

BETAFOAM

STRUCTURAL FOAMS



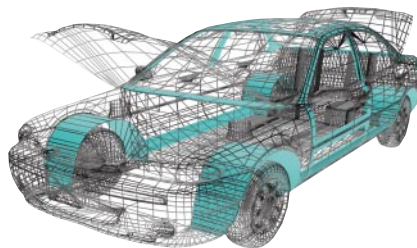
BETAFOAM Structural Foams Optimize Body Structures for Stiffness and Crash Management

Dow Automotive is a global provider of NVH and safety solutions for body-in-white (BIW), 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 to meet or exceed vehicle performance targets at lower weight and cost.

BETAFOAM* classic and low-MDI structural foam products range in density from 5 pcf to 24 pcf. The two-component polyurethane material consists of a polymeric MDI or an isocyanate prepolymer that reacts with a polyol blend or water/amine catalyst to form rigid closed-cell foam that serves the following functions. Higher density foams provide multifunctional benefits due to cavity sealing.



*Structural BETAFOAM
in upper B-pillar.*



Applications

Body-side joints
Rocker/sill panels
Pillars
Underbody cross-car structure
Frame rails/longitudinal structure
Door panels
Engine cradles
Lateral rails
Hydroformed reinforcements

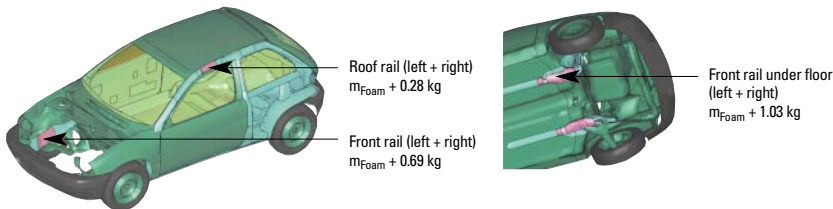
Product advantages and ROI

- ▶ Significantly improved body joint rigidity
- ▶ Higher mass efficiency compared to steel solutions
- ▶ Potential to lower gauge and/or eliminate BIW content
- ▶ Improved performance with net body structure mass and cost savings
- ▶ Design flexibility due to foam filling any cavity shape and contour, and no redesign required after sheet metal changes
- ▶ Low material cost and reduced or eliminated metal tooling cost
- ▶ New low-MDI formulations may relieve ventilation requirements and can be more easily facilitated in assembly plant environments

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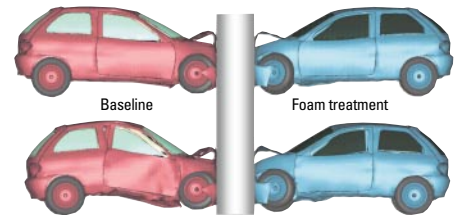
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Application of structural BETAFOAM



Application areas: front rail, front rail under floor, roof rail. Total mass applied: 2.00 kg.

Case study: crash management



Performance comparison - vehicle deformation.
Top: @ 45 ms. Bottom: @ 90 ms.

Case study: weight reduction

In this case, foam treatments can reduce weight by 16.2 kg compared to sheet metal, contributing greatly to BIW weight optimization. Structural BETAFOAM was placed in the following locations at indicated weight.

- ▶ Front rail under floor 1.94 kg
- ▶ B pillar to rocker 0.97 kg
- ▶ B pillar to roof 0.20 kg
- ▶ A pillar to cowl 0.78 kg
- ▶ Total mass 3.89 kg

Full-service support from a single-source supplier

In addition to the largest selection of material solutions, Dow Automotive offers design engineering services including predictive modeling within the vehicle development process, total CAE capabilities with prototype support in all phases, and assistance with foam dispensing equipment specification, training and management of

the complete foam process in the assembly plant. Our experts perform the following services during BETAFOAM material modeling.

- ▶ Employ material characterization data to develop accurate nonlinear CAE material models for use in full-vehicle crash simulations
- ▶ Provide a detailed understanding of BETAFOAM mechanical performance and failure characteristics including foam and steel composite interactions and compressive/bending and strain rate behavior
- ▶ Run concurrent CAE and test activities such as developing material models for static and high-speed impact; testing quasi-static and dynamic bending and compression; and correlating CAE and test results

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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Form No. 299-50613-204 HMG/GG500