CARPENTER ADDITIVE®

DATASHEET

PowderRange H13

Applicable specifications: DIN EN ISO 4957 Grade 1.2344/X40CrMoV5-1

Associated specifications: ASTM A681, JIS G4404

Type analysis

Single figures are nominal except where noted.

Iron	Balance	**Chromium**	4.80–5.50 %	**Molybdenum**	1.10–1.50 %
Silicon	0.80–1.20 %	**Vanadium**	0.80–1.15 %	**Carbon**	0.35–0.42 %
Manganese	0.25–0.50 %	**Nitrogen**	0.10 %	**Oxygen**	0.10 %
Phosphorus	0.03 %	**Sulfur**	0.02 %		

Description

PowderRange H13 is a versatile air hardening, 5% chromium hot work steel. It exhibits a good combination of high toughness, temper resistance, and thermal fatigue resistance.

PowderRange H13 has challenging weldability in laser and electron-beam additive manufacturing processes, where part geometry and build parameters could induce micro-cracking.

Key Properties:

- High impact toughness and good ductility
- High temperature strength
- Good abrasion resistance at temperature
- Resistance to thermal fatigue
- Limited distortion during hardening

Markets:

- Energy
- Industrial

Applications:

- Tooling for extrusion and molding
- Valves and fittings
- Pumps and impellers
- Manifolds
- Die casting

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Powder properties

PART NUMBER	PowderRange H13
APPLICATION	L-PBF[1]
MAXIMUM PARTICLE SIZE	Max 1 wt% > 53 µm[2]
MINIMUM PARTICLE SIZE	Max 10 vol% < 15 µm[3]
LSD PERCENTILE	D10, D50, D90[3], reported
ATOMIZATION	Vacuum Induction Melted, Nitrogen Gas Atomized
APPARENT DENSITY (G/CM³)	Measured according to ASTM B212[4] and reported
HALL FLOW (S/50G)	Measured according to ASTM B213[5] and reported

[1] ASTM/ISO 52900: Laser—Powder Bed Fusion (L-PBF), Electron-Beam Powder Bed Fusion (EB-PBF), Directed Energy Deposition (DED)
[2] ASTM B214 Standard Test Method for Sieve Analysis for Metal Powders
[3] ASTM B822 Standard Test Method for Particle Size Distribution of Metal Powders and Related Compounds by Light Scattering
[4] ASTM B212 Standard Test Method for Apparent Density of Free-Flowing Metal Powders Using the Hall Flowmeter Funnel
[5] 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 contact your nearest sales office:
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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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