ULiège - GREEnMat
Your Partner in Materials Science for Additive Manufacturing

INFORMATION ABOUT THE EXPERT

ORGANISATION	University of Liège - GREEnMat
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TYPE OF PARTNER	University
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EXPERTISE OVERVIEW

TOPIC(S) OF INTEREST:
NMBP-19-2019 : Advanced materials for additive manufacturing (IA)

HEADLINE:
Synthesis, characterization and sintering of powders for additive manufacturing

POTENTIAL CONTRIBUTION:

GREEnMat - a chemistry research laboratory - is specialized in the **optimization of nano-/microsized powders** (**ceramics, metal and organic**), the **development of formulations** (suspensions and/or slurries) and the processes related to the **additive manufacturing (AM) of suspended resins** for several applications - including personalized medicine.

GREEnMAt is able to support the entire production line from the manufacturing of powders to their shaping, including the study of the properties of the final parts.

In this purpose, the laboratory is equipped with several **pilot units** for the **synthesis of organic or inorganic powders**: a hydrothermal reactor (5.5 liters) and two spray-dryers (5 liters/h - aqueous or non-aqueous (ATEX) feed). These bottom-up synthesis techniques allow us to **control the structural** (composition) and **microstructural** (morphology) **properties** of the powders as well as their **production from a laboratory to a pilot scale** (gram to several kilograms per day). GREEnMat is also specialized in powder granulation. So, we are able to disperse nanopowders in matrix (organic or inorganic) and to produce core-shell particles to obtain micronic multiphasic powders ready to use for additive manufacturing. GREEnMat also features **top-down grinding** and **advanced blending technologies** on a pilot scale (several liters) which can reduce the particle size (1 mm down to 100 nm) but can also homogenize suspensions and pastes/slurries with high viscosity that can be further used for the preparation of hybrid matrices used in stereolithography additive manufacturing processes.

GREEnMat has also specific **physico-chemical tools** dedicated **to characterize powders and suspensions** (laser particle size, XRD, carbon analyser, ATG / DSC, liquid rheology, BET, zeta potential, powder rheology, electron microscopy, ...) and has also developed specific **expertise in debinding and sintering process**.
GREEnMat has a strong expertise in collaborative projects both from pioneering research in academia networks to innovative applied research in academia-industry consortia. It has been or is still involved into European (Interreg EMR Orga/Next/Generation, ITN EJD FunMat,...) or national research projects.
More specifically in the field of AM, GREEnMat is currently involved in an innovative research project (POWDPRINT) in collaboration with industries and will be equipped by the end of summer 2019 with a new **industrial ceramic resin 3D printer** (stereolithography) in addition of its current laboratory 3D printers.

Download here our brochure where you can find an overview of our various research topics and information about our pilot-scale equipment.