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Standardization in research and innovation projects

Success story: new technologies

STACAST:

The one and half year long StaCast 'New Quality and Design Standards for Aluminium Alloys Cast Products' FP7 (7th European Research Framework Programme) project has been addressed to the European aluminium foundry industry (more than 2000 companies, mostly SMEs), with the aim of supporting the exploitation of its enormous potential, mainly associated with the increasing demand of lightweight components. The challenge is to transform this industry into a quality/efficiency-driven sector, by developing innovative Standards and Technical Reports useful for the design and production of high quality and highly performing cast components.

www.stacast-project.org

THE PROJECT

The European aluminium alloys foundry industry has an enormous potential, responding to the increasing demand of lightweight components in various application fields, from automotive to aerospace. The industry however is facing the challenge of transforming itself into a quality/efficiency-driven and integration-oriented sector. This requires the achievement of several objectives, such as the development of new CEN Technical Reports, supporting a systematic improvement in the design and production of high quality and highly performing cast components.

StaCast identified, through a survey involving 60 EU aluminium foundries (representing 12.5% of overall EU production), the most relevant quality and standardization needs in the field, and developed 2 proposals for CEN Technical Reports: a reliable classification of defects and imperfections in aluminium alloys cast products, and a procedure for the evaluation of mechanical potential of aluminium-based foundry alloys.

These documents and other deliverables from StaCast will be a useful tool for mechanical engineers involved in the design and production of aluminium alloys cast components.

STANDARDS: A SOLUTION FOR MARKET UPTAKE

StaCast elaborated 2 CEN Technical Reports proposed to CEN/TC 132 "Aluminium and Aluminium Alloys", which have been adopted in August 2014:

"Classification of Defects and Imperfections in High Pressure, Low Pressure and Gravity Die Cast Products" has been structured with the aim of supporting EU aluminium alloys foundries to promptly perform corrective actions to reduce/eliminate defects. The document will constitute a useful "communication tool" among all the actors of the design and manufacturing chain of Al alloys cast components.

"Mechanical potential of Al-Si alloys for high pressure, low pressure and gravity die casting" will offer clear information of which properties can be expected by these alloys, cast in reference dies with state-of-the-art knowledge on die design, process management and alloy treatments correctly applied to minimize defects and imperfections.

The availability of these CEN Technical Reports will strengthen the competitiveness of the companies designing, manufacturing and using aluminium alloys cast components.

StaCast project offers additive support to the competitiveness of European aluminium alloys foundry industry. The CEN Technical Reports developed within the StaCast project represent a real "structural" action to improve the quality of foundry products.

Professor Franco Bonollo, University of Padova, StaCast Coordinator

HOW WAS THE STANDARDIZATION WORK DEVELOPED?

The standardization work was performed through CEN Technical Reports, with the joint effort of the StaCast Partners: University of Padova, Italy; Aalen Hochschule Technik und Wirtschaft, Germany; Trondheim Norges Universitet, Norway; Associazione Italiana di Metallurgia and Assomet Servizi, Italy; Federation of Aluminium Consumers Europe, Belgium) and of CEN/TC 132 (Aluminium and Aluminium Alloys). The work was proposed to the experts of CEN/TC 132 and progressed further within this Technical Committee, up to the adoption, in August 2014.

BENEFITS OF LINKING WITH STANDARDIZATION

For EU foundries, the possibility to overcome the present economical crisis is strongly associated with competitiveness, efficiency, and innovation. A key-role will be played, in the next few years, by the availability of CEN Standards and Technical Reports and design tools (such as those developed by the StaCast project). The new CEN Technical Report on defects classification will directly affect the reduction in no-quality costs, promoting process efficiency, which will be an advantage for all the stakeholders involved.

LONG-TERM EXPECTED IMPACT

Technical and organisational activities aimed at decreasing no-quality costs in aluminium alloys foundries have been carried out recently, but only with "local spot" actions as specific patents, lay-out solutions, changes in process flow.

StaCast main outcomes are

- a public survey of EU aluminium foundries, to understand their quality and standardization requirements,
- the development of a CEN Technical Report for a reliable classification of defects and imperfections in aluminium alloys cast products,
- the development of a CEN Technical Report to evaluate mechanical potential of aluminium-based foundry alloys,
- the elaboration of engineering guidelines for the mechanical design of aluminium alloys castings.

The book "Aluminium alloy castings: the EU StaCast guide to defects classification, mechanical potential and design issues", will also be fundamental as a tool for educating mechanical engineers at active in the European foundry industry.



Having a clear picture of defects in casting and a realistic vision of the mechanical potential of foundry alloys will make the European foundry industry more competitive, thanks to the increased knowledge about products which will be supported by the 2 new CEN Technical Reports. The documents will support foundries in reducing no-quality costs and expanding the margins of their competitiveness. Each action and result in terms of scrap reduction will immediately cause reduction in energy consumption.

Professor Franco Bonollo, University of Padova, StaCast Coordinator

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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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