Zoz Group

RE think nature

PM2019 – Titanium C/ODS

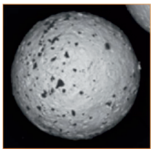
synthesize Ti-SiC powder[1] - HIP[2] - EIGA[3] – ALM[4]

tensile strength +30%, elongation +25%

ceit IK4 Research Alliance · laurentia technologies coatings & capsules · APR · Zoz GmbH · TWI · AIDIMME · TLS Technik Spezialpulver · vito vision on technology · UNIVERSITAT POLITÈCNICA DE VALÈNCIA · NANOTUN3D

HIP-cans making & decapsulation

HIP-cans loading HIP-cans closing



Zoz-HIP Service all inert/vacuum

Simoloyer® CM100-s2, processing inert/vacuum; decorated MPP-NP

Zoz-MPI EIGA ZAT 100 [1999] Additive Manufacturing PM2019 test bodies AM complex structure

2015-2019

www.nanotun3d.eu

www.zoz.de

This Project received funding from the European Union's Horizon 2020 Programme for research and innovation under grant agreement no 685932.

[advanced materials for additive manufacturing]

Since several years, Zoz in R&D is focusing on advanced (powder) materials that additionally to their properties allow consolidation by additive manufacturing. Particularly for high-strength materials, HPK (by Simoloyer®) does most frequently not provide the required morphology.

Developing processing routes from HKP / mechanical alloying e. g. through HIP-electrode manufacturing for EIGA, all under completely controlled condition, to result in utmost spherical particles at proper PSD, thus describes a challenge at high potential in ultra-materials sector.

[NANOTUN3D], an EU funded project, represents such successful example of joint research, where the C/ODS-strengthened Titanium (Ti6Al4V) is improved dramatically in strength and elongation at the same time:

- nano-enhanced Titanium powder alloy (CDS/ODS)
- Nanodispersoids (SiC, Y_2O_3)
- health, safety and environment datasheets
- 30% increase of mechanical behavior over standard Ti alloys
- 40% lower in material/process qualification than current solutions on the aerospace market
- for aerospace applications such as printed structural parts

Results Ti-6Al-4V-SiC[1-4]
Strength & Elongation Increase
in respect to ASTM F2924 (%), Building Direction (BD)

BD	yield	tensile	elongation
XY	+ 31 %	+ 28 %	+ 16 %
Z	+ 32 %	+ 30 %	+ 36 %
	ASTM reference Ti6Al4V		
--	825 MPa	895 MPa	10 %

[1]SPP - Simoloyer® powder processing
[2]HIP - Hot Isostatic Pressing
[3]EIGA - Electrode Induction Melting Inert Gas Atomization
[4]ALM - Additive Layer Manufacturing