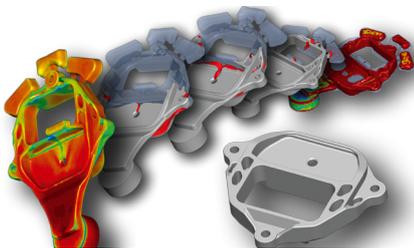


## Advanced Simulation of Metal Casting

### Fortissimo Experiment Facts:

- Segment: Casting
- Application Domain: Casting Simulation
- Application: Click2Cast



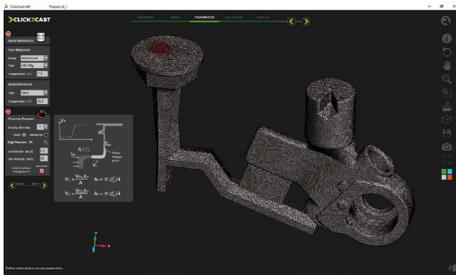
### The Company

Fundiciones de Roda is a Spanish SME specialising in the casting of grey and ductile cast iron. Like many other SMEs in this sector, Fundiciones de Roda finds the advanced simulation of its casting process prohibitively expensive because of the costs of software licences and of computer hardware.

Quantech is an ISV which develops and markets the software package, Click2Cast, which simulates the casting of a range of metals including aluminium, steel, brass and copper. The artefacts, whose casting is simulated, include automobile and aerospace components, hydraulic valves, turbine disks, impellers and flanges.

### The Challenge

To save time and money, foundries need advanced simulation to detect metal casting defects as soon as possible, that is at design time before any expensive prototypes need to be developed. However, many SMEs in the casting industry are reluctant to use advanced simulation software because of the high costs of software licences and of access to the necessary high-performance hardware to run the software. The challenge addressed in this experiment is to develop a service based on Quantech's Click2Cast package which offers SMEs such as Fundiciones de Roda an affordable pay-per-use service where its casting processes can be simulated accurately and quickly and without the need for detailed specialist knowledge of the simulation process. Accurate simulation implies that defects in the casting process can be detected at design time and before expensive prototyping. This is an essential requirement of the Click2Cast software and one which needs to be implemented in an effective service.



### The Solution

Click2Cast has been ported to a High Performance Computer system available via a Cloud infrastructure. Access to this application has been made available as a pay-per-use service which enables even naïve users access to advanced simulation via a simple click-based interface. Click2Cast tackles 90% of all casting techniques including High Pressure Die Casting, Gravity Casting, Low pressure Die Casting and Tilt Pouring.

The use of Click2Cast simulation service supported by an HPC-Cloud enables a foundry to determine the most efficient casting technique quickly and optimise its configuration. In this way, the weight of casting systems can be reduced as much as possible. This reduction in weight is a significant factor in the productivity of foundries. In particular, the use of a service that simulates the completed metal casting processes can significantly save time and money in the development of new types of moulds. A pay-per-use service such as that now offered is a very attractive option for SMEs in this sector. Through the use of an HPC Cloud-based service, design times can be significantly reduced by up to 60%, that is from a week to a couple of days.

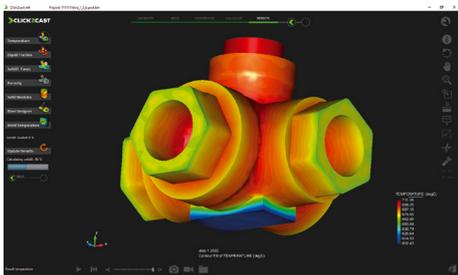
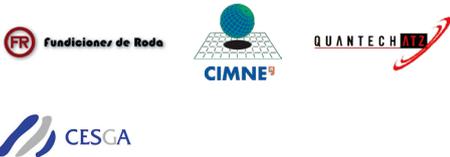
### Fortissimo Experiment Partners:

- Fundaciones de Roda (End-user)
- CIMNE (HPC Expert)
- Quantech (ISV)
- CESGA (HPC Provider)

### More Information:

[www.fortissimo-project.eu](http://www.fortissimo-project.eu)

E-Mail: [info@fortissimo-project.eu](mailto:info@fortissimo-project.eu)



### The Benefits

Through the use of the Click2Cast service Fundaciones de Roda can reduce its annual design costs by €3,200. Furthermore, because of an increase in productivity, it expects to increase its annual revenue by €20,000.

Quantech now offers the only casting design and simulation pay-per-use service in the market. Over the next 5 years, the growth in its business is estimated to be 40%, with a total of approximately 500 new customers by the third year. The additional profit for Quantech per customer, taking into account the cost of compute cycles, is estimated to be €1,000 per annum representing a significant increase in business.

### The Fortissimo Project

Fortissimo is a collaborative project that enables European SMEs to be more competitive globally through the use of simulation services running on a High Performance Computing cloud infrastructure. The project is coordinated by the University of Edinburgh and involves 123 partners including Manufacturing Companies, Application Developers, Domain Experts, IT Solution Providers and HPC Cloud Service Providers from 14 countries. These partners are engaged in 53 experiments (case studies) where business relevant simulations of industrial processes are implemented and evaluated. The project is funded by the European Commission within the 7th Framework Programme and is part of the I4MS Initiative.

**I4MS** Fortissimo is part of I4MS ICT Innovation for Manufacturing SMEs: [www.i4ms.eu](http://www.i4ms.eu)



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 609029.