EXPRESSION OF INTEREST FOR SERVICE PROVIDER

R&D&i provider: LORTEK S.COOP. (LORTEK)

Contact person: Miriam García

E-mail: mgarcia@lortek.es

Website: https://www.lortek.es/

Description of the entity

LORTEK is a non-profit private Research Center, which generates excellent knowledge in manufacturing processes and their digitalization to transfer it to industry to improve its competitiveness, environmental impact, and sustainability. We are accredited as an agent of the Basque Science & Technology Network, member of the BRTA (Basque Research & Technology Alliance) and we are a cooperative integrated in Mondragon Corporation. Our fields of specialization are Joining technologies, metal Additive Manufacturing, and Smart manufacturing and Industry 5.0.

LORTEK is considered a Competence Centre in metal Additive Manufacturing (AM) and Joining technologies because it combines state of the art equipment and infrastructure for experimentation in real-life environments together with deep expertise on innovative applications and best practices on design, simulation, manufacturing, monitoring, characterization and testing of AM and welded parts.

LORTEK has a team dedicated to apply 4.0 technologies such as artificial vision, data analytics, IoT, sensors, connectivity, simulation, virtualization, cloud computing, advanced robotics, process monitoring and control, plug&play machines, cyberphysical production systems and autonomous decision making, providing relevant improvements to the production processes such as 100% quality control, improved flexibility, manufacturing towards zero defects, customization, servitization and reduction of time-to-market.

LORTEK is member of the EIT-Manufacturing and the Basque Digital Innovation Hub (BDIH), coordinating the node of AM. Additionally, it is coordinating and participating in several European research projects and has many contracts with industrial companies.

Description of services

Service 1: Flexible robotics for welding, repairing, and inspection processes

This service aims to offer access to state-of-the-art experimental facility and knowledge such as cooperative robots, jigless robotic welding (arc welding, laser welding, friction stir welding), sensors, capabilities for automatized robotic cell development, offline path planning software, scanning and digitalization systems based on artificial vision and laser scanning, data acquisition and analysis.

The types of activities in the service include access to a test bed for entrepreneurs and companies to assess 360º vision technological assessment, technical and economic diagnostics, and viability assessment on welding technologies for product manufacturing and assembly processes. In addition, companies can also get support on:

- conceptual design of robotic cell
- simulation
- system architecture
- customised industrial solutions
- prototyping
- experimental validation
- needs for industrialisation
- robotic strategy development.

Service 2: Metal additive manufacturing (3D-printing) solutions

This service aims to offer access to state-of-the-art experimental facilities and knowledge such as robotic and CNC cells for high-rate deposition by direct deposition of powder and wire (DED-LB and DED-Arc), Laser Powder Bed Fusion (PBF-LB) cells with melt pool monitoring; as well as access to a fully equipped metallurgical laboratory for characterisation of additive manufactured parts properties.

The types of activities in the service include access to a test bed for entrepreneurs and companies to assess 360º vision technological assessment, technical and economic diagnostics, viability assessment and technology scouting (powder bed fusion, directed energy deposition and material extrusion). Standalone technological workshops (training) for skills assessment in metal additive manufacturing are also offered. In addition, companies can also get support on:

- conceptual design of products (including topology optimisation, bionic design and generative design)
- process simulation
- on-line monitoring
- part inspection
- customised industrial solutions prototyping for multiple sectors (space & defence, health, energy, transport)
- experimental validation
- needs for industrialisation
- training in additive manufacturing
- industrial strategy development in additive manufacturing

Service 3: Data driven solutions for manufacturing processes

This service aims to offer access to available tools, knowledge and experimental facilities such as GPU server for AI development, open-source machine learning libraries, DevOps tools, proprietary data and image analysis software, ad hoc web interfaces for data display and annotation, sensors, system communication and data exchange protocols based on industrial standards, local and cloud servers, 11 automated robotic cells and 2 CNC systems, PLCs, specific software (Matlab, Python, Scikit-image, Django, Docker, Plotly, Tensor Flow, OpenCV).

The types of activities in the service include access to a test platform for entrepreneurs and companies for manufacturing process optimization; real-time industrial process control systems; data capture, processing and analysis; decision making; Artificial Intelligence (AI) models (machine learning, deep learning) to optimize manufacturing processes. In addition, companies can also get support on:

- design, prototyping and validation of advanced manufacturing systems powered by data
- conceptual design
- system architecture
- customised industrial solutions prototyping
- virtual and experimental validation
- needs for industrialisation
- digital manufacturing strategy development

Service 4: Advanced joining technologies and materials

This service aims to offer access to state-of-the-art experimental facilities (robotic cells) and knowledge, such as pilot plant for the study of advanced joints (laser, arc and friction welding) including intelligent welding cells with process data acquisition and visualisation system and real-time external sensors, energy storage and electromobility welding cell, test bench for weldability of metallic materials, knowledge on metallurgy; as well as access to a fully equipped metallurgical laboratory for characterization of welded joint properties.

The types of activities in the service include access to a test bed for entrepreneurs and companies to assess 360º vision technological assessment, technical and economic diagnostics and viability assessment, technology scouting. Standalone technological workshops (training) for skills assessment in joining technologies are also offered. In addition, companies can also get support on:

- design, prototyping and validation of new products
- conceptual design
- simulation
- customised industrial solutions prototyping
- experimental validation
- needs for industrialisation (equipment, tooling, monitoring solutions)
- training in joining technologies and
- strategy development in joining

Service 5: NDT for inspection processes

This service aims to offer access to available tools such as artificial vision (computer vision), profilometry, 3D scanner, active and passive thermography, photonic sensors, electronic sensors, special sensors (microphone, ultrasonic sensors, etc.).

The types of activities in the service include access to a test bed for entrepreneurs and companies to assess 360º vision technological assessment, technical and economic diagnostics and viability assessment, technology scouting. Standalone technological workshops (training) for skills assessment in NDT technologies for inspection are also offered. In addition, companies can also get support on:

- design, prototyping and validation of inspection solutions based on breakthrough technologies
- conceptual design
- customised industrial solutions prototyping
- experimental validation
- needs for industrialisation
- training
- inspection strategy development
- Ad-Hoc AI algorithm solutions for automated weld quality inspection

Service 6: Manufacturing of welding and metal additive manufacturing prototypes

This service aims to offer access to state-of-the-art experimental facilities and knowledge, such as welding pilot plant including robotic welding (arc welding, laser welding, friction stir welding) in intelligent welding cells, and metal 3D printing pilot plant including manufacturing and repairing intelligent cells (DED-LB, DED-Arc and PBF-LB).

The types of activities in the service include access to a test bed for entrepreneurs and companies to assess technical and economic diagnostics, viability assessment, manufacturing of prototypes and proof-of-concept. In addition, companies can also get support on:

- prototyping and validation of new products
- customised industrial solutions prototyping
- experimental validation
- needs for industrialisation

Service category: Access to infrastructure, R&D support, and prototyping.

TRL: The services will contribute to scalability of company's solutions for further production and commercialization, demonstrating them at TRL 7-8.

Service delivery mode: online, offline, hybrid.

Service cost: 68-155€/h – to be negotiated with the customers according to the provided services.

Service duration: it will be adapted to the needs of the customers.