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Development of the high strength Fe and Cu based alloys for additive manufacturing (AM)

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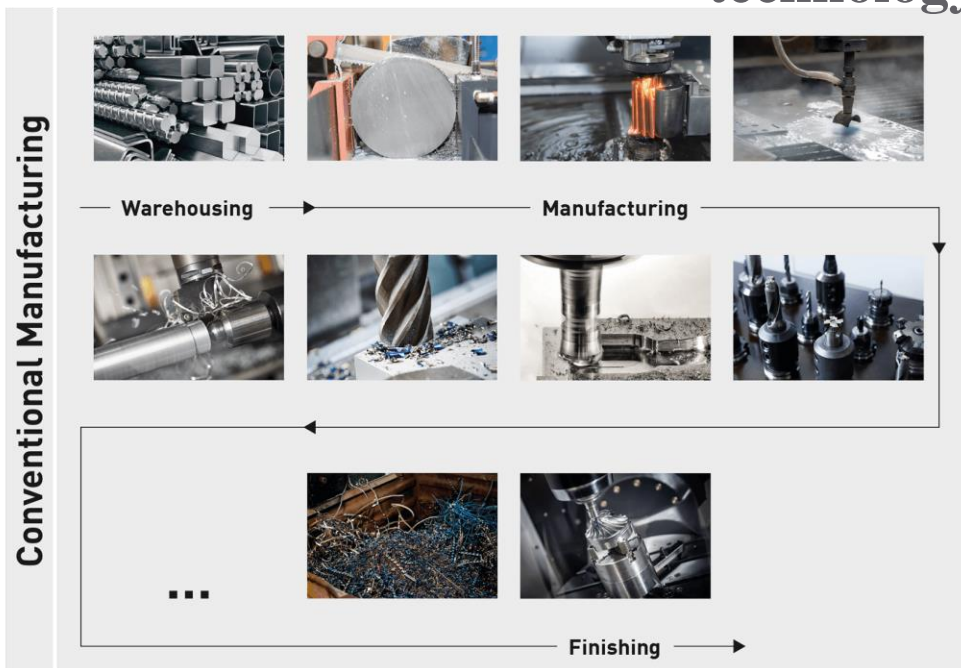


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Wire+Arc Additive Manufacturing vs Conventional technology



Advantages of WAAM technology

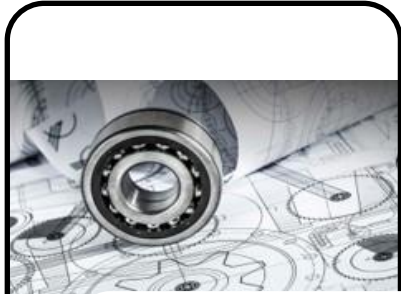
- Higher deposition rates
- Greater diversity of materials
- Improved mechanical properties
- Large parts up to 3 m³
- Reduction of manufacturing costs by up to 60%
- Reduced number of manufacturing steps
- Lower investment costs
- Maximum material utilization



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Idea of the new materials development

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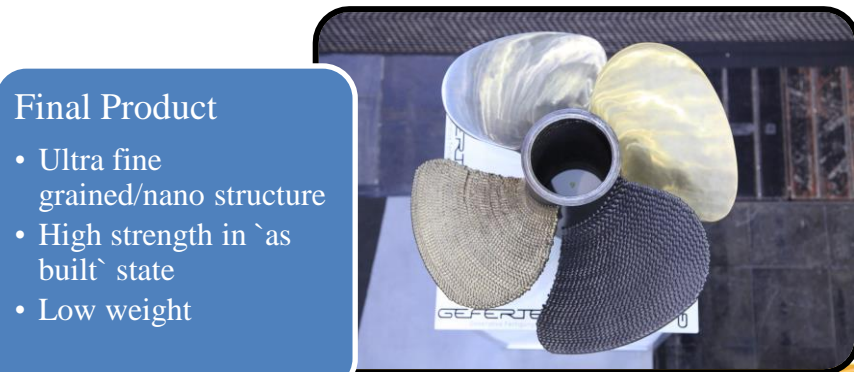
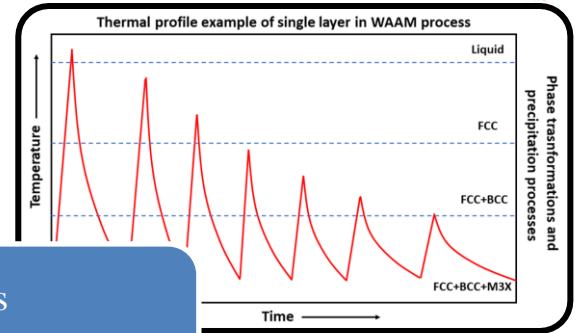
Design products

- Automotive
- Defence
- Aerospace
- Marine
- Required mechanical and physical properties



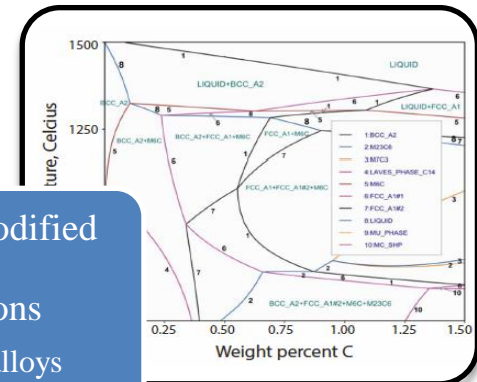
WAAM process

- Building samples
- Temperature/thermal profiles
- Heating/Cooling ratio
- Deposition speed
- Product geometry



Final Product

- Ultra fine grained/nano structure
- High strength in `as built` state
- Low weight



New or modified chemical compositions

- Fe based alloys
- Cu based alloys



Partners already involved

- **IMN** (research institute)
 - Design chemical composition of the new alloys
 - Input materials for WAAM technique
 - Thermodynamic calculations
 - Heat and thermomechanical treatment
 - Materials investigations
- **Ghent University**
 - Structural investigations
 - Fracture mechanics and fatigue
 - Examination of welded metal components
- **Gefertec GmbH**
 - Develops new method for the production of metallic parts
 - 3DMP technology – Wire Arc Additive Manufacturing
 - Machines for WAAM proces



Partners seeking ...

Research partner

- experienced in investigations of materials produced by means of AM techniques,
- experienced in investigations of AM processes

Industrial partner

- enterprises which are interested in development products
- capability to carry out tests in real conditions
- producers of input materials for WAAM process



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Project submission possibility

TOPIC : Advanced materials for additive manufacturing (IA)

Topic identifier: DT-NMBP-19-2019

Planned opening date: 16 October 2018

Deadline: 22 January 2019

Work Programme Part: Nanotechnologies, Advanced Materials,
Biotechnology and Advanced Manufacturing and Processing

Call : H2020-NMBP-TR-IND-2018-2020

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/dt-nmbp-19-2019.html>



Experience in international R&D&I projects

In the recent years Institute of Non-Ferrous Metals has been participating in the following EU funded research projects:

- ❑ "Superhigh energy milling in the production of hard alloys, ceramic and composite materials" (ACTIVATION-FP6);
- ❑ "Development of new nanocomposites using materials from mining industry" (Nanomining-FP7),
- ❑ "Nano-particle products from new mineral resources in Europe" (ProMine -FP7),
- ❑ Coordinating Action "Alliance for Materials – A value chain approach to materials research and innovation" (MatVal -FP7),
- ❑ Horizon 2020 projects: MSP REFRAM „Multi-Stakeholder Platform for a Secure Supply of Refractory Metals in Europe” and SCRREEN “Solutions for CRITICAL Raw materials - a European Expert Network”.



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Thank you for your attention !

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