

BETABRACE

REINFORCING COMPOSITES



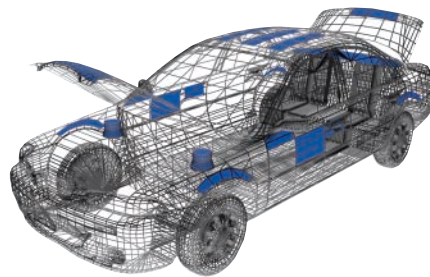
Reinforcing Composites Add Strength Without Added Weight and Cost of Steel Support Structures

Dow Automotive is a global provider of NVH solutions for body-in-white, interior and exterior applications. Our material science and characterization expertise, combined with design engineering, processing knowledge and program management, enable us to provide OEM and tier customers with solutions that meet or exceed vehicle performance targets at lower weight and cost.

BETABRACE* reinforcing composites from Dow Automotive are one of a number of solutions that improve vehicle sound quality by increasing part stiffness.

Designed for use on sheet metal and thermoset surfaces, BETABRACE reinforcements consist of a woven glass mat, adhesive polymer and covering of release paper. Die-cut shapes, in thicknesses optimized for cost and performance, are applied to areas needing reinforcement. The following product grades are approved and specified by OEMs for panel reinforcement:

- ▶ Non-expandable, paint shop applied, low bake
- ▶ Non-expandable body or fab shop applied
- ▶ Expandable, body or fab shop applied



Applications

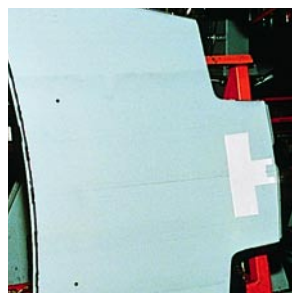
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|--------------|-----------------|
| Shock towers | Tailgates |
| Fenders | Roofs |
| Hoods | Package shelves |
| Side mirrors | Sail panels |
| Door handles | Wheel wells |
| Deck lids | Doors |
| Floorpans | Liftgates |

Product advantages and ROI

- ▶ Exceptional stiffness compared to bare steel and eliminates need to re-tool expensive sheet metal dies
- ▶ Easily adhere to contoured surfaces and can be used on the back side of Class A surfaces without read-through effects
- ▶ Improved flexural strength and distortion, impact and fatigue resistance
- ▶ Increased panel stiffness decreases number of vibrational modes and increases vibration decay rate
- ▶ Reduction of bass boom in certain applications
- ▶ Increased panel damping reduces noise amplitude, e.g. door slam noise dissipates quicker
- ▶ Products enable thinner vehicle wall construction when considered in early design stages



Left: BETABRACE force deflection test.

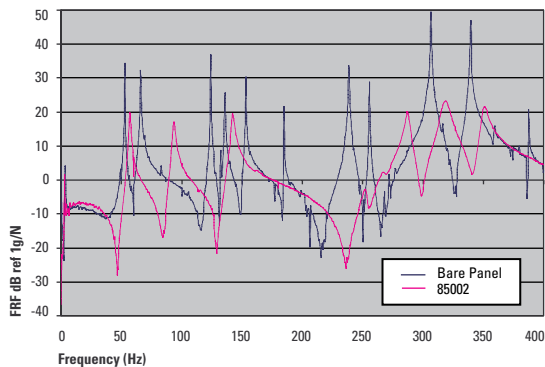


Right: BETABRACE patch applied to hood.

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Impact hammer test results



Increased panel stiffness decreases number of vibrational modes, improving NVH performance of closure panel.

Proof of performance

During an experiment designed to map low rigidity and oil canning in order to evaluate BETABRACE reinforcement feasibility to control oil canning, outer door panels at five customer-specified locations were subjected to quasi-static loading to acquire force deflection curves. Baseline and 1.3 mm BETABRACE test areas included 46 grid points covering the major central surface of the door panel. Results and conclusions were as follows.

- ▶ All 46 grid points surpassed initial stiffness target of 139.90 lbs./in. at all five locations
- ▶ Approximately 88% of average stiffness increase was observed
- ▶ 39 of 46 grid points achieved the deflection target (less than 0.1181 in. at 17.63 lbs.)
- ▶ Approximately 38% of average deflection improvement was observed

Full-service support from a single-source supplier

In addition to the largest selection of material solutions, Dow Automotive offers the following services to support BETABRACE reinforcements:

- ▶ Dow Automotive Technical Service & Development services are offered to ensure proper application techniques
- ▶ Application development and engineering support

Contact your customer service representative, or visit dowautomotive.com for more information. For technical information select "Downloads" on home page and "Technical Data Sheets" on the next page.

We listen. We deliver.



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