

DIRA-GREEN - Enhancing the competitiveness of European powder metallurgy SMEs by an improved quality assurance tool based on latest digital radiographic achievements

The aim of the DIRA-GREEN project is to develop a highly effective non-destructive testing (NDT) system to inspect 'green parts' of the powder metallurgy (PM) manufacturing process, resulting in a higher-level quality assurance alongside savings in material, time and energy. This will be achieved by developing a fast and reliable inspection tool based on digital radiography for the inspection of green parts.



PM is the major manufacturing route for many industrial sectors. Over a wide range of parts, such as transmission and gearbox steel parts for the automotive industry, cemented carbides and high speed steels for metal, wood or stone-working, magnets and soft magnetic materials, fine ceramics, refractory metals, bearings, etc., this manufacturing procedure is becoming more and more determinative.

Project objective

European PM SMEs are having difficulty remaining competitive in producing lightweight, high quality, cost-efficient parts, especially for the growing sector of applications with more demanding mechanical properties and larger production scales (i.e. aerospace and medical industries). The main drawback of PM is that following powder compaction ('green part'), porosity and cracks in the microstructure may be present. This can lead to unreliable mechanical properties that limit the usefulness of this manufacturing technique. Material porosity does not change during sintering and therefore it is preferable to determine 'green part' porosity to avoid unnecessary sintering, thus saving material, energy, and time.



There is a clear need within the industry for a rapid, non-invasive instrument capable of determining the porosity of ferrous and nonferrous 'green parts'.

The DIRA-GREEN project aims to develop an NDT technique using digital radiography to enable online quality assurance of 'green parts', by monitoring compacted material porosity and identifying microscopic cracks.

The availability of a reliable and attainable inspection tool for detecting 'green part' defects would result in a substantial increase of European PM SME competitiveness, by reduction of costs associated with the production and control of the parts, and by improving the reliability of powder metallurgy parts.

For further information, please visit the project website at www.diragreen.eu.

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under Grant agreement number 286803.