Thermo physical properties by DTA, Dilatometer, Laser Flash and DSC

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**Epitaxial growth of Titanium fabricated by SLM**

- Fine metal powders are fully melted layer by layer in thicknesses from 20 to 100 µm to achieve 3D structures
- Optimisation of processing parameters

**Microscopic observations**

- Mixed carbides (M7C3, M2C) in High Strength Steel with an electronic microscope
- Carbides with light microscope: M7C3 (Orange), M2C (Brown) and MC (Pale pink)

**Nano-hardness by nano-indentations**

- Nano-indentations on machined α+β Ti alloy

**EBSD analyses**

- EBSD images on High Alloyed Steels

**Pin-on-disc (High Temperature Friction)**

- Wear track
- Step size = 0.15 µm, Grain colour EBSD representation

**Macro-properties of materials**

**Microstructural characterisation**

**Materials selection with CES**

**Optimisation of processing parameters**

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**Laser Cladding (LC)-(Sirris)**

- A Stream of powder is fed into a focused laser beam while being scanned across a substrate, thus leaving behind a coating or object.

**Thermodynamic calculation with Thermocalc**

- Solidification range for High Speed Steel (HSS)

**STUDY ON**

**316L+XC composite produced by LC**

- Dissolution of the reinforcements by reactions with the metallic matrix

**Carbon Magnesium Composites**

- Formation of several phases by ultra-fast cooling

**AlSi10Mg produced by SLM**

- Crack propagation on C-Mg composite
- C fiber pretreated with K2ZrF6

**Columnar grain structure**

**Ductile fracture after traction test**

All publications by the MMS unit are available at www.orbi.ulg.ac.be