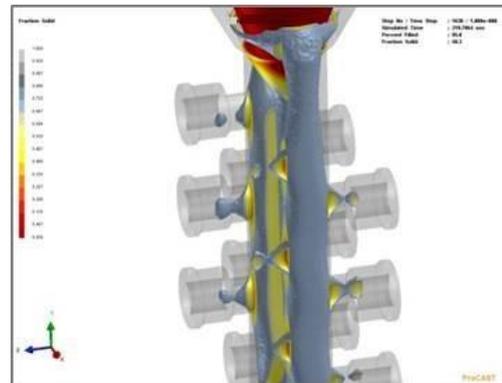


How one Global Materials Engineering Group is Advancing Manufacturing thanks to Virtual Prototyping

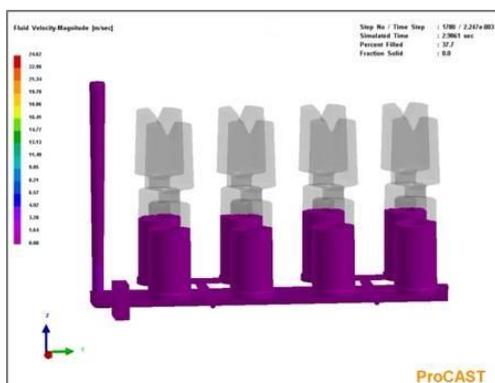
Simulation Tools are having a significant impact on the manufacturing industry. Companies of all sizes are gaining considerable competitive advantage by leveraging the latest simulation tools to optimise their manufacturing process — from design & manufacturing, research & development, to sales and marketing. With the ability to chain simulation results from various manufacturing processes, and to couple multiple domains of physics — such as fatigue and thermal properties for example — Virtual Prototyping is playing an increasing role in today’s advanced engineering. One company making strides in the world of Virtual Prototyping is global materials engineering group Wall Colmonoy.

Based in Pontardawe, South Wales, Wall Colmonoy’s European Headquarters began using ESI ProCAST casting simulation software in 2016, to assist in the design and manufacture of precision cast components – focusing predominantly on investment and sand castings. The software aids in rapid prototyping, design and manufacture of precisely engineered castings such as valve seats for oil & gas, valves for homogenisers in the food industry, seaming chucks and rolls for canning industry, neck rings for glass container, and roll end bushes for the steel industry.



ESI ProCAST solidification model of investment cast seaming chucks for the canning industry. © Image courtesy of Wall Colmonoy Ltd.

Wall Colmonoy’s engineers use ESI ProCAST in conjunction with computer-aided design (CAD) software to streamline the casting process by virtually designing and prototyping before moving into physical manufacturing. This allows for more efficient designs, as engineers can try multiple iterations by virtually simulating shop floor realities – eliminating the need for trial melts and predicting potential manufacturing defects in the cast design to manufacture parts right the first time.



ESI ProCAST fluid velocity model for sand cast roll end bushes in the steel industry. © Image courtesy of Wall Colmonoy Ltd.

ESI ProCAST is an advanced tool which is the result of more than 25 years of collaboration with major industrial partners and academic institutions around the world.

ESI engineer Ronan Cronin, said: “ProCAST is specifically designed to improve casting yield and quality, and it’s been hugely successful in streamlining casting process design for companies such as Wall Colmonoy. More than a thousand companies have adopted ProCAST since it was first developed and every day more and more manufacturers are realising the benefits Virtual Prototyping can bring to the casting process, be it high-pressure die casting, investment casting, shell casting, low pressure die

casting, sand casting, gravity die casting, tilt pouring, or the lost foam process.”



ESI ProCAST software being utilised by one of Wall Colmonoy's Component Engineers. © Image courtesy of Wall Colmonoy Ltd.

“We did a lot of research into the different Virtual Prototyping software companies out there, but for us, ESI came out top as they could provide the best software that met our requirements,” explains Michael Shreeve, Wall Colmonoy's Process Improvement Engineer.

According to Shreeve, ProCAST helps Wall Colmonoy pro-actively perfect its designs and optimise and improve its manufacturing process by allowing for a full coupling of thermal-flow-stress analyses and evaluations of all casting processes including defect detection, residual stresses, part distortion, microstructure, and mechanical properties prediction.

Wall Colmonoy's engineering expertise used together with ESI ProCAST software enables flexibility, process control, speed to manufacture, and ultimately optimal product quality for customers.

Furthermore, ProCAST simulation software will benefit Wall Colmonoy in exploring other markets, including automotive and aerospace as they typically require more intricate components. The materials engineering company looks to add ESI ProCAST to other Wall Colmonoy divisions, including Franklin Bronze Precision Components, located in Franklin, Pennsylvania, USA. Franklin Bronze manufactures investment castings for glass container and many other industrial sectors including food, automotive, drilling & mining, marine, steel, and valve & pump.

In light of increasingly complex part shapes, challenging performance requirements, and the shorter turnaround needed, Virtual Prototyping is proving to be especially effective in casting. More and more metal casting companies, like Wall Colmonoy, are using ProCAST to optimise and more efficiently manufacture metal castings. Moreover, Virtual Prototyping is allowing Wall Colmonoy to broaden their offerings into other sectors not previously explored.

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About ESI Group

[ESI Group](#) is a leading innovator in Virtual Prototyping software and services. Specialist in material physics, [ESI](#) has developed a unique proficiency in helping industrial manufacturers replace physical prototypes by virtually replicating the fabrication, assembly and testing of products in different environments. Today, coupled with Virtual Reality, animated by systems models, and benefiting from data analytics, [Virtual Prototyping](#) becomes immersive and interactive: ESI's clients can bring their products to life, ensuring reliable performance, serviceability and maintainability. ESI solutions help world-leading OEM's and innovative companies make sure that their products will pass certification tests - before any physical prototype is built - and that new products are competitive in their market space. Virtual Prototyping addresses the emerging need for products to be smart and autonomous and supports industrial manufacturers in their digital transformation.

Today, ESI's customer base spans nearly every industry sector. The company employs about 1100 high-level specialists worldwide to address the needs of customers in more than 40 countries. For more information, please visit www.esi-group.com/

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About Wall Colmonoy

Wall Colmonoy is a global materials engineering group of companies engaged in the manufacturing of surfacing and brazing products, castings, and engineered components across aerospace, automotive, oil & gas, mining, energy and other industrial sectors.

Known for our unique proven way of creating superior performing alloys that enhance engineered components, we pride ourselves on long-term strategic customer collaboration that produces value-added ideas and creative solutions. Combining over 75 years of engineering technology with a progressive, visionary outlook, Wall Colmonoy offers customers trusted, customized expertise that results in smart innovation and shared growth.

For more information, please visit www.wallcolmonoy.co.uk

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