

Additive manufacturing of the tank heat shield of the Ducati Panigale V4 R Superbike

Roboze technology on the Ducati Desmosedici GP
and on the Ducati Panigale V4 R Superbike



Technical
Partner

Introduction

Known around the world for its constant research and development of innovative design and cutting-edge technology applied to motorsport, Ducati has been producing sport motorcycles starring in world championships for different market segments since 1946.

Ducati is headquartered in Bologna, Italy, in the Borgo Panigale district. Within it, Ducati Corse is the department that manages the competitions of Ducati Motor Holding S.p.A.'s official teams for the MotoGP and SuperBike championships.

For the MotoGP22 season, Roboze, Technical Partner of Ducati Corse, aims to help the team accelerate the design and production processes of new components, reducing the need for tooling and promoting complex, customized designs.

"Ducati Corse chose Roboze for the wide range of materials available, giving us the opportunity to test the new solutions, significantly reducing the time and costs of the initial development phase. This allows us to solve problems as quickly as possible or try multiple solutions between one test and the next."

Riccardo Savin, Vehicle Dynamics and Design Manager at Ducati Corse



The need for a solution

The world of motorsport is one of the most driving forces for product innovation where the achievement of new performances can make the difference between a first and a second place. Ducati Corse is one of the most active world players in this field, always looking for new ways to expand its solutions with strategic innovations aimed at reaching new goals and improvements for the success of its team. Proof of this is its decades of experience with additive manufacturing techniques, used up to now for rapid prototyping.

Ducati Corse was looking for a new solution capable to help them validate their designs with robust and repeatable 3D printing technology to speed up the design phases of functional prototypes and finished parts while optimizing costs and geometries. The goal was to drastically reduce the time between design and track tests, ensuring mechanically performing parts even at high temperatures.



The solution

As is now well known, the creation of single, or even unique, parts using traditional techniques causes several disadvantages. Initial costs are very high, and production can take significant time. Added to these are design limitations, the difficulty in changing the design iteration after iteration, and the uneconomical nature of producing small batches. All of this for the Ducati Corse team translates into lost opportunities.

To meet these challenges, the Ducati Corse team found the best ally in the Roboze ARGO 500 solution.

"We were aware of the benefits of 3D printing in this area and found in Roboze technology the requirements for precision, repeatability and versatility we were looking for and needed." continues Savin.

Getting the ability to test new solutions with high performance polymers and having the autonomy to be able to validate different geometries in a short time was the key to the success of the collaboration between the two companies.



Case study: tank heat shield of the Ducati Panigale V4 R Superbike

Among the first developments born from the collaboration is the tank heat shield of the Ducati Panigale V4 R Superbike.

The heat shield, that is the element that thermally shields the sensitive parts of the motorcycle from heat sources, is one of the components for which complex geometries and maximum customization are required. It must adapt perfectly to the counterpart to be protected, often tracing its shapes and guaranteeing a perfect coupling.

Being located near the first part of the motorcycle exhaust, which can quickly reach 700°C, the tank heat shield must be made of a material that is particularly resistant to high temperatures, including providing a heat-reflective coating to reduce radiation.

Among the various production processes available for the realization of these components, the one mainly adopted involves the manual lamination of carbon fiber prepregs. The high mechanical and thermal resistance of the material, associated with a technological system that insulates and reflects heat, ensures the performance necessary for the component to be mounted on the motorcycle during the Grand Prix. However, the production process cannot ignore the fabrication of moulds on which to carry out the lamination, entailing production times and costs that are often incompatible with the racing world.

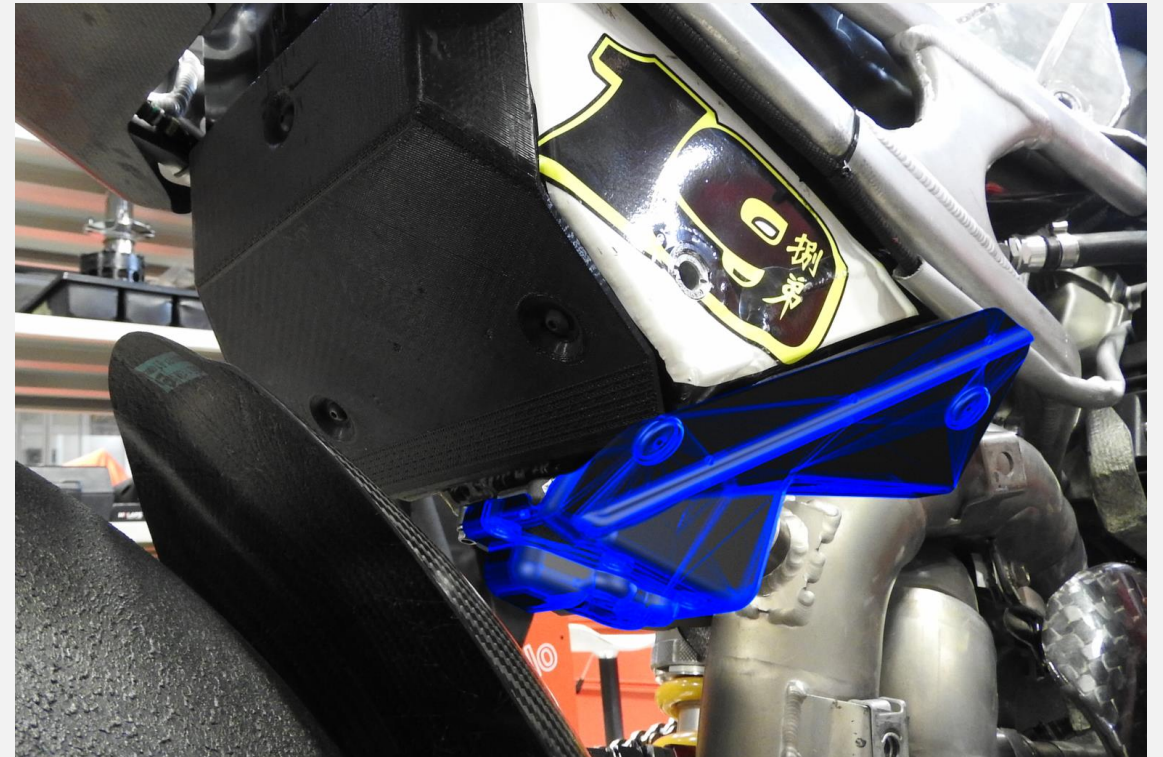


Case study: tank heat shield of the Ducati Panigale V4 R Superbike

Ducati Corse has found in Roboze technology and materials the perfect solution to reduce the development times of these components, facilitating their realization and the test phase on the track.

By realizing the heat shield of the tank in Carbon PEEK with the Roboze ARGO 500, in fact, it is possible to streamline the entire production process, eliminating the tooling phase in the initial stages and validating a new design before proceeding with the final production in carbon fiber - lighter than the printed solution.

Roboze Carbon PEEK is an advanced composite material composed of a 10% reinforced PEEK matrix with chopped carbon fibers. The reinforcement further improves the already elevated properties of the matrix, bringing the thermal resistance (CUT - Continuous Use Temperature) over 250 ° C. The functional prototypes made with this material have been successfully used during all the testing phases, easily withstanding the thermomechanical stresses and promoting the validation process of new designs.



Results

By printing the Carbon PEEK tank heat shield with the Roboze ARGO 500, Ducati Corse reduced development time by approximately two weeks, saving 37% of the estimated costs on all the iterations prior to making the final component.

	Carbon PEEK ARGO 500	Carbon fiber Laminate
Total cost - 2pcs	800,00 €	1260,00 €
Weight	180 g	60 g
Max Temperature	240°C	200°C
Lead Time	1 week	3+ weeks

"The implementation of the technology provided by Roboze will play an important role for Ducati Corse, not only in the production of finished components but also in the design of geometrically complex models, reducing assemblies and allowing the integration of new features into the parts."

concludes Savin.



Reach out to us to learn more:

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