

24M-PUBLISHABLE SUMMARY



“Development of a degassing system for aluminium casting processing based on ultrasound”

1. Publishable summary

“DEVELOPMENT OF A DEGASSING SYSTEM FOR ALUMINIUM CASTING PROCESSING BASED ON ULTRASOUND”

The **ULTRAGASSING PROJECT** define a methodology on the application of ultrasonic degassing treatment in the European light-alloys foundries, providing them with a safe and environmentally friendly method to improve the quality of their cast parts. Light alloys play a key role in vehicle weight reduction and in the last years the amount of aluminium parts in new vehicles has been steadily increasing. Moreover, weight is an even more critical factor in newly developed electric and hybrid vehicles, as it highly affects their autonomy. The global greenhouse savings derived from applying aluminium in vehicles is expected to double by 2025. However, the use of aluminium alloys is still limited by the quality and insufficient properties of the cast parts, which suffer from gas porosity.

During the **ULTRAGASSING PROJECT** the link between ultrasonic degassing parameters, melt quality and casting parameters is established, allowing the development of a versatile technology that can be finely tuned to specific casting process requirements. This new degassing technology based on ultrasound was validated and compared in performance with the currently used ones.

ULTRAGASSING is an example of R&D project that propose an important improvement for the EU foundry sector of non-ferrous alloys. The development of a new degassing system that improve the melt quality, by reducing the gas content and removing the oxides, will enhance significantly the quality of the components produced by foundries. In addition, the complete absence of harmful gas emissions will meet the present and all the future potential environmental regulations.

ULTRAGASSING Objectives:

The main objectives of the ULTRAGASSING project are:

1. To establish the link between ultrasonic degassing parameters (acoustic power, time, tool design), melt quality (gas content, oxide content), and casting parameters (temperature, melt flow rate).
2. To develop a technology that can be applied to different casting processes.
3. To demonstrate the efficiency of the developed technology as compared with the currently used one.

Work Performed and Results Achieved in 24 months of the project:

During the project, the following results were achieved:

- Establishment of the relationship between the parameters of degassing ultrasonic (acoustic power, time, design), quality of the molten material (gas and oxide content), and casting parameters (temperature, flow rate) .

- Definition of basis for the selection and design of ultrasonic equipment (transducer and sonotrodes) and electronic required.
- Definition and implementation of a new numerical model for the design and optimization of the acoustic system (sonotrodes).
- Design and construction of two prototype for aluminium degassing based on ultrasounds, one for specific purpose (High Pressure Die Casting) and other for general purpose (Gravity Casting and Low Pressure Die Casting)
- Development of a versatile technology applicable to different casting processes.
- Demonstration of ULTRAGASSING technology efficiency compared to current degassing technologies (lab and industrial validation): mechanical properties and porosity are similar or better compared with traditional technologies, with the added value of the absence of harmful gases and less dross formation.

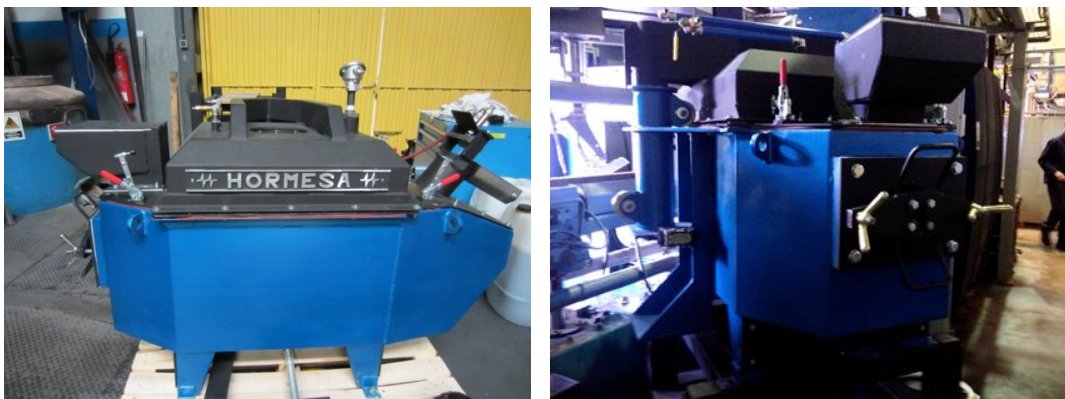


Figure: Prototype 1 for HPDC

With the present **ULTRAGASSING PROJECT** the metal casting industry will benefit from a new degassing technology based in ultrasound, and the corresponding hardware, to offer to the vast market of foundries (mostly SMEs but also to larger companies) a versatile technology applicable to different casting processes.

Other information: Project Public Website: www.ultragassing.eu

List of participants:

Participant N°	Participant name	Short name	Organization	Country
1	Fundació Privada Ascamm	ASCAMM	RTD	Spain
2	Hornos y Metales SA	HORMESA	SME	Spain
3	Ultrasion	ULTRASION	SME	Spain
4	Certa Zargyarto Presonto Es Szerszamkeszito Korlatolt Felelossegu Tarsasag	CERTA	SME	Hungary
5	Vocklabrucker Metallgiesserei Alois Dambauer & Co GMBH	VMG	SME	Austria
6	Brunel University	UBRUN	RTD	United Kingdom
7	Verein Fuer Praktische Giessereiforschung	ÖGI	RTD	Austria

Contact Person: Liceth Rebolledo
Project Coordinator
rebolledo@ascamm.com

Manel Da Silva
Technical Coordinator
mdasilva@ascamm.com

Fundació Privada Ascamm, Parc Tecnològic del Vallès, Av. Universitat Autònoma,
23, 08290 – Cerdanyola del Vallès (Barcelona) – Spain, **Tel:** +34 935 944 700 **Fax:** +34
935 801 102, www.ascamm.com