



# Material-efficient Cu wire-based 3D printing technology **3DMP**WIRE

#### PROJECT BACKGROUND

The main project objective is to develop the new Cu-based alloys and production technology of the following components: water turbine propellers, ship propellers, seawater pump elements and other marine equipment. The above-mentioned components will be manufactured by means of 3DMP® process which belongs to the Wire+Arc Additive Manufacturing (WAAM) and is considered the most promising for such applications. The 3D Metal Printing (3DMP®) process will be alternative, competitive and more environmentally friendly to presently used conventional metal processing technologies. The principle of the 3DMP® technology is to make the final product layer-by-layer from the wire as a feedstock material. The development of Cu-based alloys and production technology for seawater corrosion resistant components will be less expensive and will result in longer lifetime due to the extraordinary mechanical properties of the new alloys used to build these elements. The 3DMP® technology enables to build constructions and equipment of lower weight in comparison with the products presently available on the market at lower material loss. The cost reduction of the production process is possible due to shortening production time and using less processes from min. 7 (conventional technologies) to max. 3 (3DMP®). The project will result in ready to implement 3DMP® technology for manufacturing of corrosion resistant components. Moreover, developed materials and production technology can be used to manufacture other products in many branches of the industry.

#### CONSORTIUM



#### LUKASIEWICZ ŁUKASIEWICZ Research Network **Institute of Non-Ferrous Metals**

- Development of the Cu-based alloys
- Development of production technology of feedstock materials
- Wire arc additive manufacturing at laboratory scale
- Materials investigations

### ਫਵ**਼ਵ**ਾਵਟ Gefertec GmbH

- Development of the production process parameters by means of 3DMP® technology
- Implementation of the results of the project (end user)
- Manufacturing of the new products

### Tecnalia Research and Innovation

- Erosion tests
- Non-destructive tests

#### Italian National Agency for New Technologies, Energy and Sustainable Economic Development

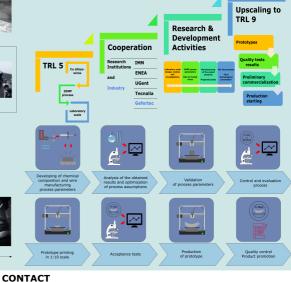
- Material investigations
- Mechanical properties

## Ghent University

- · Corrosion-fatigue investigations
- Tests of the prototypes in seawater environment
- Educational activities







#### **ACKNOWLEDGEMENTS**

The project "3DMPWire, Material-efficient Cu wire-based 3D printing tech RawMaterials technology", 2019-2021 (Upscaling) is cofunded by EIT



This activity has received funding from the European Institute of Innovation and Technology (EIT), a body of the European Union, under the Horizon 2020, the EU Framework Programme for Research and Innovation

ŁUKASIEWICZ Research Network - Institute of Non-Ferrous Metals Joanna Kulasa (joanna.kulasa@imn.gliwice.pl)

#### Gefertec GmbH

Georg Fischer (georg.fischer@gefertec.de)

Tecnalia Research and Innovation, Industry and Transport Division Patricia Caballero (patricia.caballero@tecnalia.com)

ENEA, Department for Sustainability Lab. Materials Technologies Faenza Matteo Scafè (matteo.scafe@enea.it)

Ghent University, Soete Laboratory

Wim De Waele (wim.dewaele@ugent.be)