

3M *Holding Fast*

High Performance Solutions for the Automotive Aftermarket

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Changing Automotive Materials 3M Stays Ahead of the Trends

North American original equipment manufacturers (OEMs) are implementing significant changes in the materials used for automotive interior door and trim panels. These substrate material changes will affect automotive aftermarket interior trim manufacturers as well as the tape and adhesive suppliers who provide attachment systems to secure the trim. The coming years will see significant growth in the use of TPO (thermoplastic polyolefin) as a replacement material for ABS used in the manufacturing of automotive interior trim components.

The Office for the Study of Automotive Transportation, University of Michigan, Ann Arbor, predicts that TPO use for interior door trim panels will increase from a 1998 level of 35% to 65% by the year 2007. The study also projects that TPO will comprise 75% of all other interior trim panels by the year 2007, reflecting a gain of 25%.

Why the Change?

According to Dale Stewart, technical service specialist for the 3M Automotive Division, vehicle manufacturers prefer TPO for a variety of reasons. "TPO provides better impact resistance and durability than ABS. The material is easier to process because it can be blow-molded rather than injection-molded, which lowers processing costs and saves time. TPO is also easier to recycle and therefore a better choice in terms of environmental impact."

The use of TPO offers increased design flexibility over ABS and PVC/ABS alloys because the material allows for deeper draws. Stewart explains, "TPO can be blow-molded, thermoformed or heat-formed, and one can achieve a more

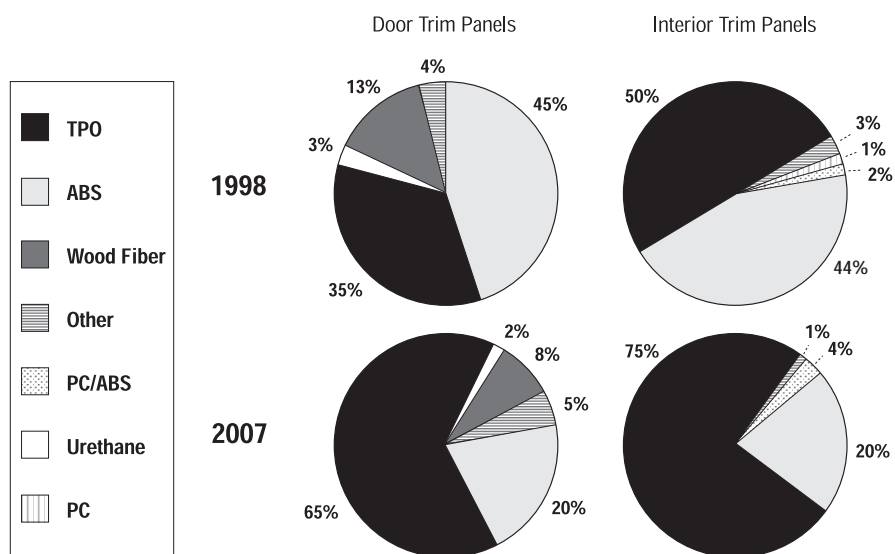
contoured effect without deforming the material." This is especially important in light of the trend toward highly complex lines and contours in today's vehicle interiors.

The significant drop in petroleum prices over the last several years has resulted in lower prices for TPO. "OEMs have been aware of the added benefits of using TPO for many years, but until recently the high prices restricted them from changing to this material," said Stewart.

Change Brings Challenge

The chemistry of TPO presents challenges to the bonding effectiveness of conventional adhesives, posing greater demands on automotive attachment tapes. "TPO

Materials Outlook for North American Automotive Interior Applications



Source: Office for the Study of Automotive Transportation, University of Michigan, Ann Arbor

These pie charts demonstrate the predicted change in automotive interior trim materials usage by the year 2007. 3M™ Primerless Acrylic Foam Tape 5568 was developed to provide unmatched adhesion to TPO and many other plastic materials without the use of an adhesion promoter or primer.

is a low surface energy plastic and has a slippery surface similar to the Teflon® coating used on some cookware, making it increasingly difficult to achieve a secure and permanent adhesive bond,” said Stewart.

Challenge Brings Results

3M™ Acrylic Foam Tapes from 3M’s Automotive Division have been designed to withstand the challenges presented by low surface energy plastics. Stewart explains, “The tape’s closed-cell foam core and specially formulated adhesives maintain holding strength to these hard-to-bond-to surfaces for superior adhesion and long-term reliability. The tape provides excellent wet-out on low surface energy and textured substrates, meaning that the adhesive will flow and bond with the surface extremely well. Proper cleaning and the appropriate use of 3M™ Adhesion Promoter 4298 in combination with our pressure-sensitive acrylic foam tapes results in a permanent bond.”

It has traditionally been difficult to dependably adhere parts to low surface energy plastics such as TPO without first priming the surfaces. The introduction of 3M™ Primerless Acrylic Foam Tape 5568 makes the adhesion of these parts to TPO easier and faster than ever before. With the priming step eliminated, interior trim installers can save time and avoid the risk of damage to interior vehicle surfaces from primer spills or misapplication.

“We have seen increased use of TPO by OEMs on exterior trim components as well, especially for wheel flares, claddings and body side moldings. The primary reason for this change is the lower per-pound cost of TPO compared to alternative materials. OEMs also select TPO for exterior parts because it weighs less than many other plastics, thereby improving fuel economy,” said Stewart.

The 3M Automotive Division maintains consistent contact with OEMs in order to offer the aftermarket appropriate products and information in this changing market. 3M has the experience and invests the necessary R&D resources to stay ahead of product design and advanced material changes in order to provide superior, reliable attachment solutions for all of the automotive market segments it serves.



This 1999 Saab 93 convertible features a burled walnut dash kit from Spectrum Accessory Distributors, installed using 3M™ Primerless Acrylic Foam Tape 5568 for permanent attachment without the use of adhesion promoter.



The OEM wheel flares on this 1999 Dodge Durango are made from TPO and attached with 3M™ Acrylic Foam Tape. The chemistry of TPO material challenges the bond of traditional adhesives, but 3M acrylic foam tapes are designed to maintain superior bond strength despite the challenges presented by TPO.

Photo provided by A&A Specialties, Ontario, California, who manufactured the ground effects shown on this vehicle.



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