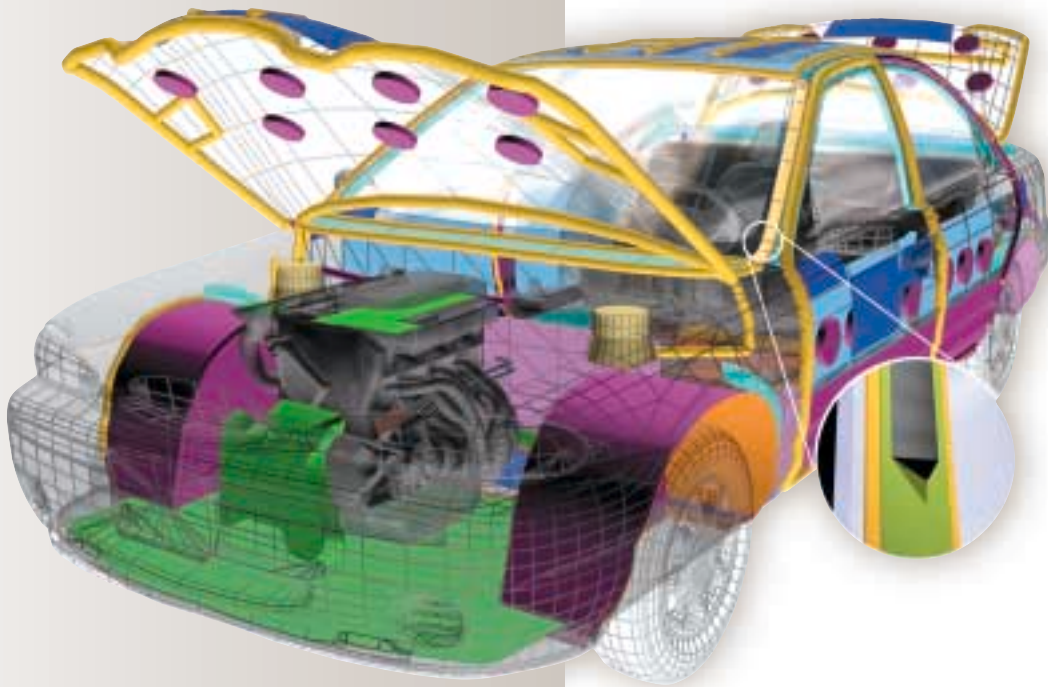




Dow Automotive

Ideas Before Materials. Materials Before Success.



Ideas . . . Start with D o w A u t o m o t i v e

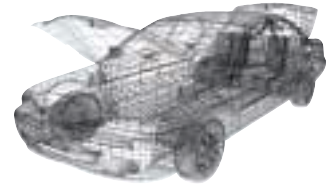
When it comes to capitalizing on great ideas, Dow Automotive is a good place to start. We have a proud tradition of research and development expertise that extends back nearly a century with The Dow Chemical Company's early involvement in the transportation industry. As Dow's first industry-focused business unit, and with the recent integration of Essex Specialty Products, Inc. and its business affiliates including Gurit-Essex GmbH, Dow Automotive has the industry knowledge and the global reach to impact all vehicle segments in the automotive market.

Our Body Engineered Systems expertise exemplifies the concept of taking an idea, optimizing it into a superior material or system and commercializing it for your success—especially for vehicle design and engineering challenges encompassing structural, thermal or acoustical management issues.

And, when considering those issues, we understand that you can't wait until a vehicle is on the road to discover how well its components—or the entire vehicle—performs. Consumer demand for vehicles that are safer, quieter, more durable and less costly continues to drive innovation in the industry. So, now more than ever, reactive solutions to problems not anticipated in the design and prototype phases of vehicle development can be costly both in dollars and reputation.

Dow Automotive's broad knowledge in predictive analysis, engineering, testing and parts design, coupled with expertise in injection molding, polymer science and product development, helps us take structural enhancement and thermal and acoustical management ideas from concept to assembly line.

Ideas



Materials...the Next Important Step



Dow Automotive has provided the broadest product portfolio for plastic applications in the automotive industry for a number of years. Now, with the integration of Essex and Gurit-Essex we have added nearly 40 years' experience with the formulation, production and distribution of superior adhesives, sealants, structural and acoustical products and systems.

This materials expertise has strengthened our ability to match great ideas with achievable outcomes. It has given Dow Automotive:

- The capability to increase vehicle structural integrity without added weight and cost
- The ability to provide thermal management solutions for vehicle occupant comfort in all cabin climate environments
- The possibility to acoustically seal the entire vehicle

Materials

These are among the ideas that have driven the development of our innovative Body Engineered Systems supported by multi-functional materials, products and systems.



BETABRACE*
reinforcing composites



BETADAMP*
acoustical damping systems



BETAFOAM*
NVH systems





● *Structural enhancement*

Vehicle safety continues to be a critical issue at all levels of the automotive supply chain—and consumers are constantly watching for improvements as they spend more and more time on the road.

Our Body Engineered Systems include a number of innovative materials that improve vehicle structure without adding weight or significant cost. In fact, in many instances Dow Automotive can help decrease both weight and cost by engineering materials solutions that enable thinner vehicle wall construction and reduced steel support structures and mechanical fasteners.

For example, we formulate high-density foams for injection into vehicle cavities to improve stiffness and impact resistance. Our structural adhesives stiffen all areas of the vehicle and add to overall durability by reducing fatigue and failure of spot welds and other traditional fasteners. And, our glass bonding systems make the windshield and backlite an integral part of vehicle structure and meet FMVSS requirements for rollover and roof crush.



BETAGUARD*
sealants



BETAMATE*
structural adhesives



Injection-molded
Dashmat



ECOSORB**
sound absorber materials

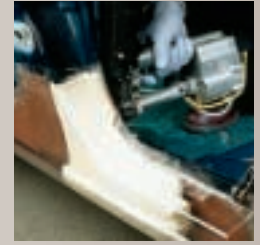


- *Thermal management*

What Dow Automotive is doing in thermal management is a good example of taking existing expertise and applying it in an innovative way to create a customized solution. In addition, we have the ability to draw on the cooperation of other internal and external resources to find new ways of addressing thermal management.

We have long been aware of the sealing and insulative properties of our foams, sealers and dampers as they impact acoustical management. Customized formulations of these materials also have the ability to impact a vehicle's cabin temperature environment. And, our years of glass bonding experience have enabled us to intimately understand how the amount of glass in a vehicle contributes to heat loss and retention.

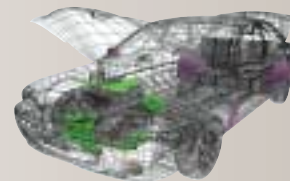
Once cabin temperature issues have been addressed, it is possible to optimize HVAC and other powertrain components accordingly, thus leading to a more fuel-efficient vehicle. Dow Automotive, with its professionals dedicated to chassis/powertrain application development, its resources at The Dow Chemical Company, and a recent joint development agreement with a major Tier One Integrator, is uniquely positioned to address your thermal management challenges.



- *Acoustical management*

In addition to consumer peace-of-mind derived from improved vehicle safety and occupant comfort needs addressed by thermal management solutions, vehicle owners are becoming more in tune with the desire for a quieter riding experience.

Dow Automotive provides Body Engineered Systems solutions that address structure-born, engine and road noise. Low-density foams can be injected into pillars and other vehicle cavities to act as reliable acoustical seals. Sprayable dampers help block road noise while also acting as corrosion-resistant underbody coatings. Injection-molded dashmats that go between the engine and the cabin, effectively reduce engine noise intrusion into the passenger compartment. In addition, injection-molded engine covers further reduce engine noise. Structure-born noise is reduced by using structural adhesives on vehicle hem flanges and along weld lines to limit vibration caused by mechanical fasteners and spot-weld fatigue.



Injection-molded barrier assemblies



BES Product Matrix

Body Engineered Systems provide complete integrated solutions supported by a full line of multi-functional materials, products and systems that address body structure enhancement and thermal and acoustical management.

Products

BETABRACE* reinforcing composites

Consists of a woven glass mat, adhesive polymer and release paper for use on sheet metal and thermoset surfaces

Applications

- Applied in fab, body, or paint shops to reinforce shock towers, fenders, hoods, side mirrors, door handles, deck lids, floorpans, tailgates, roofs and package shelves

Benefits

- Improves distortion resistance, flexural strength, impact resistance and fatigue
- Benefits realized without added weight and cost of steel support structures

BETADAMP* acoustical damping systems

Composed of sprayable, vibration-damping coatings; low-density, expandable, impact-absorbing coatings; pressure-sensitive constrained layer dampers (butyl rubber laminated to aluminum)

- Applied to underbody and floorpan with industry-standard production equipment

- Chip- and corrosion-resistant coating systems optimize cost, weight, acoustical performance on existing and new vehicle platforms
- Constrained layer dampers dissipate the vibrational energy of the sheet metal to which it is adhered

BETAFOAM* NVH systems

Low-density, injectable formulations for high-performance acoustical seals

High-density formulations for structural components

Low-MDI formulations (with relieved ventilation requirements) for application in post-paint or general assembly

- Injected into vehicle cavities including pillars, rocker panels, roof rails to form reliable acoustical seals and/or manage impact forces in frame structures

- Acoustically seals to prevent noise from resonating through vehicle cavities
- Improved body rigidity and crashworthiness
- Overall weight reduction, since BETAFOAM may allow for thinner vehicle cavity wall construction

BETAGUARD* sealants

Body, trim, paint shop sealers

- Anti-flutter sealant between inner and outer body panels
- Interior sealer for floorpan area and engine and truck compartments
- Exterior sealer for underbody seams and hood, deck lid and door hem flanges
- Underbody and anti-chip coating

- Protects passenger compartment from moisture, dirt, dust, fumes
- Reduces vibration to help improve vehicle acoustics

Products

BETAMATE* structural adhesives

Replace welds and mechanical fasteners in joining a variety of similar and dissimilar substrates

Applications

- Door, hoods and deck lid hem flanges
- Weld joints in engine compartments, cockpits, roof panels
- Rails and other load-bearing members
- Bonds structural headliners directly to roof

Benefits

- Reduces fatigue and failure commonly found around spot welds and fasteners
- Seals against environmental conditions that cause corrosion
- Reduces vibration by stiffening overall vehicle structure, so acoustics may also be improved

BETASEAL* glass bonding systems

Used worldwide for structural bonding and sealing of stationary glass; new technologies include primerless-to-paint, non-conductive, high modulus, "fixture-free" adhesives, one-step glass primers

- Windshields, backlites and quarter glass for passenger vehicles, trucks, buses, rail coaches, off-road vehicles

- Help vehicles meet Federal Motor Vehicles Safety Standards (FMVSS) requirements for barrier, rollover and roof crush regulations

Dashmats

Injection-molded cabin-side barriers

- Cabin-side barriers between engine and passenger compartment

- Prevent engine noise from intruding into vehicle
- Assembly aids and integral fasteners are designed into the part
- Molded in dead pedal, electrical wiring channels and pockets

EcoSorb sound absorber material**

High-performance, lightweight material composed entirely of meltblown polypropylene with no binders, which can be die-cut or thermally molded to shape

- Behind any interior trim panel, door panel, headliner or on package shelf
- Under-the-hood environments to 300°F

- Fine microfiber structure helps achieve superior sound absorption performance in the critical middle frequency ranges
- Material is clean, dust-free, non-irritating and completely recyclable

Injection-molded under-the-hood barriers

Injection-molded barrier assemblies

- Under-the-hood noise shields
- HVAC, transmission, timing belt and engine covers, often used with sound absorption materials for enhanced acoustical capability
- Additional barrier assemblies can be utilized on fenders and wheelhouses

- Reduce engine and transmission noise at the source

Success... from Start to Finish with Dow Automotive

Starting with great ideas and following through with innovative materials is only part of Dow Automotive's overall offering. It's the ability to optimize solutions through extensive technical capabilities and the desire to work cooperatively with our customers, and all resources at our disposal, that enables us to achieve success—for you, and for us.

We are happy to work with you at any level you desire—from a simple materials purchase decision to a relationship that utilizes our full-service supplier capability. However, Dow Automotive believes that the more things we can take off your hands adds to our overall value to your organization.

From design through product launch, we can support you by developing the technology, systems engineering and product support to satisfy current and future vehicle programs. Extensive in-house capabilities for FE predictive analysis (from your downloaded design data or from our own designs), CAE and CAD, as well as other testing and validation technologies, allow us to evaluate the impact of our materials and systems in simulated and actual driving conditions.

Dow Automotive also provides program management and engineering expertise to assist in program implementation. On-site support at your facilities, along with support from our internal functional groups (engineering, quality, manufacturing engineering, cost estimating, purchasing, customer service, etc.), assures you that our products and systems will meet or exceed your design and engineering requirements. In fact, Dow Automotive has the capability to provide turnkey systems—working with you from week 200 to Job One.

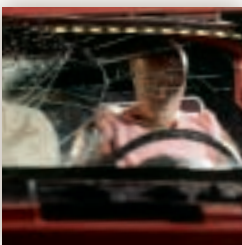
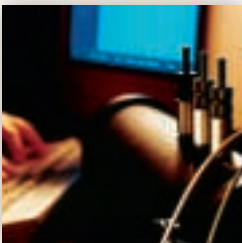
We can:

- Identify need, challenge or opportunity
- Engineer, test and validate a solution
- Specify, optimize or develop a material (from a material-neutral position—either our material or another supplier's—we will specify the best material for the application)
- Handle logistics—all the way from raw materials at a tank farm to containers and transport to your facility
- Design dispense equipment and manufacturing surroundings relating to process
- Support production startup
- Manage supply chain

Moreover, we can provide consistent, aligned resources to you on a global basis. Through facilities in nearly 40 cities on six of seven continents, Dow Automotive provides R&D, manufacturing, sales and marketing and field service support worldwide.

From great ideas to materials and systems solutions that ensure our mutual success—Body Engineered Systems from Dow Automotive are a good place to start to address structural enhancement and thermal and acoustical management opportunities. Challenge us—anytime, anywhere.

We're Dow Automotive. Throughout the vehicle. Throughout the world.







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