

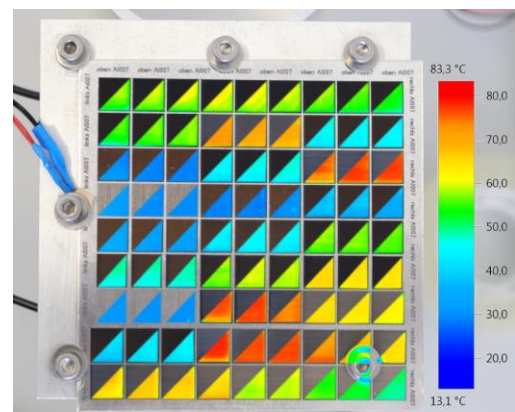
## BLAST

**BLAST** – **B**lack **L**aser **S**urface **T**reatment is a novelty surface treatment technology developed as an alternative to high emissivity and absorptivity paints and coatings for space applications, such as internal and external functional satellite structures, radiators and heat shields.

Relying on a femtosecond-pulsed laser to uniformly alter material surfaces, the microstructures created on the top layer of the material enhance the thermo-optical properties of the material itself.

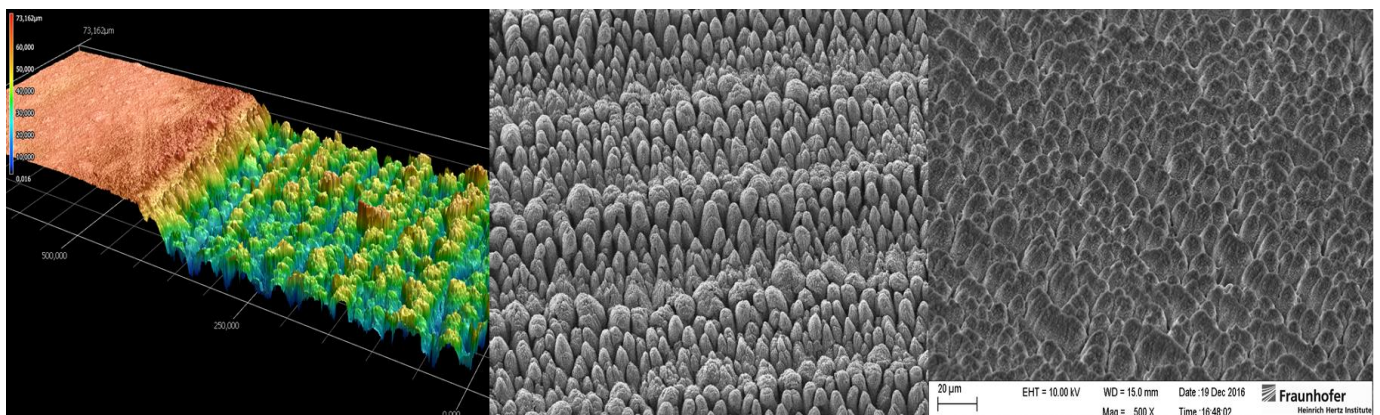
The results obtained through a complex testing campaign show that the laser surface treatment has considerable advantages compared to industry standard coatings:

- Very high Infrared Emissivity  $\epsilon$
- Very high Solar Absorptivity  $\alpha$
- High temperature stability
- No masking required even for complex forms
- No outgassing issues
- Environmentally friendly
- No pre-treatment or primer needed



Laser treated surface  
(with false color representation)

Azimut Space, in cooperation with the Fraunhofer Heinrich-Hertz-Institute, characterized this coating technique within the frames of an ESA GSTP funded project, supported by DLR. The joint team is set to qualify the surface treatment technology for space applications and reach TRL 9 by 2022.



Polished and BLAST treated surface LSM (left); BLAST treated Ti6Al4V (middle) and Al7075 (right) SEM

## Performance values:

| #   | Parameter                 | Material |        |         |
|-----|---------------------------|----------|--------|---------|
|     |                           | Al7075   | Al6082 | Ti6Al4V |
| P01 | IR Emissivity (max.)      | 0.96     | 0.95   | 0.69    |
| P02 | Solar Absorptivity (max.) | 0.82     | 0.81   | 0.96    |
| P03 | Outgassing<br>(Mean)      | TML [%]  | 0.02   | 0.03    |
|     |                           | RML [%]  | 0.02   | 0.02    |
|     |                           | CVCM [%] | 0.00   | 0.00    |

## Treatment results:



BLAST treated aluminum (visible spectrum – left; infrared - right)

### CUSTOMERS AND PARTNERS

ESA, DLR, Thales Alenia Space, AIRBUS D&S,  
OHb, TNO, Sonaca

### THERMAL SOFTWARE

ESATAN-TMS, Thermal Desktop, StarCCM+,  
Thermica, Hyperworks, LabView

### TEST FACILITIES

Thermal Lab with thermal vacuum chamber;  
Thermal cycling chamber for life cycling

### LOCATION

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