

NAP SILENTFLO

Dyna Doors

Acoustic Doors



NAP SILENTFLO 
THE EXPERTS IN NOISE CONTROL

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Introduction

NAP Silentflo makes an extensive range of acoustic doors custom built to suit individual requirements. Selections are made according to the degree of sound isolation required, space available, fire rating requirements and the environment in which the door will be located.

A typical example of this professional approach can be seen in the doors supplied and installed at the Victorian Arts Centre. This project involved acoustic ratings from STC 40 to STC 55. The largest doors, cover openings of 9m x 6m and weigh in excess of 8 tonnes. These doors run on purpose designed tracks utilising motorised opening and closing facilities. As well as conventional absorptive acoustic seals, a pneumatically actuated perimeter seal was included to further increase performance. The seal automatically inflates when the door reaches its closed position and deflates prior to the door opening.

Equally large doors have also been supplied to the Tsim Sha Tsui Cultural Centre in Hong Kong.



An example of a typical NAP Biparting and Bifolding Dyna door.

Door Types & Applications

NAP Silentflo Dyna Doors are custom built to suit a variety of applications where it is necessary to separate quiet and noisy areas.

Hinged Doors

These are used for conventional doorway situations requiring effective sound isolation between occupied areas and also in large doorways to provide equipment access to sound isolation areas.

Sliding Doors

These are commonly used where the swing path of the door leaf is too great for the available space. They are particularly well suited to motorised operation. Space availability is a major factor in determining the selection of a sliding door, which may have either vertical or horizontal movement.

Bi-fold Doors

These are commonly used when the leaf sweep area is too great for the available area.

Applications

- Reduction of interference from externally generated noises in Cinemas, Concert Halls, Opera Houses, Radio and Television Studios.
- Reduction of plant noise intrusion from Generator Rooms, Air-Conditioning Plant Rooms, Compressor and Boiler Houses, Pumping Stations and Electricity Sub-Stations.
- Reduction of external noise to provide a suitable acoustic environment in Outside Broadcast Announcing Booths, Airport Control Towers and Power Station Control Rooms.
- Provide noise reduction for other technical facilities such as Audiometric Rooms, Anechoic or Reverberation Chambers and Laboratories.



Eight large NAP Dyna doors swinging and sliding, with and without pneumatic seals, have been supplied to the Victorian Arts Centre, Melbourne, Victoria.

Fire Rating

A fire-rated version of the hinged Dyna Door is available for plant rooms and other applications, and has been granted a three hour rating when tested with Australian Standard AS 1530, Part 4 - 1975, "Methods for fire tests on building materials and structures."

NAP Silentflo have manufactured CSIRO approved fire rated Dyna Doors as large as 3.6m wide x 4.4m high in a double leaf configuration. These doors carry compliance with the Australian Standard AS 1905, Part 1 - 1984, "Fire Resistant Door Sets."

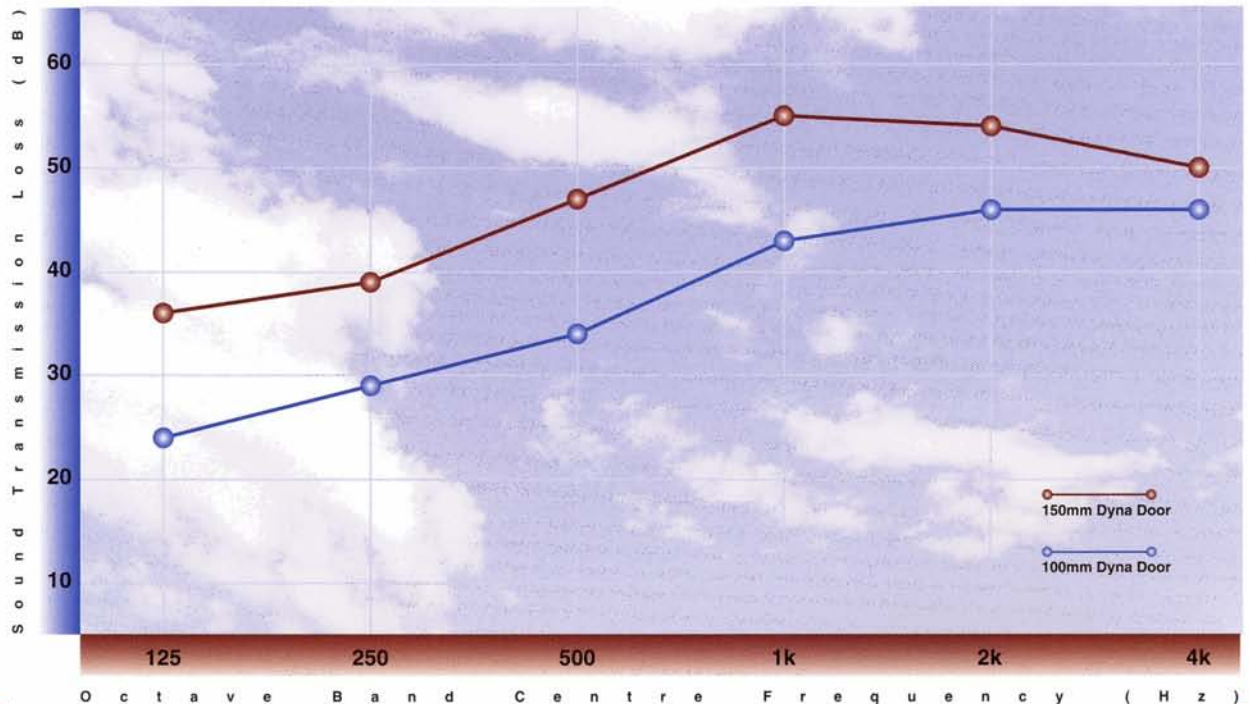
Fire-rated Dyna Doors differ from standard doors in their internal construction and hardware, these details should be discussed with a NAP Silentflo Representative prior to placing an order.

All Dyna Doors are constructed using non-combustible materials, so that they present no early fire hazard.

Acoustic Performance

The standard 100mm thick Dyna Door has a Sound Transmission Class STC 40 and the 150mm thick Dyna Door has a rating of STC 45. The Sound Transmission Loss of these two doors is represented in the following graph and tables.

Single-leaf and double-leaf doors rated up to STC 45 are readily available, while special doors rated up to STC 60 are available for purpose designed applications. Higher acoustic performance requirements will however increase door thickness and weight. Therefore the building design must be adjusted to withstand the additional loads.



The NAP Dyna door undergoing fire rating tests at the Experimental Building Station, North Ryde, NSW.

Acoustic Performance

100mm Dyna Door

Octave Band Centre Frequency (Hz)

125	250	500	1k	2k	3k
24	29	34	43	46	46

Sound Transmission Loss (dB)

150mm Dyna Door

Octave Band Centre Frequency (Hz)

125	250	500	1k	2k	3k
36	39	47	55	54	50

Sound Transmission Loss (dB)

Construction

Hinged Dyna Doors are delivered complete with a four sided steel frame, hinges and hardware. Shims are placed between the frame and leaves during transport, thus eliminating the necessity for site adjustment, trimming or packing.

The framed leaves are fabricated from pressed steel, faced with steel sheet and a heavy density acoustic infill to provide high damping with low acoustic coupling to maximise noise reduction. The jambs, head and sill are also fabricated from pressed steel, to provide strength and rigidity.

Specially designed adjustable precision ball bearing hinges provide smooth and easy movement for even the largest and heaviest of doors. These hinges are supplied as standard so that the clearances are maintained over the life of the door.

Superior Design

All jambs are locally reinforced to provide adequate strength at the hinge mounting points. The hinges themselves are secured to the frame and leaf using high tensile cap screws.

Stainless Steel Sill

The sill, a feature of hinged Dyna Doors, is fabricated from 2.5mm thick stainless steel and it provides an attractive wear resistant finish. The perimeter acoustic edge seals built into the Dyna Door leaf maintain transmission loss and eliminate the need for adjustment for the life of the door. A soft snubbing gasket is provided to allow quiet closure into the jamb.



Dyna doors can be fitted with closers to either the front or reverse face of the door.

Resistance to Environmental Attack

NAP Silentflo Dyna Doors are rigidly constructed using a specially formed heavy gauge steel frame, which eliminates bowing or warping. The materials used are resistant to most types of vermin. They are supplied prime painted, allowing a choice of finish coats to best suit the requirements.

Frame Selection

The selection of the frame for a hinged Dyna Door depends on the wall construction and whether the frame is to be built-in during wall construction or fixed into an existing opening in the wall. Composite wall constructions and larger doors may necessitate different fixing methods.

Dimensions

Dyna Doors are specially constructed to suit any reasonable structural opening. Sizes and thicknesses are available to suit higher acoustic performance requirements. The door frame can be constructed from a wide range of head, jamb and sill sections. Large door sets which may require transportation in sections and special site installation or assembly conditions should be discussed with NAP Silentflo prior to design or purchase.



Sliding two leaf Dyna door at the City West Pumping Station at Hoppers Crossing.

Sliding Doors

Sliding doors are used where the swing of the hinged doors cannot be accommodated. Typical applications include equipment access doors in live theatres, opera houses and television studios. They are also used in industrial applications where access to large machinery is required, such as test cells, engine rooms, loading bays, naval dockyards and storerooms.

Horizontal sliding doors comprise an overhead door track, door leaf, floor guide and perimeter acoustic seals. Seals are used on all four edges of the door, so that it is free to move without retracting compression seals.

The door leaf overlaps the opening at the head and sides to provide the acoustic seal. Similarly, a tongue is used to acoustically seal the bottom of the door and acts as a locating guide for the door leaf, against wind pressures or pressure differentials from air-conditioning systems. Where higher acoustic performances are required pneumatic seals are available.

The precision overhead track allows continual operation of the doors without maintenance or adjustment, with only occasional cleaning and lubrication required. The track is designed in conjunction with the mounting and carriage facilities to accommodate the door weight.

Vertical sliding doors are available in single-leaf style, counter-balanced and driven by gear motor, or multiple leaf, lifted by cable and electric hoist. These segmented doors can be made in sizes up to 16m wide by 15m high.

Multiple leaf doors are provided for use where the travel available is less than the width or height of the opening.

Selection of door type must be assessed early in the planning stage to ensure space is available to accommodate the track and head seals.



The sectional vertical lift door at the Williamstown Naval Dockyard, weighs 24 tonnes and is driven by two electrical hoists.

Size and Weight Considerations

Sliding doors can be made for any size opening, but weight becomes an important consideration in the design of larger doors. With some large doors weighing up to 30 tonnes, building design must take into account these loads. Consideration must also be given to the fixing of the overhead track to the structure.

Acoustic Performance.

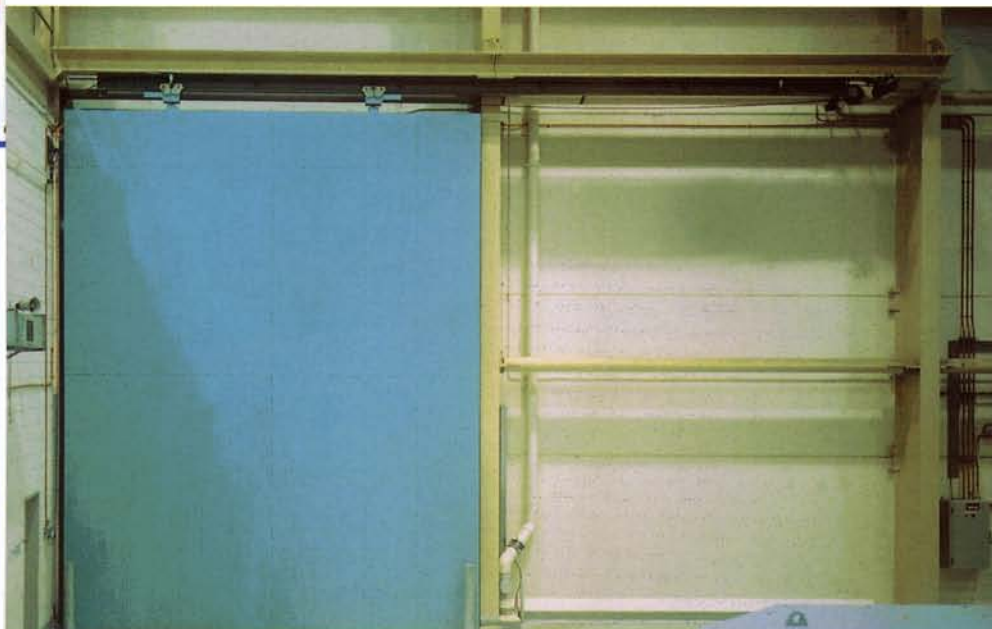
Sliding doors are available with ratings of STC 30 to STC 60. Performance is a function of construction, weight of door leaf and the length and clearance of non-contacting pneumatic acoustic edge seals. Higher acoustic ratings may necessitate the use of two separate, parallel leaves.

Motor Drive

Mechanisation is provided by a rack and pinion drive arrangement or recirculating chain drive and gear motor. The electric motor are either 3 phase, A.C., mains power or D.C. running off a battery bank. Limit switches are installed to stop the door at the end of its travel.

Safety Features.

"Dead Man's" buttons, requiring the button to be held down for the door to operate, can be provided for safety. Doors operated by unskilled personnel or the public can be fitted with retractable leading edges to activate the emergency stopping mechanism. Smoke and fire alarm systems can also be installed to activate door closure in an emergency situation.



Single leaf sliding Dyna door supplied to City Water Pumping Station at Hoppers Crossing.



Installation procedure

NAP Silentflo offers a full installation service for Dyna Doors.

General Specifications

Acoustic doors shall be NAP Silentflo Dyna Doors, comprising a flush steel leaf, factory hung in a suitably designed four sided heavy duty steel frame. The leaf shall include acoustic edge seals and all hardware and furniture.

The face of the leaf shall be braced in order to be flat and free from buckle. The acoustic infill shall be heavy duty mineral wool and the internal faces of the door damped and stiffened.

The leaves shall be hung on adjustable NAP Silentflo ball bearing hinges, in order to provide easy operation. The sill shall be formed from stainless steel to provide a wear resistant finish. Where required the door leaf is to be fire-rated and to have test certificates from the Commonwealth Experimental Building Station. Leaves must be pre-tapped for final fitting of hardware after finish painting.

NAP Dyna door used at the entrances to the Audiology Testing Suite at the Lincoln Institute of Health Sciences, Melbourne.

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