

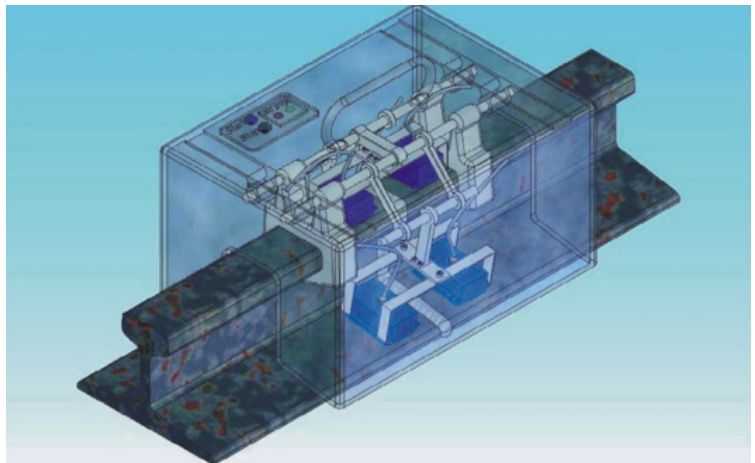
# Development of an Ultrasonic Technique, Sensors and Systems for the Volumetric Examination of Aluminothermic Rail Welds / RAILECT

## the objective of the project

Development and production of a novel 'clamp-on' ultrasonic testing device for the volumetric examination of aluminothermic rail welds. The system will ultrasonically inspect the weld and classify it.



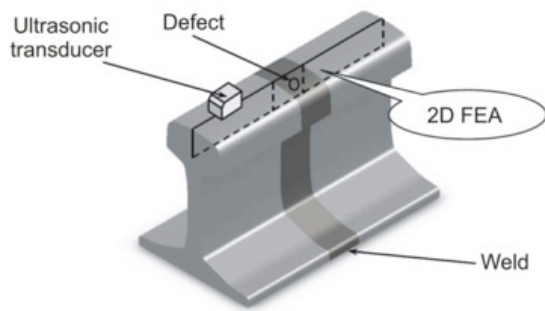
There are estimated 11 million site aluminothermic welds on the European rail network



Concept of the ultrasonics inspection system

## ultrasound institute

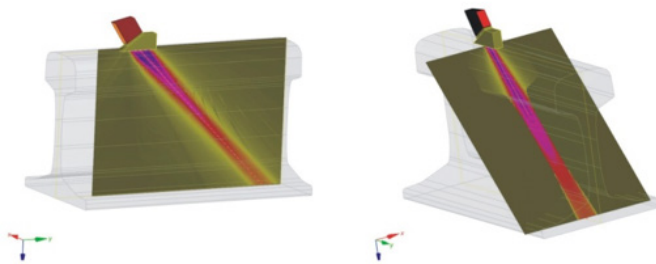
performed ultrasonic modeling in order to determine the ultrasonic beam interaction with defects and to find the optimal configuration of the ultrasonic clamp-on device, consisting of several arrays for testing different types of defects in different zones of rail weld.



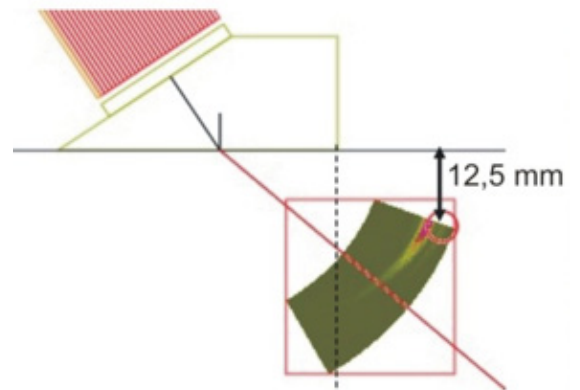
Part of the rail under investigation



The snapshot of the particle velocity modulus field modelled using ANSYS finite element method



Ultrasonic field of the 32 elements 2MHz linear phased array at 45° degrees superimposed on the rail sample modeled using CIVA software



Response from the defect at 12.5 mm depth modeled using CIVA software

## project partners

TWI (UK), Vermon (France), Spree (UK), KCC (UK), Kaunas University of Technology (KTU), Optel (Poland), Jarvis (UK).

## project homepage

<http://www.railect.com/>

## related publications

1. E. Jasiūnienė. Testing of the middle zone of the rail weld. *Ultragarsas*. 2010. Vol 65. No. 3. P. 35-40.
2. E. Jasiūnienė, E. Žukauskas. The ultrasonic wave interaction with porosity defects in welded rail head. *Ultragarsas* 2010. Vol 65. No 1. P. 12-18.