

# POWDERRANGE 304L

## Type analysis

Single figures are maximum except where noted.

<b>Iron</b>	Balance	<b>Chromium</b>	18.0–20.0 %	<b>Nickel</b>	8.0–11.0 %
<b>Manganese</b>	2.0 %	<b>Silicon</b>	1.00 %	<b>Copper</b>	0.75 %
<b>Molybdenum</b>	0.75 %	<b>Phosphorus</b>	0.040 %	<b>Carbon</b>	0.030 %
<b>Sulfur</b>	0.030 %				

## Description

PowderRange 304L is a low carbon, austenitic stainless steel that exhibits a high strength-to-weight ratio and generally good corrosion resistance, especially intergranular corrosion. It has excellent weldability in laser and electron-beam additive manufacturing processes and can be processed in either argon or nitrogen shielding gas.

PowderRange 304L cannot be strengthened through post processing heat treatments but can be solution annealed to improve corrosion resistance. It is non-magnetic in the annealed condition. Post processing can include traditional machining, abrasive flow machining, shot-peening, grinding, polishing, chemical milling/etching, and other methods.

### Key Properties:

- High strength-to-weight ratio
- Good corrosion resistance

### Markets:

- Automotive
- Industrial
- Medical

### Applications:

- Medical devices
- Chemical processing equipment, water, and boiler components

## &gt; POWDER RANGE 304L

## Powder properties

<b>CATEGORY</b>	Product Properties
<b>PART NUMBER</b>	PowderRange 304 F
<b>APPLICATION</b>	L-PBF <sup>(1)</sup>
<b>MAXIMUM PARTICLE SIZE</b>	Max 1 wt% > 53 µm <sup>(2)</sup>
<b>MINIMUM PARTICLE SIZE</b>	Max 10 vol% < 15 µm <sup>(3)</sup>
<b>LSD PERCENTILE</b>	D10, D50, D90 <sup>(3)</sup> , reported
<b>ATOMIZATION</b>	Nitrogen Gas Atomized
<b>APPARENT DENSITY (G/CM<sup>3</sup>)</b>	Measured according to ASTM B212 <sup>(4)</sup> and reported
<b>HALL FLOW (S/50G)</b>	Measured according to ASTM B213 <sup>(5)</sup> and reported

<sup>1</sup> ASTM/ISO 52900: Laser—Powder Bed Fusion (L-PBF), Electron-Beam Powder Bed Fusion (EB-PBF), Directed Energy Deposition (DED)

<sup>2</sup> ASTM B214 Standard Test Method for Sieve Analysis for Metal Powders

<sup>3</sup> ASTM B822 Standard Test Method for Particle Size Distribution of Metal Powders and Related Compounds by Light Scattering

<sup>4</sup> ASTM B212 Standard Test Method for Apparent Density of Free-Flowing Metal Powders Using the Hall Flowmeter Funnel

<sup>5</sup> ASTM B213 Standard Test Method for Flow Rate of Metal Powders Using the Hall Flowmeter Funnel

Testing of powder will fulfill certification requirements to Nadcap Materials Testing and ISO/IEC 17025 Chemical, per relevant ASTM procedures

**For additional information, please  
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*The mechanical and physical properties of any additively-manufactured material are strongly dependent on the processing conditions used to produce the final part. Significantly differing properties can be obtained by utilizing different equipment, different process parameters, different build rates and different geometries. The properties listed are intended as a guide only and should not be used as design data.*

*The information and data presented herein are typical or average values and are not a guarantee of maximum or minimum values. Applications specifically suggested for material described herein are made solely for the purpose of illustration to enable the reader to make his/her own evaluation and are not intended as warranties, either express or implied, of fitness for these or other purposes. There is no representation that the recipient of this literature will receive updated editions as they become available.*

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