AM INC625 by f3nice

Applicable Standards

- ASTM F3056, NORSOK M-630: *Properties of INC-625 by LB-PBF*
- ASTM B214, ASTM B822: *Particle Size Distribution (PSD)*
- ASTM B213, ASTM B212, ASTM B527: *Flowability and Density*
- ASTM E8, ASTM E10: *Mechanical Testing*

General Description

High quality powder produced by means of VIGA (Vacuum Inert Gas Atomization). VIGA process assures impurities levels below conventional techniques such as Water Atomization or open-furnace Inert Gas Atomization.

The AM INC625 by f3nice presents a chemical composition in accordance with ASTM F3056.

Chemical Composition

Element	**Cr [%]**	**Mo [%]**	**Nb [%]**	**Fe [%]**	**Ti [%]**	**Al [%]**
Min	20.0	8.00	3.15	-	-	-
Max	23.0	10.00	4.15	5.00	0.40	0.40

Element	**Co [%]**	**Si [%]**	**Mn [%]**	**C [%]**	**P [%]**	**S [%]**
Min	-	-	-	-	-	-
Max	1.00	0.50	0.50	0.10	0.015	0.015

Element	**Ni [%]**	**Ta [%]**	**Cu [%]**	**N [%]**	**O [%]**
Min	58.00	n/a	n/a	n/a	n/a
Max	balance				

[1] Refer to ASTM F3056 for Product Analysis Tolerance on the powder Chemistry.

Typical Particle Size Distribution (PSD)

Particle Size Analysis [µm]				**Typical Application**
Size Range	**D10**	**D50**	**D90**	
0 – 20	5 ± 2	11 ± 2	20 ± 2	**BJT**, MIM
15 – 53	18 ± 5	32 ± 5	50 ± 5	**LB-PBF**, Spraying
53 – 150	55 ± 10	90 ± 10	140 ± 10	**DED**, Laser Cladding

[2] Other PSD ranges are available at request (e.g., 15 – 45, 20 – 63 or 53 – 105 µm).

Typical Flowability and Density properties

Size Range [µm]	Flowability [s]	Apparent Density [g/cm³]	Tap Density [g/cm³]
0 – 20	n/a	-	-
15 – 53	15.5 ± 1.5	4.3 ± 0.5	5.2 ± 0.5
53 – 150	15.0 ± 1.5	4.2 ± 0.5	5.1 ± 0.5

[2] Other PSD ranges are available at request (e.g., 15 – 45, 20 – 63 or 53 – 105 µm).

Typical Mechanical Properties of Printed Parts (by LB-PBF)

Yield Strength [MPa]	Vertical direction	620 ± 50
	Horizontal direction	730 ± 50
Ultimate Strength [MPa]	Vertical direction	920 ± 50
	Horizontal direction	1˙000 ± 50
Elongation at Break [%]	Vertical direction	41 ± 7
	Horizontal direction	35 ± 5
Reduction of Area [%]	Vertical direction	-
	Horizontal direction	-
Elastic Modulus [GPa]	Vertical direction	155 ± 20
	Horizontal direction	185 ± 20
Hardness [HB]	Vertical direction	295 ± 15
	Horizontal direction	315 ± 20

[3] Typical Mechanical Properties measured on specimens printed by means of **LB-PBF technology.** Results are for reference only.

[4] Mechanical Properties data collected on specimens in the **as-built state.**