



NAP 'SOUNDWAVE'

Acoustic lining for ceilings and walls



Introducing NAP 'Soundwave'

NAP 'Soundwave' is a high performance metal based acoustic lining for ceilings and walls. It is used for the control of industrial noise, speech and reverberation control within buildings, commercial developments and factories. It provides significant performance advantages over traditional and flat absorptive wall linings, due to its unique profile. The system has been designed to combine excellent sound absorption characteristics, durability and versatility with attractive finish and ease of installation.

Walls and ceilings are key interior surfaces when

dealing with noise absorption. When acoustically 'hard', such surfaces reflect sound, thereby reinforcing direct sound from the noise source and resulting in unintelligible speech and poor communication in the reverberant field.

NAP 'Soundwave' has been designed to improve the breakup and diffusion of sound waves and provide a greater absorbing area than flat or shallow profiles, allowing better absorption per square metre and thus, lower reverberation times, at a lower cost than inferior alternative systems.

Applications

NAP 'Soundwave' is designed for acoustic treatment of highly reverberant rooms and chambers where noise reduction and an improved intelligibility of speech and sound is required.

The strength and durability of NAP 'Soundwave' makes it particularly suitable for use in a much wider range of applications than has previously been available, e.g. where indoor sporting activities are taking place or where rugged interior conditions exist, such as industrial workshops, plant rooms etc.

Typical applications include:

Sporting Stadiums, including swimming pool complexes

Gymnasiums

Shooting Galleries

Factories

Workshops

Generator Rooms

Halls

Studios

Libraries

Hospitals

Control Rooms

Churches

Plantrooms

Research facilities

Test Chambers

Community spaces

Urban Transit Passenger areas, e.g. escalators

Shopping Malls



Features and advantages of NAP 'Soundwave' wall and ceiling linings

- ◆ Independent laboratory tested for proven acoustic performance.
- ◆ Superior acoustic performance - highly absorptive; improves breakup and diffusion of sound waves in reverberant spaces.
- ◆ An attractive finish providing enhanced architectural features.
- ◆ High strength and durability - supplied in long lengths enabling rapid and economical installation.
- ◆ Added thermal insulation at no extra cost,
 - prevent loss of heat in winter
 - prevent heat buildup in summer.
- ◆ Melinex lining - can be used in damp or marine environments or where hygienic conditions are required.
- ◆ Standard galvanised finish - designed to last even in extreme climatic or environmental conditions, e.g. marine, chlorine, chemical situations.
- ◆ Easy maintenance - accidentally damaged panels may be simply replaced by removing rivets or screws and inserting the new panel.
- ◆ Ancillary services such as electrical or piping can be surface mounted on the profile.
- ◆ Designed so that installation can be carried out in SMF (Synthetic Mineral Fibre) restrictive condition. Fastening penetrations and cutouts can be made without damaging acoustically absorptive infill and creating fibre loss.
- ◆ Available in a range of special finishes and colours.



Left: Acoustic ceiling lining, City of South Melbourne workshop
 Above: Generator Room, Acoustic wall lining
 Right: Building Plant Room, Melbourne

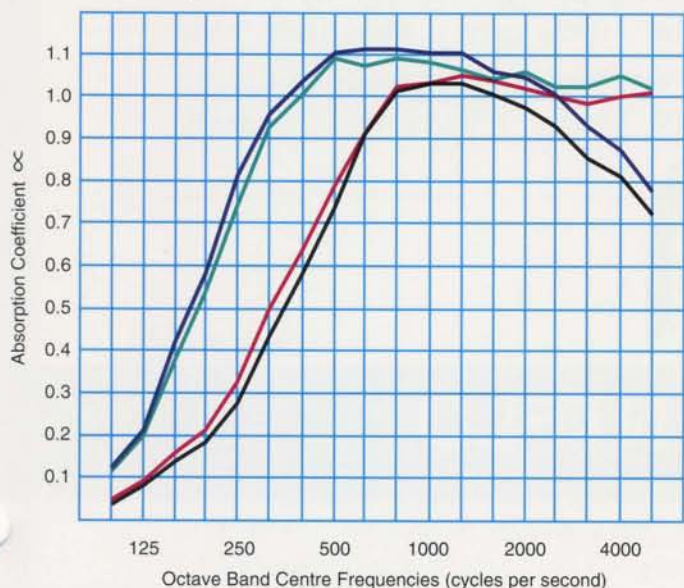


Acoustic Performance

The following acoustic Absorption Coefficients have been obtained from laboratory tests carried out at the CSIRO Division of Building Research, Victoria, Australia.

The tests have been carried out on the following samples of wall lining.

Absorption \propto Vs Third Octave Band Centre Frequency Hz



- NAP 'Soundwave' with 25mm Mineral wool
- NAP 'Soundwave' with 50mm Mineral wool
- NAP 'Soundwave' with 23 micron thick polyester film, 25mm Mineral wool
- NAP 'Soundwave' with 23 micron thick polyester film, 50mm Mineral wool

A range of different thicknesses up to and exceeding 100mm, for special low frequency situations, can be used with the NAP 'Soundwave' ceiling and wall systems.

All tests have been carried out in accordance with AS1045-1971, and test reports are available on request.

NAP 'Soundwave' with 25mm mineral wool

| Octave Band Centre Frequency Hz | 125 | 250 | 500 | 1k | 2k | 4k |
|----------------------------------|------|------|------|------|------|------|
| Absorption Coefficient \propto | 0.09 | 0.33 | 0.79 | 1.03 | 1.02 | 1.00 |

NAP 'Soundwave' with 23 micron thick polyester film, 25mm mineral wool

| Octave Band Centre Frequency Hz | 125 | 250 | 500 | 1k | 2k | 4k |
|----------------------------------|------|------|------|------|------|------|
| Absorption Coefficient \propto | 0.08 | 0.27 | 0.76 | 1.03 | 0.97 | 0.81 |

NAP 'Soundwave' with 50mm mineral wool

| Octave Band Centre Frequency Hz | 125 | 250 | 500 | 1k | 2k | 4k |
|----------------------------------|-----|------|------|------|------|------|
| Absorption Coefficient \propto | 0.2 | 0.74 | 1.09 | 1.08 | 1.06 | 1.05 |

NAP 'Soundwave' with 23 micron thick polyester film, 50mm mineral wool

| Octave Band Centre Frequency Hz | 125 | 250 | 500 | 1k | 2k | 4k |
|----------------------------------|------|------|------|------|------|------|
| Absorption Coefficient \propto | 0.22 | 0.81 | 1.10 | 1.10 | 1.05 | 0.87 |

General Technical Description

NAP 'Soundwave' comprises of a heavy duty galvanised perforated metal profile with an optional melinex polyester membrane lining and a variable depth acoustic insulation lining.

The acoustic profile can be supplied galvanised or finished with an epoxy powder coat, depending on the specific application or project requirements.

The lining is normally fixed directly to specially formed channels, girts or purlins using standard fastening techniques and all perimeter walls and ceilings are trimmed with a 40mm x 40mm steel flashing angle. The normal channel spacing is 1200mm - 1500mm depending on lining type and thickness. Channels run perpendicular to the material length direction (i.e. the rib direction).

The versatility of the NAP 'Soundwave' is demonstrated by the fact that it can also be used as a suspended acoustic ceiling, when wall treatments cannot be utilized.

After considerable research and application assessment, optimum acoustic performance and appearance has been achieved by selecting small 1.6mm diameter holes, giving a total of 23% open area perforation.

In lesser designs, large diameter hole perforations result in a downgraded appearance to an unacceptable level. Lightweight finishes, foils and fabrics, are easily damaged and are difficult to install. Flat sheets are unattractive and show up all types of imperfections and material faults.

Only NAP 'Soundwave' overcomes and solves all of the above problems.

| | |
|-------------------------------|--|
| <i>finish:</i> | Galvanised steel or epoxy powder coated in a wide range of standard colours. |
| <i>Material feed lengths:</i> | Up to 12 metres (single sheets) |
| <i>Effective Span:</i> | 700mm (width) |
| <i>Melinex Lining:</i> | Grade S23 - thickness 23 microns |
| <i>Rib Height:</i> | 25mm |
| <i>Perforations:</i> | Hole diameter 1.6mm at 3.2mm centres (23% open area) |
| <i>Material Thickness:</i> | 0.48mm TCT |
| <i>Lining Thickness:</i> | 25 - 100mm |
| <i>Airgap:</i> | Variable |

| <i>Insulation Thickness</i> | <i>Surface Density</i> | |
|-----------------------------|------------------------|------------------------|
| | Fibreglass | Mineral wool |
| 25mm | 5.9 kg/m ² | 6.7 kg/m ² |
| 50mm | 7.4 kg/m ² | 8.8 kg/m ² |
| 100mm | 10.2 kg/m ² | 13.2 kg/m ² |

Installation can be carried out by the client or NAP Silentflo's experienced installation crews using standard fixing techniques.

NAP 'Soundwave' is designed to be self-supporting and to join by simple overlapping, providing a neat seam free installation.

The steel profile is fixed directly to steel or timber girts or purlins. The melinex lining must be lightly tensioned over the mass insulation blanket. Galvanised or powder coated trim is fixed to the perimeter walls and ceilings to provide a neat finish.

In wall applications, it is recommended that the lining be applied before any services, such as electrical, signage or piping (copper, steel, PVC etc.). Doors and window cutouts must be flashed off providing a neat finish around each aperture. The steel channels are fixed to the walls horizontally and to the roof in a manner that best suits the profile arrangement. Single lengths of profile are fixed after

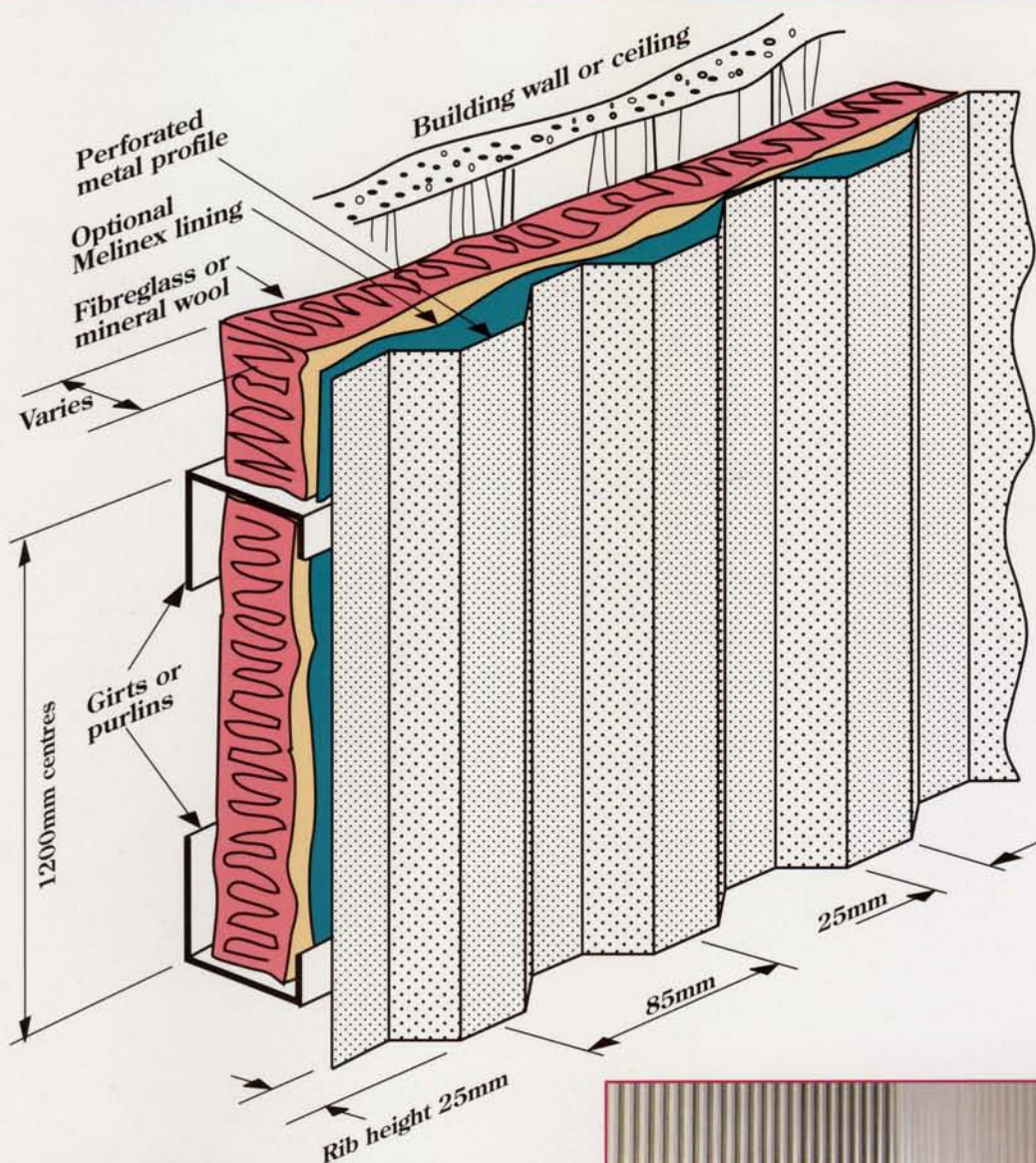
placement of the acoustic mass insulation blanket and the (optional) Melinex lining. The profile is cut to length to provide clearance at the roof and floor. In cases where the treatment is applied to both the ceiling and the walls of a room we recommend installing the roof after installation of the wall lining. The profile is fastened as detailed overleaf working from diagonally opposite corners and using as many full width sheets as possible. Special floor skirting may be required to finish off the treatment to suit individual project requirements.

Recommended Fixing Systems

| | |
|-----------------------|---|
| Steel Purlins/Girts : | Tek screws or pop rivets |
| Timber Purlins/Girts: | Cadmium plated wood screws or helical nails |

| | |
|--|--|
| Suggested spacing of purlins or girts: | approx. 1200mm centres (min) 1500mm centres (max) |
|--|--|

Typical Detail



Fixing according to wall or ceiling construction

Maintenance

NAP 'Soundwave' may be wiped down with a damp cloth and soapy water for cleaning purposes. We recommend this be carried out at least once per year.

Accidentally damaged panels can be simply replaced by removing rivets/screws and inserting a new length of panel.

Under normal circumstances, except for wear and tear, the profile is maintenance free.



Acoustic Wall Lining, 29mm Proof Facility, Graytown, Victoria



Typical Generator Room Acoustic wall lining.

NAP 'Soundwave' acoustic lining to be supplied by NAP Silentflo.

The system is to be NAP 'Soundwave', comprising of a 0.48mm thick perforated galvanised steel profile, having a rib height of 25mm and an open area of 23%. Finish shall be galvanised with a min. coating of 290 g/m² to AS1650 or epoxy powder coated paint finish.

Backing material to be a 25mm or 50mm thick acoustic fibrous infill blanket, density 50 kg/m³ fibreglass or 80 kg/m³ mineral wool.

An optional layer of 23 microns thick melinex sheeting is to be lightly tensioned over the mass insulation blanket and fixed using adhesive tape (e.g. grey duct tape). All perimeter walls and ceilings to be finished with a 40 x 40 angle

trim 'pop' riveted at 300 centres to the profile ridges. Material shall be tested in a Reverberation chamber by the CSIRO Building Research Division to AS1045-1971, minimum free area of test specimen 11.5m².

The minimum allowable absorption coefficients shall be:

Frequency, Hz

| 125 | 250 | 500 | 1k | 2k | 4k |
|--|------|------|------|------|------|
| 25mm lining absorption coefficient \propto | | | | | |
| 0.09 | 0.33 | 0.79 | 1.03 | 1.02 | 1.00 |
| 50mm lining absorption coefficient \propto | | | | | |
| 0.20 | 0.74 | 1.09 | 1.08 | 1.06 | 1.05 |



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