



Standardization in research and innovation projects

Success story: advanced manufacturing

MUSIC:

MUSIC is a 4 year FP7 (7th European Research Framework Programme) project addressing High Pressure Die Casting (HPDC) of metallic alloys and Plastic Injection Molding (PIM), which are the most “defect-generating” and “energy-consumption” processes in EU industry. MUSIC will develop a completely new ICT tool, based on innovative Control and Cognitive system linked to real time monitoring, allowing an active control of quality and avoiding the presence of defects or over-cost by directly acting on the process-machine variables optimization or equipment boundary conditions.

Standardization activities are central in the MUSIC project, with work specifically devoted to the development of CEN Technical Reports on HPDC processes (e.g. technical conditions of delivery of dies, new tests on alloys/dies, pressure).

<http://music.eucoord.com>

THE PROJECT

High Pressure Die Casting (HPDC) of light alloys and Plastic Injection Moulding (PIM) are two of the most representative large-scale production-line in manufacturing field, which are strategic for the largely SME EU-industry. Due to the high number of process variables involved and to the non-synchronisation of the process control units, HPDC and PIM are “defect-generating” and “energy-consumption” processes showing less flexibility to any changes in products and in process evolution.

MUSIC will develop and integrate a completely new Intelligent Manufacturing Approach (ICT platform) which will work at machine-mould level to optimise/adapt the production parameters to the specific product, and can be extended at factory level linking the ICT platform with ERP system. The challenge of MUSIC is to transform production-rate-dominated manufacturing into a quality/efficiency-driven and integration-oriented one, exploiting the very relevant and underestimated potential of HPDC/PIM through collaborative research and technological development, along the value chain and through advances in manufacturing, ICT, model process technologies and standardization.

STANDARDS: A SOLUTION FOR MARKET UPTAKE

MUSIC Partners defined the 6 main challenges which have to be faced for progress in this field. One of them is constituted by the capability of really impacting on EU HPDC companies (which are mostly SMEs) by focussed dissemination and standardization activities. Thus, standardization activities are clearly central in the MUSIC project, with a Work Package specifically devoted to the development of new CEN Technical Reports on HPDC processing of aluminium alloys. Some key-topics in the field have been identified, to be targeted in the second half of the project such as technical conditions of delivery of dies, testing procedure for the various alloys/dies combinations, evaluation of pressure tightness performance of aluminium alloys HPDC components and terminology of HPDC process data.

HOW WILL THE STANDARD BE DEVELOPED?

The standardization work will be performed by means of a CEN Technical Report, with the joint effort of some of MUSIC Partners (University of Padova, Italy; Aalen Hochschule Technik und Wirtschaft, Germany; Assomet Servizi, Italy; SAEN, Italy; Electronics, Germany; Tekniker, Spain; MOTUL, France) and of CEN/TC 132 (Aluminium and Aluminium Alloys). This link will take advantage of the pre-existing cooperation activated during the StaCast FP7 project, in which some of MUSIC Partners have been involved. The drafts elaborated by MUSIC will follow the consolidated procedure for approval of CEN Technical Reports to become documents available at the national and European level.

BENEFITS OF LINKING WITH STANDARDIZATION

Efficiency is the key-factor for industrial competitiveness. Some of the most relevant outcomes of MUSIC such as the increase in the process yield and in the quality content of casting, availability of Intelligent Systems to give processes more reliability from the design stage, improved material and process knowledge are directly linked to standardization activities. In fact:

- a clear definition of technical conditions of delivery of dies will support knowledge-based relationships between die-makers and HPDC foundries,
- the availability of testing procedure for the various alloys/dies combinations will support HPDC foundries in alloys and process parameters optimisation,
- the elaboration of design-based references for evaluating pressure tightness performance of HPDC components will offer mechanical designers and foundries more flexibility,
- the definition of process data terminology and database for the structure for HPDC foundries.

LONG-TERM EXPECTED IMPACT

MUSIC will contribute to the development of standards and technical reports aimed at leading HPDC industry towards the "zero-defect manufacturing" approach. This means increased safety for any kind of product considered and decreased costs such as no scraps, better efficiency in processes, less energy consumption.

The competence and know-how generated by the project will be further utilised in EU manufacturing industry, contributing to the improvement of the quality of products and thus beating the competition of low cost/low quality products coming from outside the EU.



For universities and research centres, leading the diffusion of a new knowledge based approach in manufacturing and engineering, being involved in the development of both standardization activities and specific educational programmes, is a demanding challenge. This will help the process of "shaping" a new generation of EU engineers and technologists, well skilled on application and use of standards.

Professor Franco Bonollo, Padova University, Overall Scientific Manager of MUSIC

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Every project is different. The CEN-CENELEC Research Helpdesk can provide you with advice on how to include standardization in your project. Please feel free to contact us!

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