

Development of refractory composites for extreme aerospace environments

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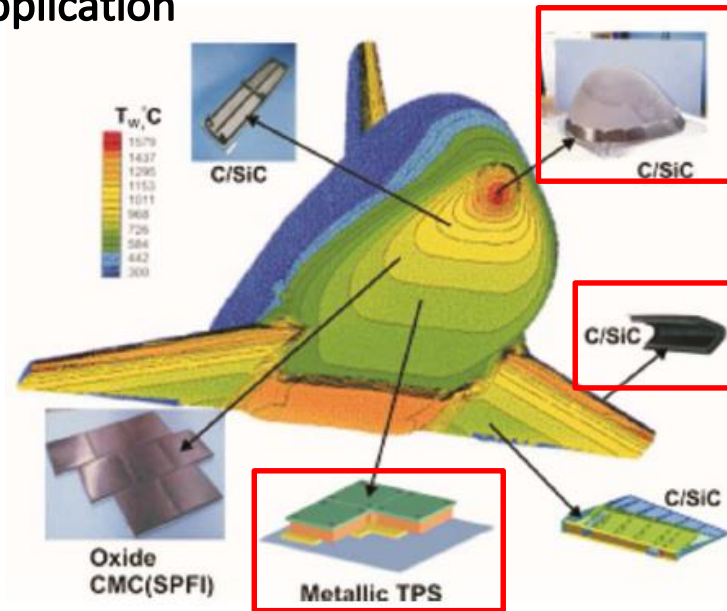
www.istec.cnr.it



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EU-Project: LIGHT-TPS

Super **L**IGHT-Weight **T**hermal **P**rotection **S**ystem for space application



SUPER LIGHT-WEIGHT THERMAL PROTECTION SYSTEM FOR SPACE APPLICATION

2014 • 2015 • 2016 • 2017

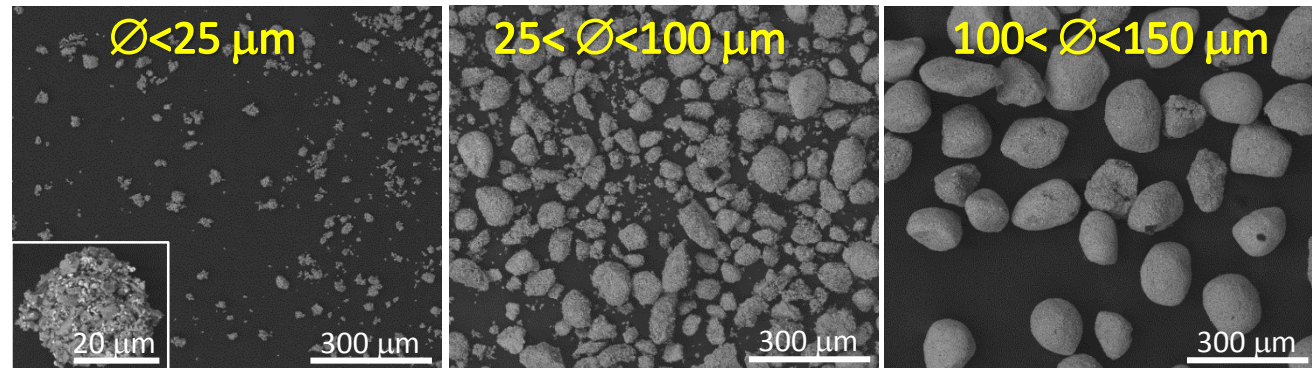
www.light-tps.eu

- **Scope:** develop, manufacture and test 1) super-light reusable TPS made of novel Ni/Cr and Nb honeycomb frames, 2) corrosion and oxidation resistant bulk UHTCs for construction elements and 3) the UHTC coatings on non-metallic materials (C/SiC,C/C).
- **Applications:** thermal protection systems for different parts of space vehicles (T~1100°C or 1600-1800°C)
- **TRL** from 2 to TRL 5

UHTC-based granules

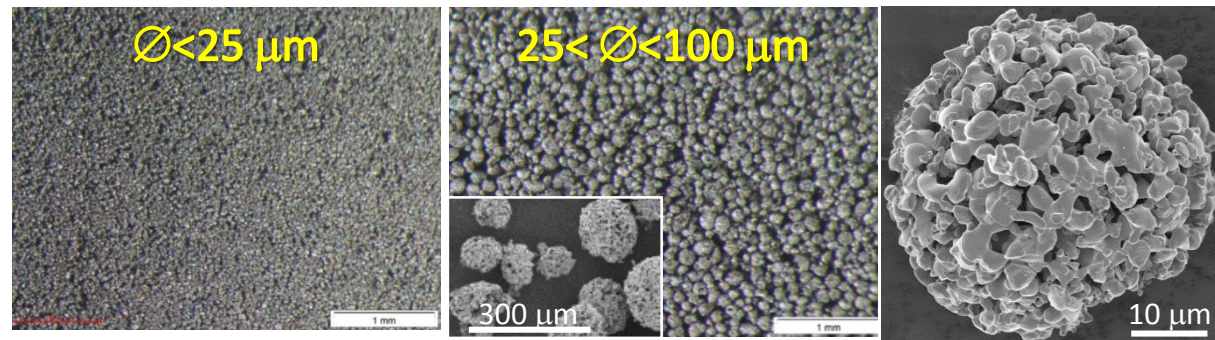
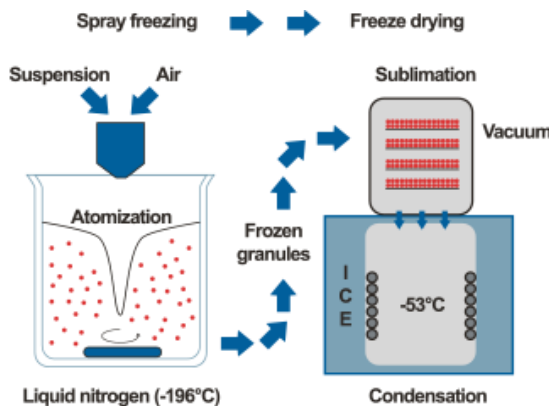
- Production of UHTC cohesive granules with specific size
- Use: feedstock for plasma spray, secondary phases for dual composites

Granulation with PEG



Irregular, compact, full

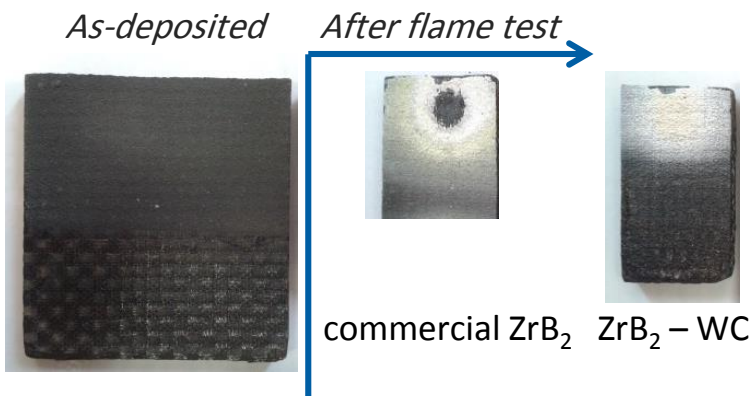
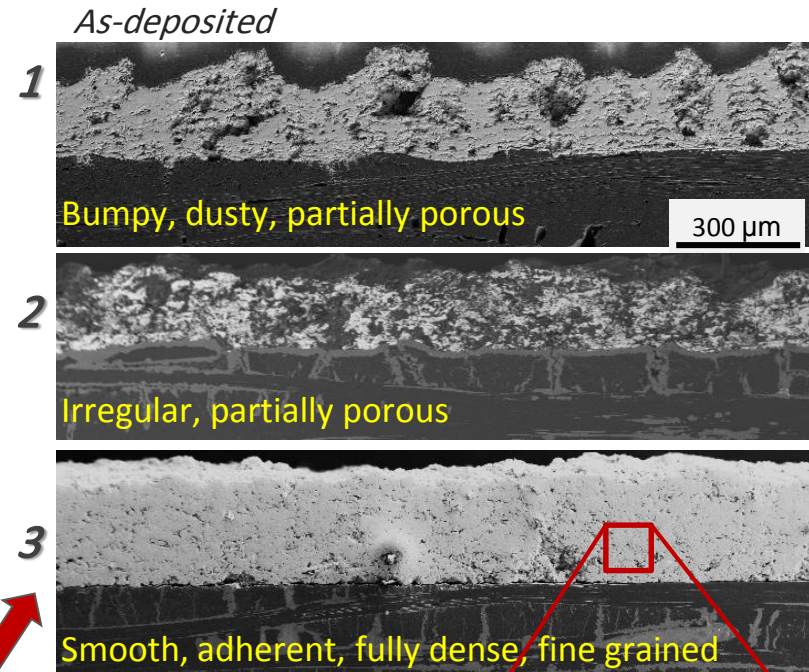
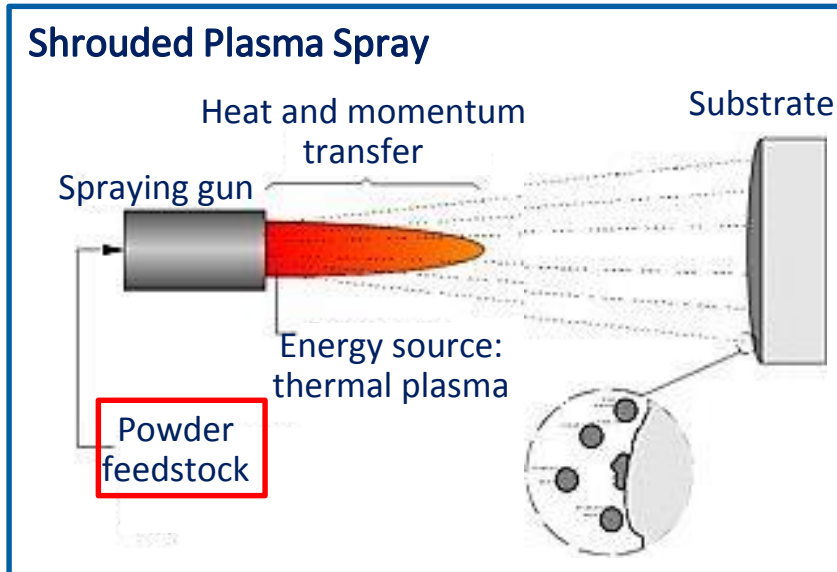
Freeze-granulation



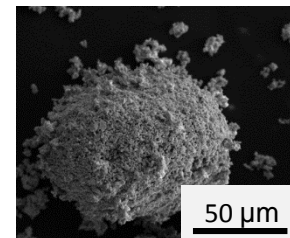
Spherical, compact

Oxidation / Weight issue

Production of UHTC coatings for C/C, SiC/C composites by SPS.



Optimized UHTC granules



- Improved cohesion
- Selected m.g.s.

