

Lightme

LightMe Technical Services

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European
Commission

Horizon 2020
European Union funding
for Research & Innovation

LightMe Technical Services



Monitoring

- Process Control
- Process Monitoring



Modelling

- Process Optimization
- Simulation
- Predictive modelling



Testing

- Structural Characterization
- Functional properties testing
- Field tests

Monitoring Building Block partners

STAM S.r.l.

- ❑ Italian Engineering SME with great experience in mechatronics and industrial automation
- ❑ Development of Monitoring & Control systems for industrial lines
- ❑ Facilities for testing of mechanical components



ISQ

- ❑ Portuguese company providing inspection, testing, training and technical consultancy
- ❑ Promotes technology transfer for the industry, contributing to “in-country value” throughout the world
- ❑ Development of Monitoring & Control Quality systems



IRIS TECH

- ❑ Spanish engineering company specialized in real-time monitoring and intelligent digital platforms for industry 4.0 transformation
- ❑ Development and integration of turnkey solutions into manufacturing lines and right along the value chain to improve quality control and process standardization



LightMe Technical Services - Monitoring

Monitoring



- Monitoring & Control system for additive manufacturing process (BOREALIS Pilot Line)
- Monitoring & Control Quality system for additive manufacturing process (AIMEN Pilot Line)
- Monitoring system with thermographic cameras for High Pressure Die Casting process (BRUN Pilot Line) and Spark Plasma Sintering process (INOP Pilot Line)
- Test bench for the assessment of small-medium size gearboxes equipped with dynamic torquemeters and sensors for vibration
- Quality control and testing for metallic and composite components

Modelling Building Block partners

ACCESS

- ❑ Independent research centre associated with the Technical University of Aachen (RWTH) with a special focus on metallic materials and casting processes
- ❑ Simulation of material processing and properties on different scales
- ❑ Provide modelling and simulation support of the casting and AM Pilot Lines



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UBRUN

- ❑ University located in England with a strong history in engineering. BCAST is a research center within the University that specializes in solidification and casting of metals
- ❑ Provides data for die design optimization through experimental and modelling approaches
- ❑ Access to HPDC PL and support of the development of the casting upscaling PLs



L-INOP

- ❑ Polish Institute focused on research and development of projects on non-metallurgical metal forming
- ❑ Provides data on SPS for improvement in terms of modelling & simulation
- ❑ Access to SPS PL and experimental and computational analysis of the SPS process



Modelling Building Block partners

STAM S.r.l.

- ❑ Italian Engineering SME with great experience in mechatronics and industrial automation
- ❑ Collaborate in activities connected with the monitoring and modelling of the Pilot Lines
- ❑ Simulation of the AM processes



AIMEN

- ❑ Spanish Non-Profit association with a mission to improve competitiveness and technology know-how of Manufacturing Industry
- ❑ Modelling the AM process via software and simulating the material behaviour
- ❑ Access to MWAM PL and modelling and simulation of the MWAM process



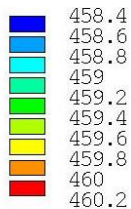
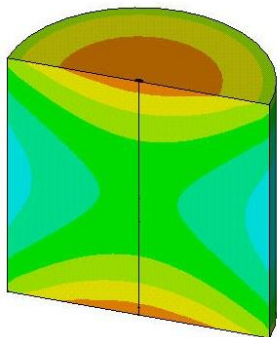
LightMe Technical Services - Modelling

Modelling

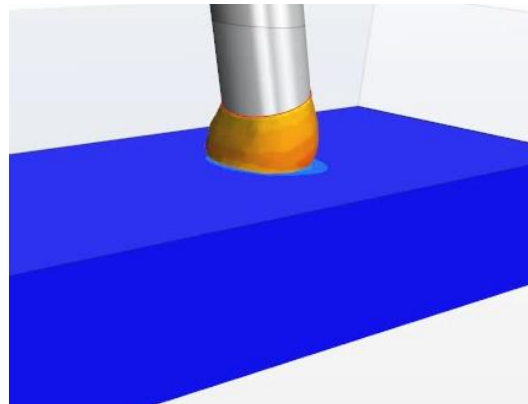


- Combination of modelling tools on different length scales to support Pilot Lines
- Access to a wide variety of modelling and simulation tools that will allow a faster optimization of the process
- Support of process development including nano-particle distribution for:
 - Low Pressure Die Casting (LPDC);
 - High Pressure Die Casting (HPDC);
 - Metal Wire Additive Manufacturing (MWAM);
 - Spark Plasma Sintering process-FEM modeling (SPS)

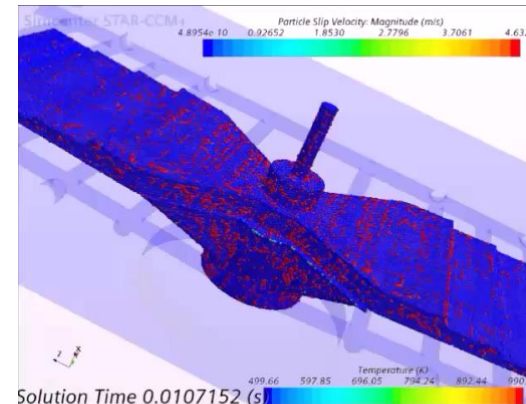
SPS



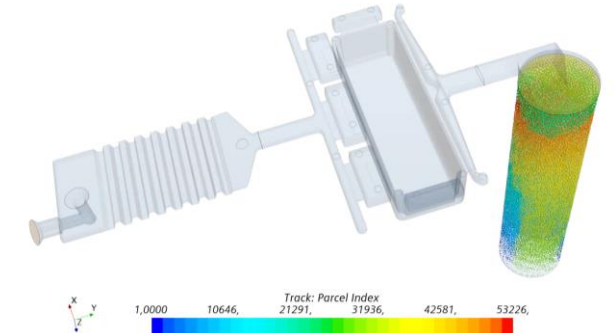
MWAM



LPDC



HPDC

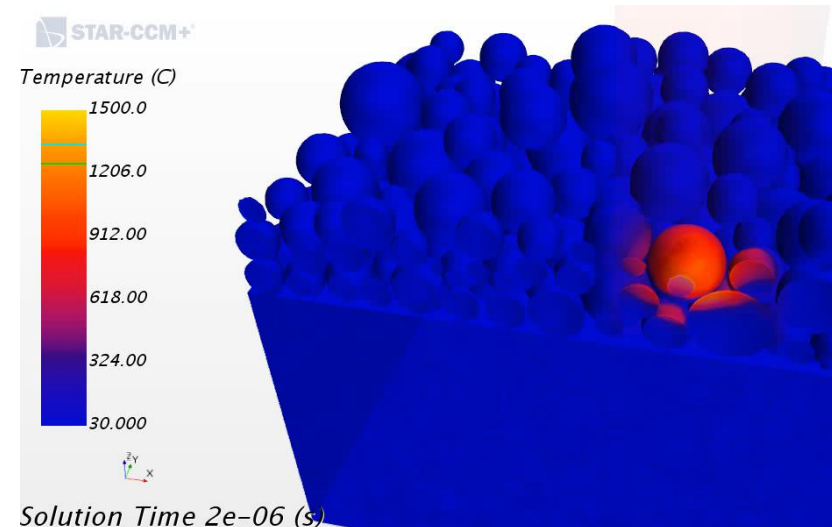
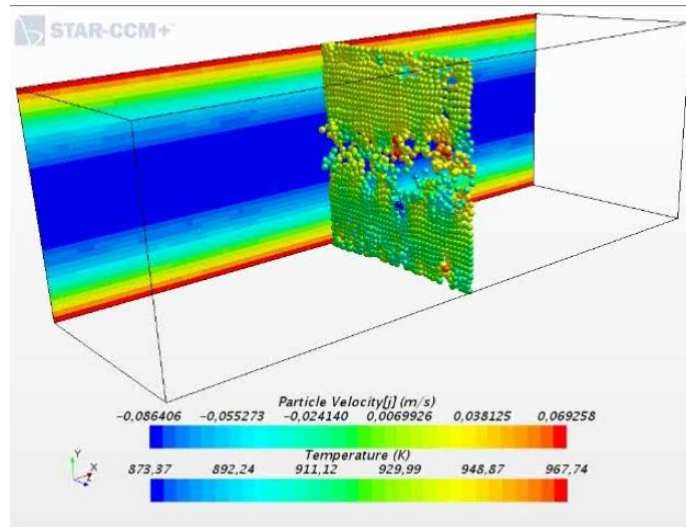


LightMe Technical Services - Modelling

Modelling



- Simulation of mechanical properties of nano-particle reinforced parts
- Study of the influence on nano-distribution:
 - Surface agglomeration
 - Agglomeration during solidification
 - Process parameters and conditions (casting filter)



Testing Building Block partners

Politecnico di Milano

- ❑ Italian scientific-technological university. Department of Chemistry, Materials and Chemical Engineering (CMIC) "Giulio Natta" offers courses on Chemical Engineering and in Materials Engineering
- ❑ Provides microstructural and Physico-chemical analyses
- ❑ Facilities for testing novel materials and leader of the Building Block



POLITECNICO
MILANO 1863

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ÖGI

- ❑ Austrian non-profit research organization aiming to increase the fundamental understanding of materials and processes related to castings.
- ❑ Pilot scale casting facilities and material characterization
- ❑ Access to LPDC and GSC PLs and to facilities accredited for chemical, physical, mechanical and microstructural properties characterization of casting and other materials



AIMEN

- ❑ Spanish Non-Profit association with a mission to improve competitiveness and technology know-how of Manufacturing Industry
- ❑ Non-Destructive Testing inspection for Additive Manufacturing
- ❑ Access to MWAM PL and to facilities for materials characterization



Testing Building Block partners

UBRUN

- ❑ University located in England with a strong history in engineering. BCAST is a research centre within the University that specializes in solidification and casting of metals
- ❑ Structural and functional (mechanical and chemical) properties characterization
- ❑ Access to HPDC PL and material characterization facilities



L-INOP

- ❑ Polish Institute focused on research, development, of national and international projects on non-metallurgical metal forming
- ❑ Test and upscale Al and Ti pre-alloyed powders and sintering process samples
- ❑ Access to SPS PL and to Accredited Investigation Laboratories



ISQ

- ❑ Portuguese company providing inspection, testing, training and technical consultancy
- ❑ Promotes technology transfer for the industry, thereby contributing for “in-country value” throughout the world
- ❑ Access to material characterization facilities



LightMe Technical Services - Testing

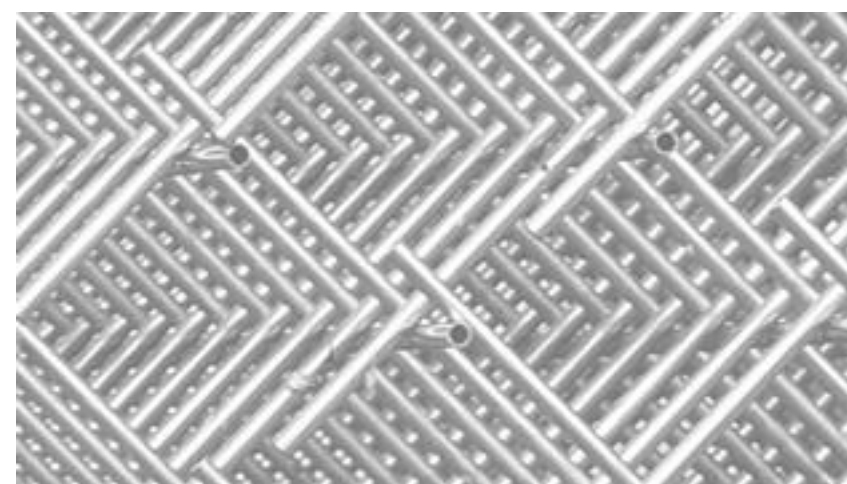
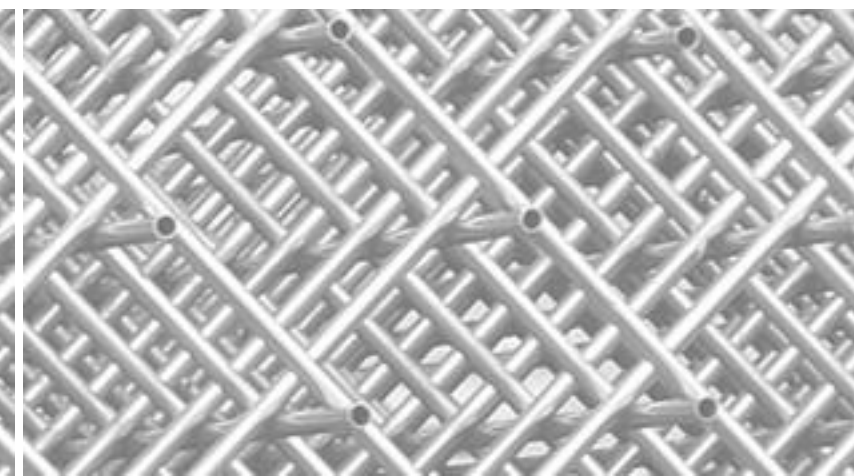
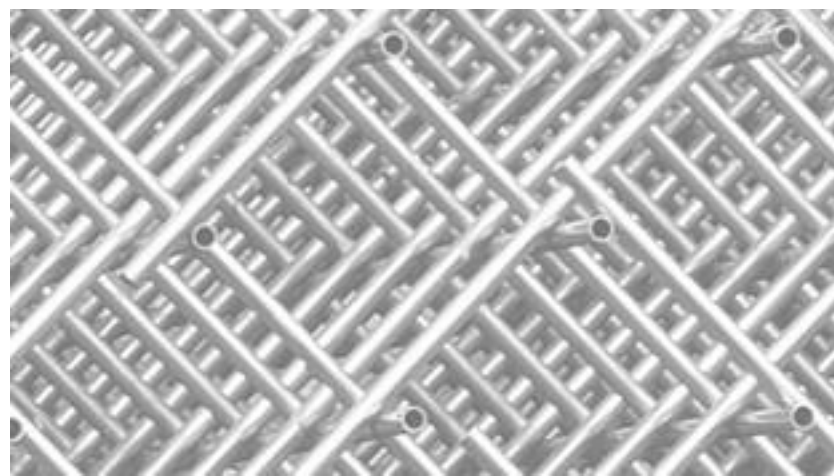
Testing



- **Microstructural characterization** (SEM, TEM, X-Ray diffraction, Metallographic analyses)
- **Physico-chemical analysis** (Inductive coupled plasma emission spectrometry, X-Ray Fluorescence Spectrometry, Residual stress measurements, GDOES, AFM Microscope, Micro-durometer, X-ray fluorescence, Laser profilometry)
- **Mechanical properties testing** (Tensile testing, Rotating bending fatigue test, Hardness testing, Resonance testing, Charpy impact test, Wear and abrasion testing, residual stress testing)
- **Thermo-physical properties testing** (Thermal diffusivity, Heat Capacity, Thermal expansion and density, Electrical Conductivity, Dynamic Young's modulus)
- **Non-destructive Radiographic Testing** (Computed Tomography 3D-CT & 2D-line-detector, Radioscopy, Radiography, X-Ray Flat Panel Detection)

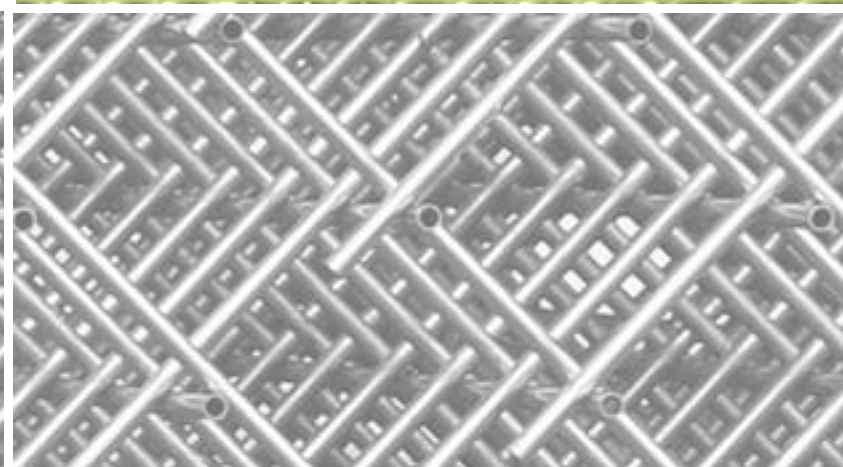
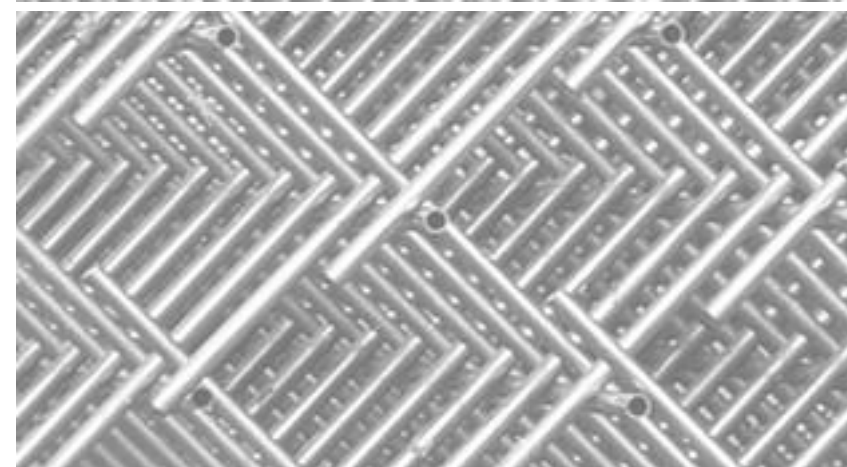


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Thank you for your attention

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