



ONSIROMAN

**ONLine Simulation & Monitoring of PROduction
Machines for Sustainable MANufacturing**



smart

advanced manufacturing

ORGANISATION PROFILE



Ermetal Automotive is top of **1000 the biggest company** among in Turkey, specialised in manufacturing auto components and assemblies for major EU car manufacturers.

Ermetal Automotive is the Tier **1 supplier** of Fiat, Renault, Ford, Toyota with 85 million € turnover and 900 workers in 28.000 m² enclosed area. Ermetal product range contains: roof, chassis, closure & body parts and steering columns.

Ermetal R&D Center continues its services since 2011 by focusing on die design and production process optimization. Ermetal participated in international R&D projects including **MSCA-RISE** (1 project) and **EUREKA** (3 projects).

PROPOSAL INTRODUCTION (I)

Vision: The need for online simulation in validation and testing processes has led to the emergence and development of Hardware-in-the-Loop (**HiL**) technology . Today, Hardware-in-the-loop enables real-time simulation and has been widely used in both research and industrial product development in recent years. The project aims to utilize this technology for machines used in industrial applications/processes.

Motivation: Since **HiL** allows **online simulation** of a physical system model, it offers great opportunities to reduce costs and optimize processes for industrial equipments, machines, and machine components. Efficiency and sustainability are the key targets.

Content: Presses have an important place among Ermetal's capabilities and are indispensable for serial production. With **HiL** based online simulations;

- Connecting machines with simulation of the physical manufacturing process is running
- Test-running realistic, high-risk, expensive and time-consuming scenarios
- Monitoring the production machine, optimizing production processes

PROPOSAL INTRODUCTION (II)

Expected outcome:

- Ability to test new or existing settings of the machine parameters and observe outcomes on machine, products, process.
- Maximizing and/or optimizing overall productivity, quality and efficiency therefore business profitability
- Improving sustainability and decreasing energy consumption

Impacts: The automotive sector plays an important role in the development of countries with its capital-intensive structure and the volume of employment it creates. The sector, which has a total size of approximately 4.5 trillion USD in the global economy in 2019, constitutes approximately 5% of the world economy and creates employment for approximately 80 million people. It is fundamental for succeeding in grasping the potentials in both emerging markets and aftermarket. Companies should consider offering new perspective for their production machines and processes. In order to understand press machine's working performance it is aimed to utilize HiL technology within scope of the project. With the opportunity of changing and testing machine parameters it will be possible to maximize efficiency. Similarly, the effect of changing the machine parameters on the product's geometric form will be investigated. In this way, it is aimed to increase product quality, process optimization and develop new processes for customers. Additionally, the platform to be developed will be adaptable to various industries.

Schedule: Expected project duration: 2,5 years

Starting Term: 2023/2 (Announcement of labelled projects 20-06-2023)

End Term: 2026/1

PARTNERS

Current Consortium: Ermetal Automotive A.S

Partner search:

Countries: Any

Organisation Type: Large Industry, Research Institute, SME, University, others.

Missing Expertise:

Software Solution Provider/Developer

Hardware-in-loop Simulation/Solution Provider

Engineering/Control Platform Provider

R&D, specifically embedded systems experts

End users for industry application

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