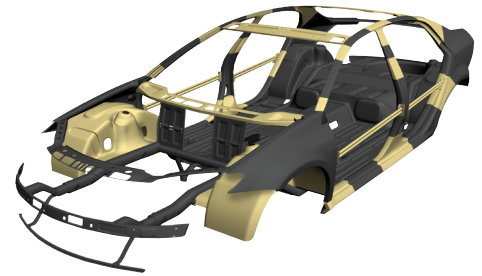




BETAFOAM™ acoustic foams

BETAFOAM™ acoustic foams provide highly effective protection against airborne noise through 3D cavity fill application, **offering superior noise, vibration, and harshness (NVH) performance.**

With superior sealing performance, BETAFOAM™ **lightweight formulations** form robust acoustical seals to prevent noise from resonating in vehicle cavities. The **consistent, secure seal** is industry-leading compared to traditional baffles while being **more cost-effective.**



Typical BETAFOAM™ application areas.

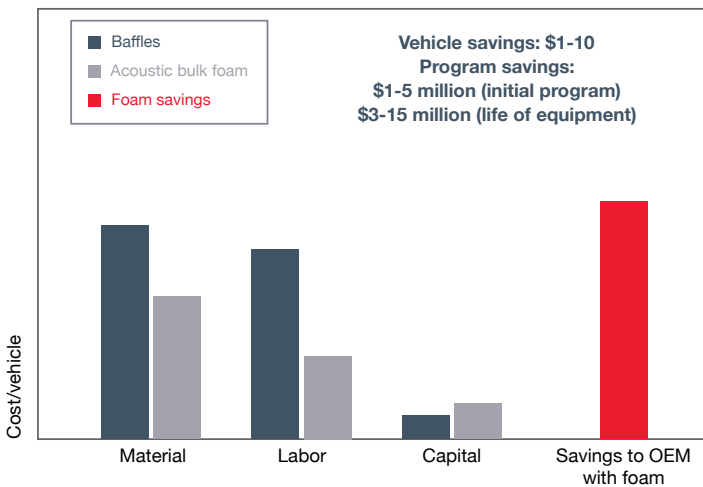
Product benefits compared to traditional baffles

BETAFOAM™	Traditional baffles
Three-dimensional cavity sealing with consistent, reliable, and superior NVH performance	Two-dimension cavity sealing with tendencies to improperly seal, resulting in poor NVH performance
Long-term cost effectiveness with no tooling cost required	Repeat tooling and design investments for each vehicle model change
Design flexibility due to foam filling any cavity and contour, and no redesign required after sheet metal changes	Costly and time intensive redesigns of molds for parts unable to meet changing design needs
Significantly reduce parts inventory with bulk solution	Requires multiple part numbers and logistical oversight for accountability

Looking to the future

Electric vehicles (EVs) create unique NVH challenges and disruptions, like high frequency noises and tones, to the driver experience. BETAFOAM™ is specially positioned to mitigate these factors and even upgrade a brand's offerings unlike traditional baffles. With proven performance in existing EV vehicles, Dow is able to use BETAFOAM™ to offer tailor-made NVH cavity-fill solutions.

Business case studies for BETAFOAM™



Based on models involving mid to high volume auto assembly plants (+250,000 vehicles per year).

We have compared the cost of using traditional cavity-sealing materials and BETAFOAM™ for several vehicle programs. Existing vehicle production facilities have used foam equipment for 10 to 15 years with minimal annual maintenance costs. Savings of \$1 million to \$5 million are possible for the first program using foam for cavity sealing, especially when robotic application is used.

Foam equipment can be used in a plant for multiple platforms running concurrently in production, as well as over several vehicle platforms at a facility. These studies confirm BETAFOAM™ is a cost- and mass-efficient solution compared to baffles.

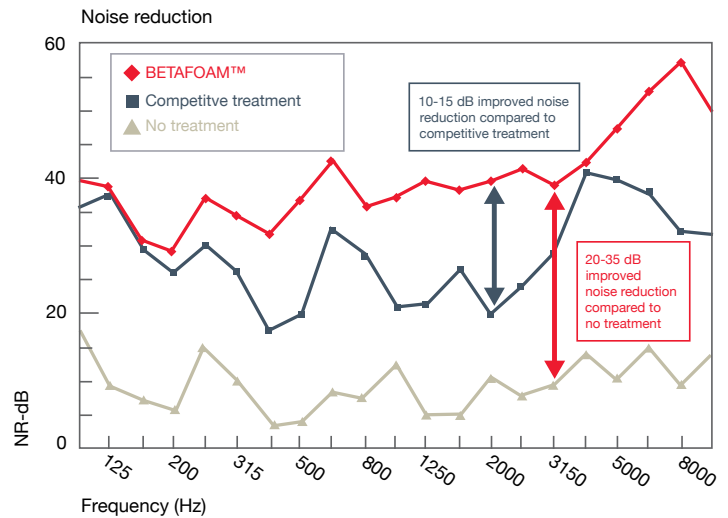
Engineering methodology

ACOUSTIMIZE™, a specialized Dow testing methodology, is used to evaluate the performance of cavity-fill applications and optimize the NVH performance of a vehicle to the driver's ear.

As a result, Dow engineers can use BETAFOAM™ acoustic foam to develop robust sound packages for OEMs and tier suppliers. ACOUSTIMIZE™ studies have demonstrated a component noise reduction (NR) of five to 20 dB in applications using BETAFOAM™ compared to competitive treatments and designs.

Upon replacing baffles in a mid-size luxury vehicle with BETAFOAM™, a body leak test was used to benchmark cavity-sealing performance by measuring the airflow rate exiting cavities under given air pressures. BETAFOAM™ clearly provided excellent cavity-blocking performance compared to baffles, per the following cubic feet per minute (cfm) body-in-white test results.

- Baseline performance: ~115 cfm
- Performance with baffles: ~97 cfm
- Customer target: < 30 cfm
- Performance with BETAFOAM™: < 15 cfm



Example of single-location NR improvement comparing NVH options.

Sealing repeatability study

Material	Mean	Standard deviation
Baffles	34.2 cfm	9.06 cfm
BETAFOAM™	3.0 cfm	1.57 cfm

Note: 25 vehicles were tested using body leak testing procedures at A-pillar. BETAFOAM™ showed significantly improved sealing properties with less variation compared to baffles.

About Dow

Dow (NYSE: DOW) combines one of the broadest technology sets in the industry with asset integration, focused innovation and global scale to achieve profitable growth and become the most innovative, customer centric, inclusive and sustainable materials science company. Dow's portfolio of performance materials, industrial intermediates and plastics businesses delivers a broad range of differentiated science-based products and solutions for our customers in high-growth segments, such as packaging, infrastructure and consumer care. Dow operates 113 manufacturing sites in 31 countries and employs approximately 37,000 people. Dow delivered pro forma sales of approximately \$50 billion in 2018. References to Dow or the Company mean Dow Inc. and its subsidiaries. For more information, please visit www.dow.com or follow [@DowNewsroom](https://twitter.com/DowNewsroom) on Twitter.

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