuum Solution Heat Treat at 1135°C (2075°F) for 30 min. Two-step vacuum age, first at 1010°C (1850°F) for two hours followed by rapid air cool, then at 790°C (1450°F) for eight hours, followed by rapid air cool.