

## COMPANY

Ironcastings SPA is an Italian foundry specialized in the manufacturing of casting parts in of grey Iron (GJL) and ductile iron (GJS), austempered ductile iron (ADI) .

Our company was established in 2013, and was born thanks know-how built up through more than 60 years' experience, excellent technology and an outstanding team.

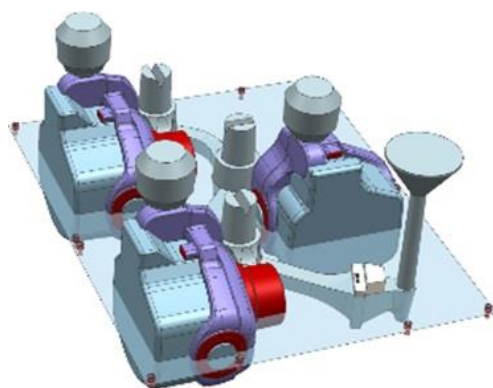
We aim to be single point of contact for our clients, from the design of the component to the delivery of the finished product.

A solid integrated process which take place in our plant in Reggio Emilia allow IRONCASTINGS to offer to the customers a single point of contact for the supply machined, tested and certified cast iron castings.

Our products cover a wide range of industries including truck, wind power, forklift, agricultural machinery, construction, pumps and so on.

The weight of our products go from 10 kg to 250 kg.

## Key success: Highest quality cast iron castings with ProCAST. The IRONCASTING case



## THE CHALLENGE

Produce a knuckle in GJS 500-7 with a weight of 41,5 kg. The dimensions of the flask are 1100 x 900 x 700 mm.

Meet the customer's quality standard by delivering high excellent casts, with complex geometry and tight tolerance. Ironcastings aim to precisely solve residual stress problems predicting and optimizing microstructure, mechanical properties and porosity formation along with maximum efficiency during foundry process (metal yield maximization) leading to production cost reduction, for example reducing weight of cores.

All these goals have been reached without modify the part geometry.

## BENEFITS

- To reduce core weight
- To enhance competitiveness, reduce development time and cost and improve product quality
- Casting/process optimization . Better fit with customer requirements

**IRON**  
CASTINGS

*"It is  
forbidden to  
say I can't"*

**Alberto Albertini**  
Technical & Plant Manager  
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**ECOTRE**  
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TECNOLOGIE D'AVANGUARDIA  
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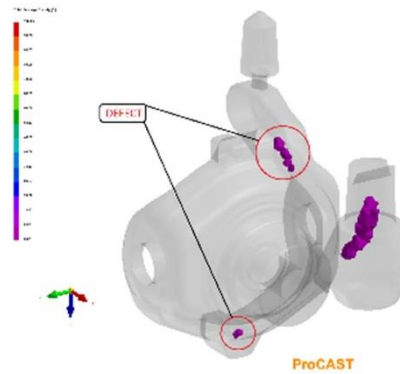
[www.ecotre.it](http://www.ecotre.it)

## HISTORY

Ironcastings produces ductile since 1985, nowadays forms over 85% of its production.

The company choose to bet on ductile iron because is an important industrial materials offering to the design engineer unique combinations of high strength, wear resistance, ductility and toughness. We kicked off with simulating in early 2000 and after 22 years has paid off since quality has become Ironcastings' selling point is quality. Introducing ProCast has been a turning point thanks to its features which allowed us to better express our know how.

## FIRST CONFIGURATION



In this initial step we placed 3 models on the pattern plane. This solution ensured us to reduce porosities in some area where the customer used to have problems but not in definitely manner. Residual porosities have been detected as shown in the image. Moreover, there was a problem due to residual stress. In addition, this solution, useful for feeding the cast, was not optimal for numbers of patterns in the flask and for the productivity. Productivity was 65%. The weight of core 20 kg for each cavity and a net weight of casting of 125 kg.

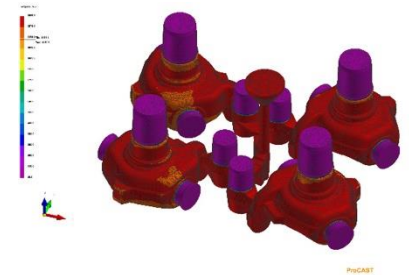
## SECOND CONFIGURATION

We decide to change the pattern plane of 90°. We had a challenger with the feeder system because it was studied in a peculiar way in order to feed the part in strategical points. In this way we could add one cavity (from 3 to 4 cavities), so the productivity rose, net weight of casting of 166 kg.

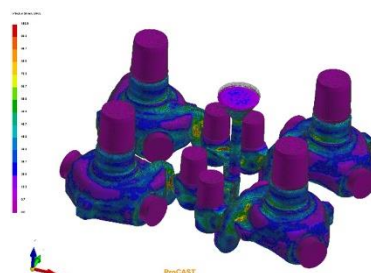
Moreover, the core weight decreased from 20 kg to 1,66 kg for each cavity.

The weight of the core has been reduced by 92%.

The addition of one cavity has allowed us to earning around 0.3€/kg of net weight. We checked this solution using ProCast. After many trials we found the solution for the feeder and solved the porosities pointed out by the customer also. ProCast's previsions was compare with the real sample by Ironcastings quality. The software matches the reality in an optimal manner.



## RESIDUAL STRESS



Another goal reached with ProCast was the residual stress analysis. The customer pointed out some problems due to residual stress. We analysed them and compare with the customer real results. Our studies with ProCast matches with the independent customer experimental data. The error between real results and ProCast predictions was estimated around 10%.