We first showed you Dynamat's Dynaliner Coupe back in TR/#32 as part of our faux feature on this faux racer. But here it has relevance as an illustration of how various Dynamat insulation products are used in most hot-rod applications. Dynamat founder, Scott Whitaker, suggests that Dynamat Xtreme be applied to the inside of all interior panels and that it then be covered with a layer of Dynaliner. On the cut-away coupe the Xtreme is identified by its shiny aluminum backing while the Dynaliner has a black foam surface. The Xtreme is primarily an acoustic insulator while the Dynaliner blocks both noise and heat.

Dynamat
A Sound Foundation
Climbing inside a well-tuned hot rod or custom, there’s usually a sense of sturdiness that is inherent in the car’s construction. We surround ourselves with heavy-gauge steel held together by painstakingly restored latches and hinges and gaskets and brackets. And it all comes together when the door to that time machine is pulled shut with a solid thunk. Or does it?

Chances are if you are reading this, you have either had some experience with automotive insulation and sound deadening or you’re considering it for your project. For hot rodders, the Dynamat brand has become synonymous with the acoustic control and insulation technology available for our cars, so when we decided to take a closer look at that technology we turned to them for some insight. Before we discuss the specifics, however, an explanation of the theory behind the technology may be helpful.

Cars are noisy. The vast expanses of sheet metal that come together to form the body are all highly resonant, possessing the ability to produce and perpetuate a substantial amount of ambient noise within the cabin of a car. Add to that the sounds of the road
humming beneath the tires, a rumbling engine, and wind noise at seventy miles per hour and you’ve got yourself quite a commotion. Now some of these elements are music to our ears; we spend a great deal of time assembling engine and exhaust components, for example, to create the perfect exhaust note. The last thing we want to do is shut that out. But there’s a big difference between the aural aesthetic of a hot flathead and the buzzing, rattling, and humming of a poorly insulated hot rod. It’s that unwanted ambient noise that has been linked to driver fatigue and generally detracts from the enjoyment of cruising in an old car. That’s where sound damping and insulation products come into play.

Sound damping relies on the premise of viscoelasticity to reduce noise and vibration. When a damper is adhered to metal body panels, it moves with the vibration of the panels and then returns to its original shape at a slower rate, dissipating that noise-producing vibration as a very low-grade heat. The mass of the material also reduces the panel’s resonant qualities beyond the range that is typically audible. This used to be accomplished through the use of asphalt-based dampers, but they were unnecessarily heavy and their composition broke down under the conditions they were exposed to in automotive applications. Companies like Dynamat recognized those limitations and moved on to develop dampers made with butyl, a synthetic rubber that can be found in everything from inner tubes to chewing gum. These materials have excellent sound-deadening characteristics while remaining stable under the extreme conditions that we expose our cars to such as heat and moisture.

These developments didn’t happen overnight though. Dynamat founder Scott Whitaker is a self-professed lifelong car guy with a healthy interest in—and talent for—marketing. Working as a product manager for an auto paint and hardware company, he spent a good deal of his spare time modifying cars. In Scott’s quest to make his personal vintage projects feel more like new cars, he researched ways to dampen sound and create a tighter, more solid-feeling ride. The more he learned, the more he recognized an opportunity to sell these damping products to other builders. The marketing side of his brain told him the product had to be based on a flexible sheet. That way they could not only easily conform to any interior, but could also be easily rolled up and packaged. He found a manufacturer that was able to produce the sheets to his specifications, and in 1989 Dynamic Control of North America, Dynamat’s parent company, was born in Hamilton, Ohio, just shy of twenty-five miles north of Cincinnati. Initially the product was a tough sell to hot rodders, so Scott focused on the car audio industry. This was a good fit because these products not only reduce the ambient noise you don’t want in your car’s cabin, they also improve the quality of the sounds you do want. Builders like Chip Foose and Troy Trepanier were incorporating modern sound systems into the high-end street rods they were turning out, and both began using Dynamat products. These relationships eventually lead to Dynamat gaining a foothold with hot rodders.

Although Dynamat offers a wide range of materials shown here are the most popular for typical rod and custom use. Dynamat Xtreme (above) is an aluminum backed butyl sound insulator that seems to have become ubiquitous in the hot rod world. But Scott Whitaker tells us that in order to get the full benefit in both sound and heat insulation a second layer of Dynaliner (above left) should be applied. It is available in a variety of thicknesses with the thicker versions providing more of a thermal barrier. But under carpet a thinner version may be all that is practical. Becoming increasingly popular with traditional rodders is the DynaDeck (below left), which looks much like the rubber floor mats that used to be standard equipment on many cars. It is in fact a vinyl barrier over waterproof thermo-acoustic foam and takes the place of carpet in most installations. In this photo, the DynaDeck sits on a small piece of DynaPad, which is a composite barrier material with a urethane top facing. Both the Dynaliner and Dynamat Xtreme are self-adhesive while the DynaDeck and DynaPad are not.
Over the next two decades, Dynamat has developed an extensive product line that reaches beyond hot rods into the world of architectural, OEM, and even computer insulation. We are most concerned with three main product lines within their automotive focus, Dynamat Xtreme, Dynaliner, and DynaDeck, because these are the materials that are most commonly employed and provide the greatest benefit to our cars.

Dynamat Xtreme is the sound damper and is the most commonly used and referenced product in the line. It is constructed from a self-adhesive layer of .060” rubber with a .004” aluminum backer that is designed and recommended to be installed on every metal surface within the car, floor to roof, hood to trunk. The version available today is actually the fifth-generation of the product. Improvements since its introduction have lead to a thinner, lighter, and more efficient damper. Weighing about .45 pounds per square foot, an average installation using one hundred twenty-five square feet of material adds roughly fifty six pounds to the car. That’s the equivalent of about nine gallons of gas.

Dynaliner is the thermal and acoustic insulating layer that is applied over top of the Xtreme layer. Also a self-adhesive material, it is comprised of a closed cell foam that acts as a barrier against heat and additional unwanted noise. Just as Dynamat improves sound quality inside the car while working to keep unwanted noise out, Dynaliner positively impacts the effectiveness of the climate control inside while keeping the excess heat below the floorpans.

Installation of the materials is relatively straightforward, and the type of vehicle being insulated doesn’t impact the method of installation, be it a stripped down ‘32 Ford or a mile-long chrome-laden ‘59 Cadillac. Incidentally, even roadsters will benefit from the sound damping and insulation; despite the obvious environmental noise, having a body that doesn’t contribute additional audible vibrations makes a significant difference. In any case, surface preparation borders on the obvious: everything must be solid and rust-free. What’s not so obvious is that Dynamat can actually serve as a coating over bare metal. While we can’t imagine leaving any interior surfaces unfinished in a finished hot rod or custom, both Dynamat Xtreme and Dynaliner are moisture barriers that will not absorb or hold water. Corrosion and mildew are not a concern.

In the spirit of the “measure twice, cut once” mantra, owner Scott Whitaker recommends using cardboard or kraft paper to create templates that can be test fit before being transferred to the Dynamat. Sheet sizes for Xtreme range from 10’x10” to 24’x48”, so having some idea of how to arrange and trim those pieces in advance will minimize waste and maximize economy. It will also hopefully mean less need to re-position the material once its been applied; while it can be repositioned to some extent, the adhesive is quite aggressive and doesn’t leave much room for error.

Dynaliner is also a self-adhesive sheet, so installation over top of the Xtreme layer isn’t much different. The main difference is the variation in the thickness of the material used. Dynaliner is available in ¼”, ⅛”, and ½” thicknesses, with the ½” offering the most insulation. Not all areas will allow for ½” thick insulation under the carpet however, so one installation may employ all three thicknesses in various locations.

For those of us who may want to incorporate the simple look of plain rubber mats in our hot rods, Dynamat offers an alternative to the Xtreme/Dynaliner/carpeting combination in their DynaDeck product. The material is comprised of a thin embossed vinyl grain barrier mated to ¼” Dynaliner and is simply laid in place on the floors of the car with no adhesive. It is intended to be used over top of a layer of Xtreme, but is often found installed over the steel floors with no additional damper.

Research and development within the sound damping and insulation industry is an ongoing exercise. As with many aftermarket products, Dynamat has recognized the advantage that vehicle-specific kits offers to their customers, and they currently offer pre-packaged solutions for certain year muscle cars along with Corvettes and tri-five Chevys. Whatever the application, sound dampers and insulation certainly give any hot rod or custom enthusiast the ability to improve their ride quality and get more enjoyment out of their cars.