

Aheadd® CP1 20/63

ALUMINIUM POWDERS FOR ADDITIVE MANUFACTURING

Aheadd® CP1: The solution of choice for Aviation, Satellites, Automotive, Motorsport, Defense, Transportation, Semiconductor

AHEADD® CP1 is an Aluminum-Iron-Zirconium powder solution designed specifically for additive manufacturing using laser powder bed fusion (L-PBF). AHEADD® CP1 brings multiple advantages including high strength & ductility, excellent thermal/electrical conductivity, high productivity LPBF processing and simplified post-processing.



AHEADD® CP1 is approved by FIA in Formula 1 (2024) for Additive Manufactured Components.

POWDER

Powder is available in 20-63µm particle size distribution and can be customized on request. Powder is compatible with all L-PBF machines.

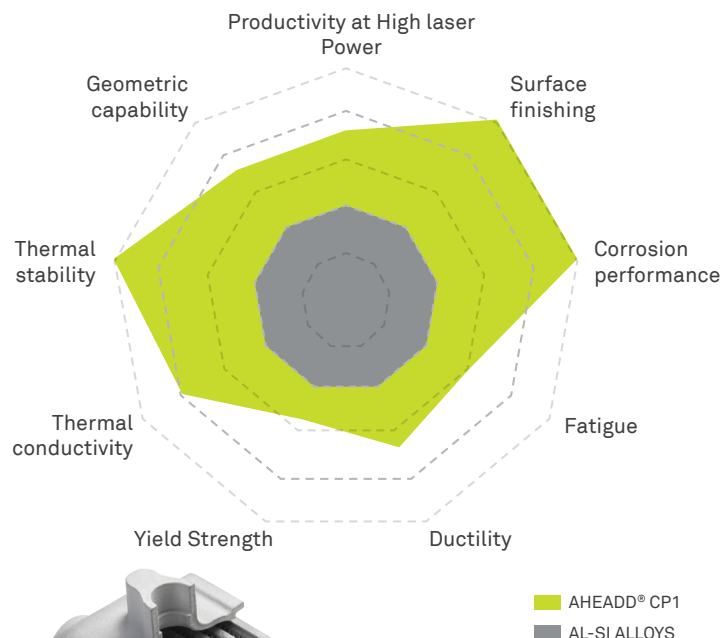
Packaging options : 5, 10, 25kg drums.

Inert gas atomization, 3 separate production routes validated.

CHEMICAL COMPOSITION

(Aluminum Association No 8A61)

	Fe	Zr
Wt% Min	0.8	0.9
Wt% Max	1.4	1.4



PARTICLE SIZE DISTRIBUTION & DENSITIES

Size (µm)	Wt% Max
< 20 µm	< 10
20 µm < X < 63 µm	> 80
> 63 µm	< 10

	Tap density (ISO 3953)	Apparent density (ISO 3923/1)
Min	1.5 g/cm³	1.2 g/cm³

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FOR ADDITIVE MANUFACTURING

PROPERTIES

Standard heat treatment is 4h 400°C. This ageing (precipitation hardening) treatment can be done in air without tight control of ramp & cooling rates. Properties can be tuned with customized heat treatments – information available on request.

PRODUCTIVITY VERSUS LASER POWER

Laser Power	Layer thickness	Productivity	Density
370 W	60 µm	39 cm³/h	99.8 %
650 W	90 µm	78 cm³/h	99.7 %
1000 W	150 µm	164 cm³/h	99.5 %

MECHANICAL PROPERTIES

	Tensile properties (Z axis) at 25°C		
	YS MPa	UTS MPa	El%
As built	137	203	23
Heat treated 4h-400°C	300 +/- 15	320 +/- 15	15 +/- 5

Machined samples, vertical direction, EOS M290, 60µm layers.

CONDUCTIVITY

	Thermal Conductivity W/mK	Electrical Conductivity MS/m (%IACS)
As built	124	18.1 (31.2)
Heat treated 4h-400°C	187	28.4 (49.0)
Optimized Heat Treatment	202	30.8 (53.1)

SURFACE FINISHING & CORROSION PERFORMANCE

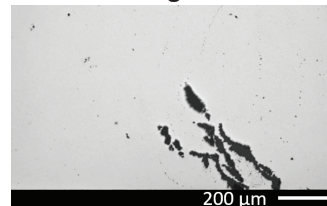
Aheadd® CP1 (Si-free alloy) allows:

- Chemical polishing
- Decorative anodizing (type II)
- Hard anodizing (type III)

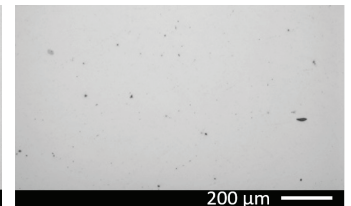


Excellent corrosion resistance: AHEADD CP1 outperforms conventional alloy systems in corrosion performance due to rapid solidification microstructure.

AlSi7Mg
Direct age 160°C



Aheadd® CP1
4h - 400°C



Corrosion test: 24h immersion, 30g/L NaCl + 10ml/L HCl, 30°C (ISO 11846B).

