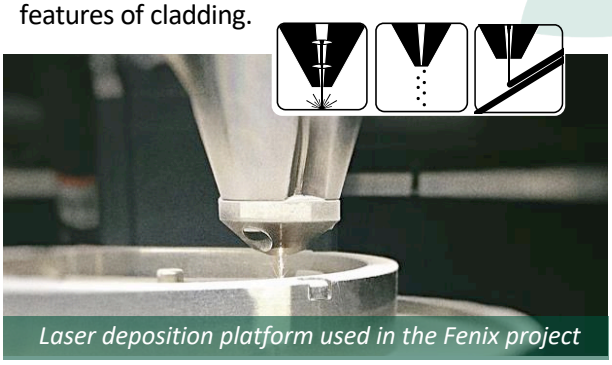
Demonstrator Fact-Sheet
Micro Laser Deposition of recycled alloys

FENIX steel alloy is obtained with Mechanomade® process, using primary metals and ***recycled Copper***.
The Alloy has been developed to have optimal sinterability and mechanical properties.

Direct Energy Deposition

MBN had tested the use of its powder also with other Direct Energy Deposition AM technique: the Micro Laser Deposition. This is an improved additive manufacturing method and machine to sinter inorganic materials for the fabrication of three-dimensional solid objects.

MBN has tested the application of the powders in a laser sintering process since there is a strong industrial pull for this technology in various sectors which include power generation, oil and gas, aerospace and transport, medical, mining, tooling that can be addressed by expanding the materials range available. The strategic advantage of direct laser sintering relies on the possibility to offer new manufacturing and product solutions with a reduced time to market and small batch production and, most of all, on the possibility to build over other components for repairing, adding features of cladding.

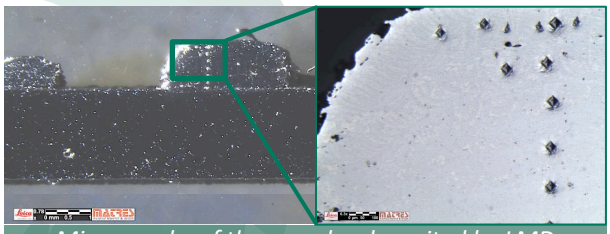


Laser deposition platform used in the Fenix project

Description of its use

Based on the experience with other Fe-based materials, cuboids were manufactured considering several combinations of parameters for further analyses.

The samples exhibit promising results in the direct laser sintering. A preliminary study on the cross-sections reveals a dense bulk with small porosities. Microhardness in these samples is in line with the hardness obtained on the sample sintered with other techniques as well as the samples obtained from Robocasting and sintering.



Micrographs of the samples deposited by LMD

Main Technical Data

	Value
Recycled Material	22%
Source of Material	CPUs
Deposit Hardness	48 HRC
	Process:
Spot size	30-150 µm
Maximum laser power	100 W
Scanning speed	1-10 mm/s
Local sintering condition	2-1000 J/mm^3
Powders size	10-30 µm
	20-45 µm
	38-75 µm

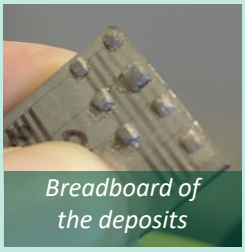
Application

- Functionally graded materials
- Repairing
- Topology optimization

Printers

Comparable with:

Laser metal deposition (LMD)
Direct laser deposition (DLD)
Laser engineered net shaping (LENS)
Laser cladding
Laser deposition welding
Powder fusion welding



Breadboard of the deposits

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More information can be found at : **www.fenix-project.eu** **marketplace.fenix-apps.eu**