

PROJECT CONSORTIUM

KU LEUVEN

The Katholieke Universiteit Leuven is an academic institution at which groundbreaking research and knowledge transfer are essential and complementary. Two divisions of KU Leuven participate in HYMACER: the Production Engineering, Machine Design and Automation (KUL-PMA) and the Faculty of Materials Engineering (KUL-MTM)

www.kuleuven.be



Nanoker is a SME company dedicated to the development, manufacturing and selling of advanced technical ceramic materials and products for the industrial and biomedical field.

www.nanoker.com



Over recent decades ARTooling has evolved from a tool and die maker into a group of high-tech companies that offers the complete chain from design through to batch production of stamping tools and moulds. This all is done on the very highest standard.

www.artooling.com



Ik4-Tekniker is a manufacturing, industrial production and design centre aiming at helping the industrial sector to increase its innovative capacity by means of generating and applying technology and knowledge in order to be more competitive.

www.tekniker.es



The CINN is a public research center specialized in the controlled design of multiscaled multifunctional materials. A particular research interest is focused on the investigation of Spark Plasma Sintering of multifunctional nanocomposites working under extreme conditions.

www.cinn.es



FCT Systeme GmbH is the leading producer of FAST/SPS, Hybrid-FAST/SPS and standard hot presses, gas pressure sintering furnaces and vacuum sintering equipment for maximum temperatures.

www.fct-systeme.de

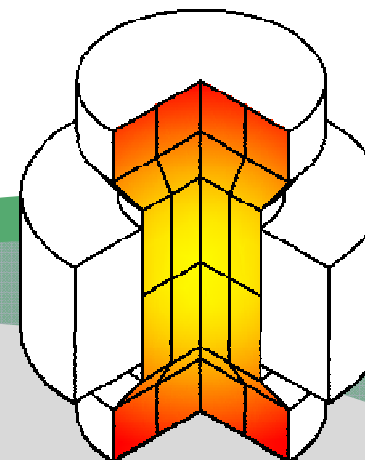


Ceratec Technical Ceramics BV is specialized in industrial technical ceramic components since 1983. Ceratec uses technical ceramics for products and components in which the material properties produce distinct added value e.g. improved wear resistance.

www.ceratec.nl



www.HYMaCER.eu



HYMaCER

HYbrid sintering and advanced Machining of technical CERamics

The HYMaCER project, driven by 4 dedicated Hi-Tech SMEs, aims at developing a **complete supply chain for large size technical ceramic blanks** in order to fulfil their need for economically produced, innovative and difficult to densify technical ceramics, all three parameters which are currently limiting the SMEs market expansion.

The research will be focused on the **fabrication of electrically conductive technical ceramics** (e.g.: ZrO_2 , Al_2O_3 based composites), combining an oxide matrix with a secondary, electrically conductive phase, by means of the **largest world-wide hybrid spark plasma sintering** equipment, with pressing force up to 400 tons and component capacity up to 400 in diameter.

www.HYMaCER.eu

Project reference: FP7-SME 606390

Contract type: Research for the benefit of specific groups
From **4/12/2013** till **3/12/2015**

Project Coordinator: Prof. dr. ir. Bert Lauwers

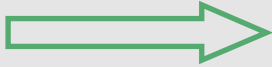


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PROJECT OBJECTIVES

“Development of a SME scale, cost effective and complete supply chain for processing and machining large scale innovative ceramics blanks and products”

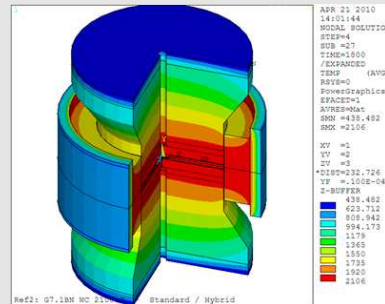
SPECIFIC OBJECTIVES



Economical SME-scale processing route for oxide-based electrically conductive ceramic composites



Fabrication of large scale ceramic blanks



Hybrid SPS model



Efficient machining strategies



New/enhanced ceramic engineering applications

FIRST RESULTS

Manufacturing of large and fully dense electro-discharge machinable ceramic blanks by hybrid SPS/HP



FAST/SPS Hybrid System

HHP D 400 SP



Ø250 mm x 21 mm ZrO₂-TiN

Examples of EDM machined parts manufactured from the ceramic composite material.



Ø150 mm Al₂O₃-SiC-TiC blank



Ø400 mm WC blank