cobra advanced composites

Carbon Parts BMW R 1300 GS

CAC and BMW Motorrad Develop High-Volume, Out-of-Autoclave, Clear Coated Carbon Fibre Motorcycle Parts for High Volume Production

CAC and BMW Motorrad Develop High-Volume, Out-of-Autoclave, Clear Coated Carbon Fibre Motorcycle Parts for High Volume Production

COBRA Advanced Composites (CAC) has been a supplier of lightweight carbon fibre composite parts to BMW Motorrad since 2016, supplying primarily autoclave consolidated prepreg parts for a number of different motorcycle model platforms. CAC, as a key strategic partner of BMW for composite components, frequently shares open technical discussions with BMW about new projects, including their latest generation Big Adventure Bike (MY2024).

This new model is the premium Adventure product within BMW Motorrad's range. It can be tailored for comfortable long-distance journeys or sporty off-road runs, depending on how its rider specifies it. The challenge for CAC was to develop a high volume production process for the lightweight carbon fibre parts – left and right hand versions of the wind deflector and engine guards that owners can add to the motorcycle as they configure it.

CAC has historically supplied BMW with autoclave processed prepreg parts, such as the M carbon parts it delivers for BMW's premium sportsbike. However, this technology is not economically viable based on the planned uptake of the carbon fibre parts by owners and increased project numbers of 30,000 units and more. BMW already had a material in mind, having selected a carbon fibre sheet moulding compound (SMC) that provided the "chopped carbon" visual effect they desired. CAC had to bring production out of the autoclave, without compromising the surface finishing of the parts that the company is so well known for.

Building the foundations that enable compression moulding to succeed

To deliver their press and mould workstations, CAC partnered with industry leaders MDC® Mould. CAC is world renowned for the exceptional surface finish and coatings it provides for automotive OEMs, MDC® Mould has now supplied the production firepower to significantly increase the capacity for the new adventure bike carbon parts. A pair of 500 ton presses, each running a chrome plated, heated, steel mould, was designed, manufactured and then installed at CAC, providing CAC with a turn-key package ready to output world-class compression moulded parts.

As part of its in-house process flow, CAC has developed a rapid toolbox to define the ply books for the prepreg carbon parts it manufactures. With the new parts sharing a relatively simple geometry, it was not difficult to modify this process for the thicker SMC material. A CNC plotter and high efficiency nesting patterns combine to quickly cut, stack and weigh the SMC plies, with extremely low waste levels, ready for the press.

CAC uses a hot in and hot out moulding process, with the core and cavity moulds kept hot after demoulding the previous part. The moulds are cleaned before a new coating of release agent is added, after which the tooling is closed and reheated, ready to accept the newly assembled preform. Once loaded, the cavity mould closes and a 5 minute consolidation and curing cycle begins before the tool opens and the ejection system releases the parts. This rapid curing of the carbon fibre SMC parts allows CAC to comfortably match the delivery targets for the BMW parts, with additional capacity in reserve for additional demand if required.

Seamlessly moving from press to surface finishing

The accuracy of the SMC tooling closure means that cured and demoulded parts do not require CNC or robot trimming, they move from press to surface finishing after a slight resin flash has been quickly removed by hand. Compression moulding the carbon parts reduces the labour input compared to the lay up of a prepreg autoclave component, with the same surface finishing and coating processes being applied as with Cobra's historic parts. To handle the increased part volumes, CAC has optimised its process flow to manage production through its multi-coat satin finish clear coat operation.

Whilst the techniques for surface finishing are identical, the randomly distributed carbon fibres in an SMC part create a more natural looking surface than the perfectly uniform autoclave consolidated finish of a prepreg woven fabric. CAC has mastered the way in which the resin system works with the tooling surface and the pressing process, delivering perfectly consistent visual carbon parts.

Following inspection and shipment from Thailand to CAC Europe GmbH, CAC's office and parts distribution warehouse in Germany, parts are delivered to BMW and customers are already able to add the CAC parts to their motorcycle when configuring their new vehicle.

Providing automotive OEMs with a powerful range of production options now including out-of-autoclave compression moulding

Compression moulding is an important new technology for CAC. Just like the company's sustainability program adding in flax surface or backing plies to reduce the environmental impact of a part – this new process gives customers another processing option. Faster, more economical, out-of-autoclave manufacturing is now fully productionised at CAC, providing OEMs with SMC parts when project run rates and part design features make compression moulding the obvious choice.

cobra advanced composites

cobra advanced composites

One-Stop Shop for Serial Production of
Strong, Light and Beautiful Composite Products

Tel: +66 38 454 219
Email: info@cobrainter.com

700/478 Amata City Chonburi Industrial Estate,
Moo 7, Donhuaror, Muang District,
Chonburi 20000, Thailand

www.cobrainter.com