HASTELLOY X

To Learn More Visit
velo3d.com
info@velo3d.com

Headquarters
511 Division Street
Campbell, CA 95008

European Technology Center
Am Technologiezentrum 5
86159 Augsburg, Germany

Material & Process Capability

HASTELLOY® X alloy (UNS N06002) is a nickel chromium-iron-molybdenum alloy widely used in high temperature and corrosive atmosphere applications. The alloy is commonly used in gas turbine engines. Its corrosion resistance also make it an excellent candidate for applications in petrochemical and energy generation applications, such as transition duct, combustor cans, afterburners, and spray bars.

The Velo3D intelligent additive printing solution uniquely enables companies to build the parts they need without compromising design or quality - resulting in complex, higher performance parts than traditional casting techniques or other additive methods.

General Process

HASTELLOY X possesses excellent forming and welding characteristics and is easy to fabricate. It offers outstanding localized corrosion resistance and oxidation resistance up to 2200°F (1200°C) along with excellent stress corrosion crack resistance.

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 Praxair TruForm HXLC, a Velo3D-approved HASTELLOY X powder. HASTELLOY is a registered trademark of Haynes International, Inc.

Typical Volume Rate[1], cc/hr	51
Density, g/cc (lbs/cubic inch)	8.22 (0.297)
Relative Density, percent	99.9+
Surface Finish[2], S_a, µm (µin)	<15 (590) for angles >25° from horizontal

Mechanical Properties at Room Temperature

	As Printed		After Heat Treatment[4]		After HIP[5]	
Property[3]	Mean -3σ	Mean	Mean -3σ	Mean	Mean -3σ	Mean
Modulus of Elasticity, GPa (msi)	131 (19)	179 (25.9)	132 (19.1)	227 (32.9)	148 (21.5)	204 (29.5)
Ultimate Tensile Strength, MPa (ksi)	665 (96.4)	674 (97.7)	625 (90.7)	644 (93.5)	643 (93.2)	658 (95.4)
Yield (0.2% Offset), MPa (ksi)	461 (66.8)	487 (70.6)	320 (46.5)	336 (48.8)	303 (44.0)	323 (46.9)
Elongation At Break, percent	40.0	45.6	52.6	57.8	51	57.7

1. Geometry-dependent. **2.** Depends on orientation and process selected. **3.** Mechanical & test samples printed in vertical orientation. **4.** Solution annealed at 1177°C (2150°F) for two hours followed by rapid air cool. **5.** Hot Isostatic Pressing at 1177°C (2150°F) & 14.5 KSI for 3-5 hrs, followed by cooling at 150-200°C/min (300-390°F/min), processed at Quintus Technologies.