

# Quieter rides

Cell phones, high-end stereos, satellite radios, navigation systems, CD and DVD players. No, it's not necessarily the inventory at your local consumer-electronics store. These are just some of the audio-related devices used in cars today, and surely these and others will be staples in the car of tomorrow.

As a result, automobiles will have to become significantly quieter, keeping the noise out so passengers inside can enjoy the latest advances in communications and entertainment technologies.

A 2004 vehicle acoustic study done by **J.D. Power and Associates** confirms that quietness—long associated with a vehicle's overall quality and performance—continues to be a primary consumer desire. In fact, the drive to eliminate sound from entering the passenger compartment has reached such levels that automobile manufacturers are featuring their acoustic performance in television commercials, proof positive that technologies leading to a quiet ride can help make noise in dealer showrooms. The J.D. Power report supports the concept that consumer expectations for quietness are anticipated to increase.

To meet this need, automotive suppliers are racing to minimize noise by damping vibrations and blocking sound from entering the passenger cabin. For example, advances in technology have produced laminated, cold-rolled steel held together with elastic polymer cores, thus reducing noise levels from vibration. Other suppliers, meanwhile, are addressing the noise generated by HVAC systems and transmitted through instrument panel vents. Even the carpet in the passenger compartment can be tuned to block noises at certain frequencies.

To reduce unwanted noises, **PPG Industries** has developed a series of acoustic glass and coating solutions while continuing to lead research into innovations that will make the car of tomorrow even quieter.

In most vehicles, windows provide a significant pathway for noise to enter the passenger compartment. To prevent this,

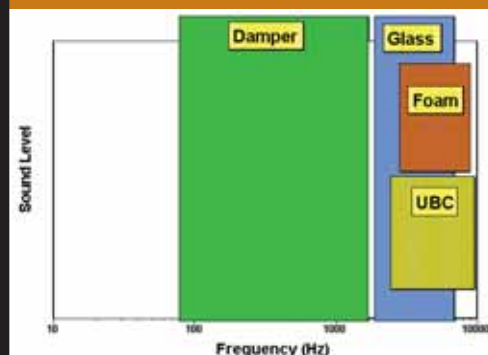
automobile manufacturers are relying on laminated glass. Long the standard construction for windshields, laminated glass is increasingly being used for side windows. Last year, approximately 5% of the automobiles manufactured in North America used laminated glass for side windows, and that number is expected to rise to 10% next year and to 20% by 2010. Advances in manufacturing enable glass to be made at thicknesses few thought possible only a few years ago, allowing laminated products in many cases to fit in the same door pocket as a single-layer, tempered product. Improvements in the interlayer material, meanwhile, have significantly improved the ability of automotive glass to absorb sound, both for side windows and windshields.

Of course, as one source of sound is minimized, a previously undetected or unnoticed noise is unearthed. A cost-effective way to address these sounds is through the use of coatings, which are environmentally friendly and integrated easily into a standard coatings process. Take, for example, the sound emanating from beneath the passengers' feet. A coating applied to the metal frame provides damping to reduce interior noise levels from engine, transmission, and drivetrain sources. In addition, the coating stiffens body panels prone to vibration. Car cavities, such as pillars and rocker panels, can also transmit unwanted noise. Foam materials blown into these voids can reduce noise and contribute to overall quietness. Even the mere rolling of tires on pavement creates unwanted sound. Coatings in wheel wells can minimize these noises, too.

The consumer love affair with communications and entertainment technology will continue to impact the consumer love affair with the automobile. As suppliers and auto manufacturers continue to work together to drum out sources of sound in the passenger compartment, one day they may build a car with acoustic performance that even a librarian could love. **aei**



by **Jim Trainham**, Vice President, Science and Technology, PPG Industries



Different noise-reduction technologies for different frequencies



Acoustical coating