

Sound Advice

Helpful Information from *Stewart Acoustical Consultants*

A member firm of the National Council of Acoustical Consultants

7406 L Chapel Hill Road, Raleigh, NC 27607

The information in this document is not provided as a consulting service or as a solution to any specific problem.

919-858-0899

copyright 2004

www.sacnc.com

Operable Partitions

by Noral D. Stewart

Operable partitions are often desirable to provide flexibility in the size of rooms for meetings, classes, or social functions. These functions also need high degrees of sound isolation. It is very, very difficult to achieve and maintain the fully desirable levels of isolation using operable partitions. The major difficulty is in achieving and maintaining seals around the partition panels in actual installations. Manufacturers carefully inspect the manufacture and installation of the partitions tested in laboratories. Seals are very carefully adjusted to minimize leakage and achieve high STC values. Partitions installed in the field do not get such careful attention in either manufacture or installation. A very small crack can drastically reduce the performance in the field. Even if carefully installed initially, performance often deteriorates with use.

Two important ratings are used to evaluate the performance of an operable partition. These are the Sound Transmission Class, STC, and the Noise Isolation Class, NIC. The STC is measured in a laboratory and published by the manufacturer. The NIC is the result actually achieved between two rooms in the field. It depends on the STC actually achieved in the field installation and other factors. These are the size of the partition, the absorption in the quieter or receiving room, and any other paths of sound transmission. Assuming no other significant paths, the NIC usually should in theory be more than the effective STC in the field. This is because the area of equivalent perfect absorption is usually larger than the area of the partition.

However, the NIC achieved in the field is usually several points less than the STC measured in the laboratory. This is because of leaks around and through the seals or at the floor.

Suppose a perfectly sealed partition achieves STC 50. An effective crack of .002-.004 inches around each panel can reduce the effective STC to 40. Larger actual cracks are often found at places. Even where there is no actual crack, there can be leakage through thin seal material. If the partition rests on carpet, some sound can pass through the carpet. Realistically, the sealing conditions control the NIC in the field. However, a partition with a higher STC is needed to make sure sound passing through the panels is insignificant compared to that leaking at the seals.

Two steps are most important to assure initial good performance. First, the facility to receive the partition must be designed according to ASTM E 557. Again, this primarily provides requirements for the architect to meet in space design, not requirements to place on the partition manufacturer. This provides good installation conditions for a seal and eliminates significant other paths of transmission. Second, the installation must meet a specified NIC demonstrated by a test. Without a test, there is no way to know the quality of the installation.

The most important steps to assure long-term performance are selection of durable seals and maintenance. Most partitions have a sweep seal at the top that requires significant maintenance to keep good performance. Proper adjustment of this seal for good acoustical performance can sometimes make it difficult to move panels. A mechanical seal at the top usually requires less maintenance. Mechanical seals are more common at the bottom of partitions. However, all bottom seals require maintenance for good performance.