Area C

Symposium C.4

Title: Powder technologies to obtain high performance materials		
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Abstract

Scope

This symposium aims to bring together the progress that has been made in the processing of high-performance materials using powder technologies. The innovation and technological developments have allowed to reach a more efficient microstructural control that allows to incorporate this family of sintered materials to the field of high-performance applications. The irruption in other fields lies in the design capacity of the alloy systems -completely adapted to their final application- and in the variety of new processing forms that allow obtaining nanometric microstructures in consolidated products.

Description

The symposium covers both the processing of the powders and their consolidation and sintering. Therefore, advanced techniques of mechanical atomization and alloying, granulation and agglomeration of particles to obtain the powders to be processed, colloidal processing and the so-called "green processing" will be brought together. Advanced sintering techniques include those of high density (HP, HIP, SPS, ERS, "flash sintering" and microwave sintering) of both pre-alloyed powders and elemental mixtures. Examples of new sintered materials include high-strength steels, titanium alloys, aluminium alloys, materials for biomedical applications and high-temperature materials such as superalloys and intermetallics, as well as high-performance ceramics and metal-ceramic composites.

It should not be forgotten that powder technology is also considered as a sustainable technology due to its high efficiency in energy consumption and in the use of the material. All this makes it a field with a high capacity for research, innovation and development.

Targeted topics

These themes (that cover Powder Manufacturing and Processing) will be developed by focusing attention on but not exclusively:

- Green and Energy Efficient Processing
- Atomization
- Novel powder synthesis routes
- Colloidal processing and shaping.
- Mechanical Alloying and High Energy Milling.
- Shaping of porous materials.
- Shaping of complex micro- and nanostructures.
- Tailored microstructures developed by PM
- Solid freeform manufacturing.
- Sintering and Liquid Phase sintering
- Non-conventional and fast sintering techniques (SPS, Flash sintering, microwaves sintering, etc).
- Mechanical characterization
- Modelling and Simulation
- Secondary and Finishing Operations
- PM processing against COVID-19