The COMBILASER project is a European research project, co-financed by the European Union Horizon 2020 framework research programme.

Project partners succeeded in creating a new production process by integrating an industrial laser process (welding and cladding) with a seamless Self-Learning System. This system, which represents the heart of the COMBILASER project, creates an autonomous process optimization loop for new applications to be applied in the production of many different, high technology products.

The breakthrough solution of the COMBILASER project lies in the combination of the Self-Learning System with Monitoring and Non-destructive testing technologies.

COMBILASER WAS APPLIED TO THE FOLLOWING USE-CASES:

- **Automotive industry**
- **White and capital goods industry**
- **Oil & gas industry**

PROJECT INFORMATION

Project title:
COMbination of non-contact, high speed monitoring and non-destructive techniques applicable to LASER Based Manufacturing through a self-learning system
Programme: H2020-FoF-2014
Topic: FoF-01-2014
Start and end date of the project: 01.01.2015 - 31.12.2017
Project value: 3.439.420,00 EUR

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PROJECT PARTNERS

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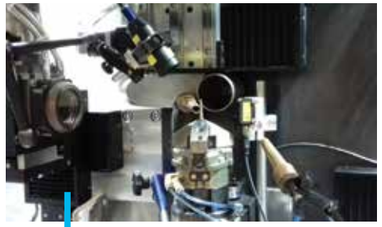
COMBILASER

PRESENTATION OF PROJECT RESULTS



HIDRIA AET USE-CASE

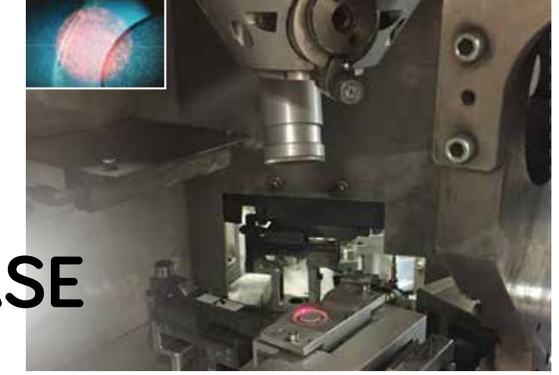
This industrial use-case has seen project solutions being applied to a manufacturing process of the HIDRIA OPTYMUS pressure-sensor-glow plug. The COMBILASER project gave this Tier-1 automotive supplier significant advantage and uptake in welding technologies. The state-of-the-art solution gave the company an advanced diagnostics tool in form of a Self-Learning-System. The COMBILASER solutions will in the future be applied to manufacturing processes related to internal combustion engine and hybrid electrification drivetrain parts.

COMBILASER SOLUTIONS

Self-Learning System integrated with:

- **Spectral signal monitoring**
- **Melt-pool diameter measuring system**

ORKLI USE-CASE



In the case of white and capital goods industry, COMBILASER project offered a breakthrough in the flame sensor device manufacturing process for a major manufacturer Orkli, who is a part of the Mondragon worker cooperative. The high demanding standards of this industry established very challenging requirements in the quality of these products. Thanks to COMBILASER approach, a better understanding of the process was gained as well as a useful tool for diagnosis. In the near future, the implementation of the developed system in real production will allow the elimination of manual verification process and above all, the delivery of non-defective parts to the final customers.

COMBILASER SOLUTIONS

Self-Learning System integrated with:

- **Post-weld inspection system**

TMCOMAS USE-CASE

In addition to laser welding processes, the COMBILASER approach was also addressed for additive manufacturing and more precisely for the oil and gas industry. TMCOMAS represents a small European company operating in a highly specific market. The developed system proved to be an optimum tool for closed-loop process control applied to laser power control management. The self-learning concept served also as a tool for optimizing process parameters which leads to a considerable productivity increase. The implementation of the system in real production will undoubtedly serve for rising product reliability.

COMBILASER SOLUTIONS

Self-Learning System integrated with:

- **Laser Power control system**.