

Noise and vibration are concerns in most industrial settings, and controlling them requires attention to a multitude of sources and receivers. Some high-tech manufacturing processes need extraordinary vibrational stability. All facilities include human occupants who need safe and productive environments. Workplace noise limits set by OSHA and other regulatory agencies are intended to protect workers against undue exposure to loud sounds. Emitted noise can violate community noise regulations. Given the complexity and scale of large factories, designs can be refined to reduce project cost and minimize risk of disruptions to sensitive manufacturing processes or violations of noise and vibration regulations. Below are some of our projects addressing the needs of both human occupants and manufacturing processes.



Inotera Fabs 1&2 (Taoyuan, Taiwan): Structural and mechanical vibration design of two 300mm DRAM (memory chip) factories. For both projects, we proposed a moment frame system with no interior shearwalls and unified structures. We utilized small shearwalls at the perimeter of the manufacturing floor to carry lateral loads. This design enhanced subfab space management and is an accomplishment for a tall structure with micro-vibration requirements.

Freescale Semiconductor (Arizona): Boiler noise mitigations at a campus utilities plant. Previously, we had performed large-scale environmental noise testing and modeling for the campus, which included multiple electronics factories. A recent change in one set of boilers cause new very-low-frequency noise emissions. While too low in frequency to hear, the emissions rattled windows in the nearby neighborhood. We performed testing to identify the source of the sound emission and helped design a mitigation strategy.



Solyndra Kato & Page Fabs (Fremont, CA): Factory workplace / OSHA noise control. The Owner asked us to help improve production floor noise levels. Newly-created process tools had been developed, but tool noise emissions had not yet been addressed. We measured noise levels at worker positions in the development fabs. Where problematic noise levels were encountered, we helped the Owner and tool vendors develop cost-effective mitigations for deployment in newer fabs then under construction.