



CASE OF SUCCESS

# Construction of an e-bike motor

The innovation of the **electric motor**  
guaranteed by high-performance die-casting thanks to  
QuikCast and ProCast

Client ECOTRE VALENTE: **PIALORSI STAMPI**

FINAL PROJECT: **E-BIKE POLINI MOTORI**

# AN AMBITIOUS PROJECT

The Ecotre Valente technical team is proud to have contributed to the creation of the ambitious project for an **electric motor** for e-bikes, resulting from the collaboration between Pialorsi Stampi, a company specialised in the design and construction of moulds for use in aluminium die-casting and Polini Motori.

The idea became reality thanks to Ecotre Valente's know-how, developed over a period of **more than 30 years** alongside companies in the metallurgical sector, with its offer of advanced software for the digitisation of the production process and digital sampling of the finished product, accompanied by consulting services for the digitisation of production departments.



# AN AMBITIOUS PROJECT

## THE CHALLENGE

In 2017, Polini Motori asked Pialorsi Stampi's engineers for advice on the construction of an e-bike motor, and more specifically for the aluminium supports to connect it to the bike frame.

The **components** had to have characteristics that would allow them to be welded to each other and to the bicycle frame, and also to withstand an additional final heat treatment.

## THE GOAL

To make two non-porous parts using an alloy with sufficient mechanical properties to withstand the stresses of off-road use.

A technologically challenging request which led Pialorsi Stampi to contact Ecotre Valente's technical team and use **the predictive solutions of ProCAST** for light alloy die-casting.



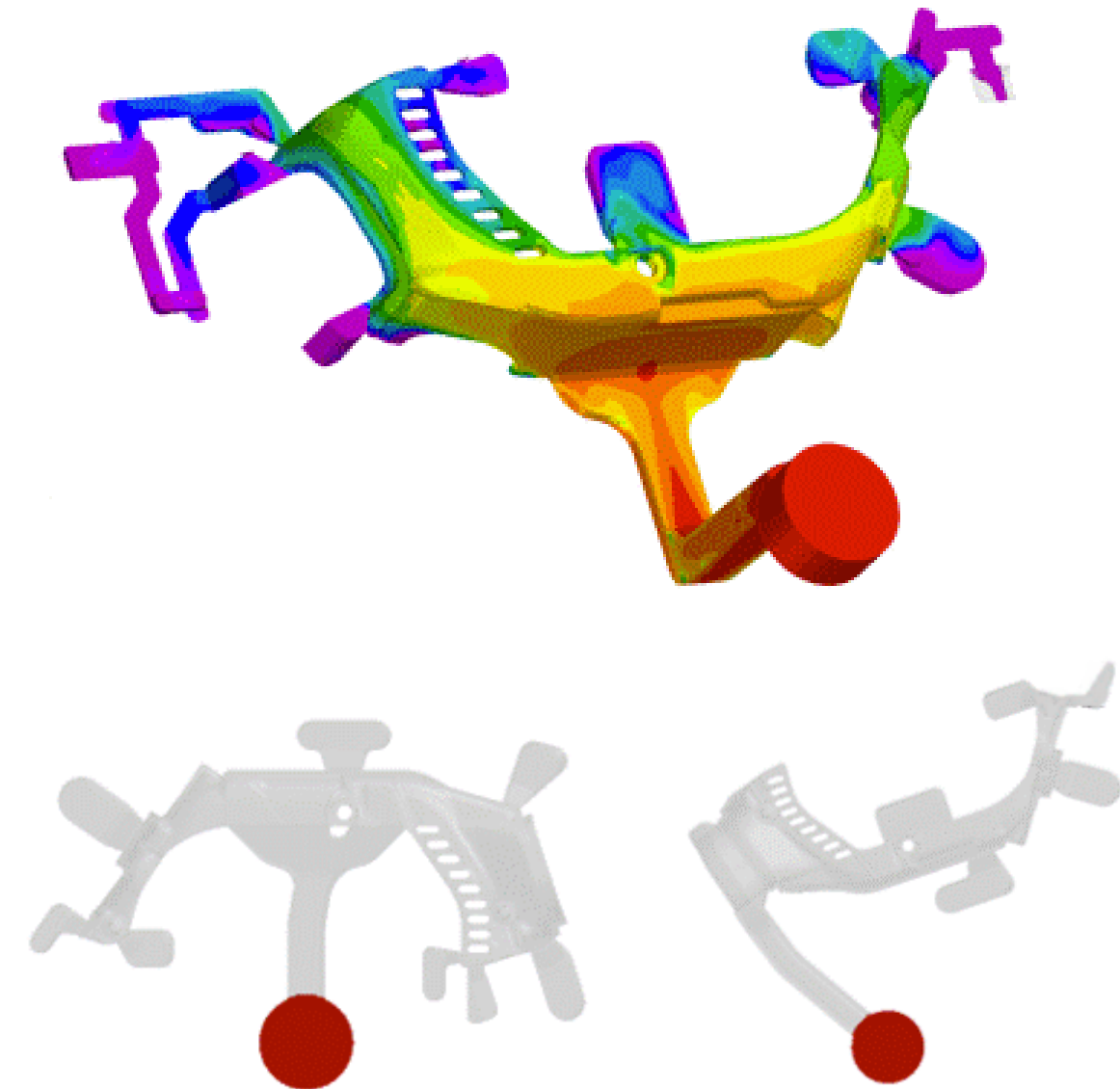
# AN AMBITIOUS PROJECT

## THE BENEFITS

The choice fell on an aluminium and magnesium alloy, better suited to a **T6 heat treatment**, which would achieve the tensile strength and elongation required by the client.

Simulation with the predictive programme QuikCAST allowed the assessment of **three different possible settings for the mould**, offering the possibility to choose the optimal filling arrangement.

Thanks to the identification of potential defects by the **QuikCAST** software, the setting chosen was promptly optimised, adjusting the casting and improving the evacuation using wells. However, it was noted that there were two areas where air became trapped inside the part that could have generated blisters during heat treatment. The decision was made to insert **two vacuum valves**.



**ProCAST**

# AN AMBITIOUS PROJECT

**ECOTRE<sup>®</sup>**  
**VALENTE**  
DIGITAL MANUFACTURING

**polini<sup>®</sup>**  
*trasforma il meglio in massimo*

  
PIALORSI STAMPI



Analysis with the **QuikCAST** tools confirmed the validity of the integration, which also made it possible to decrease the volume of the wells, thereby optimising the total casting cost. After achieving the required quality in the simulations, and designing and building the moulds, the idea was transformed into a **perfectly functioning product**.

# AT YOUR DISPOSAL

Ecotre Valente is always open to new collaborations to **support its customers in the digital transformation of the production department** in order to reduce production time and costs and deliver innovative products that are ready for the market.



THANK YOU!

**ECOTRE<sup>®</sup>**  
**VALENTE**  
DIGITAL MANUFACTURING

PHONE: **030 3365383**

EMAIL: **MAIL@ECOTRE.IT**