High-Performance Cleanroom Noise Reduction at Texas Instruments Fabrication Facilities

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OVERVIEW

Texas Instruments operates advanced semiconductor fabrication facilities where microelectronic components are manufactured within highly controlled cleanroom environments. These facilities rely on precision equipment, robotic wafer handling systems, and high-capacity air filtration infrastructure that operate continuously to maintain strict environmental conditions required for semiconductor production.

While these systems are essential for fabrication operations, they can generate continuous background noise within the cleanroom environment. To improve acoustic performance while maintaining strict contamination control standards, Texas Instruments partnered with All Noise Control to implement VibraCore® Acoustic Cleanroom Wall Panel Systems engineered to reduce sound reflections within semiconductor cleanroom facilities.

CHALLENGES

Semiconductor fabrication cleanrooms contain complex air handling systems, vacuum pumps, robotic processing equipment, and wafer fabrication tools that generate consistent operational noise. Hard surfaces commonly used in cleanroom construction can reflect sound energy, creating reverberation that spreads throughout the workspace. The facility required an acoustic solution capable of reducing sound reflections while remaining compatible with strict semiconductor cleanroom environmental standards.

SOLUTION:

All Noise Control implemented VibraCore® Acoustic Cleanroom Wall Panel Systems to enhance acoustic performance within semiconductor fabrication areas. The installation utilized 2' x 4' x 2" thickness fiberglass cleanroom acoustic panels engineered with a 6–7 PCF rigid fiberglass core designed to provide high levels of sound absorption.

These panels deliver NRC 0.85 acoustic performance, effectively reducing reverberation generated by fabrication equipment and airflow systems. The panels feature a fully encapsulated PVF cleanroom surface, providing a durable and hygienic finish suitable for semiconductor manufacturing environments while maintaining Class 100 cleanroom compliance and ASTM E84 Class A fire safety performance.

RESULTS:

- Reduced sound reflections in semiconductor fabrication cleanrooms
- Improved communication between engineers and technicians
- Maintained strict semiconductor cleanroom compliance standards
- Enhanced acoustic performance in wafer fabrication environments
- Installed durable cleanroom acoustic wall panel systems