INTRODUCTION
This poster summarizes some relevant research developed for the automotive sector at CEIT’s Materials and Manufacturing Division. The development of new materials, processing routes and inspection techniques are key for facing the industrial challenges:
• Weight reduction with the subsequent energy saving
• Reliability of the components

MICROSTRUCTURE DESIGN FOR AUTOMOTIVE COMPONENTS. NON-DESTRUCTIVE TECHNIQUES
Development of Advanced High Strength Steels (AHSS) based on boron metallurgy and application of these new grades into hot stamping lines:
• Economical route to increase the safety of vehicles reducing weight.
• Understanding the process parameters/final microstructure relationship.
• Obtaining tailored microstructures for specific areas in the component.

POWDER METALLURGY FOR AUTOMOTIVE
• Highly efficient material and energy “near net shape” technology
• Economical production of large number of parts with high reproducibility and close dimensional tolerances.
• Highly complex geometries with excellent precision,
• New alloy systems and/or thermochemical low pressure carburizing (LPC) process for obtaining high performance products.

INNOVATIVE HEAT TREATMENT TECHNOLOGIES
Substitution of induction heating by laser in surface hardening of components such as crankshafts.
• Successful implementation implies understanding microstructural changes provoked by the change of technology.

VISION AND MONITORING
• Development of intelligent and automatic systems for industrial handling and monitoring.
• Implementation of multi-view metrology systems for inspection of complex containers for automotive parts.
• Development of an assistant software tool in maintenance tasks based on augmented reality:
  • Training of operators to assure quality, reliability and safety in the production environment.
  • Guiding users in assembly/disassembly tasks

CONCLUSIONS
• The results gathered in this poster illustrate the importance of a multidisciplinary approach in research for the automotive industry
• Focusing research activities for the automobile industry on Metallurgical Processes and Components CEIT expertise extends from Modelling to microstructural and mechanical characterization, as well as NDT inspection and Vision.