

Project: Developing a Bespoke GRP Fibreglass Enclosure for Advanced Car Scanning Technology.

Introduction

The advent of advanced car scanning technologies has necessitated the development of specialised enclosures that house sensitive equipment, ensuring optimal performance and durability.

This case study explores the collaboration between Quantum Mouldings and the customer's engineering team to design and manufacture a bespoke enclosure using Glass Reinforced Plastic (GRP) fibreglass.

The project focused on creating a cost-effective, stylish, and weatherproof unit that meets the rigorous demands of global deployment.



Background

The primary objectives of the car scanner enclosure project were:



- **Cost-Effective Manufacturing:** Develop a solution that balances quality and affordability, making it accessible for widespread use.
- **Aesthetic Design:** Move away from conventional boxy structures to create a visually appealing unit that reflects the advanced technology it houses.
- **Ease of Assembly:** Design the enclosure for straightforward assembly, reducing installation time and complexity.
- **Weatherproofing:** Ensure the unit can withstand diverse environmental conditions, maintaining functionality and integrity in extreme weather.

Collaborative Design Process

Quantum Mouldings collaborated closely with the client's engineering team to transform conceptual designs into a manufacturable product. Key aspects of this process included:

- **Innovative Design Development:** Departing from traditional, box-like enclosures, the team focused on creating a sleek, modern design that enhances the visual appeal of the car scanner.
- **Integration of Fixing Points:** To accommodate multiple fixing points required for the equipment, drill bushes were incorporated directly into the mould design. This approach ensured precise alignment of holes and significantly reduced the time needed for separate drilling operations during assembly.
- **Component Alignment and Testing:** The enclosure was designed as three separate elements that needed to fit together seamlessly. Rigorous testing and validation processes were implemented to ensure precise fit and alignment, facilitating efficient assembly and optimal performance.



Manufacturing Process

The choice of GRP fibreglass was instrumental in achieving the project's objectives. GRP offers a unique combination of strength, durability, and design flexibility, making it ideal for creating complex shapes and structures. The manufacturing process employed a mix of hand lay-up and spray lay-up techniques:

- **Hand Lay-Up:** This method involves manually placing fibreglass mats into the mould and applying resin, allowing for meticulous control over the thickness and orientation of the fibres. It is particularly effective for areas requiring enhanced structural integrity.
- **Spray Lay-Up:** Utilising a spray gun to simultaneously chop fibreglass strands and mix them with resin, this technique efficiently covers large surface areas and reduces overall production time.

Combining these techniques enabled the production of a complex part that meets stringent aesthetic and functional requirements while remaining optimised for manufacturability.

Outcomes and Benefits

The collaborative efforts culminated in a car scanner enclosure that successfully meets all project objectives:

- **Cost-Effectiveness:** Optimised design and manufacturing processes resulted in a high-quality product that is affordable and accessible for widespread use.
- **Enhanced Aesthetics:** The sleek, modern design sets the enclosure apart from traditional structures, reflecting the advanced technology it houses and appealing to clients seeking innovative solutions.
- **Simplified Assembly:** Incorporating drill bushes and designing for precise component alignment streamlined the assembly process, reducing time and labour costs.
- **Robust Weatherproofing:** The use of GRP fibreglass, combined with foam reinforcement, ensures the enclosure's durability and functionality in diverse environmental conditions, providing reliable protection for sensitive equipment.

About Quantum Mouldings

Quantum Mouldings is a UK-based manufacturer of high-quality GRP components, offering various Production methods to suit a wide range of industries.

With a focus on quality, innovation, and collaborative engineering, Quantum delivers reliable composite solutions tailored to each client's needs.

Specialising in higher volume Production within the following markets:

- Industrial
- Marine
- Renewable Energy
- Leisure
- Healthcare
- Automotive