



VACC Recent Key Projects: Inotera Memories Fab 1 Vibration Design Consulting Hwa Ya Science Park Taoyuan, Taiwan

Owner
Inotera Memories

VACC Work Scopes
Structural Vibration Design
Mechanical Vibration Design
Vibration Testing

Special Work Scope
Power Plant Vibration Impact
Rotary UPS Vibration Impact

Architect/Engineer
Fei & Cheng Architects

Contractor
Tokioiki

Total Building Area
Confidential

Clean Room Area
Confidential

Clean Room Class
Class 1

Completion
2004

Vibro-Acoustic Consultants was asked to provide structural/mechanical vibration design and testing services for the construction of a DRAM semiconductor fab for Inotera in Taiwan.

The Fab 1 site presented unique challenges from an environmental vibration standpoint. The most significant was the vibration impact of the 300MW Hwa Ya cogeneration plant at about 30m from Fab 1. The power plant was under construction at the same time as Fab 1. Large numbers of blowers, pumps, cooling towers, and turbines, at very large capacities were included in the power plant. We performed one-of-a-kind studies to identify the most significant vibration sources and generate predictions for vibration impact at Fab 1 from each source.

Fab 1 was designed as moment frame system with no interior shearwalls. Shearwalls at fab edges were utilized to carry the moment frame distributed loads to the foundation. This is considered a novel design, and the elimination of all interior shearwalls on a tall two-story subfab system is a significant accomplishment. The slightly larger column size of 75x75cm was a small price to pay for the benefit of the open, no-shearwall design. Subfab utilization was greatly enhanced and optimized in the absence of no interior shearwalls.

The fab, support wing, and shell are all part of one monolithic structure with no Structural Isolation Breaks, another significant accomplishment for a mega-fab of this size.

Inotera focuses on the production of DRAM products on 300 mm wafers at geometries of 0.11 micron and below. Fab 1 was the first 300mm facility for Nanya prior to the creation of the joint venture with Infineon.