# 

# Stainless Steel 415

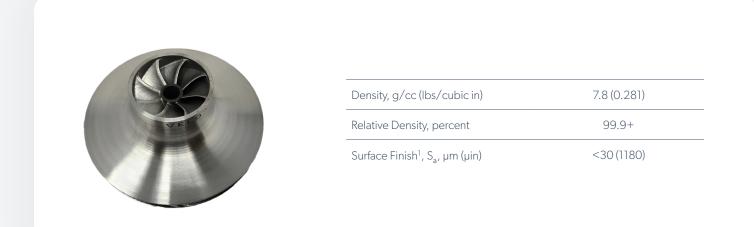
To Learn More Visit velo3d.com info@velo3d.com **Headquarters** 2710 Lakeview Court Fremont, CA 94538

## Material & Process Capability

Stainless Steel 415 is a chromium-nickel stainless steel with additional molybdenum. It exhibits high mechanical properties due to the concentration of molybdenum and nickel. Its molybdenum content also provides basic pitting and crevice corrosion resistance. The combination of good corrosion resistance and excellent strength and toughness makes it a perfect candidate for mechanically highly stressed components in wet corrosive environments.

### **General Process**

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 with Velo3D standard 50 µm layer thickness parameters, using Carpenter CT 415-AAVD 45-90 µm, a Velo3D approved powder.



### Mechanical Properties at Room Temperature

					After Heat Treatment <sup>4</sup>			
Property <sup>2</sup>			Ultimate Tensile Strength, MPa (ksi)		Yield (0.2% Offset), MPa (ksi)		Elongation At Break, percent	
Process Recipe	TBR (cc/h) <sup>3</sup>	Sample Size	Mean-3o	Mean	Mean-3o	Mean	Mean-3o	Mean
1kW/50 µm	35	66	866 (126)	887 (129)	531 (77)	569 (83)	18.9	21.8

1. For angles >25° from horizontal, actual finish depends on orientation and process selected.

2. Mechanical & test samples printed in vertical orientation, machined to ASTM E8 (round specimen #3).

3. TBR: Theoretical Build Rate (TBR) is a per-laser build rate calculated from the process conditions of bulk core as scan speed x hatch spacing x layer thickness. This value represents a

single laser only and is reported for comparison purposes across different materials and recipes, but does not correspond to true build rate, which is dependent on geometry and system characteristics (i.e. number of lasers, recoat times, etc.)

**4.** Solution anneal at 1052 °C (1925 °F) for 2 hours. Temper at 613 °C (1135 °F) for 5 hours.

DS-Stainless415.EN.2024-02-19.v1.U.USL 0905-26234\_A 2024-02-19. Specifications are subject to change without notice. ©2024 Velo3D, Inc. All rights reserved. Velo, Velo3D, Sapphire, and Intelligent Fusion are registered US trademarks and Assure, Flow, and Without Compromise are trademarks of Velo3D, Inc. All other product or company names may be trademarks and/or registered trademarks of their respective owners.