



Manufacturing Environments Application Profile

Excessive noise is one of the most common workplace hazards in industrial facilities. Prolonged exposure to noise in manufacturing, power generation, printing and other industries can result in compromised verbal communication, fatigue, lower productivity and work-related hearing loss.

Manufacturing areas are not the only places where noise can be hazardous and counterproductive. Offices that front factories or are subjected to outside noise from highways or airports face similar problems. In such environments, uncontrolled sound can interfere with the intended purpose of the space, resulting in hampered interpersonal communication, headaches and other problems.

SONEX® Panels, Curtains and Baffles offer many durable choices to easily and affordably create a healthier work environment.

Basic principles of noise control

Noise control entails suppressing audible kinetic energy in two ways, and the most effective solutions may require a combination of the two:

- 1) Containing noise with barrier materials and enclosures
- 2) Absorbing noise with panels, baffles and other acoustical foam products

SONEX Baffles from pinta acoustic, inc. tone down noise levels at car horn factory

At FIAMM Technologies, Cadillac, Mich., a factory that makes more than 60,000 truck, car and boat horns each month, noise has been toned down as part of the factory's drive toward product quality, worker safety and ISO 14000 certification. Instead of feeling like they're caught in the middle of a busy intersection all day, workers now walk comfortably around the floor, free of a mandatory requirement to wear earplugs during their shifts.

The sound of all those horns used to reverberate throughout the plant, requiring employees to wear earplugs to meet OSHA safety standards. At FIAMM, the goal is to provide the world's best car horns with minimal environmental impact—including noise. A system of wall panels and ceiling baffles, designed for easy installation in the large FIAMM plant, absorbs noise and controls reverberation, reducing the overall sound level in the factory.

"With 600,000 square feet of production area made of concrete walls and floors as well as high metal ceilings, we had a reverberation problem," says Brenen Fuller, a technologist at FIAMM. "Although the horns are tested in sealed test cabinets, we hear them during the production process. That noise, combined with typical manufacturing sounds such as welders, compressors and conveyors, reverberated off all the hard parallel surfaces."

The horns can be as loud as 115 decibels at frequencies of up to 500 hertz, a significant interruption to employee communication and concentration, not to mention their long-term hearing ability. The reverberation levels had to be reduced so employees wouldn't have to wear earplugs to meet OSHA standards (less than 90 decibels averaged over 8 hours).

FIAMM contacted an acoustics consultant who conducted sound level tests throughout the plant. SONEX Valueline Panels and Baffles were recommended to absorb overall reverberation. The panels are Class 1 fire-rated for low flammability and flame spread, a major criterion for FIAMM. Made from willtec® foam, SONEX Valueline Panels are Hypalon®-coated to resist dust and oils. The 24-inch by 48-inch white panels, which add to the clean, crisp look of the production area, were installed on the walls about 20 feet up from the floor and hung in rows from the ceiling.

Concerned about interrupting production time to install the baffles over the work area, FIAMM asked pinta engineers to develop a time- and labor-saving installation system. The U-shaped production area made it inconvenient to move a scissor lift around the floor. pinta engineers based their idea on the age-old clothesline hanging method, which allowed baffles to be installed over the production area from one side of the room.

The new system cut installation time in half, while the baffles reduced overall sound in the plant by 12 decibels. "The baffles certainly helped to quiet the area," says Fuller.

As a result of the sound-absorbing installation, workers can make quality warning systems at levels and frequencies that sound loud and clear without the feeling that they're in heavy traffic.

Caterpillar® eases noise level on factory floor using SONEX® Valueline Panels and a SONEX Curtain Enclosure

At the Caterpillar production facility in Brooklyn Park, Minn., workers make a variety of heavy equipment used for road paving. Before they are released for sale, each of the enormous cold planers, soil and asphalt compactors, road reclaimers, and other machines, is driven into the building to undergo a rigorous set of final tests.

Noise from the machines' 750-horsepower diesel engines reverberates through the plant during testing. Employees working in the area wear hearing protection, but it doesn't ease the strain caused by exposure to the constant commotion. Several workers went to the plant's safety and protection manager, Larry Narikawa, for help.

"I was hearing a lot of complaints from people working out there that the loud noise was really annoying," says Narikawa. "Even though they all wear hearing protection, it was still very loud. It was hard for them to talk to each other without yelling."

Narikawa contacted a pinta distributor. "With concrete floors and metal decking in the facility, there was nothing to absorb the sound that was causing the reverberation problem," the distributor recalls.

Using several barrier-backed curtain panels, a 30-foot x 60-foot ceiling-mounted enclosure was created so that workers could drive heavy equipment into it for testing. The enclosure was to descend from the ceiling, but not come all the way to the floor in most areas. "This worked

really well because it didn't get in the way of the cranes and it took up very little space," the distributor says, "and still leaves room below for the workers to move machinery freely."

"In a huge factory like this, it is important for them to maintain product flow and to be able to change that flow when they need to," she continues. "These curtains act like a wall, yet they're flexible enough that if the workers change the flow of the room they can unhook the curtains and reconnect them to create another area somewhere else."

The barrier-backed curtains are designed to absorb and contain noise. But this situation needed to take sound absorption one-step further. Using SONEX Valueline Panels, in natural willtec® foam, on the ceiling was recommended. "When trying to control noise, it's important to contain it first and then work on absorption," the distributor says.

SONEX products were the perfect choice for the Caterpillar site. "SONEX is what I chose to go with because I knew it was the best fit. The entire installation looks great and doesn't detract from the facility at all."

"People are really happy about the new enclosure because they don't have to yell anymore," says Narikawa, "Now they can just talk normally."

"The ease of installation when working with SONEX products, proved once again that quick and easy turnaround is possible even with a large installation like this" he says.

Acoustic panels integral to design of electronic research lab

The 40,000-square foot electronics research lab at Juniper Networks, Westford, Mass., is designed to meet three criteria: provide an open, contiguous space for optimal worker flexibility; supply adequate power, cabling and cooling systems to support research and development; and create a pleasant and inviting work environment. Early on in the planning stages, designers

recognized that such a large, open environment with its exposed mechanical systems would create a noise problem—making the third objective difficult to achieve. To solve the problem before it even started, designers installed SONEX One acoustic panels to absorb background noise while allowing engineers to work comfortably and efficiently.

"The core and edge routers in development at this site require lots of fans and motors running in the lab," says Steven Lyons, facilities manager, Juniper Networks. Plus, the lab's hard-surfaced materials—tile, drywall, metal and glass—reflect rather than absorb sound. Without some sort of acoustic control, reverberation from all these motors and fans would interrupt worker concentration and communication.

From the beginning, Lyons ruled out the option of a standard suspended ceiling; there needed to be plenty of overhead room for the mechanical and electrical cabling necessary to support the lab. "In addition, standard ceiling tiles don't absorb enough background sound. We know that from previous experience in one of our other labs," says Lyons.

SONEX One Panels are installed with adhesive directly to the ceiling's steel pan, between each of the steel-framing members. The steel frame and exposed pan areas were painted white to match the color of the panels, increasing the room's brightness. The sculpted pattern provides a sound-absorbing surface area that efficiently reduces reverberation (echo) and background noise.

Made from willtec foam, SONEX One Panels keep this Class 1 fire-rated for flame spread and smoke density. The panels at Juniper Networks are Hypalon®-coated for added surface protection.

"The white panels lend to the room's spaciousness and the sculpted pattern adds dimension. Best of all, they perform just as we wanted, which is to dampen the echo effect. We have had no complaints about noise levels—and that is exactly what we want to hear," says Lyons.