

NUMERICAL SIMULATION OF THE MINTING PROCESS FOR INNOVATIVE COINS

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Abstract

The aim of this work is to give consistent design criteria in innovative coinage processes. The use of finite element computer simulation in the design path leading to manufacture is a deep seated practice in many scientific and technological domains. The minting process has always required considerable efforts in prototype modelling of dies and blanks, leading to a longer time needed from design to market. However, discretised solid mechanics, allowing for elasto-plasticity non linear algorithms, has involved, at most, the investigation of the response of blanks. As a matter of fact the development of innovative bi- and trimetallic coins was definitely supported by the employment of FEM simulations. In principle, only by resorting to refined frictional contact algorithms can the aesthetical and quantitative parameters of the output coin be looked into. The prediction capabilities of numerical simulations have been explored in the present work in order to optimise the design of an innovative trimetallic coin.

Keywords: Numerical simulation, Contact mechanics, Coinage

Presenting Author's Biography

Federico Alberto Tocchetti. Born in Naples 1975 and educated in his birth-town, graduated in civil engineering at the University of Naples in 1999. In 2003 he attained the PhD degree in structural engineering at “Tor Vergata” University in Rome with a thesis on stress based algorithms for unilateral frictional contact problems between elastically deformable bodies. Presently a contract professor at “Tor Vergata” University, he has a research assignment at ITC-CNR Institute for Technology in Construction. Research topics: contact mechanics, computational mechanics, numerical simulation.

