Techniques and technologies for noise and vibration control have been used for decades in manufacturing processes. Sound damping materials, in particular, are used to help reduce the noise level of vibration-induced sounds. Now, new coatings with sound damping and noise reduction capacity are having a big impact in the functional coatings space. PCI spoke with Ray Somich, Dow Coatings Materials, to discuss the science behind liquid-applied sound damping (LASD) technology and the trends driving its use.

Q. Are you noticing any shifts in the noise reduction industry that are driving the development of new technologies?

A. The biggest trend we’re seeing is that consumers are demanding quieter environments and machines, whether from cars or agriculture and manufacturing equipment to appliances or even buildings. As a result, original equipment manufacturers (OEMs), engineers and construction managers are looking for ways to minimize noise that emanates from a variety of sources across industries. They aim to achieve desired noise reduction results with streamlined application and minimized costs.

Traditional sound damping materials include asphaltic pads, viscoelastic materials and polyurethane foams. Commonly used bitumen pads are cut and applied in layers on pieces of equipment to reduce vibrations that cause noise. Because manufacturing processes are consistently being streamlined, we saw a need in the market for a more flexible material. Our new ACOUSTICRYL™ Acrylic Resins offer equivalent or improved sound damping performance to bitumen pads across a range of applications and offer an easy-spray, liquid-applied alternative to conventional materials. The airless spray application helps maintain high-efficiency processing. Because it’s waterborne, ACOUSTICRYL™ Technology also helps lower volatile organic compound (VOC) emissions and improves the health and safety profile for workers by reducing their exposure to VOCs.

Q. Can you share an example of how this technology is used for a particular application?

A. In the automotive industry, OEMs are always looking for ways to lessen weight, improve performance and minimize costs, and flexible specifications can help accomplish this. This new liquid-applied sound damping (LASD) technology gives users greater functionality by allowing them to specify the material to meet certain performance standards, including the coating thickness (mil-thickness).

For instance, for various portions of a vehicle three different bitumen pads with different widths may be needed – each requiring its own measurement and production. In contrast, with LASD only one coating needs to be applied, but desired performance across the three vehicle parts can be achieved by spraying the coating at different mil-thicknesses. This efficiency and flexibility cuts down on inventory costs, overhead, labor costs and ergonomic concerns.

Essentially, LASD technology offers equal or better performance than the competitive material – typically bituminous pads – with the ability to deliver various performance properties depending on the application at an overall lower cost.
Q. **What industries and applications benefit most from this technology?**

A. Any application that can benefit from reduced noise, vibration, and harshness (NVH) and general sound management benefits from LASD. These include applications in marine and rail equipment, automotive parts/vehicles, agriculture & construction equipment (ACE), appliances including washers/dryers, dishwashers and refrigerators, HVAC units and ducts, air conditioners, floors/roofs, elevator shafts, service conduits and boiler rooms.

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Q. **Why would customers consider using LASD if they are already using another sound damping product or mechanism?**

A. There are other products on the market, but none are as versatile as LASD technology. With LASD, the final coating can be formulated in a variety of ways to meet the end user performance requirements and demands. At Dow, our Technical Services team works closely with customers to modify formulations and test materials to meet customer needs. Understanding the desired results helps us improve the standards in a cost-effective way – we keep in mind needs for higher or lower Tg, required composite loss factor (CLF), the width or thickness tolerance and the potential need for insulation properties. We have the in-house ability to test products and will work with customers to show how our LASD solution compares with other offerings.

LASD provides a cost-effective, total offering. Customers using LASD have the ability to cover all necessary surfaces easily with a spray application. Our all-acrylic offering is safer and more sustainable than conventional materials, and our ACOUSTICRYL AVANSE™ Resins for direct-to-metal industrial applications do not require the use of styrene.

From an R&D perspective, Dow is willing to develop a solution from the ground up. In other words, if a customer has a vibration noise issue, we will work to develop a material solution to meet their need.

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Q. **How does the LASD technology work?**

A. Sound is the result of a source, typically a vibrating object, creating airborne noise in an audible frequency range. Vibrations often radiate from structures as audible noise, and by reducing the vibration, the noise is significantly reduced (Figure 1). Sound damping is the absorption of vibration energy that enters a system, which is then dissipated into another form of energy for sound reduction (Figure 2).

![Figure 1](image1.png)

**Figure 1.**

![Figure 2](image2.png)

**Figure 2.**
A. Figures 3 and 4 show the basic concept in utilizing an LASD coating to deal with unwanted noise. The coating in Figure 3 roughly reflects the coated bar samples shown in Figure 4. For this project the coating is 3.5mm thick after air-dry and is applied to 1.6mm thick hardened steel. 1.6mm bars are common but many different configurations of substrates can be tested.

Figure 3.

Day to day items are made of substrates such as thin sheet steel

A layer of LASD coating is able to remove the vibration and noise

Some of the nuisance vibration in the object is transmitted through the air as noise

Instead of creating nuisance vibration and noise, the LASD coating absorbs and dissipates the energy from the object

Figure 4.

Raymond Somich, Marketing Manager for Dow Coating Materials (DCM), is responsible for the Company’s LASD and traffic paint segments. A 15-year veteran in polymer coatings and infrastructure, Raymond began his career at Dow through the Formulated Systems business and joined DCM in 2014. Raymond earned a Bachelor of Science degree in business administration from Myers University, Cleveland, Ohio. He and his family reside outside of Philadelphia.