

Plastic/Metal Hybrid Using Blow Molding Case Study



Picture 1: Blow Molded Plastic/Metal Hybrid Tube and Beam Structures

Materials Used: DURETHAN® KU2-2140 15Z and Mild 270 mPa·s Carbon Steel

Many current tubes and reservoirs have a primary function of holding or transporting fluids or gases. They do not act as reinforcement to neighboring components.

Plastic/Metal Hybrid technology, an innovation of LANXESS, reinforces tubes and reservoirs for better NVH performance, has fewer attachments to the body (due to increased rigidity), and provides a strong structure for other components to mount to. Typical applications are, but not limited to, structural front-end carriers with integrated washer and radiator reservoirs, car cross-beams with integrated air ducting, bumper beams with integrated energy absorbers for low speed impact and pedestrian safety, etc.

Plastic/Metal Hybrid technology begins when the plastic parison is dropped into the blow molding tool, with the steel insert on the outer wall of the cavity. The parison is then injected with air to replicate the shape of the cavity. This process forces the plastic through the perforations in the insert to form a lock when the viscous plastic cools and hardens. In the case of a car cross-beam for the instrument panel, the weight savings in a minivan proposal could be as much as 40% and cost savings may reach 20%, with no degradation in performance versus an all steel solution.

Advantages:

- Potential cost reduction of up to 20% compared to an all steel component.
- Potential weight reduction of up to 40% compared to an all steel component.
- Plastic/Metal Hybrid technology may provide better NVH performance, has fewer attachments to the body and provides a strong structure for other components to mount to.

As with any product, use of the products mentioned in this publication in a given application must be tested (including field testing, etc.) by the user in advance to determine suitability.



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