Lightweight material application for Aston Martin Rapide

Dow Automotive Systems supplies structural epoxy and polyurethane based adhesive technology from its Betamate product range to the new Aston Martin Rapide. Applications include body structure and panel bonding. The body structure has an extremely high structural efficiency, taking into account strength, torsional rigidity and weight. The joining technology had to provide both rigidity and allow the lowest possible weight to enable advanced handling and agility.

On the body structure, three aluminium types are used: aluminium extrusion, aluminium casting and aluminium sheet anodised prior to bonding. For this application, Dow Automotive Systems' one-component toughened epoxy adhesive, was used because it can bond all three aluminium types. This adhesive technology improves body stiffness, providing significant improvements in handling, ride and crash performance.

For the lightweight body panels, two-component PU adhesives were selected because of their advanced application properties regarding various curing characteristics and non conductivity. Different curing times were a critical component due to the unique hand craftsmanship nature of Aston Martin production techniques.

In terms of mechanical properties, the two-component PU adhesives provide an appropriate ratio between modulus and elongation, required to join dissimilar materials like aluminium, steel and fibre reinforced plastics. Additionally, in order to avoid contact corrosion and provide long term durability for the different materials including aluminium, steel and composites, the adhesive also needed to be non-conductive.

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