

# FAR Uses Simulation to Select the Right Die Casting Machine and Improves Production Rate and Margins

**FAR**  
PRESSOFUSIONI IN ALLUMINIO  
ALUMINIUM DIE CASTING

**ECOTRE  
VALENTE**  
TECNOLOGIE D'AVANGUARDIA



## Challenge

To increase the production of an automotive oil pump, FAR knew they needed to move from a single cavity die to a double cavity die. With this change, they would need to keep costs low yet still produce the highest quality casting possible, with the right die casting machine (DCM).

## Benefits

New functionality within ESI ProCAST allows simulation to account for DCM characteristics. FAR successfully switched from one to two high-quality cavities and engineered a new die design for the right die casting machine at a minimum cost.

## Story

Since 1992, FAR has played an active role in the constantly evolving and challenging automotive sector, with dedication and innovation. FAR's commitment to its clientele is to remain a reliable and proactive partner, leveraging the best technologies, offering their expertise in the die casting process, and ensuring close cooperation for better planning and problem-solving. Therefore, when a customer called on FAR to increase production on an automotive oil pump, it was only natural for FAR to seek out the most cutting-edge and effective approach.

FAR had been successfully producing this automotive oil pump on a single-cavity die using a Colosio 560 tons die casting machine (DCM). When their customer challenged them to increase production volumes, the obvious thought was to switch to a double cavity die. In doing so, however, they would need to keep costs low while, at the same time, maintaining the same high-quality castings. For that reason, choosing the best DCM was imperative.

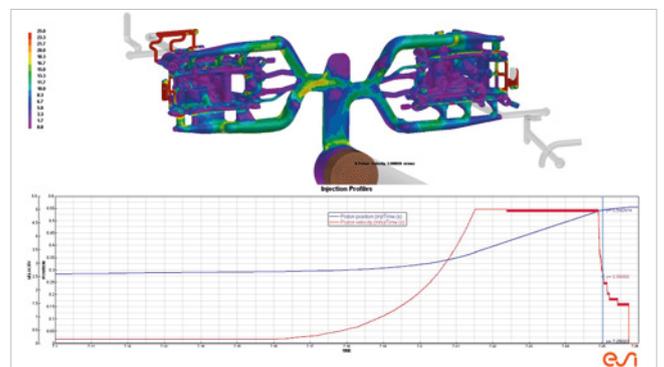
*"Today Casting simulation is mandatory and necessary to reach best quality results including choosing the right tonnage of the machine to reduce costs. Thanks to these results in quality and costs, FAR can be competitive in the market."*

**Gianfranco Lenzi**  
CEO  
FAR srl

The standard approach, using empirical evaluation, showed the necessity to use a 1000t-1200t DCM to produce this oil pump on two cavities – but the challenge for FAR's technical & management teams were to manage with a smaller, more cost-effective 750t DCM. Also, to meet final quality requirements, FAR elected to use High Vacuum on the double cavity die, sharply decreasing air counterpressure during filling, to prevent gas porosity problems and reduce the injection force.

ESI collaborated with its partner ECOTRE Valente SRL to develop a new solution for FAR: a virtualized die casting machine integrated into the ESI ProCAST simulation software to account for the hydraulic injection force of the DCM controlling the piston movement during filling, as it would in real-time. The optimized piston speed profile could then be exported from simulation directly onto the DCM PLC system.

Ultimately, the simulation allowed FAR to optimize the gating and evacuation system of the double cavity die, making it suitable for the 750t machine. The vacuum system further reduced the required hydraulic injection force. With ProCAST, FAR identified the right DCM to produce a prospective cast part, ultimately reducing their parts cost by 28%. In addition to this, an estimated operational cost of 165k€ is saved per year, due to the virtual machine selection of Colosio 750 ton instead of Colosio 1200t machine.



Simulation results using the new real-time Piston Control feature in ESI ProCAST



for more information  
[www.fonderia-far.com/eng](http://www.fonderia-far.com/eng)

