



## PARTNERS

HVAF spraying will be investigated to spray WC-Co and WC-Co-Cr powders in order to improve wear and corrosion resistant properties of mechanical components.

Some of the benefits envisaged include:

- Nanostructured coatings with improved tribological properties
- Valorization of economic substrates at affordable costs
- Coating with improved efficiency and surface quality

### **PRODUCT-LINE 3: Additive manufacturing**

DLS will be used to produce biomedical components with Titanium CerMet and to outline the sintering conditions for Ni and Ti super-alloys.

SLS will be investigated to process innovative polypropylene based powders to produce automotive and consumer goods.

Some of the benefits envisaged include:

- new cost effective plastic materials for SLS to expand the range of industrial applications
- Sintering of superalloys to enable new commercial opportunities such as repair of aerospace turbine blades
- Better joint implants.

- MBN Nanomaterialia
- Manudirect
- Matres
- INOP
- CPI
- Diam Edil
- IMPACT INNOVATIONS
- Putzier Oberflächentechnik
- IMDEA Materials
- +90

### **PROJECT COORDINATOR**

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[www.pilotmanu.eu](http://www.pilotmanu.eu)



**PILOTMANU**

**Pilot-production of  
nanostructured  
components**

[www.pilotmanu.eu](http://www.pilotmanu.eu)

# TECHNOLOGY

PilotManu aims to enable pilot scale production of nanostructured materials at affordable costs. In order to achieve this important goal, the consortium has outlined the following work-plan:

- Design and scale-up the current manufacturing process by a factor of ten;
- Improving production efficiency reducing materials costs
- Validate the obtained materials in three high value product-lines
- Supply powder materials for industry consumption at affordable conditions

The €5.3Mn PilotManu project, which is partially funded by European Union's Framework Programme Seven (FP7), involves 10 partner organisations from Germany, Italy, Poland, Spain, Switzerland, Turkey, and the United Kingdom, and runs between October 2013 and September 2017.



## INNOVATIVE NANOSTRUCTURED POWDERS

PilotManu will manufacture the nanostructured powders using a proprietary high energy ball milling (HEBM) technology developed by MBN Nanomaterialia. It will enable the manufacture of tailored materials with “ultrafine” crystalline structure.

The achieved nanostructure enables new properties to be harnessed in a variety of applications compared to larger micron scale similar composition powders.

## PRODUCT-LINES

The advantages of scale-up will be validated by the adoption of the obtained materials in three industrial product-lines:

- Product-line 1: Conventional and advanced sintering
- Product-line 2: Coatings by Cold gas spraying (CGS) and High velocity air fuel (HVOF)
- Product-line 3: Additive manufacturing by Direct metal laser sintering (DMLS) and Selective laser sintering (SLS)

The 3 product-lines highlight the versatility of the HEBM technology and the capability to be exploited also at industrial level.

## PRODUCT-LINE 1: Conventional and advanced sintering

Diamond abrasive tools are produced from the HEBM powders by pressure and pressure-less sintering techniques. A selection of innovative and lightweight materials with high performance will also be processed by advanced sintering technique: spark plasma sintering (SPS).

Some of the benefits envisaged include:

- Nanostructured materials in the final components with improved mechanical properties
- Supply of commercial volume at competitive costs materials

## PRODUCT-LINE 2: CGS and HVOF

CGS will be used to coat industrial components in order to provide high performance and nanostructured coatings at affordable prices.