
COMPANY

COMSA, S.A.U.

BUSINESS AREA

Infrastructures Area

DURATION

1/3/2018 - 1/9/2020

BUDGET

307.462,69 Euros

KEYWORDS

Ballast, durability, railway

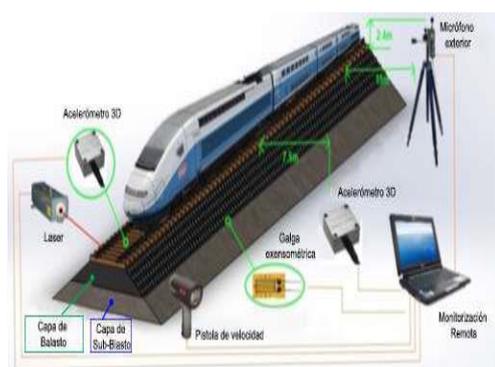
RESPONSABLE

Project Manager: Joan Peset Iribarren

Technical coordinator: Miquel Morata Royes

EXTERNAL FINANCING

115.229,82 Euros- Financing granted



Optimized ballast for extended durability

RDUNI17-2-0003

Project BALLAXT

State of the art

Currently, the maintenance of railway tracks is carried out on those elements or parameters on which there is certainty that some type of defect is developing. In this way, there is interest in the elements that make up the track being of good quality and endowing it with a good geometry for as long as possible, with the aim of reducing maintenance interventions and lowering the costs that these imply. In railway infrastructures, the passage of high-speed trains translates into high stresses due to the increase in loads produced by the dynamic nature of the efforts, produced by the action of the mobile load moving along the track. In the case of ballast tracks, which make up approximately 90% of the tracks in the world, these efforts must be absorbed and damped by the granular ballast layer, causing its deterioration over time. La capa de balasto sufre un elevado nivel de vibraciones en sus partículas que pueden llegar a afectar a su comportamiento mecánico, causando fenómenos como la licuefacción del balasto. This phenomenon causes a decompaction of the grains in the layer, reducing their ability to resist the stresses generated that are transmitted through the sleepers.

General objectives

The Ballaxt project aims to develop an optimized ballast of extended durability with controlled characteristics and improved performance compared to the currently used ballast of natural origin. By optimizing parameters such as shape, size and unit weight, give better performance in terms of durability to the ballast layer on existing and future railway lines. The particles that make up the optimized ballast are synthetic elements in which two fundamental characteristics can be controlled: geometry (shape and dimension) and material composition. The optimized ballast allows, with respect to the natural ballast, to improve the mechanical behavior and increase the life of the ballast bed, as well as to reduce track maintenance costs and reduce the environmental impact generated by the exploitation of natural rock quarries. For this, one must work based on three different lines, and clearly defined:

- Complete modeling of the ballast's behaviour from the mechanical point of view (vibrations and stresses). From this analysis the optimum density, shape and size of the particles to be developed will be obtained. Tests of mechanical properties (impact resistance, anti abrasion, etc.) for optimized ballast samples. Laboratory tests under simulated train load. Field test demonstration on a railway track to evaluate the suitability of the product obtained.

Project tasks

- PT1 Optimized ballast development for extended durability
- PT2 Laboratory tests of the optimized ballast. Mechanical characterization
- PT3 On-site test under real load conditions
- PT4 Project management

Project conclusions

At this moment the project is in the initial phase