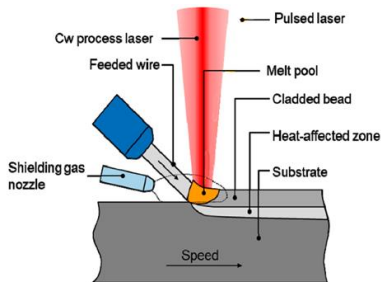


PROYECTO I+D+i



Title of the project

Development of a multiprocess solution for the in situ recovery and reinforcement of railway rail elements

Acronym

REPAIR

Project content

Maintenance and recovery operations in railway infrastructure networks take place continuously, due to the high frequency of vehicles passing through the tracks. The objective of these recovery works is to ensure the circulation of trains in safe and comfortable conditions, avoiding great efforts on the different components (sleepers, rails, turnout cores, etc.). One of the most widespread methods is manual recharge operations using arc welding technology. This welding technology, assisted by other tools, such as grinders and grinders, allow rail components to be recovered quickly. However, these conventional welding methods do not constitute a definitive solution, since they present different drawbacks. In this context, the use of a less aggressive, more versatile and efficient recharging technology is proposed. Laser technology, given its particularities in terms of flexibility, localized energy supply, high productivity and ease of use, is presented as a suitable technology to carry out these lane recovery operations.

General objectives

The aim of the project is to develop and optimise a less aggressive, more versatile and efficient laser-based hardfacing system, given its particularities in terms of flexibility, localised energy input, high productivity and ease of use, in order to carry out different manual maintenance operations (cleaning, hardfacing, polishing) on rail track elements, mainly Vignole (standard) rails and crossings.

Results and conclusions

A study has been carried out on the recovery process of rails and crossings using the metallic alloys in wire format AISI 316L austenitic stainless steel and Tubrodur reference manganese steel alloy, analysing the speed, power, width, gas pressure and oscillation of the cladding with both materials. Both materials have been validated in a 6 m long crossing section, with different characteristic defects, obtaining satisfactory results.

It was found that repairs using the laser system are faster and use cheaper material, thus compensating for the higher initial cost of the laser system compared to conventional welding. Furthermore, as it generates less heat and requires less energy consumption, it makes it possible to obtain higher quality and more precise contributions, at the same time as the operator is less exposed to heat and radiation during the welding process. All this makes it a more sustainable, efficient and safer solution than conventional welding.



BUSINESS AREAS

Technical and Innovation Area
COMSA

DURATION

01/06/2022 al 31/12/2023

BUDGET

COMSA : 361.712,81€

KEYWORDS

Rails, laser, LMD process

COORDINATOR

Joan Peset (COMSA)



EUSKO JAURLARITZA
GOBIERNO VASCO

EKONOMIAREN GARAPEN,
JASANGARRITASUN
ETA INGURUMEN SAILA

DEPARTAMENTO DE DESARROLLO
ECONÓMICO, SOSTENIBILIDAD
Y MEDIO AMBIENTE



Europar Batasunak
kofinantzatua

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