

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Vibration Isolated Inertia Block
Cambridge, MA



PROJECT DESCRIPTION

The MIT/Harvard Center for Magnetic Resonance plans called for the installation of a 900 MHz Nuclear Magnetic Resonance (NMR) device. Unfortunately, a very large generator next door produced a narrow-band vibration peak at 28 Hz that exceeded the NMR's vibration criterion.

Acentech surveyed the floor vibrations and determined ways to reduce the vibrations to acceptable levels, considering that potential solutions had to accommodate the NMR's own internal vibration isolation system.

We determined that the generator-induced vibrations could be reduced to acceptable levels using high-performance commercial air spring isolators (natural frequencies: 1.5 Hz vertical, 1.2 Hz horizontal). We recommended an 80,000 pound inertia block to dynamically separate the primary isolation system from the NMR isolators, thereby minimizing adverse interactions between the two isolation systems.

The above photo shows the underside of the block with the air spring isolators; the photo to the right shows the top surface of the block where the NMR is now located. At the generator's operating frequency, the system attenuates the floor vibrations by 45 db, allowing the researchers to use the NMR even while the generator is in service.

Acentech

CONSULTING SERVICES

- Vibration isolation design
- Two stage isolation system

REFERENCE

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