



THE ITALIAN SOCIETY FOR NDT presents:



DIRA-GREEN is a cooperative project in the EU's [Seventh Framework Programme](#), in the 'Research for SME Association' call. The DIRA-GREEN project (Contract no.286803) started on 1st October 2011 with participation of 13 partners from 7 European countries. The aim is to develop a fast and reliable inspection tool based on digital radiography for the inspection of green parts.

A highly effective non-destructive system to inspect 'green parts' of powder metallurgy manufacturing process resulting in a higher-level quality assurance and savings in material, time as well as energy.

Overview

Powder metallurgy (P/M) is the major manufacturing route for many industrial sectors. Over a wide range of parts, such as transmission and gearbox steel parts for automotive, 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. European P/M SMEs are having difficulty being 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).

Scope

DIRA-GREEN project is aimed to develop a Non-Destructive Testing (NDT) technique using Digital Radiography (DR), which enables online quality assurance of 'green parts', by monitoring compacted material porosity, and identifying microscopic cracks.

Objectives

- To design a **unique inspection tool prototype for the assessment and quality control of internal defects in 'green parts'** that is:
 - **reliable** (resolution of 1% in density, and flaws of 0.5mm – the accuracy required by the industry according to EPMA),
 - **low cost** (commercial price to be below €100.000), cost effective (saves time, energy, and material),
 - **rapid** (seven parts per minute),
 - **easy to use** (automated),
- DIRA-GREEN will consist of three systems: **digital radiography, mechanical and control**; integration of which will provide an inspection tool for industrial use
- To design the digital radiography subsystem including an **electronic subsystem** capable of generating and measuring the signals needed for operation of the digital radiography system

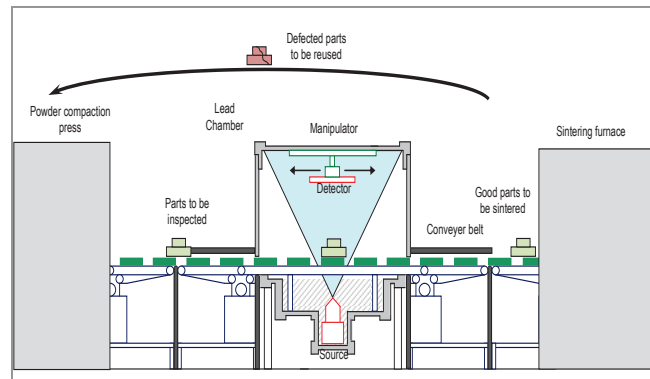
The approach

The project leads to gain a greater understanding of digital radiography technology applied in P/M. The density map for component, indicating the size and location of defects will be stored in a database, and will facilitate an 'improvement cycle' to optimize powder metallurgy mould and die designs.

Benefits

The availability of a reliable and attainable inspection tool for detecting 'green part' defects would result in substantial increasing of European P/M SMEs' competitiveness, by reduction costs associated with the production and control of the parts, and by improvement of powder metallurgy parts reliability.

Dira-Green concept



Partnership



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