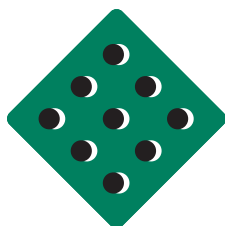


Australian Plaster Acoustics

Quiet Sound – Contemporary Plaster Acoustic Ceiling Tiles and Panels



AUSTRALIAN
PLASTER ACOUSTICS

Innovative Sound Solutions



ABOVE: CASINO INSTALLATION
STAR CITY CASINO
SYDNEY NSW AUSTRALIA

COVER : CELL AIR INSTALLATION
UNIVERSITY OF WOLLONGONG
NSW AUSTRALIA

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CELL AIR INSTALLATION

UNIVERSITY OF WOLLONGONG

NSW AUSTRALIA

Quiet Sound CONTEMPORARY COLLECTION

The **Quiet Sound** collection was developed from our *Standard Range of Plaster Acoustic Ceiling Tiles*. It involved major research and development that highlighted the substantial relationship between acoustic performance and the weight of the tiles. As a consequence of research and development, the **Quiet Sound** collection provides:

- New innovative modern designs only achievable from cast plaster
- Exceptionally sharp tile profiles possible only with the use of silicone rubber moulds
- Higher acoustic & sound transmission properties
- Lightweight properties which allow lighter structural ceiling grid
- Easier installation
- Easier packaging & transportation

The **Quiet Sound** consists of perforated ceiling tiles and panels, perfect for acoustic engineers architects and interior designers who are looking for aesthetic designs coupled with high acoustic properties. **Quiet Sound** provides subtle innovative solutions for creating a unique, decorative finish giving many benefits.

KEY SELECTION ATTRIBUTES

- Cost effective ceiling and wall solution
- High-quality product
- Decorative or non-decorative
- High humidity performance. Our acoustic tiles and panel do not sag in humid conditions. They are able to withstand high humidity and temperature from 0° to 80°C
- Dimensional stability up to 95% humidity
- Anti-mould paint applied at the time of manufacture which stops growth of mould (Tiles are prepainted white)
- Simple installation Plaster Acoustic Tiles.
- Plaster glass panels screw fix to steel or timber battens
- Flush jointing
- High acoustic performance – all products having NRC ranges between 0.70 up to 0.90 NRC
- Reduces noise reverberation
- Prevents dust entering into room space
- Reduces echo
- Able to distinguish between music and speech
- Fire rated to group 1 certification
- High light reflective
- Good R values in plaster acoustic tiles 0.80 thermal resistance
- All products 100% Australian made

All acoustic tests for NRC carried out by RMIT University of Melbourne and CSIRO Melbourne in accordance with ASTM-C423-90A NRC (Noise Reduction Coefficient)

APPLICATIONS

- Commercial office buildings
- Show rooms
- Schools and universities
- Restaurants, cafes, food halls
- Retail complexes
- Shopping centres
- Auditoriums and concert halls
- Libraries and galleries
- Cinemas
- Home theatres
- Foyers for public buildings
- Music rooms
- Public Domains
- Health Care Areas

THE CONTEMPORARY COLLECTION CONSISTS OF

1. Craftstone collection Plaster acoustic tiles

Two unique designs that have high acoustic performance made in modules to suit 600 x 600mm exposed ceiling grid.

2. Coffered plaster acoustic ceiling tiles for exposed grid ceiling system

Three unique coffered designs with either round or square perforations, or a very stylish slotted design. made to suit 600 x 600mm steel or aluminium grid systems.

3. New York collection Plasterglass panels

Three subtle designs with either round or square perforations. Panels are made in 1200 x 1200mm modules, which enables high acoustic performance.

THE CRAFTSTONE COLLECTION

– for plaster acoustic tiles

ADVANTAGES

DURABLE

Each tile is made of reinforced plaster. This means they will not deteriorate. These tiles are pre-painted white. They are resistant to humidity, will not grow mould or bacteria. They will not sag.

EASILY INSTALLED

They simply drop into exposed grid systems. Acoustic fabric backing is attached to the back of the tiles for testing only, fabric not included.

NOISE REDUCTION

The ceiling tiles are 600 x 600 mm, 15 - 25mm thick and with added acoustic fabric backing, gives an excellent NRC insulation rating of 0.90 creating a quiet and pleasant environment.

MASS

11.50 – 14.10 kg/m²

ABOVE: MOON INSTALLATION

WESTERN SYDNEY LEAGUES CLUB
ASHFIELD, NSW AUSTRALIA

A truly beautiful, decorative ceiling tile, the Craftstone Collection is aesthetic, artistic and functional.

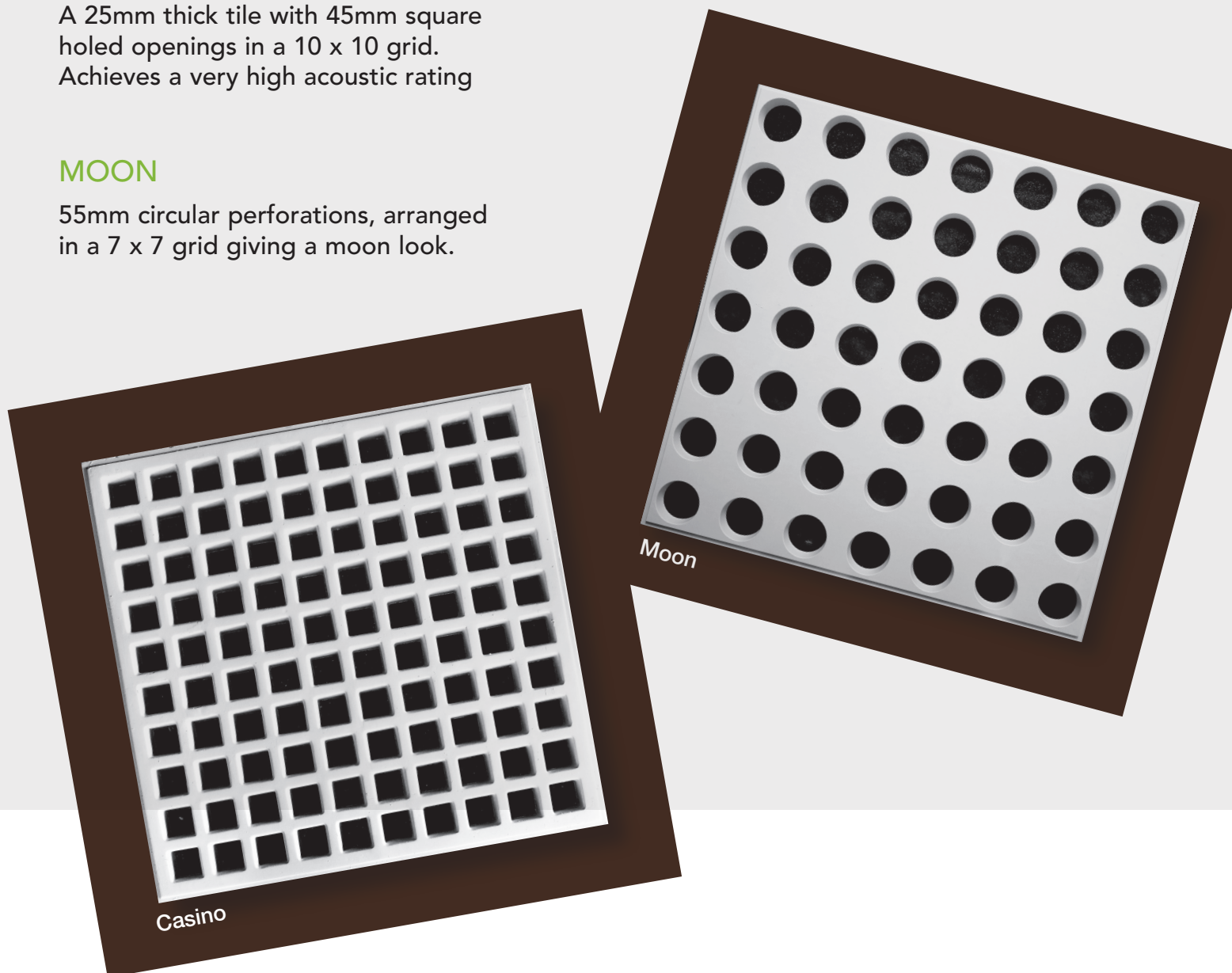
THE CRAFTSTONE RANGE

CASINO

A 25mm thick tile with 45mm square holed openings in a 10 x 10 grid. Achieves a very high acoustic rating

MOON

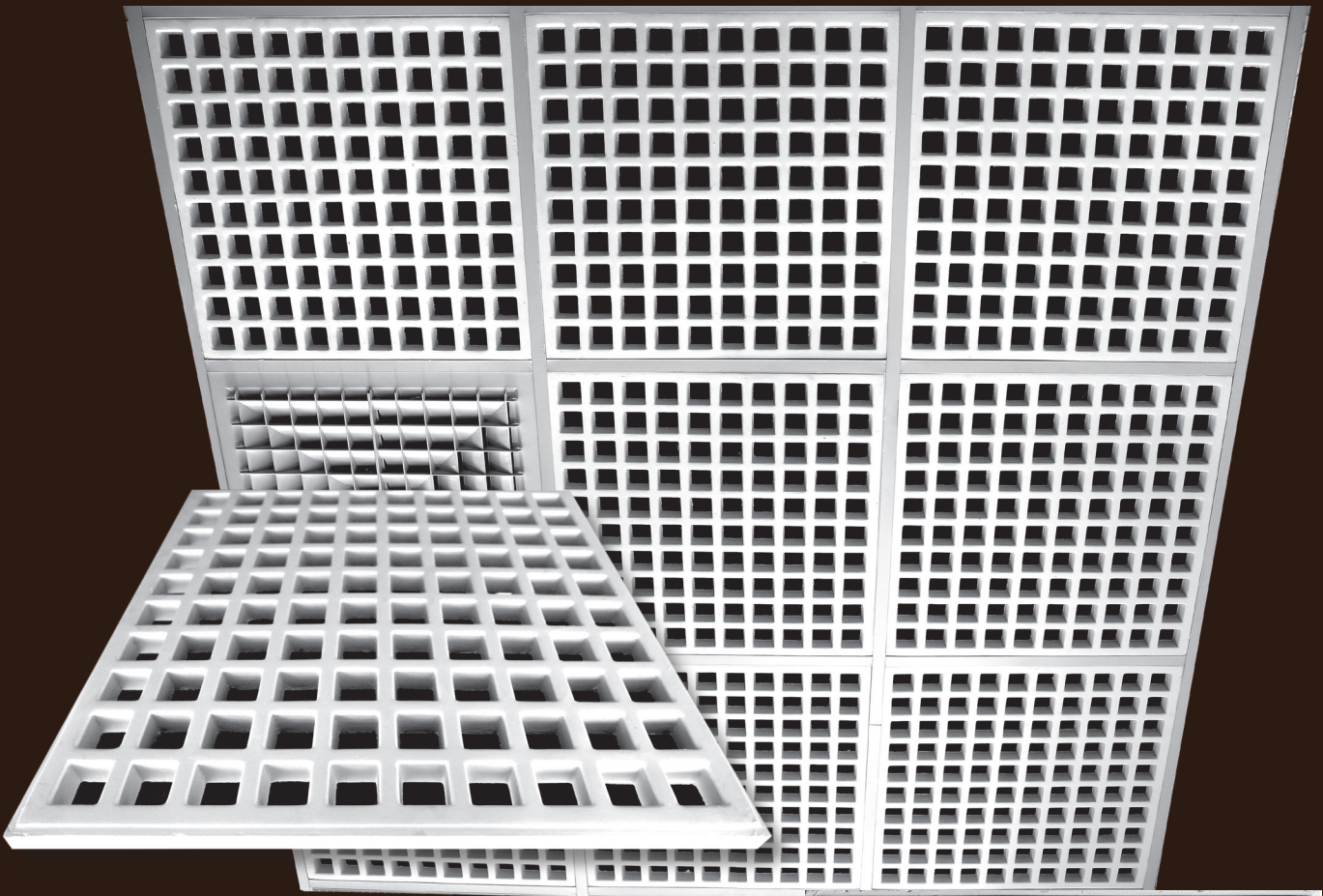
55mm circular perforations, arranged in a 7 x 7 grid giving a moon look.



CASINO INSTALLATION
STAR CITY CASINO
SYDNEY NSW AUSTRALIA



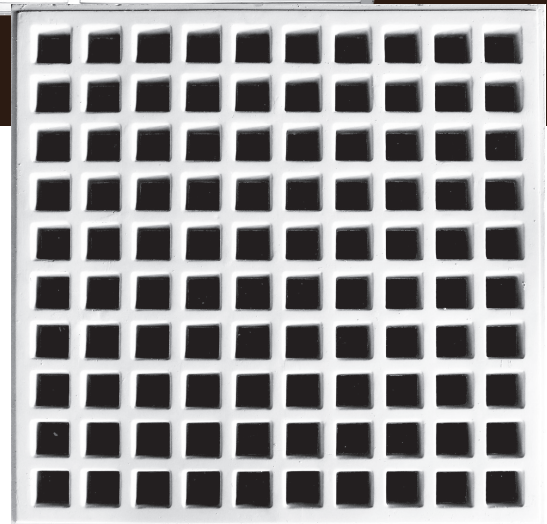
Casino



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PROPERTIES

- Square edge.
- Insulation with black acoustic fabric attached to back of tile is included.
- To be used in conjunction with ceiling grid exposed 24 mm T Bar steel or aluminum 600 x 600 system.



Casino ACOUSTIC PERFORMANCE AND SPECIFICATION

| Open Area | Thickness mm | Size mm | R Value | NRC | SAA | α_w | % Light Reflective | Mass Kg/m ² | Weight per Tile Kg |
|-----------|--------------|-----------|---------|------|------|------------|--------------------|------------------------|--------------------|
| 35.8% | 25 | 600 x 600 | 0.80 | 0.90 | 0.90 | 0.90 | 0.70 | 14.10 | 5.08 |

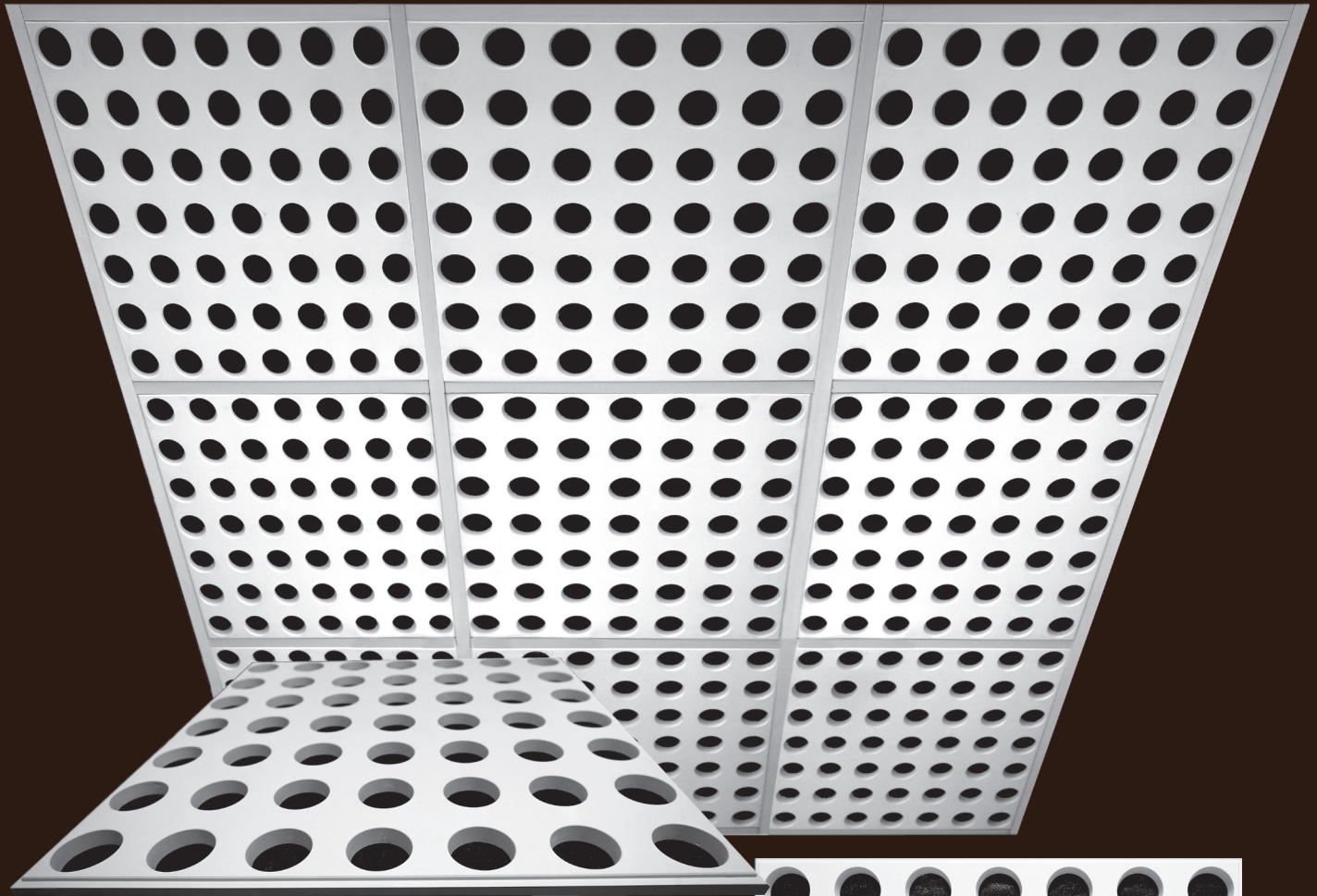
ABOVE: MOON INSTALLATION

WESTERN SYDNEY LEAGUES CLUB

ASHFIELD, NSW AUSTRALIA



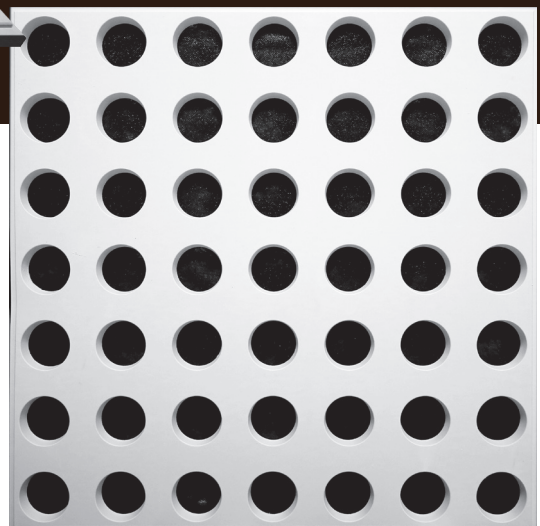
Moon



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PROPERTIES

- Bevelled edge.
- Insulation with black acoustic fabric attached to back of tile is included.
- To be used in conjunction with ceiling grid exposed 24 mm T Bar steel or aluminum 600 x 600 system.



Moon ACOUSTIC PERFORMANCE AND SPECIFICATION

| Open Area | Thickness mm | Size mm | R Value | NRC | SAA | α_w | % Light Reflective | Mass Kg/m ² | Weight per Tile Kg |
|-----------|--------------|-----------|---------|------|------|------------|--------------------|------------------------|--------------------|
| 30.0% | 16 | 600 x 600 | 0.80 | 0.90 | 0.90 | 0.90 | 0.74 | 11.50 | 4.14 |

COFFERED COLLECTION

– for both exposed and concealed grid ceiling systems.

Coffered Collection

Sound Absorptive, Decorative Cast Plaster, Ceiling Tiles.

1. This collection is perfect for interior designers and architects who are looking for aesthetic designs coupled with high acoustical properties.
2. This collection is the subtle, innovative solution for creating a unique decorative finish while providing a high level of sound absorption for ceilings.
3. Ceiling tiles are available in three unique designs with either with round perforations or no perforations.

FEATURES

1. Full acoustic perforations
2. Simple installation screw fix to steel or timber battens
3. Flush jointing
4. Precise lines
5. Three unique and innovative designs

BENEFITS

- High sound absorption with NRC up to 0.85
- Reduces noise reverberation
- Unique and innovative designs which can only be achieved with cast plaster
- Prevents dust entering into room space
- Reduces echo
- Able to help to distinguish between music and speech

MEET OUR LATEST ADDITION

Plaster acoustic ceiling tiles are manufactured from reinforced casting plaster and offer excellent sound absorption, controlled sound transmission and decorative finishes.

The tiles are supplied with an attached acoustic fabric and sound absorbent batt inserted at the back of the tile. These tiles are pre-painted white and produced in a range of varying designs.

ACOUSTIC PROPERTIES

These tiles measure 30mm thick, 600 x 600mm with a 20mm thick sound absorbent batt giving a high NRC value.

ADVANTAGES

1. Dimensionally stable will not warp or buckle at 95% humidity
2. Fire resistant
3. Acoustic properties
4. Redecoration does not affect the properties
5. Easy removal and replacement
6. Mass 12.2-12.4 kg/m²

THE COLLECTION CONSISTS OF:

ECOCHECK COFFERED DROP IN

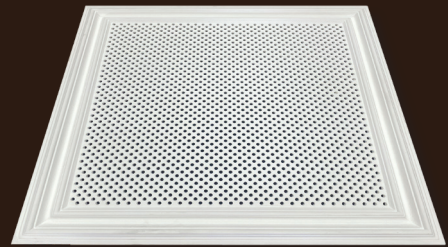
a plain faced tile with diagonal circular hole perforations over the entire tile

ECOCHECK COFFERED DIRECT FIX

a plain faced tile with diagonal circular hole perforations over the entire tile

PLAIN COFFERED DIRECT FIX

a plain faced tile with no perforations. Note this is not an acoustic tile.



EcoCheck Coffered - Drop In

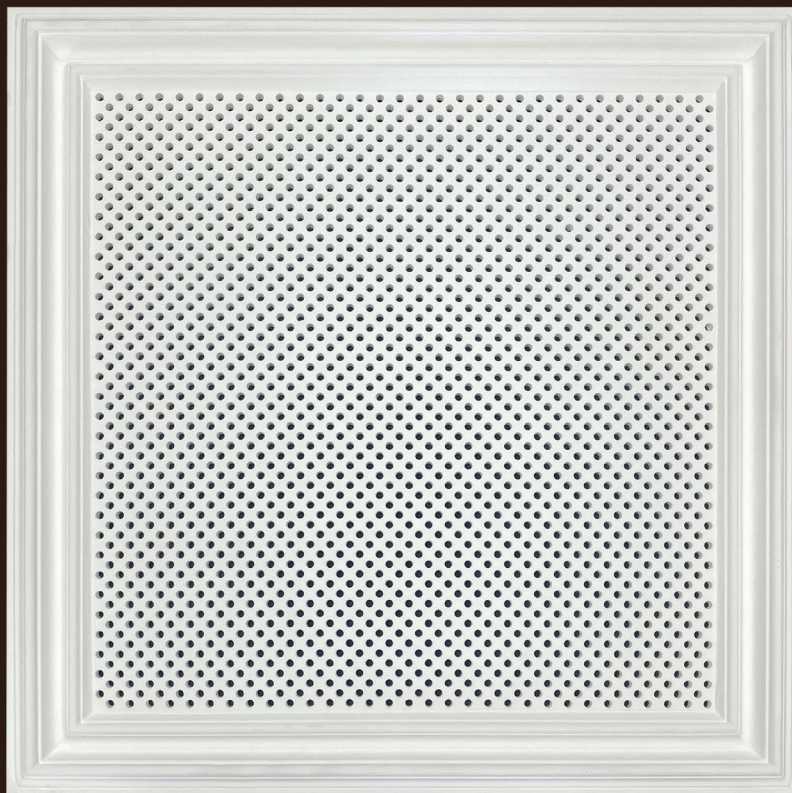


EcoCheck Coffered - Direct Fix



Plain Coffered - Direct Fix

EcoCheck Coffered





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PROPERTIES

- Coffered tile, perforated with regular, diagonal pattern of 6.5mm holes.
- 30mm thick perforated moulded plaster tile
- Insulated with 20 mm Supertel 42Kg/m² glasswool with black fabric to the back
- To be used in conjunction with ceiling grid exposed 24mm T Bar steel or aluminum 600 x 600 system.

| EcoCheck Coffered | | ACOUSTIC PERFORMANCE AND SPECIFICATION | | | | | | | |
|-------------------|--------------|--|---------|------|------|------------|--------------------|------------------------|--------------------|
| Open Area | Thickness mm | Size mm | R Value | NRC | SAA | α_w | % Light Reflective | Mass Kg/m ² | Weight per Tile Kg |
| 12.7% | 13, 30 edge | 600 x 600 | 0.80 | 0.75 | 0.76 | 0.65 | 0.78 | 12.50 | 4.50 |

EcoCheck Coffered DF





PROPERTIES

- Coffered tile, perforated with regular, diagonal pattern of 6.5mm holes.
- 13mm thick with 30mm surrounding border moulded plaster tile
- Insulated with 20 mm Supertel 42Kg/m² glasswool with black fabric to the back
- Direct fix installation type

EcoCheck Coffered DF ACOUSTIC PERFORMANCE AND SPECIFICATION

| Open Area | Thickness mm | Size mm | R Value | NRC | SAA | α_w | % Light Reflective | Mass Kg/m ² | Weight per Tile Kg |
|-----------|--------------|------------|---------|------|------|------------|--------------------|------------------------|--------------------|
| 11.1% | 13, 30 edge | 1200 x 600 | 0.80 | 0.70 | 0.70 | 0.60 | 0.80 | 12.50 | 9.00 |

Plain Coffered





PROPERTIES

- Plain Coffered tile.
- 13mm thick with 30mm surrounding border moulded plaster tile
- Note: this tile is not supplied with insulated
- Direct fix installation type

| Open Cell Coffered ACOUSTIC PERFORMANCE AND SPECIFICATION | | | | | | | | | |
|---|--------------|------------|---------|-----|-----|------------|--------------------|------------------------|--------------------|
| Open Area | Thickness mm | Size mm | R Value | NRC | SAA | α_w | % Light Reflective | Mass Kg/m ² | Weight per Tile Kg |
| 0% | 13, 30 edge | 1200 x 600 | 0.80 | n/a | n/a | n/a | 0.90 | 12.50 | 9.00 |

NEW YORK COLLECTION

– Plasterglass panels

New York Collection

Sound Absorptive, Decorative Cast Plaster, Wall and Ceiling Panels.

1. This collection is perfect for interior designers and architects who are looking for aesthetic designs coupled with high acoustical properties.
2. This collection is the subtle, innovative solution for creating a unique decorative finish while providing a high level of sound absorption for ceilings and walls.
3. Ceiling and wall panels are available in three unique designs with either round or square perforations.

FEATURES

1. Full acoustic perforations
2. Simple installation screw fix to steel or timber battens
3. Flush jointing
4. Precise lines
5. Four unique and innovative designs

BENEFITS

- High sound absorption with NRC up to 0.90
- Reduces noise reverberation
- Unique and innovative designs which can only be achieved with cast plaster
- Prevents dust entering into room space
- Reduces echo
- Able to help to distinguish between music and speech

APPLICATION

- Commercial office buildings
- Show rooms
- Schools and universities
- Restaurants, cafes, food halls
- Retail complexes
- Shopping centres
- Auditoriums and concert halls
- Libraries and galleries
- Cinemas
- Home theatres
- Foyers for public buildings
- Music rooms

INSTALLATION

- Plan layout before commencing
- Take measurements from the center of the room to ensure even borders
- Fit furring channels at 600 centres
- Line up perforated panels to create uniform pattern
- Use insulation behind board for better NRC performance

FUNCTIONALITY MEETS STYLE

The perfect solution for walls & ceilings

- Acoustical solutions and plaster innovations available in 4 stylish designs with either square, round or slotted perforations to suit restaurants, home theatres and music rooms, schools, public buildings and more.
- Perforated cast plaster ceiling sheet is suitable for installation of feature panels on walls and ceilings.
- Sound absorptive decorative plaster. It is the quiet solution, functional and decorative. It provides a high level of sound absorption to the space. These are exceptional designs.

THE COLLECTION CONSISTS OF:

CEIL SOUND PANEL

14mm square hole perforated cast plaster with a half round intersecting indent into each square. Pattern is arranged in a grid of 4 per panel. Perimeter band 65mm

OPEN CELL PANEL

Perforated with 4 sets of holes per panel, 25 x 25 holes per set, hole size 15 mm diameter at the mouth, tapering to 13.5 mm at the rear; holes at 19.2 mm centres.

CELL AIR PANEL

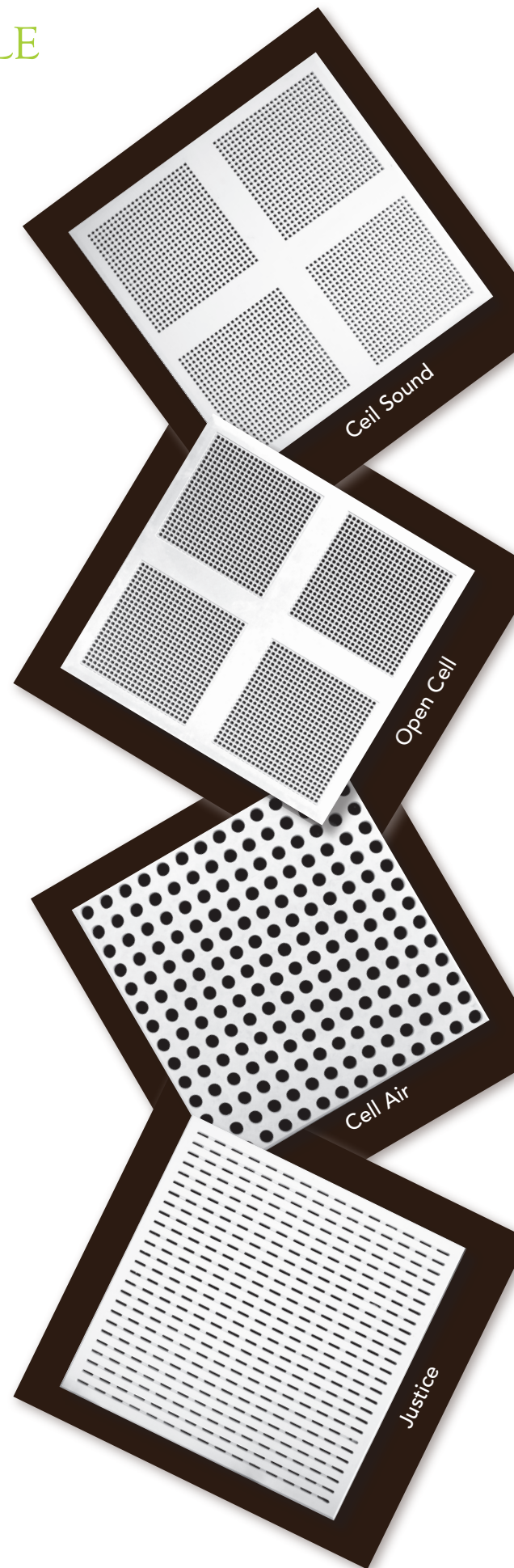
V-Edged panel, perforated with a set of 14 x 14 circular holes, 55 mm opening at the mouth, tapering to 53 mm at the rear; holes at 86 mm centres, open area percentage 30.0% based on 53 mm throat opening.

JUSTICE PANEL

800mm linear slots intersected at 50mm intervals with plain 25mm x 10mm band. Perimeter band 50mm

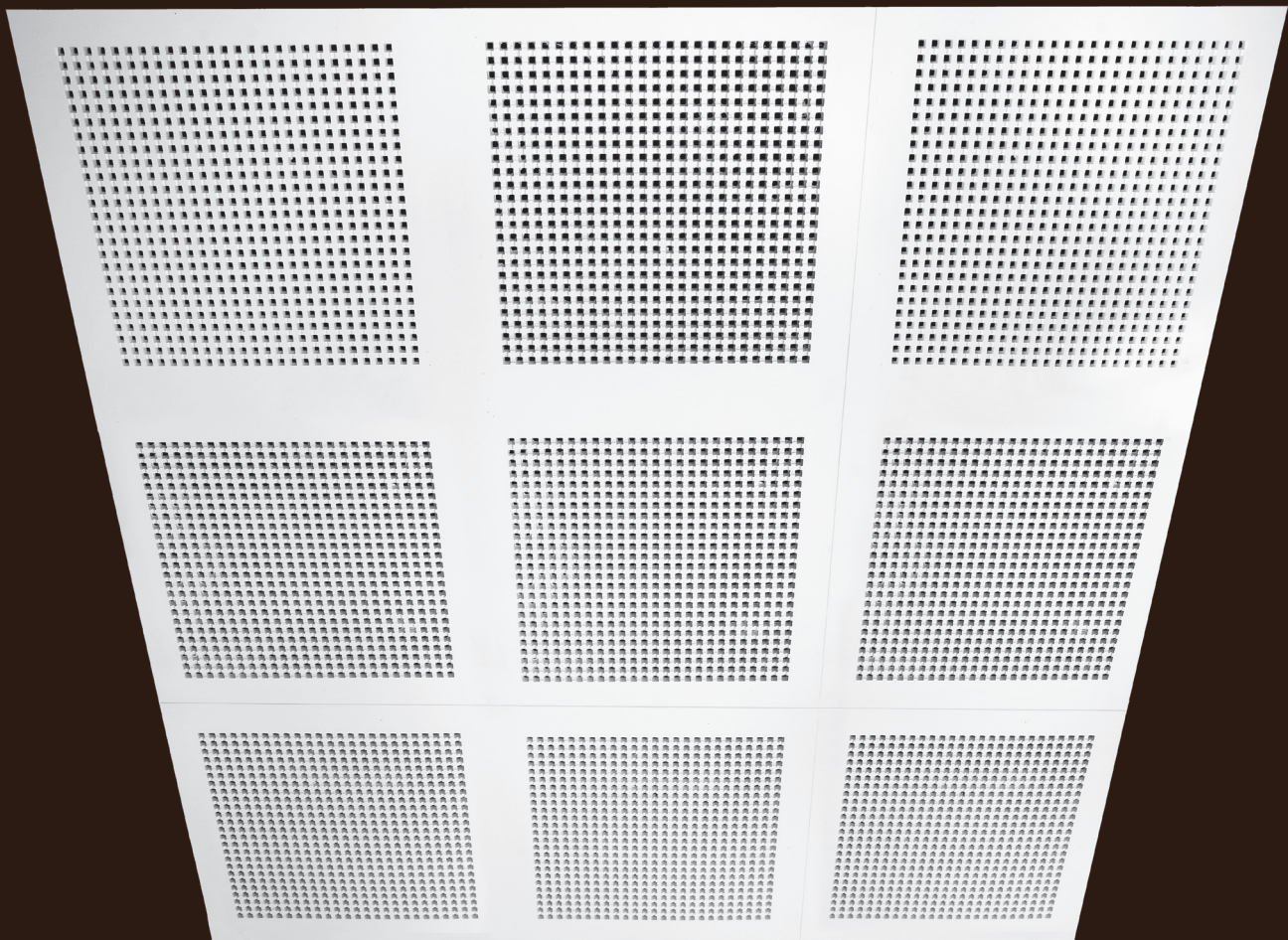
FEATURES

- Four unique and innovative designs
- Full acoustic perforations
- Simple installation screw fix to steel or timber battens
- Flush jointing for Ceil Sound and Open Cell panels
- V-edged jointing for Cell Air panel (requires minimal setting)
- Precise lines





Ceil Sound Panel



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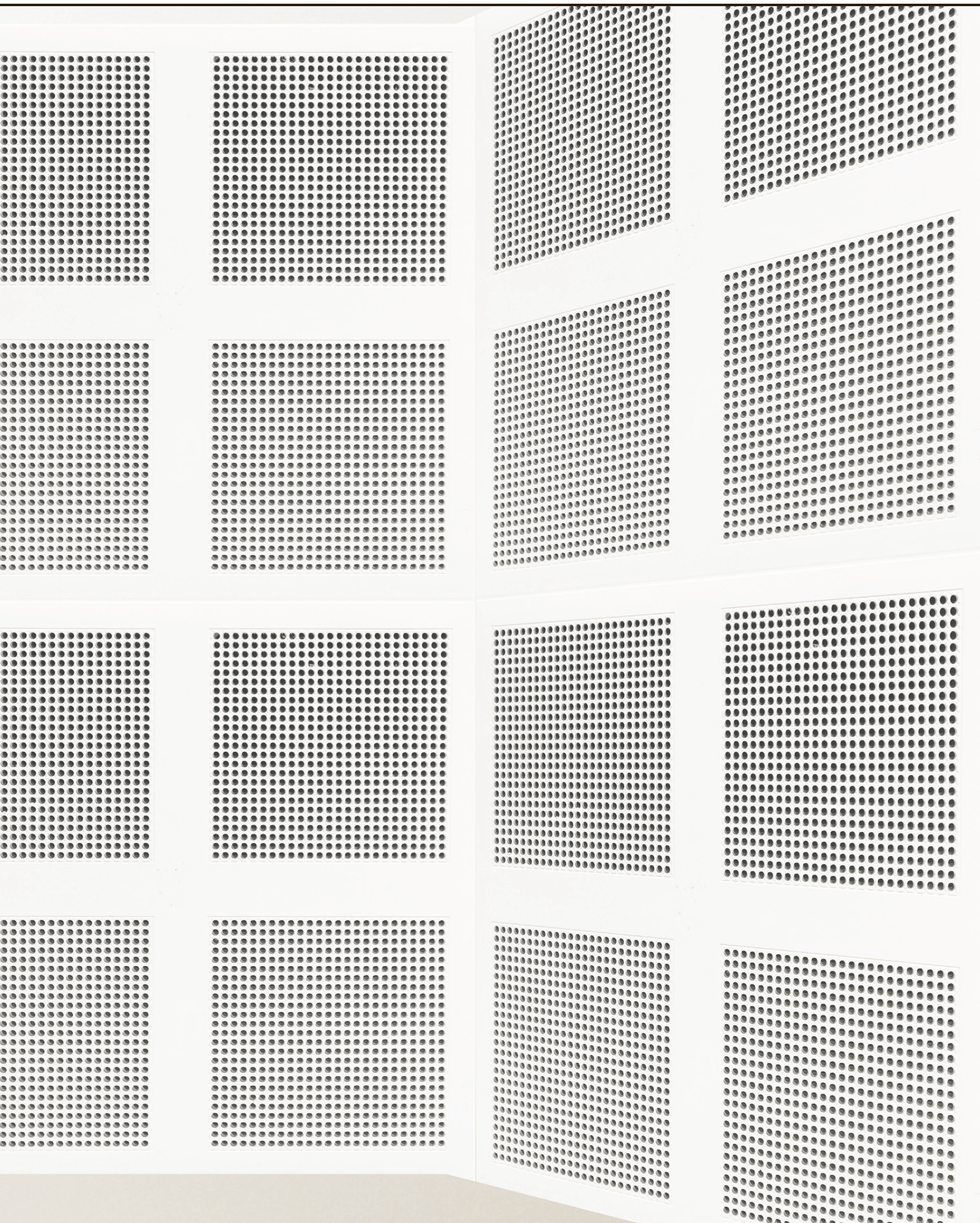
PROPERTIES

- 14mm square hole perforated plasterglass with a half round intesecting indent into each square. Pattern is arranged in a grid of 4 per panel, forming a continous pattern when joined. Perimeter band 65mm
- 13mm thick perforated moulded plaster panel
- Mechanically fixed (screwed to furring channel)
- Insulated with 20 mm Supertel 42Kg/m³ glasswool (1) or 50 mm Supertel 42Kg/m³ glasswool behind, faced with black matt tissue (2)

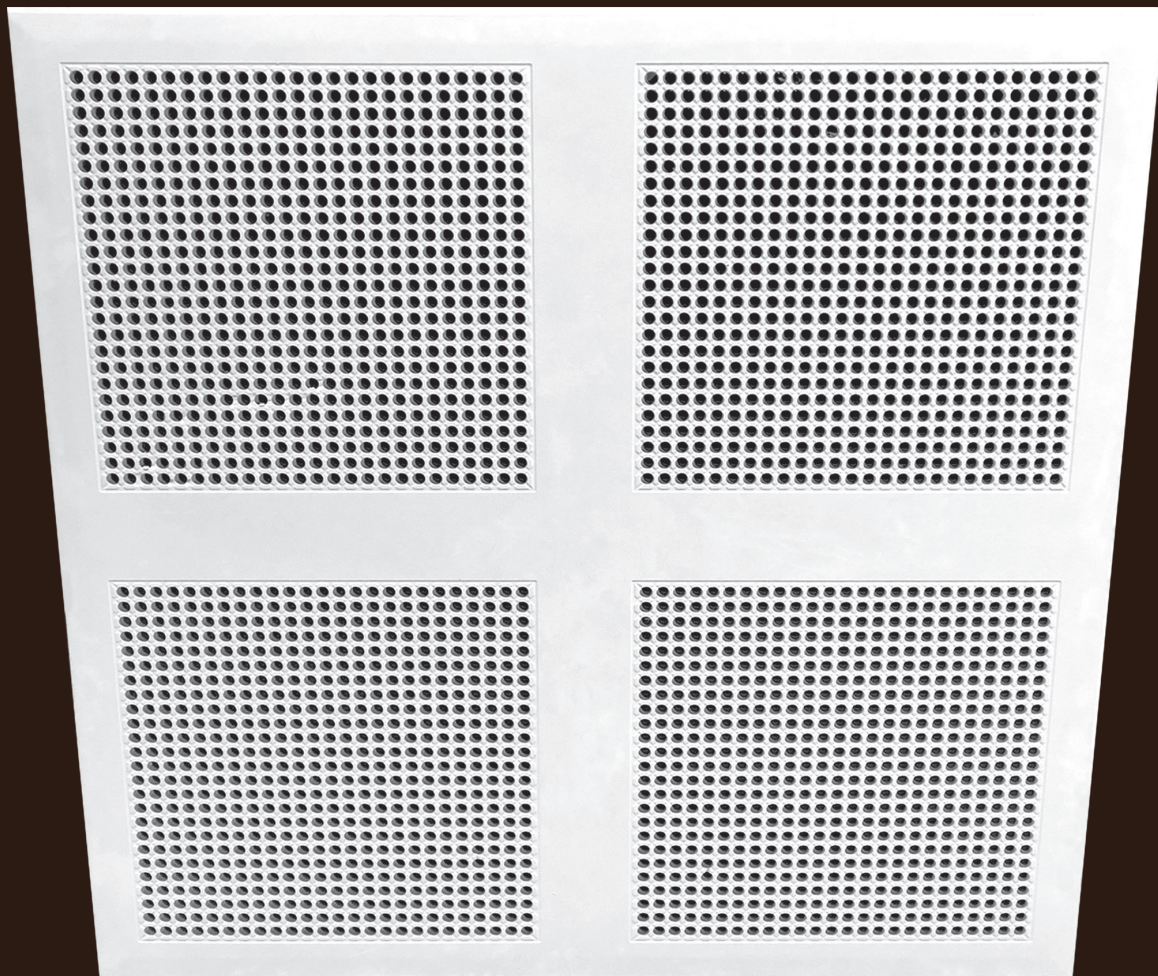
| Ceil Sound Panel ACOUSTIC PERFORMANCE AND SPECIFICATION | | | | | | | | | |
|---|--------------------|-------------|---------|-------------------------|------|------|------------|--------------------|------------------------|
| Open Area | Panel Thickness mm | Size mm | R Value | Insulation Thickness mm | NRC | SAA | α_w | % Light Reflective | Mass Kg/m ² |
| 27.2% | 13 | 1200 x 1200 | 0.80 | 20 | 0.80 | 0.79 | 0.75 | 0.78 | 11.00 |
| | | | | 50 | 0.90 | 0.88 | 0.80 | | |

All dimensions are in mm and are approximate

Australian Plaster Acoustics – Ph (02) 9533 3909



Open Cell Panel



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PROPERTIES

- Recessed edged panel 1200 x 1200mm, perforated with 4 sets of holes per panel, 25 x 25 holes per set, hole size 15 mm diameter at the mouth, tapering to 13.5 mm at the rear; holes at 19.2 mm centres.
- 13mm thick perforated moulded plaster panel
- Insulated with 20 mm Supertel 42Kg/m³ glasswool (1) or 50 mm Supertel 42Kg/m³ glasswool behind, faced with black matt tissue (2)
- Mechanically fixed (screwed to furring channel)

Open Cell Panel ACOUSTIC PERFORMANCE AND SPECIFICATION

| Open Area | Panel Thickness mm | Size mm | R Value | Insulation Thickness mm | NRC | SAA | α_w | % Light Reflective | Mass Kg/m ² |
|-----------|--------------------|-------------|---------|-------------------------|------|------|------------|--------------------|------------------------|
| 30.7% | 13 | 1200 x 1200 | 0.80 | 20 | 0.80 | 0.92 | 0.75 | 0.78 | 11.00 |
| | | | | 50 | 0.90 | 0.90 | 0.85 | | |



CELL AIR INSTALLATION
UNIVERSITY OF WOLLONGONG
NSW AUSTRALIA

Cell Air Panel



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PROPERTIES

- V edged 1200 x 1200mm panels with a set of 14 x 14 circular perforations 55mm at the mouth, tapering to 53 mm at the rear; holes at 86 mm centres, forming a continuous pattern when joined.
- 15mm thick perforated plasterglass V-edged ceiling panel requires minimal setting
- Mechanically fixed (screwed to furring channel)
- Insulated with 20 mm Supertel 42Kg/m³ glasswool (1) or 50 mm Supertel 42Kg/m³ glasswool behind, faced with black matt tissue (2)

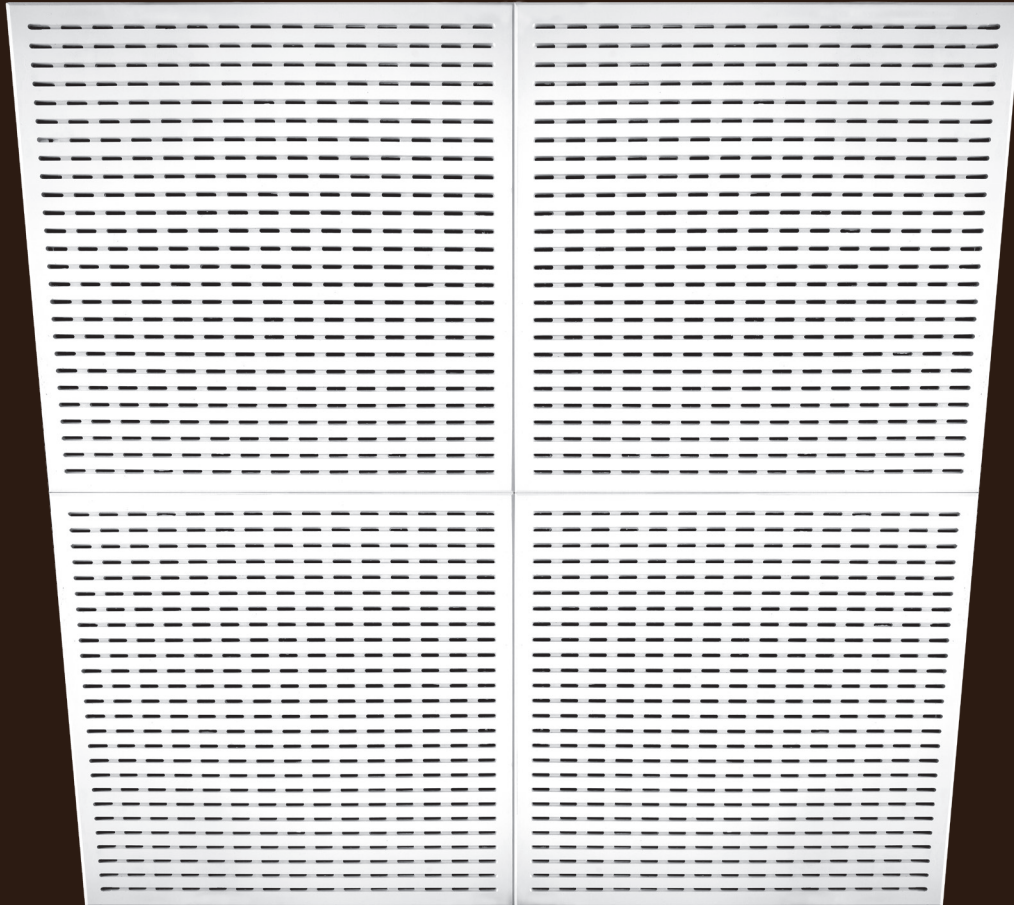
| Cell Air Panel ACOUSTIC PERFORMANCE AND SPECIFICATION | | | | | | | | | |
|---|--------------------|-------------|---------|-------------------------|------|------|------------|--------------------|------------------------|
| Open Area | Panel Thickness mm | Size mm | R Value | Insulation Thickness mm | NRC | SAA | α_w | % Light Reflective | Mass Kg/m ² |
| 31.8% | 13 | 1200 x 1200 | 0.80 | 20 | 0.85 | 0.84 | 0.70 | 0.80 | 11.00 |
| | | | | 50 | 0.95 | 0.93 | 0.75 | | |

JUSTICE INSTALLATION

High Court of Australia, Canberra



Justice Panel



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PROPERTIES

- V edged 1200 x 1200mm panels with a set of 14 x 14 circular perforations 55mm at the mouth, tapering to 53 mm at the rear; holes at 86 mm centres, forming a continuous pattern when joined.
- 15mm thick perforated plasterglass V-edged ceiling panel requires minimal setting
- Mechanically fixed (screwed to furring channel)
- Insulated with 50 mm Supertel 32Kg/m³ glasswool behind, faced with black matt tissue

Justice Panel ACOUSTIC PERFORMANCE AND SPECIFICATION

| Open Area | Panel Thickness mm | Size mm | R Value | Insulation Thickness mm | NRC | SAA | α_w | % Light Reflective | Mass Kg/m ² |
|-----------|--------------------|------------|---------|-------------------------|------|------|------------|--------------------|------------------------|
| 10.4% | 13 | 1100 x 900 | 0.80 | 50, 200 gap | 0.75 | 0.75 | 0.55 | 0.78 | 11.00 |
| | | | | 50, 50 gap | 0.90 | 0.85 | 0.55 | | |

SUMMARY

EXPOSED GRID SYSTEM

RONDO Suspension: Duo1/DuoH x 1200 Duo2/600

PLASTER ACOUSTIC TILES – CRAFTSTONE COLLECTION

Tile Dimensions: 600mm x 600mm

| | Open Area | Mass Kg/m ² | Thickness Tile | Thickness Insulation | NRC | SAA | α_w | R Value | % Light Reflective |
|---------------|-----------|------------------------|----------------|----------------------|------|------|------------|---------|--------------------|
| Casino | 35.8% | 14.10 | 25mm | 20mm | 0.90 | 0.90 | 0.90 | 0.80 | 0.70 |
| Moon | 30.0% | 11.50 | 16mm | 20mm | 0.90 | 0.90 | 0.90 | 0.80 | 0.74 |

PLASTER ACOUSTIC TILES – COFFERED COLLECTION - DROP IN

Tile Dimensions: 600mm x 600mm

| DROP IN | Open Area | Mass Kg/m ² | Thickness Tile (mm) | Thickness Insulation | NRC | SAA | α_w | R Value | % Light Reflective |
|--------------------------|-----------|------------------------|---------------------|----------------------|------|------|------------|---------|--------------------|
| EcoCheck Coffered | 12.7% | 12.50 | 13, 30 at border | 20mm | 0.75 | 0.76 | 0.65 | 0.80 | 0.80 |

CONCEALED GRID SYSTEM

RONDO Suspension: Furring channel 28mm thick Steel Stud (Walls) 64, 76, 92 wide

PLASTER ACOUSTIC TILES – COFFERED COLLECTION - DIRECT FIX

Tile Dimensions: 1200mm x 600mm

| DIRECT FIX | Open Area | Mass Kg/m ² | Thickness Tile (mm) | Thickness Insulation | NRC | SAA | α_w | R Value | % Light Reflective |
|-----------------|-----------|------------------------|---------------------|----------------------|------|------|------------|---------|--------------------|
| EcoCheck | 11.1% | 12.50 | 13, 30 at border | 20mm | 0.70 | 0.70 | 0.60 | 0.80 | 0.80 |
| Plain | 0.0% | | | | n/a | n/a | n/a | 0.80 | 0.76 |

PLASTER ACOUSTIC PANELS – NEW YORK COLLECTION

| | Open Area | Panel Size (mm) | Mass Kg/m ² | Thickness Panel | Thickness Insulation | NRC | SAA | α_w |
|-------------------------|-----------|-----------------|------------------------|-----------------|----------------------|------|------|------------|
| Ceil Sound Panel | 27.2% | 1200 x 1200 | 11.0 | 13mm | 20mm | 0.80 | 0.79 | 0.75 |
| | | | | | 50mm | 0.90 | 0.88 | 0.80 |
| Open Cell Panel | 30.7% | 1200 x 1200 | 11.0 | 13mm | 20mm | 0.80 | 0.75 | 0.82 |
| | | | | | 50mm | 0.90 | 0.85 | 0.90 |
| Cell Air Panel | 31.8% | 1200 x 1200 | 12.5 | 15mm | 20mm | 0.85 | 0.84 | 0.70 |
| | | | | | 50mm | 0.95 | 0.93 | 0.75 |
| Justice Panel | 10.4% | 1100 x 1200 | 11.0 | 13mm | 50mm ^a | 0.75 | 0.75 | 0.55 |
| | | | | | 50mm ^b | 0.90 | 0.85 | 0.85 |

NOTE: a tested with 200mm air gap, b tested with 50mm air gap

SUMMARY - PHYSICAL PROPERTIES

- **Material:** Glass reinforced plaster
- **Surface finish:** Factory applied white Anti Mould paint (Plaster acoustic tiles only)
- **Flame spread/ fire resistance:** Conforms to BCA Spec CI 10 tested to AS/NZS 3837 - 1998 Group 1
- **Thermal resistance (R Value):** 0.80 m²k/w
- Insulated with 42Kg/m³, Bradford Supertel glasswool 20mm thick, with lightweight black acoustic fabric backing
- This product has a "non-dangerous goods" classification
- **Dimensional stability:** up to 95% humidity

Results shown is a guide to acoustic performance. Acoustic Test shown here are examples of what can be achieved for NRC using different insulation methods.

Products can be supplied with acoustic fabric or choice of insulation. Thicker Insulation may be used to further increase absorption. **All tiles and panels are supplied with acoustic fabric to backing.**

All thicknesses and weights are nominal.

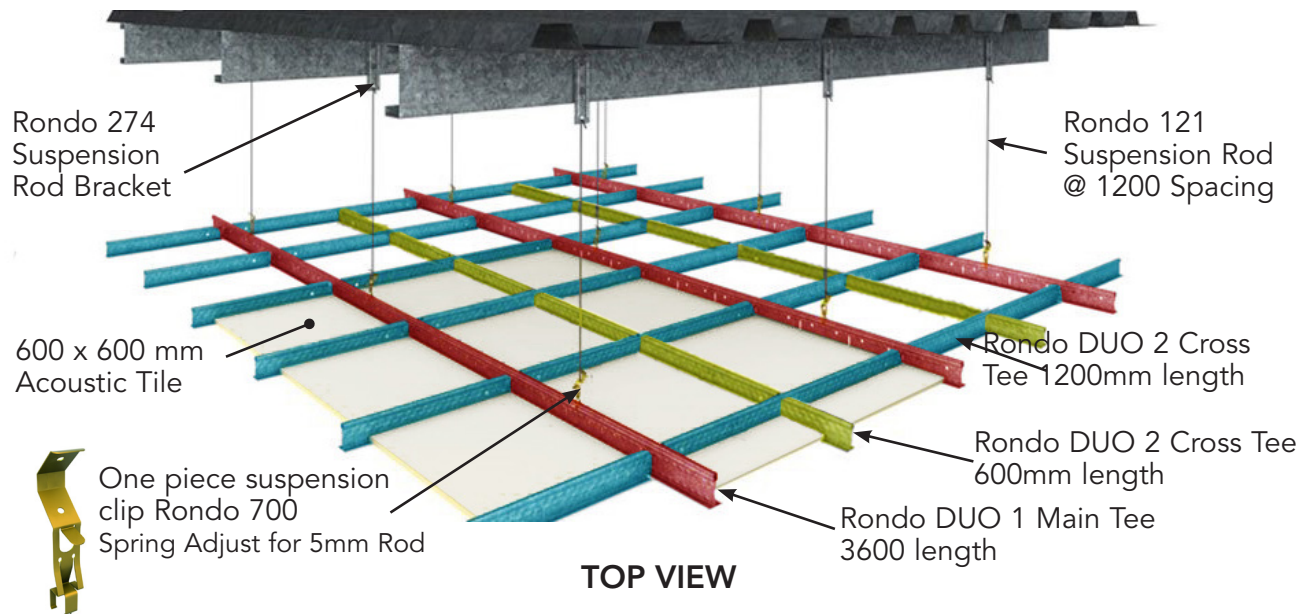
INSTALLATION

PLASTER ACOUSTIC CEILING TILES, 600 X 600 MM SIZE

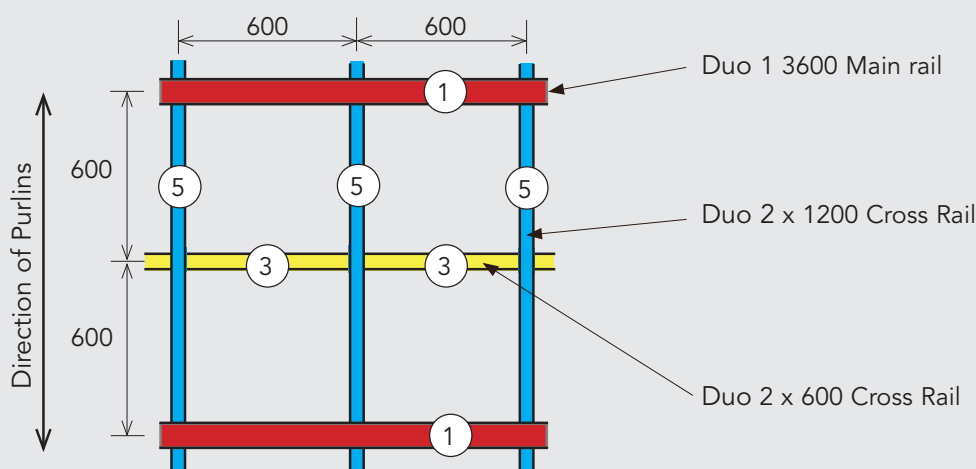
1. Plan ceiling layout to provide even margins at the perimeter.
2. Centre the ceiling both ways ensuring centre lines are at right angles.
3. Fix wall angle trim to perimeter walls at the correct height set by a level line. Mitre the wall angle trim around piers and columns.
4. Fix ceiling grid in accordance to Rondo grid layout using Duo system.
5. Cutting tiles can generally be avoided by designing the ceiling so that whole tiles or panels extend as close as practicable to the room area perimeters and then filling to the wall with a plaster board margin.
6. If cutting cannot be avoided the following typical methods are recommended.
 - When ordering plaster acoustic ceiling tiles make sure to order solid tiles with the same pattern but without the acoustic insulation, these separate tiles will make cutting of the tiles much easier to perform.
 - Use a router bit to cut panels and tiles to the required size. The router bit rebates the tile to enable installation into the ceiling grid.
 - Panels and tiles can also be cut to size with a panel saw.
 - Cable penetrations and sprinkler head holes should be cut into solid tiles or panels using a drill with an appropriate hole saw attachment.
 - Down light & pipe penetrations should also be cut into solid tiles or panels using a key hole saw or a drill with an appropriate hole saw attachment.

EXPOSED GRID SYSTEM LAYOUT

PLASTER ACOUSTIC CEILING TILE 600 X 600 MM



TOP VIEW



PLAN VIEW

- 1** The Duo 1 main tee shall be hung on soft galvanize rod or 2.5mm wire, accurately levelled. Suspension clips shall be spaced at 1200mm centres along the Duo 1 main tee.
- 5** Duo 2 main tees to be spaced at 1200mm centres. Duo 2 X 1200 cross tees shall intersect main tees at 600mm centres and be positively locked together.
- 3** Duo 2 x 600 cross tees are to be spaced at 600mm and shall intersect Duo 1200 cross tees at 600mm centres and be positively locked together.

Wall angle shall be securely fixed to the wall at 600mm centres providing a true level edge.

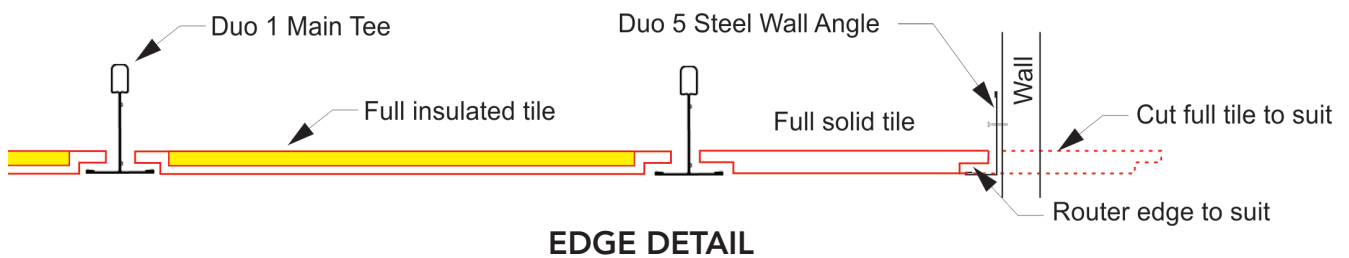
The suspension hangers, main tees and cross tees shall be spaced as not to exceed the design ceiling load, or as required to prevent deflection, in excess of 1/360 of the span of cross tee or main tee.

Extra hangers are to be provided for light fittings and conditioning units etc.

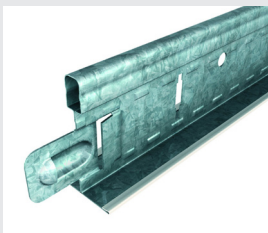
All light fittings are to be supported on the main tee.

RONDO DUO SYSTEM COMPONENTS

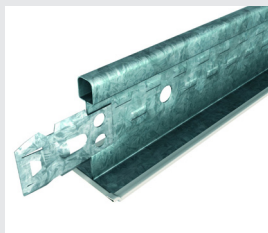
FOR EXPOSED GRID SYSTEM



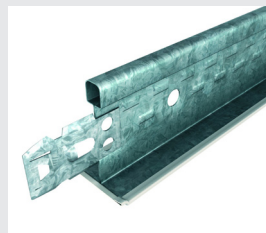
RONDO DUO COMPONENTS



Rondo DUO 1
24 x 38mm Main Tee
3600 mm Length



Rondo DUO 2
24 x 34mm Cross Tee
1200 mm Length

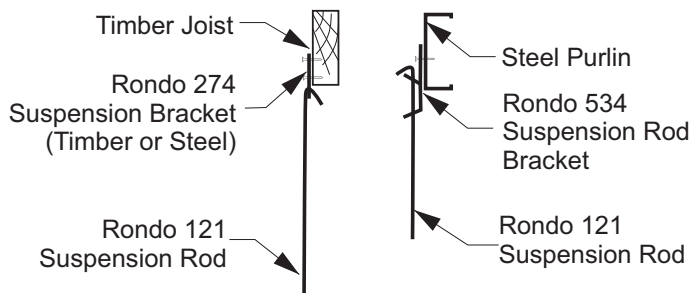


Rondo DUO 2
24 x 34mm Cross Tee
600 mm Length

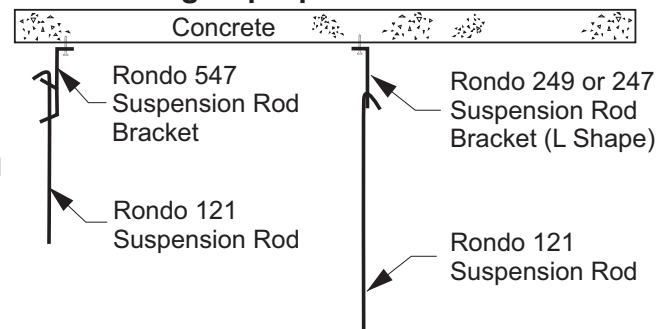


Rondo DUO 5
25 x 19mm Steel
Wall Angle

Direct Fixing Clip Options to Timber or Steel Purlins



Direct Fixing Clip Options to Concrete



FIXING DETAIL

RONDO SUSPENSION ROD HANGERS



Rondo 274 Suspension
Rod Bracket (Timber/
Steel)



Rondo 547
Adjustable Hanger
(Concrete)



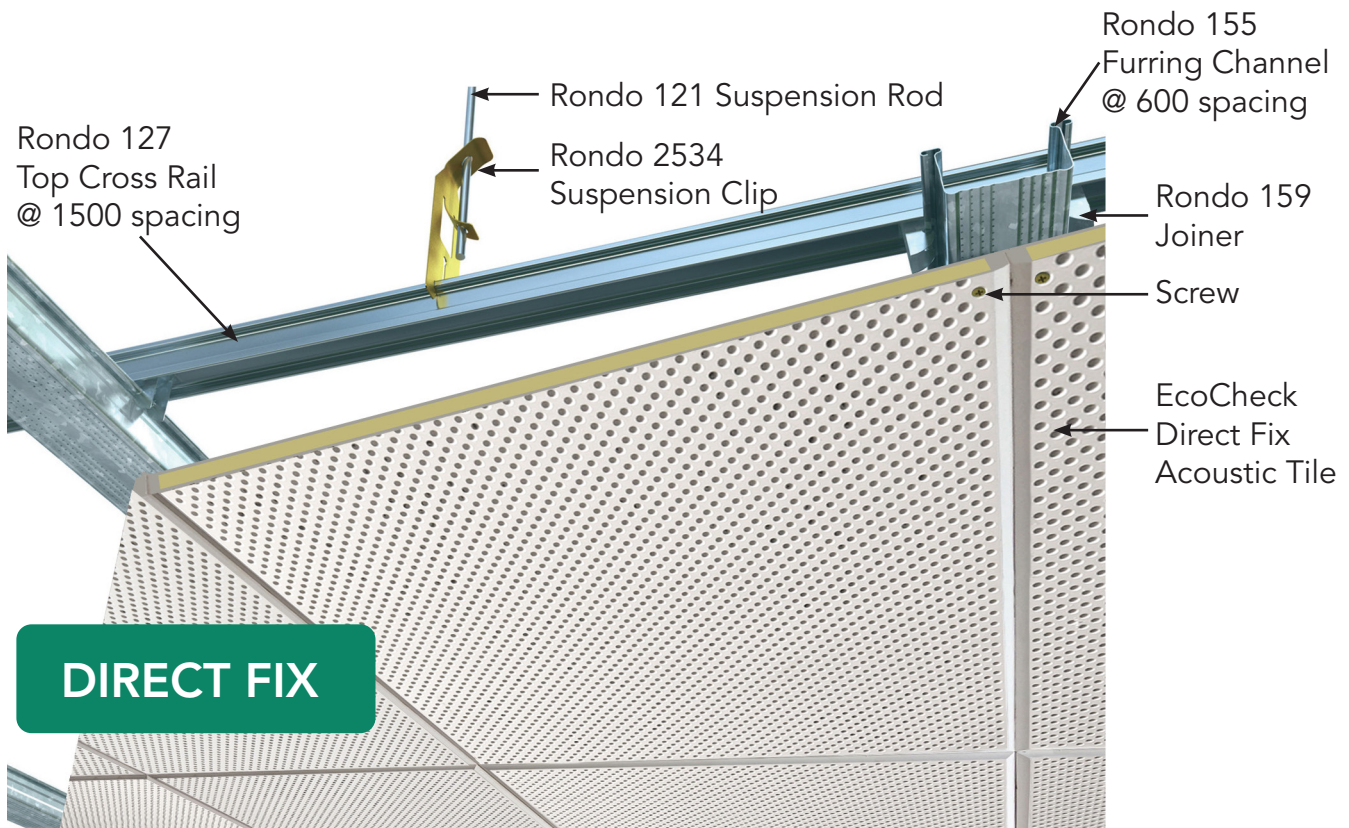
Rondo 534
Adjustable Hanger
(Purlins)



Rondo 247
Suspension Rod
Bracket (Concrete)

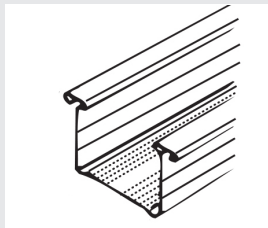
CONCEALED GRID SUSPENDED CEILING

PLASTER ACOUSTIC CEILING TILE 600 X 600 MM, 1200 X 600

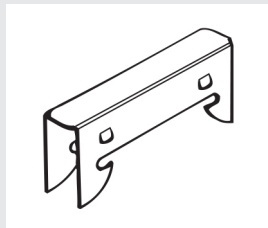


BOTTOM VIEW Typical Ceiling Installation with RONDO KEY-LOCK® Ceiling System

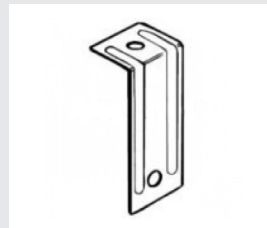
RONDO KEY-LOCK® Components



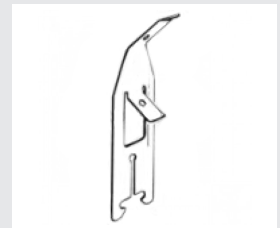
155 Furring Channel



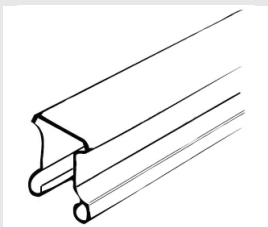
159 Joiner



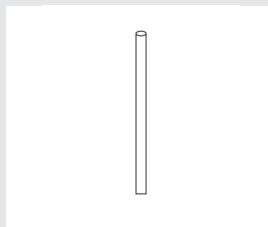
Rondo 247 Suspension Rod Bracket



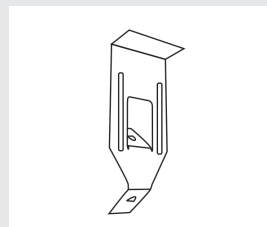
Rondo 2534 Suspension Clip



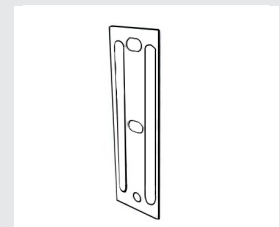
Rondo 127 Top Cross Rail



Rondo 121 Suspension Rod



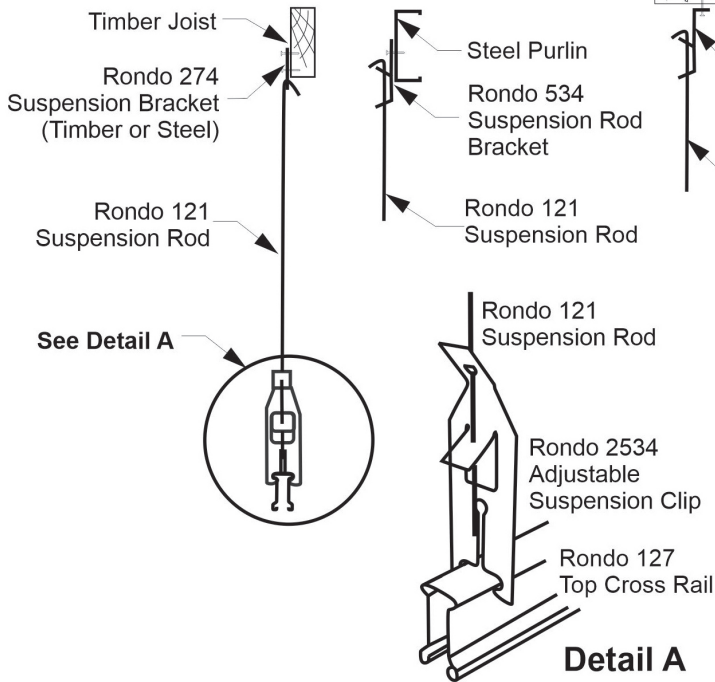
Rondo 547 Adjustable Suspension Hanger



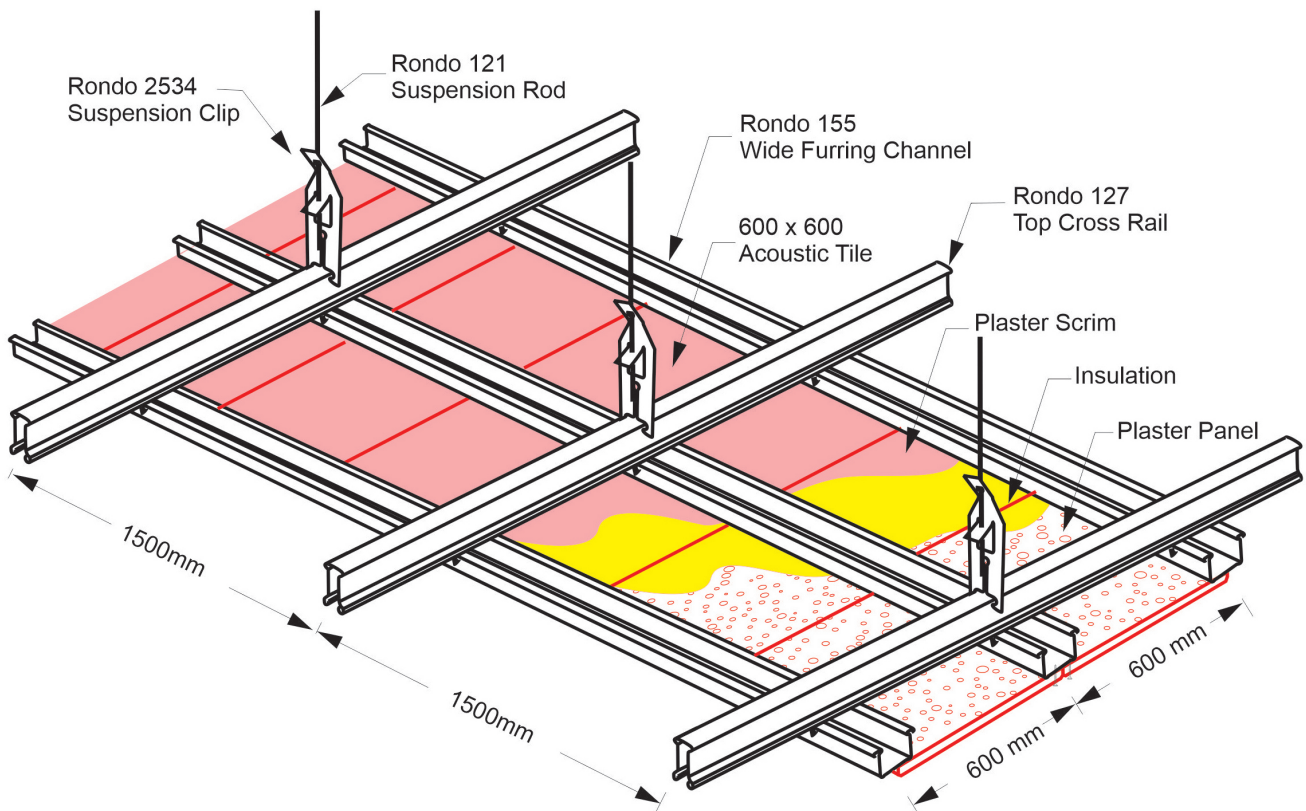
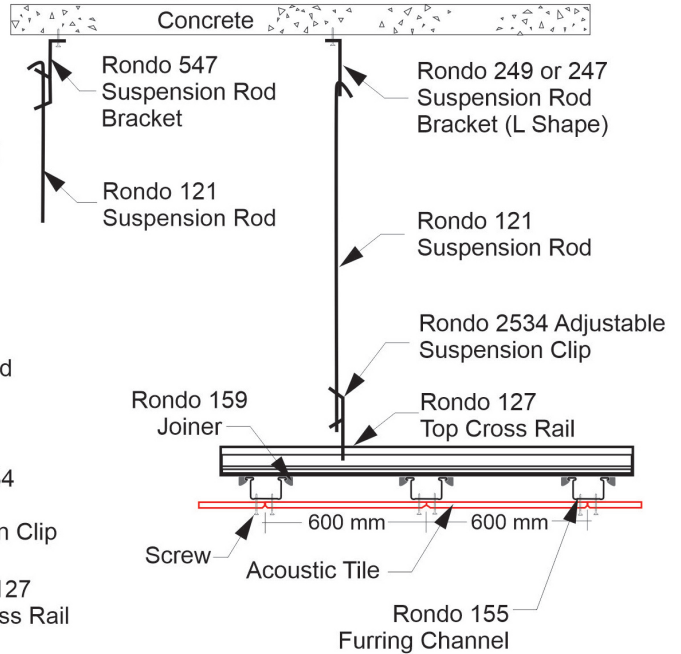
Rondo 274 Suspension Bracket

CONCEALED SUSPENDED CEILING INSTALLATION

Direct Fixing Clip Options to Timber or Steel Purlins



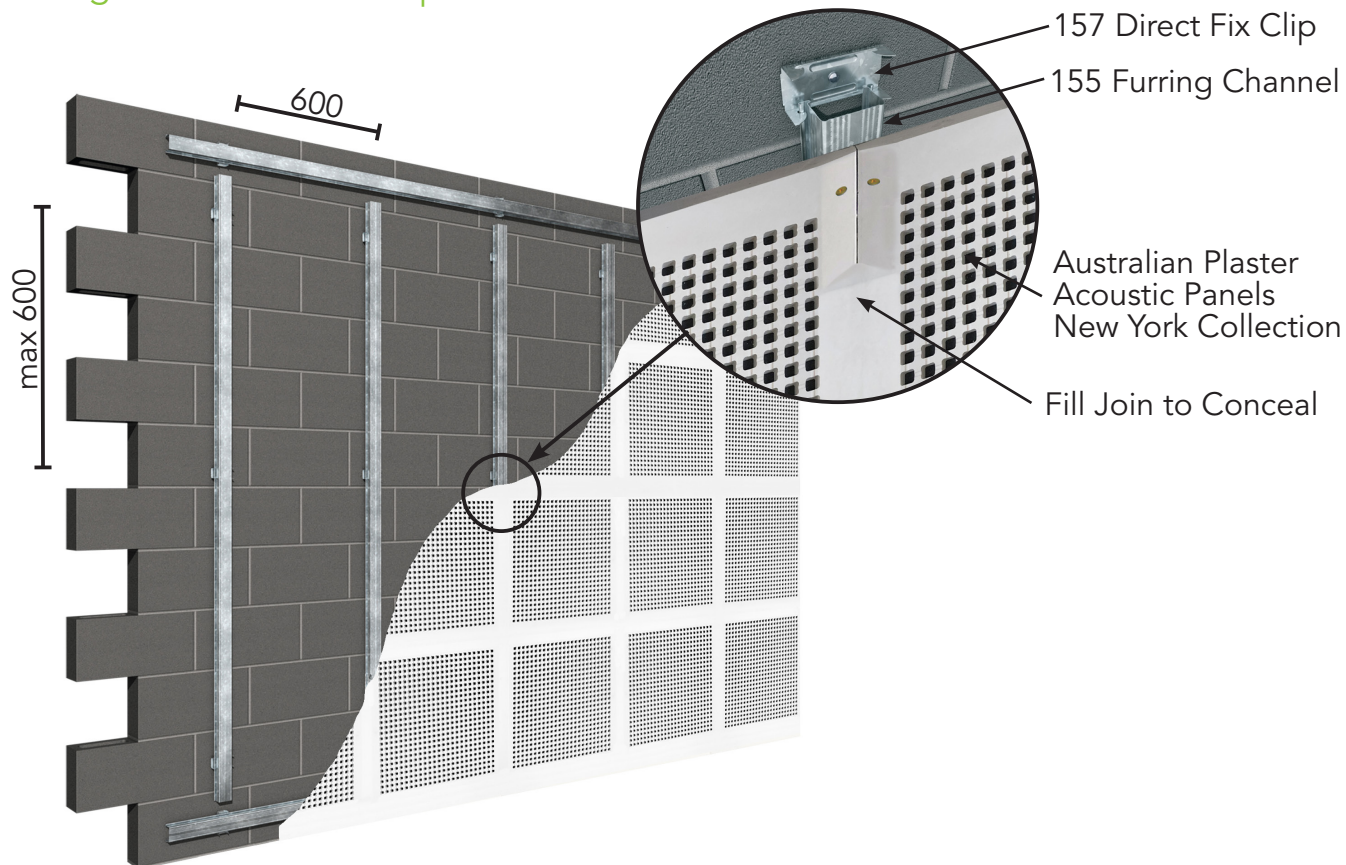
Direct Fixing Clip Options to Concrete



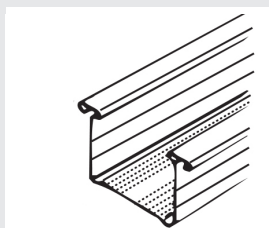
DIRECT FIX

ACOUSTIC PANEL WALL INSTALLATION

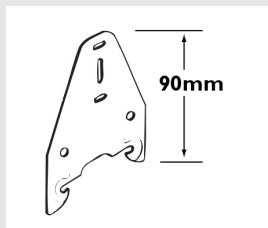
Using Rondo Internal Express Joint Wall



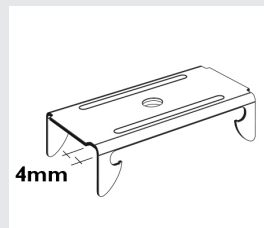
Typical Wall Installation with RONDO KEY-LOCK® Components



155 Furring Channel

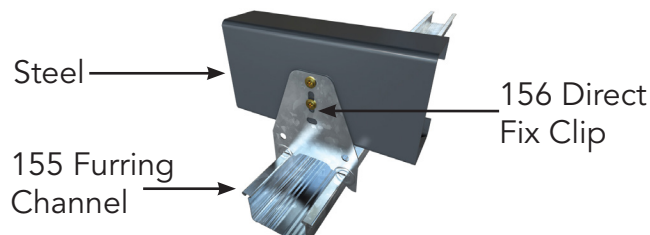
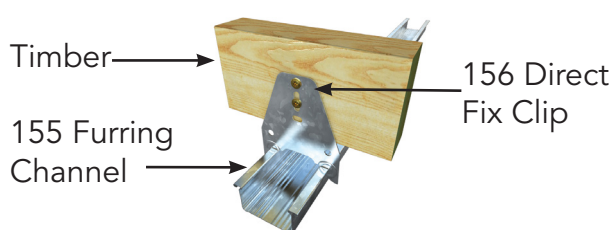


156 Direct Fix Clip



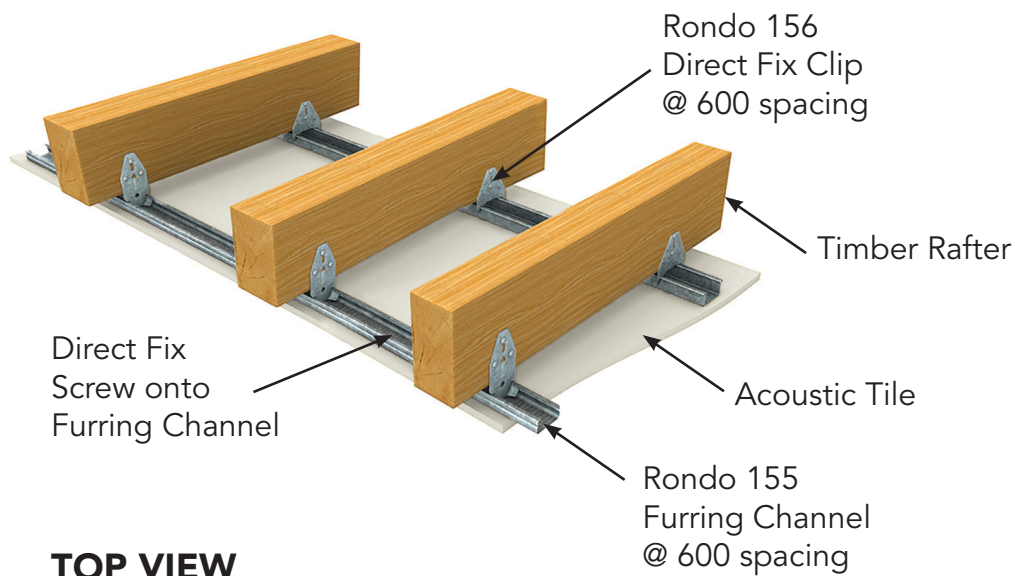
157 Direct Fix Clip

The 156 Direct Fix Clip is able to fix the 155 Furring Channel to steel purlins or timber joists in ceiling applications as well as to steel girts or timber stud work in walls.



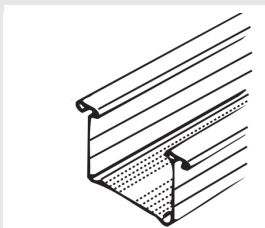
DIRECT FIX**ACOUSTIC PANEL CEILING INSTALLATION**

Using RONDO KEY-LOCK® Ceiling System

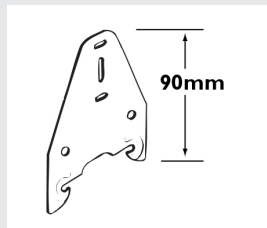


Typical Ceiling Installation with RONDO KEY-LOCK® Ceiling System

Typical Direct Ceiling Installation with RONDO KEY-LOCK® Components

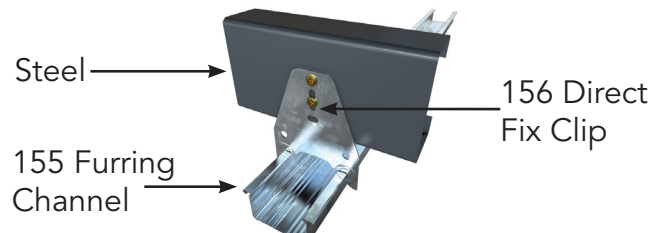
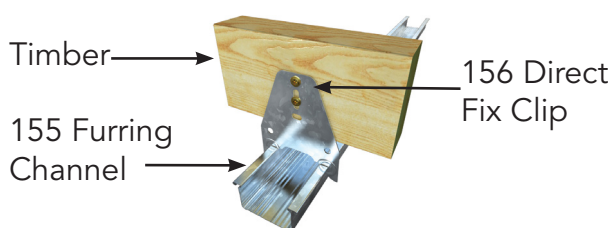


155 Furring Channel



156 Direct Fix Clip

The 156 Direct Fix Clip is able to fix the 155 Furring Channel to steel purlins or timber joists in ceiling applications as well as to steel girts or timber stud work in walls.



TESTING

Plaster Acoustic Products have been tested for **NRC** in accordance with ASTM-C423-90A at CSIRO Melbourne, Australia with NATA accreditation.

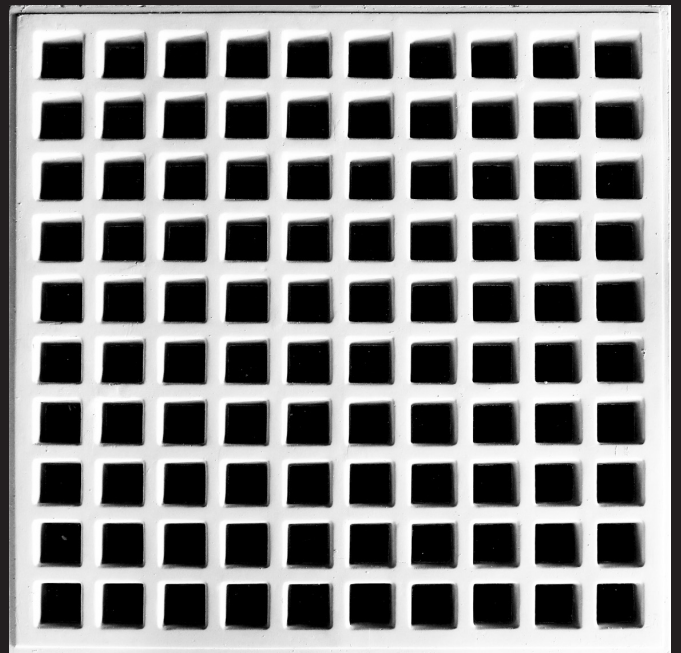
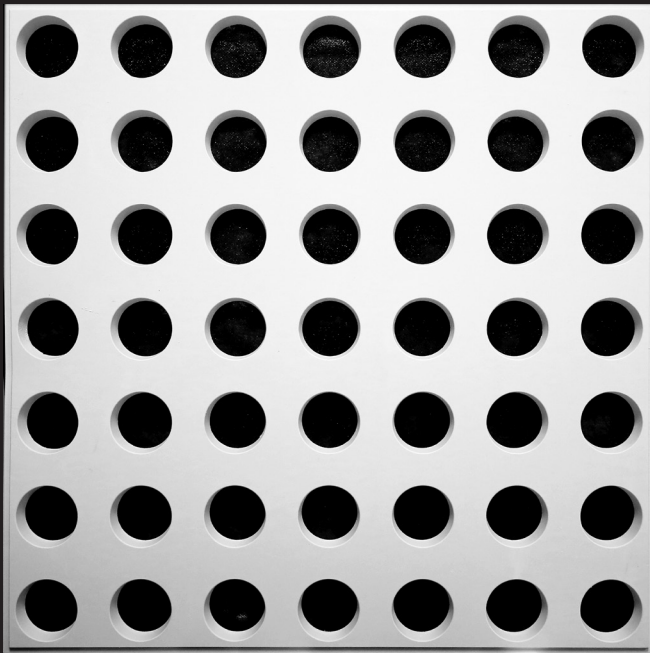
Plaster Products tested for **Room to Room CAC** have been tested in accordance with ASTM E1414 / E 1414M - 11A at Acoustic Laboratories Australia Pty Ltd, Perth, Western Australia.

Plaster Products tested for **Steady - State Thermal Transmission** properties by means of the Heat Flow Apparatus have been product tested in Melbourne, Australia at AWTa Product Testing. (ASTM-C518) 2010

Plaster Products tested for **Heat + Smoke** release have been tested in accordance with AS/NZS 3837 - 1998 and ISO 5660.1- 2002 (Cone Colorimeter Method) at AWTa Product Testing Melbourne, Australia.

TEST RESULTS

Craftstone Collection





CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:
AC277-23-1

Client: Bailey Interiors Pty Ltd
83-85 Boundary Road, Mortdale, NSW 2223

Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: *Acoustics-Measurement of sound absorption in a reverberation room*
AS ISO 11654-2002 [R2016] (ISO 11654:1997): *Acoustics-Rating of sound absorption-Materials and systems*

Test Specimen [Specimen area: 3.6 x 3.0 m (10.8 m²)]

Description: • Bailey "Casino" drop-in ceiling tiles, • in 600 mm grid, • with black tissue faced glass fibre batt fixed to rear of each tile, open to the cavity airspace (Type E-200)

Tile and Batt Details³

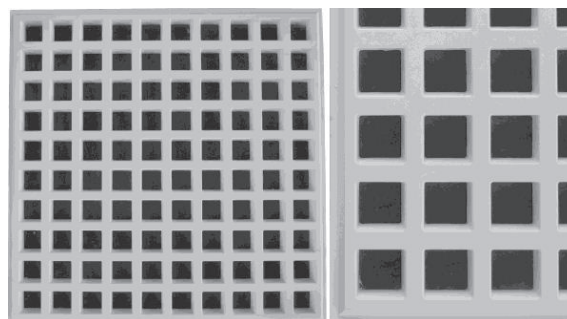
- Moulded plaster ceiling tiles designed to drop into a standard 600 mm suspended ceiling grid.
- Perforated with a regular pattern of 100 square holes with rounded corners (10 x 10 array), opening into a black tissue-faced glass fibre batt behind (stapled to the rear of the tile). Hole size was approx 40 mm at the face, tapering to 36 mm at the rear, positioned at approx 56 mm centres. The perforated region of the tile extended proud of the perimeter by approx 5 mm.
- Open area percentage⁴ (estimated): 44.2 % (based on mouth area at face); 35.8 % (based on throat area at rear of tile).
- Each tile was fitted with a black tissue-faced semi rigid high-density CSR Bradford glass fibre batt, approx 570 x 570 x 20 mm (nom 32 kg/m³); factory-stapled to the rear of the tile.

Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m², built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at an 11° angle to the chamber walls (not parallel, as per AS ISO 354 cl6.2.1.2). All enclosure edges and junctions were taped.
- A system of extruded aluminium profiles (all solid, not hollow) and plastic support pieces was set up inside the enclosure to support the tiles with their edges nominally flush with the enclosure. The cavity behind was a single undivided cavity without internal partitions.
- Tiles were arranged in a 6 x 5 array on the support system.
- Tee sections were placed on top to cover the gaps between adjacent tiles, equivalent to a normal ceiling installation. The perimeter of the installed test specimen was taped with masking tape to seal between the tiles and the enclosure at the perimeter.
- Specimen installation was carried out by laboratory staff.



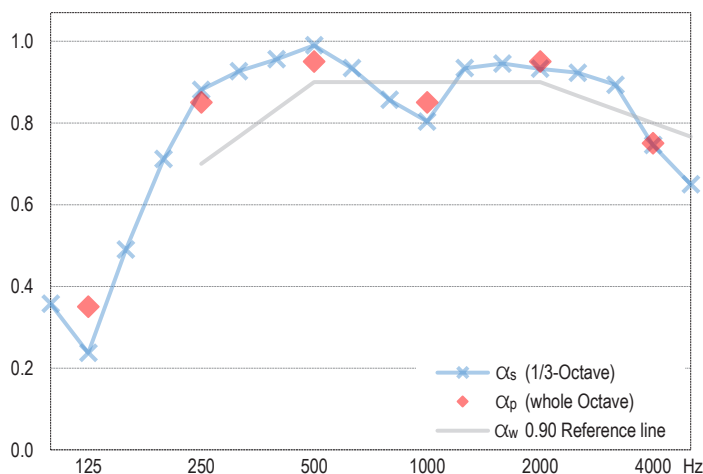
Test specimen installed for testing (image inverted to depict ceiling installation)



Tile details – Left: whole tile, Right: close-up view

Measurement Details & Results

| Freq Hz | Absorption coefficients | | | Reverberation times, T ₆₀ (sec) | |
|------------|-------------------------|----------------|--------------|--|---------------|
| | α _s | α _p | 95% Conf (δ) | Empty room | with Specimen |
| 100 | 0.36 | | 0.07 | 5.13 | 3.19 |
| 125 | 0.24 | 0.35 | 0.04 | 6.60 | 4.35 |
| 160 | 0.49 | | 0.06 | 6.48 | 3.16 |
| 200 | 0.71 | | 0.08 | 5.80 | 2.45 |
| 250 | 0.88 | 0.85 | 0.05 | 5.20 | 2.07 |
| 315 | 0.93 | | 0.09 | 6.22 | 2.14 |
| 400 | 0.96 | | 0.05 | 6.19 | 2.10 |
| 500 | 0.99 | 0.95 | 0.07 | 5.74 | 1.99 |
| 630 | 0.93 | | 0.05 | 5.75 | 2.07 |
| 800 | 0.86 | | 0.05 | 5.42 | 2.14 |
| 1000 | 0.80 | 0.85 | 0.04 | 5.23 | 2.19 |
| 1250 | 0.93 | | 0.05 | 4.65 | 1.91 |
| 1600 | 0.95 | | 0.03 | 4.15 | 1.81 |
| 2000 | 0.93 | 0.95 | 0.05 | 3.69 | 1.73 |
| 2500 | 0.92 | | 0.04 | 3.23 | 1.63 |
| 3150 | 0.89 | | 0.03 | 2.83 | 1.55 |
| 4000 | 0.75 | 0.75 | 0.03 | 2.30 | 1.48 |
| 5000 | 0.65 | | 0.05 | 1.85 | 1.34 |



Performance Indices^{1,2}

α_w = 0.90
SAA = 0.90
NRC = 0.90

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.

Measurement Conditions

| | Empty room | with Test Specimen |
|-------------------------|------------------|--------------------|
| Date of measurement: | 25 Aug 2020 | 25 Aug 2020 |
| Temperature & humidity: | 16 °C, 55 % R.H. | 17 °C, 55 % R.H. |
| Atmospheric pressure: | 1018 mBar | 1017 mBar |

Notes, Deviations etc

1. Shape indicators (L, M, and H), if any, following the α_w index, indicate α_p values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
2. SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

3. Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
4. Open area estimates are based on 600 x 600 mm of ceiling area being 'treated' by each tile.

Issuing Authority

Signed:
Date: 9 September 2020

Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2
Microphones/preamps: • 2 x GRAS type 46AR mic/preamp sets, and 2 x B&K type 4134 mics on B&K 2669 preamps, in 4 fixed positions as per AS ISO 354
Noise source: • Room populated with three dodecahedron loudspeakers;

Laboratory Construction

Reverb room: • 300 mm thick concrete (closed off from the adjoining room by a plasterboard wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m³ total room volume • approx 215 m² surface area excluding diffusers



CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:
AC277-24-1

Client: Bailey Interiors Pty Ltd
83-85 Boundary Road, Mortdale, NSW 2223

Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: *Acoustics-Measurement of sound absorption in a reverberation room*

AS ISO 11654-2002 [R2016] (ISO 11654:1997): *Acoustics-Rating of sound absorption-Materials and systems*

Test Specimen [Specimen area: 3.6 x 3.0 m (10.8 m²)]

Description: • Bailey "Moon" drop-in ceiling tiles, • in 600 mm grid, • with black tissue faced glass fibre batt fixed to rear of each tile, open to the cavity airspace (Type E-200)

Tile and Batt Details³

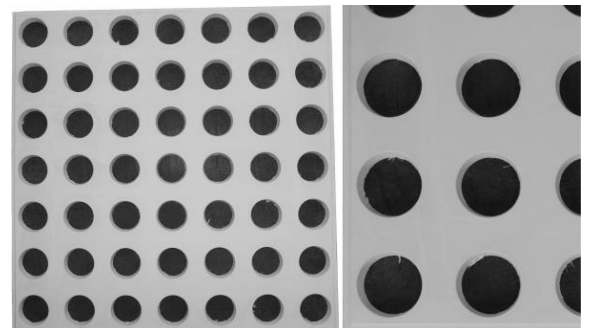
- Moulded plaster ceiling tiles designed to drop into a standard 600 mm suspended ceiling grid.
- Perforated with a regular pattern of 49 circular holes (7 x 7 array), opening into a black tissue-faced glass fibre batt behind (stapled to the rear of the tile). Hole size was approx 54 mm at the face, tapering to 50 mm at the rear, positioned at approx 84 mm centres.
- Open area percentage⁴ (estimated): 31.2 % (based on mouth area at face); 26.7 % (based on throat area at rear of tile).
- Each tile was fitted with a black tissue-faced semi rigid high-density CSR Bradford glass fibre batt, approx 590 x 590 x 20 mm (nom 32 kg/m³); factory-stapled to the rear of the tile.

Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m², built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at an 11° angle to the chamber walls (not parallel, as per AS ISO 354 d6.2.1.2). All enclosure edges and junctions were taped.
- A system of extruded aluminium profiles (all solid, not hollow) and plastic support pieces was set up inside the enclosure to support the tiles with their edges nominally flush with the enclosure. The cavity behind was a single undivided cavity without internal partitions.
- Tiles were arranged in a 6 x 5 array on the support system.
- Tee sections were placed on top to cover the gaps between adjacent tiles, equivalent to a normal ceiling installation. The perimeter of the installed test specimen was taped with masking tape to seal between the tiles and the enclosure at the perimeter.
- Specimen installation was carried out by laboratory staff.



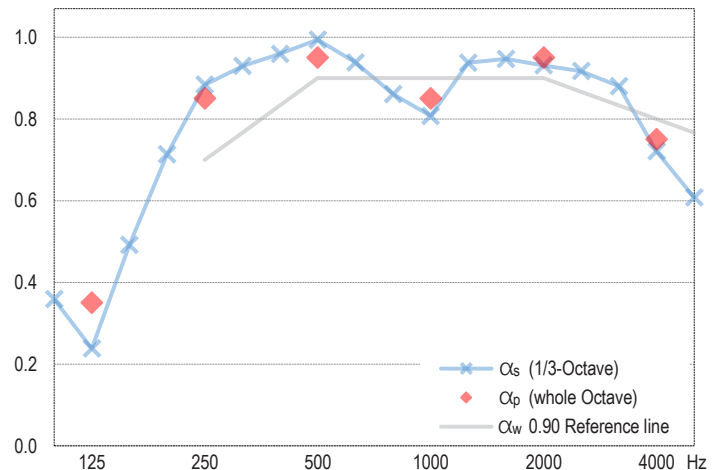
Test specimen installed for testing (image inverted to depict ceiling installation)



Tile details – Left: whole tile, Right: close-up view

Measurement Details & Results

| Freq Hz | Absorption coefficients | | | Reverberation times, T ₆₀ (sec) | |
|------------|-------------------------|----------------|--------------|--|---------------|
| | α _s | α _p | 95% Conf (δ) | Empty room | with Specimen |
| 100 | 0.36 | | 0.07 | 5.13 | 3.19 |
| 125 | 0.24 | 0.35 | 0.04 | 6.60 | 4.35 |
| 160 | 0.49 | | 0.06 | 6.48 | 3.16 |
| 200 | 0.71 | | 0.08 | 5.80 | 2.45 |
| 250 | 0.88 | 0.85 | 0.05 | 5.20 | 2.07 |
| 315 | 0.93 | | 0.09 | 6.22 | 2.14 |
| 400 | 0.96 | | 0.05 | 6.19 | 2.10 |
| 500 | 0.99 | 0.95 | 0.07 | 5.74 | 1.99 |
| 630 | 0.94 | | 0.05 | 5.75 | 2.07 |
| 800 | 0.86 | | 0.05 | 5.42 | 2.14 |
| 1000 | 0.81 | 0.85 | 0.04 | 5.23 | 2.19 |
| 1250 | 0.94 | | 0.05 | 4.65 | 1.91 |
| 1600 | 0.95 | | 0.03 | 4.15 | 1.81 |
| 2000 | 0.93 | 0.95 | 0.05 | 3.69 | 1.73 |
| 2500 | 0.92 | | 0.04 | 3.23 | 1.63 |
| 3150 | 0.88 | | 0.03 | 2.83 | 1.55 |
| 4000 | 0.72 | 0.75 | 0.03 | 2.30 | 1.48 |
| 5000 | 0.61 | | 0.05 | 1.85 | 1.34 |



Performance Indices^{1,2}

α_w = 0.90
SAA = 0.90
NRC = 0.90

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.

Measurement Conditions

| | Empty room | with Test Specimen |
|-------------------------|------------------|--------------------|
| Date of measurement: | 25 Aug 2020 | 25 Aug 2020 |
| Temperature & humidity: | 16 °C, 55 % R.H. | 16 °C, 54 % R.H. |
| Atmospheric pressure: | 1018 mBar | 1017 mBar |

Notes, Deviations etc

1. Shape indicators (L, M, and H), if any, following the α_w index, indicate α_p values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
2. SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

3. Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
4. Open area estimates are based on 600 x 600 mm of ceiling area being 'treated' by each tile.

Issuing Authority

Signed:
Date: 9 September 2020

Instrumentation

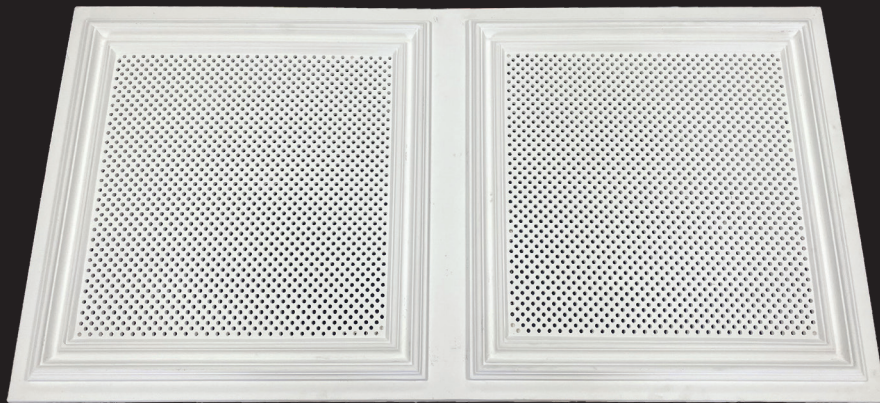
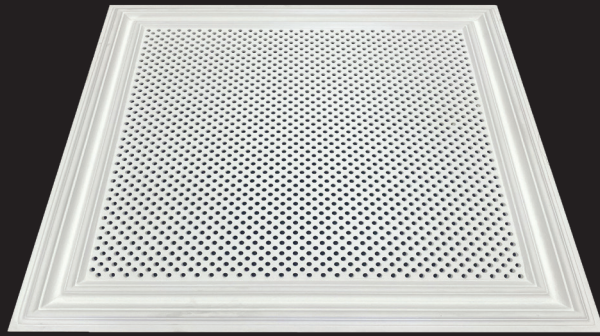
Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2
Microphones/preamps: • 2 x GRAS type 46AR mic/preamp sets, and 2 x B&K type 4134 mics on B&K 2669 preamps, in 4 fixed positions as per AS ISO 354
Noise source: • Room populated with three dodecahedron loudspeakers;

Laboratory Construction

Reverb room: • 300 mm thick concrete (closed off from the adjoining room by a plasterboard wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m³ total room volume • approx 215 m² surface area excluding diffusers

TEST RESULTS

Coffered Collection





CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:
AC287-16-1

Client: Bailey Interiors Pty Ltd
83-85 Boundary Road, Mortdale, NSW 2223

Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: *Acoustics—Measurement of sound absorption in a reverberation room*

AS ISO 11654-2002 [R2016] (ISO 11654:1997): *Acoustics—Rating of sound absorption—Materials and systems*

Test Specimen [Specimen area: 3.6 x 3.0 m (10.8 m²), Test configuration: Type E-200]

Description: • Bailey "EcoCheck Acoustic Coffers" ceiling tiles, • drop-in type (600 mm ceiling grid),
• with pre-fitted glass fibre batts behind the perforated area (stapled to rear of tile)

Tile Details³

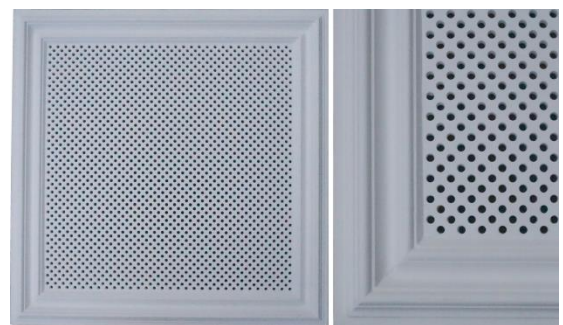
- Moulded plaster ceiling tiles, approx 588 x 588 mm, designed to drop into a standard 600 mm suspended ceiling grid.
- Factory-fitted with a glass fibre batt (500 x 500 mm, Bradford Supertel, ≈42 kg/m³, 20 mm thick, faced with black Regina tissue fabric), stapled to the rear of the tile behind the perforated area.
- Perforated with a regular pattern of holes, approx 5.5 mm dia (1922 count), all penetrating through the plaster tile and exposing the tissue fabric face of the glass fibre batt behind; the decorative effect of the perforations was supplemented by a raised coffer profile framing the perforated area.
- Open area percentage⁴ (estimated): 12.7%

Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m², built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at an 11° angle to the chamber walls (not parallel, as per AS ISO 354 cl 6.2.1.2). Two modules (each 100 mm deep) were stacked to create the E-200 enclosure.
- A system of plastic support feet sitting on aluminium extrusions (upside-down Tees) was set up inside the enclosure to support the tiles with their exposed face nominally flush with the enclosure. The cavity behind was a single undivided cavity without internal partitions.
- Tiles were arranged in a 6 x 5 array on the support system, then a full grid of main and cross tees was placed on top to cover the gaps between the tiles, matching a normal ceiling installation.
- All relevant joints in the installation were taped to close off any gaps – ie the junctions of the enclosure modules to each other, to the floor, and to the tile array.
- Specimen installation was carried out by laboratory staff.



Test specimen installed for testing (image inverted to depict ceiling installation)



Tile details – Left: whole tile, Right: close-up view

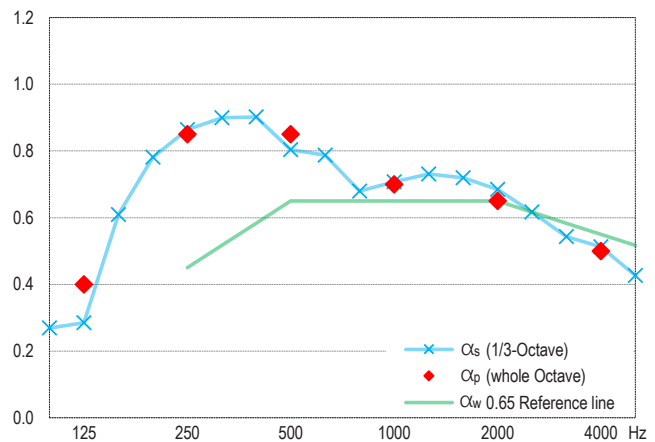
Measurement Details & Results

| Freq Hz | Absorption coefficients | | | Reverberation times, T ₆₀ (sec) | |
|------------|-------------------------|----------------|--------------|--|---------------|
| | α _s | α _p | 95% Conf (δ) | Empty room | with Specimen |
| 100 | 0.27 | 0.06 | 0.06 | 5.25 | 3.59 |
| 125 | 0.28 | 0.40 | 0.06 | 6.26 | 3.94 |
| 160 | 0.61 | | 0.08 | 6.70 | 2.86 |
| 200 | 0.78 | | 0.12 | 5.92 | 2.35 |
| 250 | 0.86 | 0.85 | 0.09 | 4.83 | 2.03 |
| 315 | 0.90 | | 0.05 | 6.21 | 2.19 |
| 400 | 0.90 | | 0.06 | 6.06 | 2.16 |
| 500 | 0.80 | 0.85 | 0.06 | 5.75 | 2.28 |
| 630 | 0.79 | | 0.04 | 5.52 | 2.27 |
| 800 | 0.68 | | 0.04 | 5.22 | 2.41 |
| 1000 | 0.71 | 0.70 | 0.05 | 5.06 | 2.32 |
| 1250 | 0.73 | | 0.04 | 4.58 | 2.18 |
| 1600 | 0.72 | | 0.04 | 4.13 | 2.09 |
| 2000 | 0.68 | 0.65 | 0.03 | 3.72 | 2.02 |
| 2500 | 0.62 | | 0.03 | 3.28 | 1.97 |
| 3150 | 0.54 | | 0.03 | 2.87 | 1.90 |
| 4000 | 0.51 | 0.50 | 0.03 | 2.35 | 1.68 |
| 5000 | 0.43 | | 0.04 | 1.89 | 1.49 |

Performance Indices^{1,2}

α_w = 0.65 (L)
SAA = 0.76
NRC = 0.75

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.



Measurement Conditions

| | | |
|-------------------------|-------------------|---------------------------|
| | Empty room | with Test Specimen |
| Date of measurement: | 9 Aug 2021 | 9 Aug 2021 |
| Temperature & humidity: | 17 °C, 56 % R.H. | 16 °C, 58 % R.H. |
| Atmospheric pressure: | 1011 mBar | 1011 mBar |

Notes, Deviations etc

- Shape indicators (L, M, and H), if any, following the α_w index, indicate α_p values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
- SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

- Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
- Open area estimates are based on 600 x 600 mm of ceiling area being 'treated' by each tile.

Issuing Authority

Signed:

David Truett

David Truett

Date:

11 August 2021

Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3050-A-060
Microphones/preamps: • 4 microphones (1 x B&K 4134, 1 x B&K 4166, and 2 x GRAS 40AR) on B&K and GRAS preamps, in fixed positions as per AS ISO 354
Noise source: • Room populated with three Norsonic NOR276 dodecahedron loudspeakers, driven in turn by a Norsonic NOR280 power amplifier.
Calibration: • Analyser: December 2019 (NATA cal)

Laboratory Construction

Reverb room: • 300 mm thick concrete (closed off from the adjoining room by a plaster-board wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m³ total room volume
• approx 215 m² surface area excluding diffusers
Diffusers: • 20 stationary diffusers, approx 40 m² total surface area
Absorption area: • in accordance with AS ISO 354, unless noted otherwise

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CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:
AC287-18-1

Client: Bailey Interiors Pty Ltd
83-85 Boundary Road, Mortdale, NSW 2223

Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: *Acoustics-Measurement of sound absorption in a reverberation room*
AS ISO 11654-2002 [R2016] (ISO 11654:1997): *Acoustics-Rating of sound absorption-Materials and systems*

Test Specimen

[Specimen area: 3.6 x 3.0 m (10.8 m²), Test configuration: Type E-200]
Description: • Bailey "EcoCheck Acoustic Coffer" ceiling panels, • direct-fix type,
• with pre-fitted glass fibre batts behind the perforated areas (stapled to rear of panel)

Panel Details³

- Moulded plaster ceiling panels, approx 1200 x 600 mm, designed to be nail/screw-fixed to overhead ceiling battens.
- Factory-fitted with two glass fibre batts (500 x 500 mm, Bradford Supertel, ≈42 kg/m³, 20 mm thick, faced with black Regina tissue fabric), stapled to the rear of the panel behind the perforated areas.
- Perforated with a regular pattern of holes, approx 5.5 mm dia (3364 count per panel; 1682 count per half-panel), all penetrating through the plaster panel and exposing the tissue face of the glass fibre batt behind; the decorative effect of the perforations was supplemented by a raised coffer profile, framing each perforated area.
- Open area percentage⁴ (estimated): 11.1%

Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m², built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at an 11° angle to the chamber walls (not parallel, as per AS ISO 354 cl 6.2.1.2). Two modules (each 100 mm deep) were stacked to create the E-200 enclosure.
- A system of plastic support feet sitting on aluminium extrusions (upside-down Tees) was set up inside the enclosure to support the panels with their exposed face nominally flush with the enclosure. The cavity behind was a single undivided cavity without internal partitions.
- Panels were arranged in a 3 x 5 array on the support system.
- All relevant joins in the installation were taped to close off any gaps – ie the junctions of the enclosure modules to each other, to the floor, and to the panel array, and where adjacent panels butted against each other in the installed array.
- Specimen installation was carried out by laboratory staff.



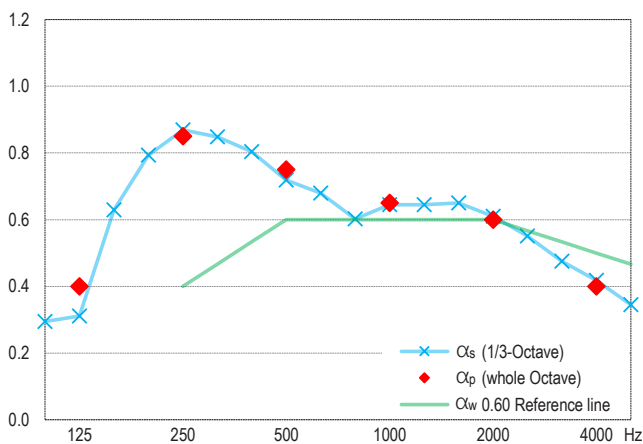
Test specimen installed for testing (image inverted to depict ceiling installation)



Panel details – Left: whole panel, Right: close-up view

Measurement Details & Results

| Freq Hz | Absorption coefficients | | | Reverberation times, T ₆₀ (sec) | |
|------------|-------------------------|----------------|--------------|--|---------------|
| | α _s | α _p | 95% Conf (δ) | Empty room | with Specimen |
| 100 | 0.29 | | 0.06 | 5.25 | 3.48 |
| 125 | 0.31 | 0.40 | 0.06 | 6.26 | 3.81 |
| 160 | 0.63 | | 0.08 | 6.70 | 2.80 |
| 200 | 0.79 | | 0.13 | 5.92 | 2.32 |
| 250 | 0.87 | 0.85 | 0.08 | 4.83 | 2.03 |
| 315 | 0.85 | | 0.07 | 6.21 | 2.27 |
| 400 | 0.80 | | 0.05 | 6.06 | 2.33 |
| 500 | 0.72 | 0.75 | 0.06 | 5.75 | 2.44 |
| 630 | 0.68 | | 0.04 | 5.52 | 2.47 |
| 800 | 0.60 | | 0.04 | 5.22 | 2.57 |
| 1000 | 0.64 | 0.65 | 0.05 | 5.06 | 2.44 |
| 1250 | 0.65 | | 0.04 | 4.58 | 2.32 |
| 1600 | 0.65 | | 0.03 | 4.13 | 2.19 |
| 2000 | 0.61 | 0.60 | 0.03 | 3.72 | 2.13 |
| 2500 | 0.55 | | 0.03 | 3.28 | 2.07 |
| 3150 | 0.48 | | 0.03 | 2.87 | 1.99 |
| 4000 | 0.42 | 0.40 | 0.04 | 2.35 | 1.79 |
| 5000 | 0.34 | | 0.04 | 1.89 | 1.57 |



Performance Indices^{1,2}

α_w = 0.60 (L)
SAA = 0.70
NRC = 0.70

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.

| Measurement Conditions | |
|--|--------------------|
| Empty room | with Test Specimen |
| Date of measurement: 9 Aug 2021 | 9 Aug 2021 |
| Temperature & humidity: 17 °C, 56 % R.H. | 16 °C, 60 % R.H. |
| Atmospheric pressure: 1011 mBar | 1011 mBar |

Notes, Deviations etc

- Shape indicators (L, M, and H), if any, following the α_w index, indicate α_p values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
- SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

- Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
- Open area estimates are based on 1200 x 600 mm of ceiling area being 'treated' by each panel.

Issuing Authority

Signed:

David Truett

Date:

11 August 2021

Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3050-A-060
Microphones/preamps: • 4 microphones (1 x B&K 4134, 1 x B&K 4166, and 2 x GRAS 40AR) on B&K and GRAS preamps, in fixed positions as per AS ISO 354
Noise source: • Room populated with three Norsonic NOR276 dodecahedron loudspeakers, driven in turn by a Norsonic NOR280 power amplifier.
Calibration: • Analyser: December 2019 (NATA cal)

Laboratory Construction

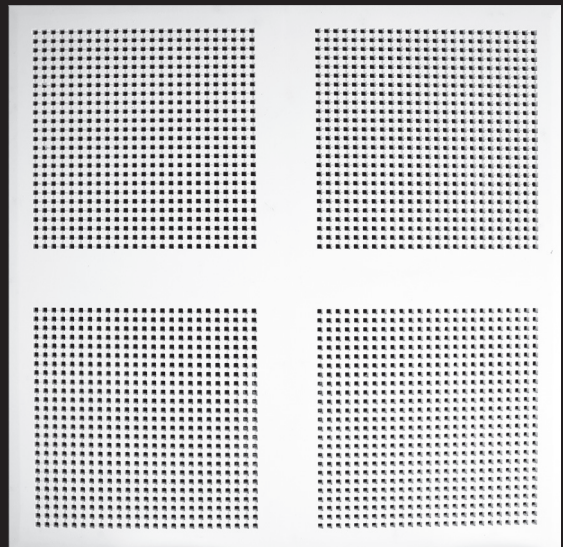
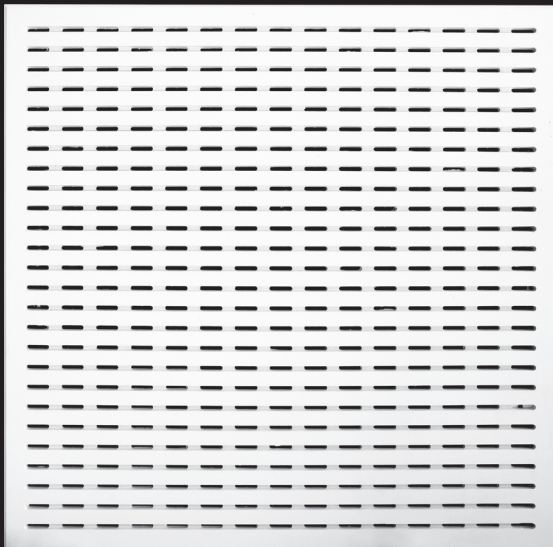
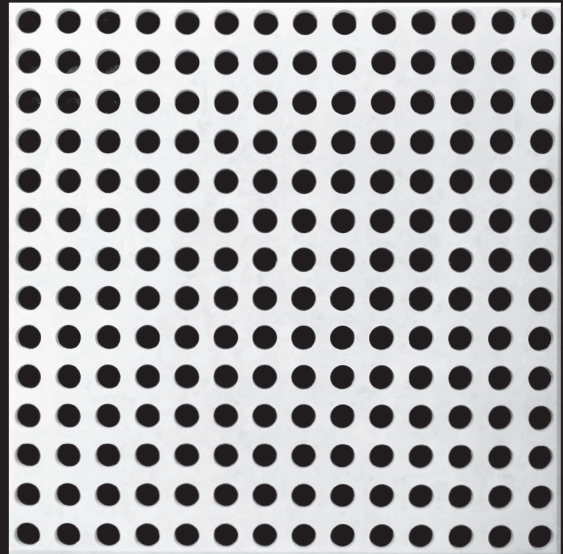
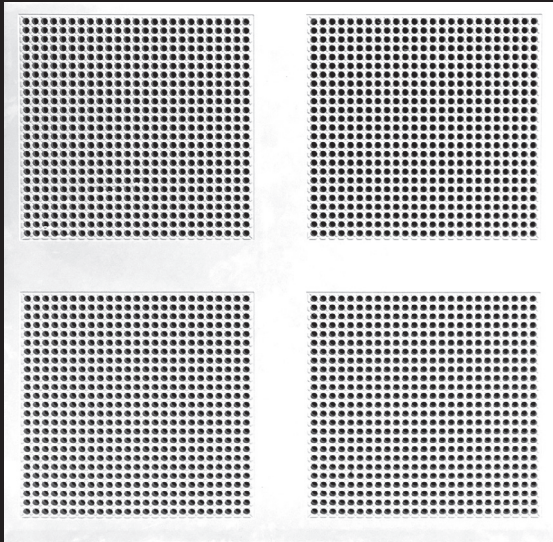
Reverb room: • 300 mm thick concrete (closed off from the adjoining room by a plaster-board wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m³ total room volume
• approx 215 m² surface area excluding diffusers
Diffusers: • 20 stationary diffusers, approx 40 m² total surface area
Absorption area: • in accordance with AS ISO 354, unless noted otherwise

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TEST RESULTS

New York Collection





CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:
AC277-15-1

Client: Bailey Interiors Pty Ltd
83-85 Boundary Road, Mortdale, NSW 2223

Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: *Acoustics—Measurement of sound absorption in a reverberation room*
AS ISO 11654-2002 [R2016] (ISO 11654:1997): *Acoustics—Rating of sound absorption—Materials and systems*

Test Specimen

[Specimen area: 3.6 x 3.0 m (10.8 m²)]

Description: • Bailey "Ceil Sound" screw-up acoustic ceiling panels (1200 x 1200 mm),
• with black tissue-faced glass fibre batts behind, open to the cavity (Type E-200)

Panel and Batt Details³

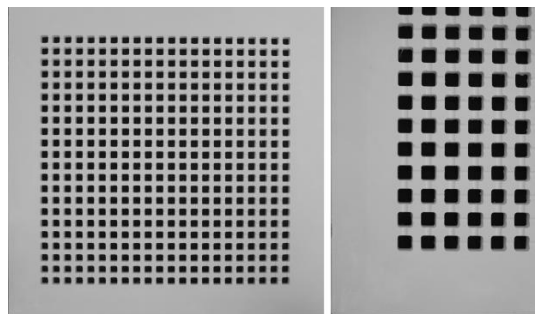
- Moulded plaster ceiling panels designed to be screw fixed to ceiling battens above.
- Perforated with square holes with rounded corners; hole size approx 14.5 mm at the face, tapering to 13 mm at the rear. Holes were positioned at approx 22 mm spacing in four banks of 22 x 22 holes (484 holes per 600 x 600 mm quarter-panel; 1936 holes per 1200 x 1200 mm panel).
- Decorative effect of perforations was supplemented by orthogonal grooves between adjacent perforations within each bank.
- Open area percentage⁴ (estimated): 27.2 % (based on mouth area at perforated face); 21.7 % (based on throat area at rear of panel, behind which lay the fibre batt and ceiling cavity).
- Each bank of perforations on each tile backed with a semi rigid high-density glass fibre batt faced with a black tissue material (CSR Bradford product), 500 x 500 x 20 mm (approx 42 kg/m³); the black tissue face being against the perforated rear face of the tile. Ordinarily the batts would be factory-fixed (stapled) to the rear of each tile, but in this instance the batts were provided as separate items and positioned behind the perforated area of the tiles during test-installation.

Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m², built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at a 11° angle to the chamber walls (not parallel, as per AS ISO 354 cl6.2.1.2). The junction of the enclosure and the floor was taped.
- A system of steel wall studs/track, and support struts was set up inside the enclosure to support the batts and tiles. The cavity behind was a single undivided cavity without internal partitions.
- 30 batts in a 6 x 5 array were carefully arranged on the support struts to align with the banks of holes in the panels placed on top (3 x whole panels and 3 x half panels).
- All panel joints were taped with masking tape, as also was the junction between the enclosure and the perimeter of the test specimen panel installation.
- Specimen installation was carried out by laboratory staff.



Test specimen installed for testing (image inverted to depict ceiling installation)



Panel details - Left: perforations (quarter of a panel), Right: close-up view

Measurement Details & Results

| Freq Hz | Absorption coefficients | | | Reverberation times, T ₆₀ (sec) | |
|------------|-------------------------|----------------|--------------|--|---------------|
| | α _s | α _p | 95% Conf (δ) | Empty room | with Specimen |
| 100 | 0.36 | | 0.06 | 5.79 | 3.42 |
| 125 | 0.22 | 0.35 | 0.05 | 6.33 | 4.34 |
| 160 | 0.54 | | 0.07 | 6.21 | 2.95 |
| 200 | 0.71 | | 0.05 | 5.62 | 2.43 |
| 250 | 0.91 | 0.85 | 0.09 | 5.11 | 2.01 |
| 315 | 0.93 | | 0.07 | 6.01 | 2.11 |
| 400 | 0.95 | | 0.05 | 5.96 | 2.08 |
| 500 | 0.87 | 0.85 | 0.06 | 5.54 | 2.14 |
| 630 | 0.79 | | 0.05 | 5.26 | 2.22 |
| 800 | 0.73 | | 0.05 | 5.09 | 2.29 |
| 1000 | 0.73 | 0.75 | 0.04 | 4.98 | 2.26 |
| 1250 | 0.74 | | 0.03 | 4.40 | 2.13 |
| 1600 | 0.74 | | 0.03 | 3.95 | 2.01 |
| 2000 | 0.71 | 0.70 | 0.05 | 3.59 | 1.95 |
| 2500 | 0.68 | | 0.03 | 3.21 | 1.87 |
| 3150 | 0.64 | | 0.03 | 2.88 | 1.79 |
| 4000 | 0.60 | 0.60 | 0.04 | 2.41 | 1.64 |
| 5000 | 0.59 | | 0.04 | 1.95 | 1.42 |

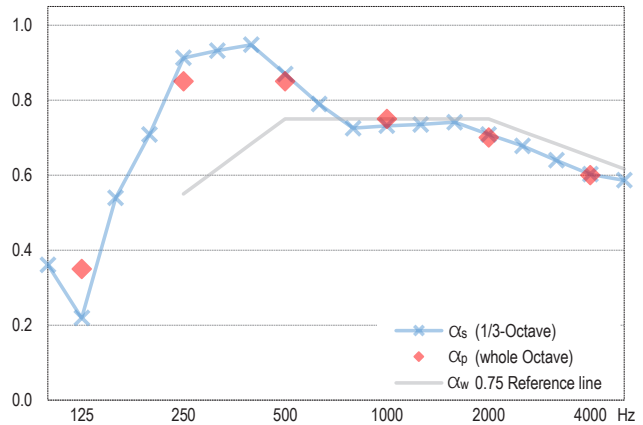
Performance Indices^{1,2}

α_w = 0.75 (L)

SAA = 0.79

NRC = 0.80

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.



Measurement Conditions

| | Empty room | with Test Specimen |
|-------------------------|------------------|--------------------|
| Date of measurement: | 28 Jul 2020 | 28 Jul 2020 |
| Temperature & humidity: | 17 °C, 61 % R.H. | 18 °C, 61 % R.H. |
| Atmospheric pressure: | 1008 mBar | 1007 mBar |

Notes, Deviations etc

1. Shape indicators (L, M, and H), if any, following the α_w index, indicate α_p values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
2. SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

3. Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
4. Open area estimates are based on 1200 x 1200 mm of ceiling area being 'treated' by each panel.

Issuing Authority

Signed:
Date: David Truett
4 August 2020

Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2
Microphones/preamps: • 4 x GRAS microphones (types 40AR & 40AP, 2 ea) on GRAS & B&K preamplifiers, in 4 fixed positions as per AS ISO 354
Noise source: • Room populated with three dodecahedron loudspeakers; (2 x Norsonic NOR276 & 1 x B&K 4296), driven in turn by a Norsonic NOR280 power amplifier.
Calibration: • Analyser: July 2018 (NATA cal)

Laboratory Construction

Reverb room: • 300 mm thick concrete (closed off from the adjoining room by an MDF wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m³ total room volume
• approx 215 m² surface area excluding diffusers
Diffusers: • 20 stationary diffusers, approx 40 m² total surface area
Absorption area: • in accordance with AS ISO 354, unless noted otherwise

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CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:
AC277-27-1

Client: Bailey Interiors Pty Ltd
83-85 Boundary Road, Mortdale, NSW 2223

Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: *Acoustics-Measurement of sound absorption in a reverberation room*

AS ISO 11654-2002 [R2016] (ISO 11654:1997): *Acoustics-Rating of sound absorption-Materials and systems*

Test Specimen

[Specimen area: 3.6 x 3.0 m (10.8 m²)]

Description: • Bailey "Ceil Sound" screw-up acoustic ceiling panels (1200 x 1200 mm),
• with black tissue-faced 50 mm glass fibre behind, open to the cavity (Type E-200)

Panel and Batt Details³

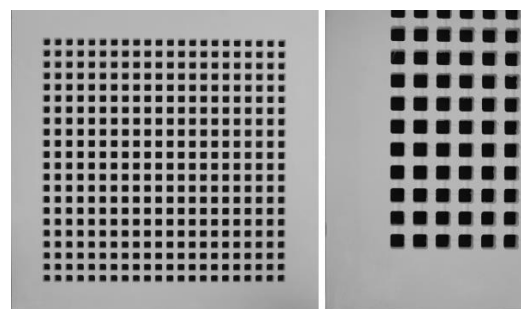
- Moulded plaster ceiling panels designed to be screw fixed to ceiling battens above.
- Perforated with square holes with rounded corners; hole size approx 14.5 mm at the face, tapering to 13 mm at the rear. Holes were positioned at approx 22 mm spacing in four banks of 22 x 22 holes (484 holes per 600 x 600 mm quarter-panel; 1936 holes per 1200 x 1200 mm panel).
- Decorative effect of perforations was supplemented by orthogonal grooves between adjacent perforations within each bank.
- Open area percentage⁴ (estimated): 27.2 % (based on mouth area at perforated face); 21.7 % (based on throat area at rear of panel, behind which lay the fibre batt and ceiling cavity).
- A layer of 50 mm thick semi rigid high-density CSR Bradford glass fibre material (nom 32 kg/m³), faced with a black tissue fabric was supported to the underside of the perforated panels during installation.

Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m², built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at a 11° angle to the chamber walls (not parallel, as per AS ISO 354 d6.2.1.2).
- A system of extruded aluminium profiles (all solid, not hollow) and plastic support pieces was set up inside the enclosure to support the panels with their exposed face nominally flush with the enclosure, and the tissue-faced glass fibre material against the rear surface of the panels. The cavity behind was a single undivided cavity without internal partitions.
- The glass fibre material was cut to size and laid on the supporting ledges formed by the aluminium extrusions, and the plaster panels laid on top; 6 x full panels and 3 x half-panels.
- All exposed edges/junctions/joins of panels, enclosure and the floor of the room were taped with masking tape.
- Specimen installation was carried out by laboratory staff.



Test specimen installed for testing (image inverted to depict ceiling installation)



Panel details – Left: perforations (quarter of a panel), Right: close-up view

Measurement Details & Results

| Freq Hz | Absorption coefficients | | | Reverberation times, T ₆₀ (sec) | |
|------------|-------------------------|----------------|--------------|--|---------------|
| | α _s | α _p | 95% Conf (δ) | Empty room | with Specimen |
| 100 | 0.47 | | 0.09 | 5.38 | 2.93 |
| 125 | 0.32 | 0.55 | 0.06 | 6.62 | 3.88 |
| 160 | 0.79 | | 0.11 | 6.51 | 2.41 |
| 200 | 0.90 | | 0.08 | 5.85 | 2.15 |
| 250 | 1.02 | 1.00 | 0.08 | 5.07 | 1.88 |
| 315 | 1.04 | | 0.09 | 6.15 | 1.98 |
| 400 | 1.00 | | 0.06 | 6.24 | 2.05 |
| 500 | 0.91 | 0.95 | 0.05 | 5.82 | 2.12 |
| 630 | 0.92 | | 0.04 | 5.75 | 2.09 |
| 800 | 0.91 | | 0.04 | 5.38 | 2.07 |
| 1000 | 0.86 | 0.85 | 0.05 | 5.19 | 2.10 |
| 1250 | 0.83 | | 0.05 | 4.65 | 2.05 |
| 1600 | 0.77 | | 0.03 | 4.15 | 2.02 |
| 2000 | 0.73 | 0.75 | 0.04 | 3.67 | 1.95 |
| 2500 | 0.70 | | 0.03 | 3.19 | 1.83 |
| 3150 | 0.65 | | 0.04 | 2.78 | 1.73 |
| 4000 | 0.63 | 0.65 | 0.05 | 2.25 | 1.52 |
| 5000 | 0.68 | | 0.04 | 1.80 | 1.27 |

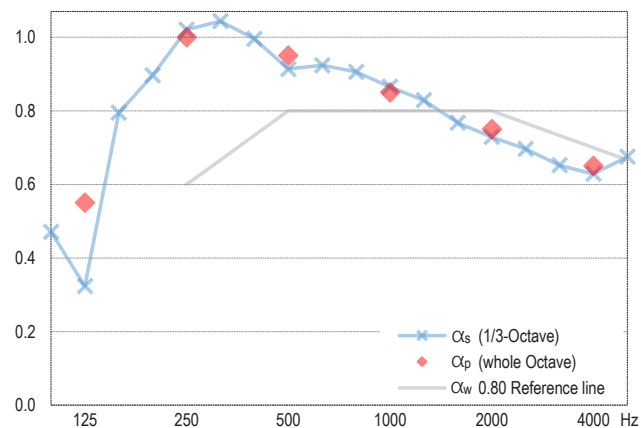
Performance Indices^{1,2}

α_w = 0.80 (L)

SAA = 0.88

NRC = 0.90

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.



Measurement Conditions

| | Empty room | with Test Specimen |
|-------------------------|------------------|--------------------|
| Date of measurement: | 26 Aug 2020 | 26 Aug 2020 |
| Temperature & humidity: | 17 °C, 51 % R.H. | 16 °C, 50 % R.H. |
| Atmospheric pressure: | 1019 mBar | 1018 mBar |

Notes, Deviations etc

1. Shape indicators (L, M, and H), if any, following the α_w index, indicate α_p values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
2. SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

3. Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
4. Open area estimates are based on 1200 x 1200 mm of ceiling area being 'treated' per whole panel.

Issuing Authority

Signed:
Date: 9 September 2020

Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2

Microphones/preamps: • 2 x GRAS type 46AR mic/preamp sets, and 2 x B&K type 4134 mics on B&K 2669 preamps, in 4 fixed positions as per AS ISO 354

Noise source: • Room populated with three dodecahedron loudspeakers; (2 x Norsonic NOR276 & 1 x B&K 4296), driven in turn by a Norsonic NOR280 power amplifier.

Calibration: • Analyser: July 2018 (NATA cal)

Laboratory Construction

Reverb room: • 300 mm thick concrete (closed off from the adjoining room by a plasterboard wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m³ total room volume • approx 215 m² surface area excluding diffusers
Diffusers: • 20 stationary diffusers, approx 40 m² total surface area
Absorption area: • in accordance with AS ISO 354, unless noted otherwise

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CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:
AC277-29-1

Client: Bailey Interiors Pty Ltd
83-85 Boundary Road, Mortdale, NSW 2223

Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: *Acoustics—Measurement of sound absorption in a reverberation room*

AS ISO 11654-2002 [R2016] (ISO 11654:1997): *Acoustics—Rating of sound absorption—Materials and systems*

Test Specimen

[Specimen area: 3.6 x 3.0 m (10.8 m²)]

Description: • Bailey "Open Cell" screw-up acoustic ceiling panels (1200 x 1200 mm),
• with black tissue-faced 50 mm glass fibre behind, open to the cavity (Type E-200)

Panel and Batt Details³

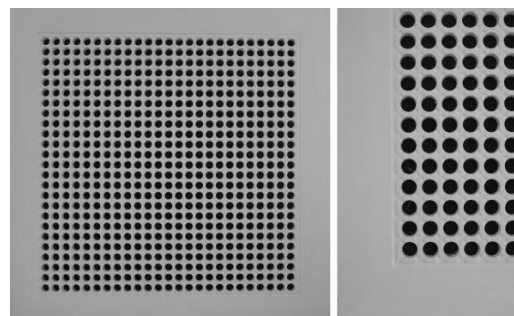
- Moulded plaster ceiling panels designed to be screw fixed to ceiling battens above.
- Perforated with circular holes; hole size approx 15 mm at the face, tapering to 13.5 mm at the rear. Holes were positioned at approx 19.1 mm spacing in four banks of 25 x 25 holes (625 holes per 600 x 600 mm quarter-panel; 2500 holes per 1200 x 1200 mm panel).
- Decorative effect of perforations was supplemented by diagonal grooves on the facets between the perforations within each bank, and a square groove framing each bank of perforations.
- Open area percentage⁴ (estimated): 30.7 % (based on mouth area at perforated face); 24.9 % (based on throat area at rear of panel, behind which lay the fibre batt and ceiling cavity).
- A layer of 50 mm thick semi rigid high-density CSR Bradford glass fibre material (nom 32 kg/m³), faced with a black tissue fabric was supported to the underside of the perforated panels during installation.

Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m², built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at a 11° angle to the chamber walls (not parallel, as per AS ISO 354 cl6.2.1.2).
- A system of extruded aluminium profiles (all solid, not hollow) and plastic support pieces was set up inside the enclosure to support the panels with their exposed face nominally flush with the enclosure, and the tissue-faced glass fibre material against the rear surface of the panels. The cavity behind was a single undivided cavity without internal partitions.
- The glass fibre material was cut to size and laid on the supporting ledges formed by the aluminium extrusions, and the plaster panels laid on top; 6 x full panels and 3 x half-panels.
- All exposed edges/junctions/joins of panels, enclosure and the floor of the room were taped with masking tape.
- Specimen installation was carried out by laboratory staff.



Test specimen installed for testing (image inverted to depict ceiling installation)



Panel details – Left: perforations (quarter of a panel), Right: close-up view

Measurement Details & Results

| Freq Hz | Absorption coefficients | | | Reverberation times, T ₆₀ (sec) | |
|------------|-------------------------|----------------|--------------|--|---------------|
| | α _s | α _p | 95% Conf (δ) | Empty room | with Specimen |
| 100 | 0.49 | | 0.09 | 5.38 | 2.88 |
| 125 | 0.31 | 0.50 | 0.05 | 6.62 | 3.93 |
| 160 | 0.75 | | 0.16 | 6.51 | 2.49 |
| 200 | 0.89 | | 0.07 | 5.85 | 2.15 |
| 250 | 1.04 | 1.00 | 0.10 | 5.07 | 1.85 |
| 315 | 1.06 | | 0.08 | 6.15 | 1.96 |
| 400 | 1.00 | | 0.05 | 6.24 | 2.05 |
| 500 | 0.95 | 0.95 | 0.07 | 5.82 | 2.07 |
| 630 | 0.91 | | 0.04 | 5.75 | 2.11 |
| 800 | 0.91 | | 0.05 | 5.38 | 2.07 |
| 1000 | 0.88 | 0.90 | 0.04 | 5.19 | 2.07 |
| 1250 | 0.85 | | 0.05 | 4.65 | 2.01 |
| 1600 | 0.82 | | 0.03 | 4.15 | 1.96 |
| 2000 | 0.77 | 0.80 | 0.04 | 3.67 | 1.89 |
| 2500 | 0.76 | | 0.04 | 3.19 | 1.76 |
| 3150 | 0.74 | | 0.04 | 2.78 | 1.63 |
| 4000 | 0.73 | 0.75 | 0.04 | 2.25 | 1.43 |
| 5000 | 0.76 | | 0.04 | 1.80 | 1.21 |

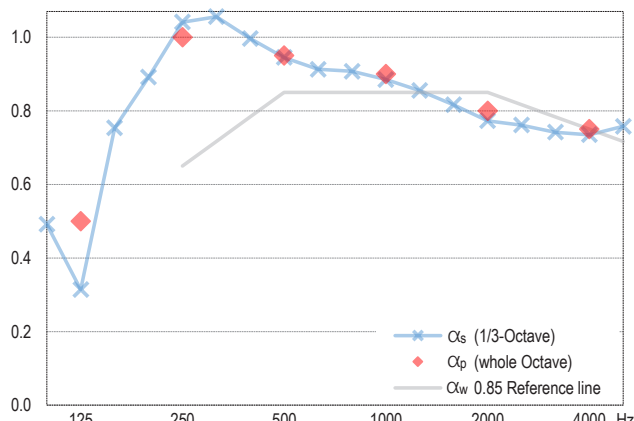
Performance Indices^{1,2}

α_w = 0.85 (L)

SAA = 0.90

NRC = 0.90

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.



Measurement Conditions

| | Empty room | with Test Specimen |
|-------------------------|------------------|--------------------|
| Date of measurement: | 26 Aug 2020 | 26 Aug 2020 |
| Temperature & humidity: | 17 °C, 51 % R.H. | 16 °C, 49 % R.H. |
| Atmospheric pressure: | 1019 mBar | 1016 mBar |

Notes, Deviations etc

1. Shape indicators (L, M, and H), if any, following the α_w index, indicate α_p values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
2. SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

3. Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
4. Open area estimates are based on 1200 x 1200 mm of ceiling area being 'treated' per whole panel.

Issuing Authority

Signed:
Date: 9 September 2020

Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2
Microphones/preamps: • 2 x GRAS type 46AR mic/preamp sets, and 2 x B&K type 4134 mics on B&K 2669 preamps, in 4 fixed positions as per AS ISO 354
Noise source: • Room populated with three dodecahedron loudspeakers; (2 x Norsonic NOR276 & 1 x B&K 4296), driven in turn by a Norsonic NOR280 power amplifier.
Calibration: • Analyser: July 2018 (NATA cal)

Laboratory Construction

Reverb room: • 300 mm thick concrete (closed off from the adjoining room by a plasterboard wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m³ total room volume • approx 215 m² surface area excluding diffusers
Diffusers: • 20 stationary diffusers, approx 40 m² total surface area
Absorption area: • in accordance with AS ISO 354, unless noted otherwise

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CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:
AC277-16-1

Client: Bailey Interiors Pty Ltd
83-85 Boundary Road, Mortdale, NSW 2223

Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: *Acoustics-Measurement of sound absorption in a reverberation room*

AS ISO 11654-2002 [R2016] (ISO 11654:1997): *Acoustics-Rating of sound absorption-Materials and systems*

Test Specimen

[Specimen area: 3.6 x 3.0 m (10.8 m²)]

Description: • Bailey "Open Cell" screw-up acoustic ceiling panels (1200 x 1200 mm),
• with black tissue-faced glass fibre batts behind, open to the cavity (Type E-200)

Panel and Batt Details³

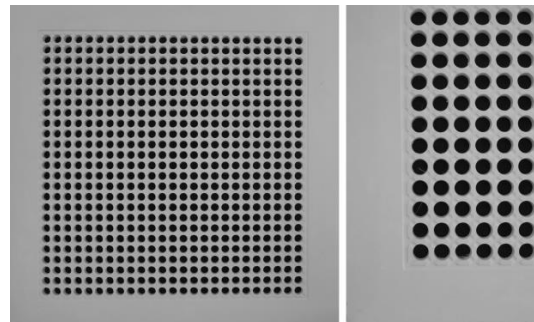
- Moulded plaster ceiling panels designed to be screw fixed to ceiling battens above.
- Perforated with circular holes; hole size approx 15 mm at the face, tapering to 13.5 mm at the rear. Holes were positioned at approx 19.1 mm spacing in four banks of 25 x 25 holes (625 holes per 600 x 600 mm quarter-panel; 2500 holes per 1200 x 1200 mm panel).
- Decorative effect of perforations was supplemented by diagonal grooves on the facets between the perforations within each bank, and a square groove framing each bank of perforations.
- Open area percentage⁴ (estimated): 30.7 % (based on mouth area at perforated face); 24.9 % (based on throat area at rear of panel, behind which lay the fibre batt and ceiling cavity).
- Each bank of perforations on each tile backed with a semi rigid high density glass fibre batt faced with a black tissue material (CSR Bradford product), 500 x 500 x 20 mm (approx 42 kg/m³); the black tissue face being against the perforated rear face of the tile. Ordinarily the batts would be factory-fixed (stapled) to the rear of each tile, but in this instance the batts were provided as separate items and positioned behind the perforated area of the tiles during test-installation.

Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m², built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at a 11° angle to the chamber walls (not parallel, as per AS ISO 354 cl6.2.1.2). The junction of the enclosure and the floor was taped.
- A system of steel wall studs/track, and support struts was set up inside the enclosure to support the batts and tiles. The cavity behind was a single undivided cavity without internal partitions.
- 30 batts in a 6 x 5 array were carefully arranged on the support struts to align with the banks of holes in the panels placed on top (3 x whole panels and 3 x half panels).
- All panel joints were taped with masking tape, as also was the junction between the enclosure and the perimeter of the test specimen panel installation.
- Specimen installation was carried out by laboratory staff.



Test specimen installed for testing (image inverted to depict ceiling installation)



Panel details – Left: perforations (quarter of a panel), Right: close-up view

Measurement Details & Results

| Freq Hz | Absorption coefficients | | | Reverberation times, T ₆₀ (sec) | |
|------------|-------------------------|----------------|--------------|--|---------------|
| | α _s | α _p | 95% Conf (δ) | Empty room | with Specimen |
| 100 | 0.37 | | 0.07 | 5.79 | 3.39 |
| 125 | 0.27 | 0.40 | 0.06 | 6.33 | 4.05 |
| 160 | 0.57 | | 0.08 | 6.21 | 2.87 |
| 200 | 0.72 | | 0.06 | 5.62 | 2.40 |
| 250 | 0.88 | 0.85 | 0.06 | 5.11 | 2.06 |
| 315 | 0.96 | | 0.07 | 6.01 | 2.06 |
| 400 | 0.94 | | 0.05 | 5.96 | 2.08 |
| 500 | 0.86 | 0.90 | 0.06 | 5.54 | 2.15 |
| 630 | 0.83 | | 0.05 | 5.26 | 2.15 |
| 800 | 0.75 | | 0.02 | 5.09 | 2.24 |
| 1000 | 0.78 | 0.75 | 0.04 | 4.98 | 2.18 |
| 1250 | 0.77 | | 0.03 | 4.40 | 2.08 |
| 1600 | 0.79 | | 0.03 | 3.95 | 1.94 |
| 2000 | 0.76 | 0.75 | 0.04 | 3.59 | 1.88 |
| 2500 | 0.74 | | 0.03 | 3.21 | 1.79 |
| 3150 | 0.71 | | 0.04 | 2.88 | 1.72 |
| 4000 | 0.65 | 0.65 | 0.04 | 2.41 | 1.59 |
| 5000 | 0.61 | | 0.05 | 1.95 | 1.40 |

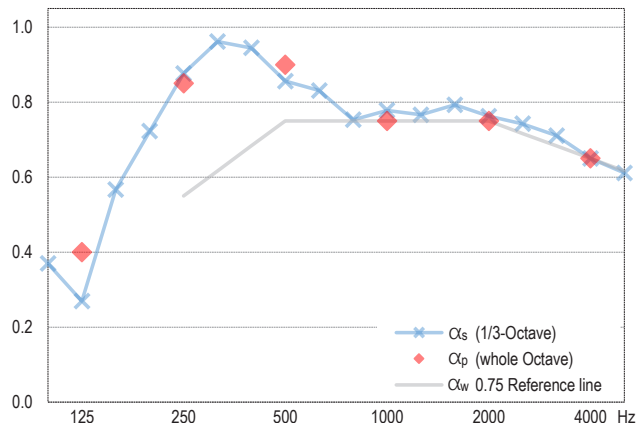
Performance Indices^{1,2}

α_w = 0.75 (L)

SAA = 0.82

NRC = 0.80

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.



Measurement Conditions

| | Empty room | with Test Specimen |
|-------------------------|------------------|--------------------|
| Date of measurement: | 28 Jul 2020 | 28 Jul 2020 |
| Temperature & humidity: | 17 °C, 61 % R.H. | 18 °C, 60 % R.H. |
| Atmospheric pressure: | 1008 mBar | 1007 mBar |

Notes, Deviations etc

1. Shape indicators (L, M, and H), if any, following the α_w index, indicate α_p values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
2. SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

3. Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
4. Open area estimates are based on 1200 x 1200 mm of ceiling area being 'treated' by each panel.

Issuing Authority

Signed:

David Truett

Date: David Truett
4 August 2020

Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2
Microphones/preamps: • 4 x GRAS microphones (types 40AR & 40AP, 2 ea) on GRAS & B&K preamplifiers, in 4 fixed positions as per AS ISO 354
Noise source: • Room populated with three dodecahedron loudspeakers; (2 x Norsonic NOR276 & 1 x B&K 4296), driven in turn by a Norsonic NOR280 power amplifier.
Calibration: • Analyser: July 2018 (NATA cal)

Laboratory Construction

Reverb room: • 300 mm thick concrete (closed off from the adjoining room by an MDF wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m³ total room volume
• approx 215 m² surface area excluding diffusers
Diffusers: • 20 stationary diffusers, approx 40 m² total surface area
Absorption area: • in accordance with AS ISO 354, unless noted otherwise

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CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:
AC277-17-1

Client: Bailey Interiors Pty Ltd
83-85 Boundary Road, Mortdale, NSW 2223

Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: Acoustics—Measurement of sound absorption in a reverberation room
AS ISO 11654-2002 [R2016] (ISO 11654:1997): Acoustics—Rating of sound absorption—Materials and systems

Test Specimen

[Specimen area: 3.6 x 3.0 m (10.8 m²)]

Description: • Bailey "Cell Air" screw-up acoustic ceiling panels (1200 x 1200 mm),
• with black tissue-faced glass fibre batts behind, open to the cavity (Type E-200)

Panel and Batt Details³

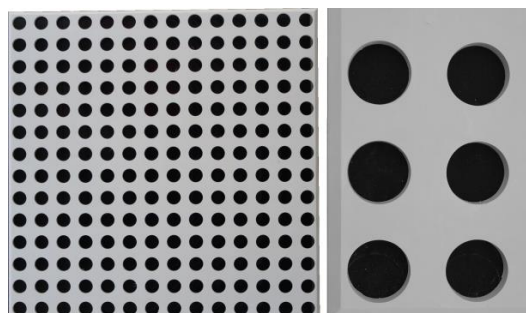
- Moulded plaster ceiling panels designed to be screw fixed to ceiling battens above.
- Perforated with large circular holes; hole size approx 54.5 mm at the face, tapering to 53 mm at the rear. Holes were positioned at approx 85.5 mm spacing in a continuous array of 196 holes per panel (14 x 14 array).
- Open area percentage⁴ (estimated): 31.8 % (based on mouth area at perforated face); 30.0 % (based on throat area at rear of panel, behind which lay the fibre batt and ceiling cavity).
- The perforated area of each tile was backed with a set of semi rigid high density glass fibre batts 20 mm thick, faced with a black tissue material (CSR Bradford product), (approx 42 kg/m³); the black tissue face being against the perforated rear face of the tile. Ordinarily, 550 x 550 mm batts would have been used, four batts to be factory-fixed (stapled) to the rear of each tile, but in this instance 500 x 500 mm batts were provided as separate items, and were positioned behind the perforated area of the tiles during test-installation (this necessitated cutting additional batts in order to ensure the entire perforated area of the panels was backed with the tissue-faced batt material).

Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m², built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at a 11° angle to the chamber walls (not parallel, as per AS ISO 354 cl6.2.1.2). The junction of the enclosure and the floor was taped.
- A system of steel wall studs/track, and support struts was set up inside the enclosure to support the batts and tiles. The cavity behind was a single undivided cavity without internal partitions.
- 35 whole batts and approximately 6 batts cut into strips were carefully arranged on the support struts to align with the holes in the panels placed on top (3 x whole panels and 3 x half panels).
- All panel joints were taped with masking tape, as also was the junction between the enclosure and the perimeter of the test specimen panel installation.
- Specimen installation was carried out by laboratory staff.



Test specimen installed for testing (image inverted to depict ceiling installation)



Panel details – Left: whole panel, Right: close-up view

Measurement Details & Results

| Freq Hz | Absorption coefficients | | | Reverberation times, T ₆₀ (sec) | |
|------------|-------------------------|----------------|--------------|--|---------------|
| | α _s | α _p | 95% Conf (δ) | Empty room | with Specimen |
| 100 | 0.36 | | 0.06 | 5.79 | 3.42 |
| 125 | 0.24 | 0.40 | 0.06 | 6.33 | 4.22 |
| 160 | 0.55 | | 0.11 | 6.21 | 2.90 |
| 200 | 0.79 | | 0.06 | 5.62 | 2.28 |
| 250 | 0.96 | 0.90 | 0.09 | 5.11 | 1.95 |
| 315 | 0.98 | | 0.06 | 6.01 | 2.04 |
| 400 | 0.92 | | 0.06 | 5.96 | 2.11 |
| 500 | 0.89 | 0.90 | 0.07 | 5.54 | 2.11 |
| 630 | 0.82 | | 0.05 | 5.26 | 2.16 |
| 800 | 0.77 | | 0.03 | 5.09 | 2.20 |
| 1000 | 0.82 | 0.80 | 0.06 | 4.98 | 2.12 |
| 1250 | 0.84 | | 0.04 | 4.40 | 1.97 |
| 1600 | 0.83 | | 0.03 | 3.95 | 1.89 |
| 2000 | 0.78 | 0.75 | 0.03 | 3.59 | 1.87 |
| 2500 | 0.69 | | 0.04 | 3.21 | 1.86 |
| 3150 | 0.57 | | 0.03 | 2.88 | 1.89 |
| 4000 | 0.49 | 0.50 | 0.03 | 2.41 | 1.77 |
| 5000 | 0.44 | | 0.03 | 1.95 | 1.57 |

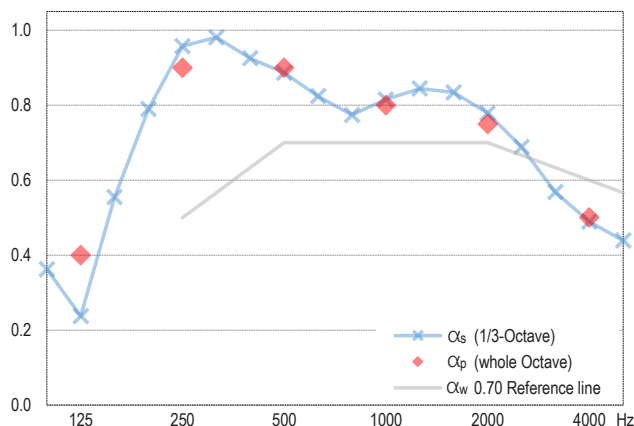
Performance Indices^{1,2}

α_w = 0.70 (L)

SAA = 0.84

NRC = 0.85

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.



Measurement Conditions

| | Empty room | with Test Specimen |
|-------------------------|------------------|--------------------|
| Date of measurement: | 28 Jul 2020 | 28 Jul 2020 |
| Temperature & humidity: | 17 °C, 61 % R.H. | 19 °C, 65 % R.H. |
| Atmospheric pressure: | 1008 mBar | 1008 mBar |

Notes, Deviations etc

1. Shape indicators (L, M, and H), if any, following the α_w index, indicate α_p values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
2. SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

3. Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
4. Open area estimates are based on 1200 x 1200 mm of ceiling area being 'treated' by each panel.

Issuing Authority

Signed:
Date: 4 August 2020

Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2
Microphones/preamps: • 4 x GRAS microphones (types 40AR & 40AP, 2 ea) on GRAS & B&K preamplifiers, in 4 fixed positions as per AS ISO 354
Noise source: • Room populated with three dodecahedron loudspeakers; (2 x Norsonic NOR276 & 1 x B&K 4296), driven in turn by a Norsonic NOR280 power amplifier.
Calibration: • Analyser: July 2018 (NATA cal)

Laboratory Construction

Reverb room: • 300 mm thick concrete (closed off from the adjoining room by an MDF wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m³ total room volume
• approx 215 m² surface area excluding diffusers
Diffusers: • 20 stationary diffusers, approx 40 m² total surface area
Absorption area: • in accordance with AS ISO 354, unless noted otherwise

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CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:
AC277-25-1

Client: Bailey Interiors Pty Ltd
83-85 Boundary Road, Mortdale, NSW 2223

Measurement Type: Sound Absorption

AS ISO 354-2006 [R2016]: *Acoustics-Measurement of sound absorption in a reverberation room*

AS ISO 11654-2002 [R2016] (ISO 11654:1997): *Acoustics-Rating of sound absorption-Materials and systems*

Test Specimen [Specimen area: 3.6 x 3.0 m (10.8 m²)]

Description: • Bailey "Cell Air" screw-up acoustic ceiling panels (1200 x 1200 mm),
• with black tissue-faced 50 mm glass fibre behind, open to the cavity (Type E-200)

Panel and Batt Details³

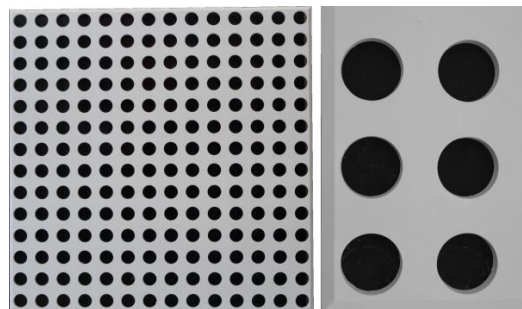
- Moulded plaster ceiling panels designed to be screw fixed to ceiling battens above.
- Perforated with large circular holes; hole size approx 54.5 mm at the face, tapering to 53 mm at the rear. Holes were positioned at approx 85.5 mm spacing in a continuous array of 196 holes per panel (14 x 14 array).
- Open area percentage⁴ (estimated): 31.8 % (based on mouth area at perforated face); 30.0 % (based on throat area at rear of panel, behind which lay the fibre batt and ceiling cavity).
- A layer of 50 mm thick semi rigid high-density CSR Bradford glass fibre material (nom 32 kg/m³), faced with a black tissue fabric was supported to the underside of the perforated panels during installation.

Installation

- The test specimen was installed as an upside-down ceiling on the floor of the chamber.
- A 200 mm deep enclosure (32 mm MDF timber, approx 23 kg/m², built to surround an area of 3600 x 3000 mm) was placed on the floor of the chamber at a 11° angle to the chamber walls (not parallel, as per AS ISO 354 cl6.2.1.2).
- A system of extruded aluminium profiles (all solid, not hollow) and plastic support pieces was set up inside the enclosure to support the panels with their exposed face nominally flush with the enclosure, and the tissue-faced glass fibre material against the rear surface of the panels. The cavity behind was a single undivided cavity without internal partitions.
- The glass fibre material was cut to size and laid on the supporting ledges formed by the aluminium extrusions, and the plaster panels laid on top; 6 x full panels and 3 x half-panels.
- All exposed edges/junctions/joins of panels, enclosure and the floor of the room were taped with masking tape.
- Specimen installation was carried out by laboratory staff.



Test specimen installed for testing (image inverted to depict ceiling installation)



Panel details – Left: whole panel, Right: close-up view

Measurement Details & Results

| Freq Hz | Absorption coefficients | | | Reverberation times, T ₆₀ (sec) | |
|------------|-------------------------|----------------|--------------|--|---------------|
| | α _s | α _p | 95% Conf (δ) | Empty room | with Specimen |
| 100 | 0.45 | | 0.07 | 5.38 | 2.98 |
| 125 | 0.29 | 0.50 | 0.07 | 6.62 | 4.08 |
| 160 | 0.79 | | 0.13 | 6.51 | 2.42 |
| 200 | 0.92 | | 0.08 | 5.85 | 2.10 |
| 250 | 1.01 | 1.00 | 0.09 | 5.07 | 1.88 |
| 315 | 1.07 | | 0.09 | 6.15 | 1.95 |
| 400 | 1.03 | | 0.06 | 6.24 | 2.00 |
| 500 | 1.00 | 1.00 | 0.04 | 5.82 | 2.00 |
| 630 | 1.00 | | 0.04 | 5.75 | 1.98 |
| 800 | 0.96 | | 0.04 | 5.38 | 1.99 |
| 1000 | 0.98 | 0.95 | 0.04 | 5.19 | 1.93 |
| 1250 | 0.92 | | 0.06 | 4.65 | 1.94 |
| 1600 | 0.82 | | 0.03 | 4.15 | 1.95 |
| 2000 | 0.78 | 0.75 | 0.04 | 3.67 | 1.89 |
| 2500 | 0.67 | | 0.03 | 3.19 | 1.88 |
| 3150 | 0.57 | | 0.03 | 2.78 | 1.84 |
| 4000 | 0.52 | 0.55 | 0.03 | 2.25 | 1.64 |
| 5000 | 0.51 | | 0.03 | 1.80 | 1.40 |

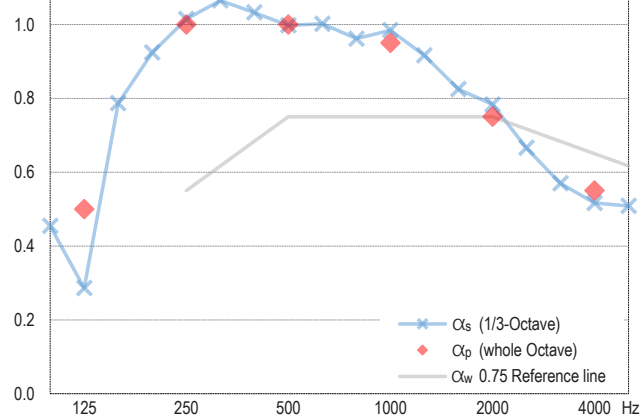
Performance Indices^{1,2}

α_w = 0.75 (LM)

SAA = 0.93

NRC = 0.95

The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.



Measurement Conditions

| | Empty room | with Test Specimen |
|-------------------------|------------------|--------------------|
| Date of measurement: | 26 Aug 2020 | 26 Aug 2020 |
| Temperature & humidity: | 17 °C, 51 % R.H. | 17 °C, 53 % R.H. |
| Atmospheric pressure: | 1019 mBar | 1019 mBar |

Notes, Deviations etc

1. Shape indicators (L, M, and H), if any, following the α_w index, indicate C_p values above the reference contour by ≥ 0.25 in the Low, Medium or High frequency ranges respectively; it is strongly recommended to use this single number rating in combination with the complete sound absorption coefficient curve.
2. SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.

3. Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
4. Open area estimates are based on 1200 x 1200 mm of ceiling area being 'treated' per whole panel.

Issuing Authority

Signed:
Date: 9 September 2020

Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2
Microphones/preamps: • 2 x GRAS type 46AR mic/preamp sets, and 2 x B&K type 4134 mics on B&K 2669 preamps, in 4 fixed positions as per AS ISO 354
Noise source: • Room populated with three dodecahedron loudspeakers; (2 x Norsonic NOR276 & 1 x B&K 4296), driven in turn by a Norsonic NOR280 power amplifier.
Calibration: • Analyser: July 2018 (NATA cal)

Laboratory Construction

Reverb room: • 300 mm thick concrete (closed off from the adjoining room by a plasterboard wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 202 m³ room volume • approx 215 m² surface area excluding diffusers
Diffusers: • 20 stationary diffusers, approx 40 m² total surface area
Absorption area: • in accordance with AS ISO 354, unless noted otherwise

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Page 1 of 1



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Australia

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Australia

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• www.rmit.edu.au

**REPORT ON THE DETERMINATION OF SOUND ABSORPTION
COEFFICIENTS OF BAILEY INTERIORS JUSTICE PANEL 1200MM X
1200MM PERFORATED PLASTER CEILING PANELS WITH A
GLASSWOOL BACKING (50MM @ 32KG/M³) TESTED WITH A 400MM
AIR GAP IN A REVERBERATION ROOM.**

Testing Procedure: AS ISO 354 - 2006

Testing Laboratory: Applied Acoustics Laboratory
School of Electrical and Computer Engineering
RMIT University
Melbourne, Victoria 3000, Australia
NATA Accreditation Number: 1421

Client: Bailey Interiors Pty. Ltd.
83-85 Boundary Road
Mortdale, New South Wales 2223
Australia

Date of Test: 18th of July 2013

Date of Report: 3rd of September 2013

Report Number: 13-091/PD

Testing Officer: Peter Dale

Peter Dale
Approved NATA Signatory



Accredited for compliance with ISO/IEC 17025

The weighted sound absorption coefficient α_w of the sample determined in accordance with AS ISO 11654-1997 “Acoustics: Sound Absorbers for Use in Buildings - Rating of sound absorption” is:

$$\alpha_w = 0.55(\text{LM})$$

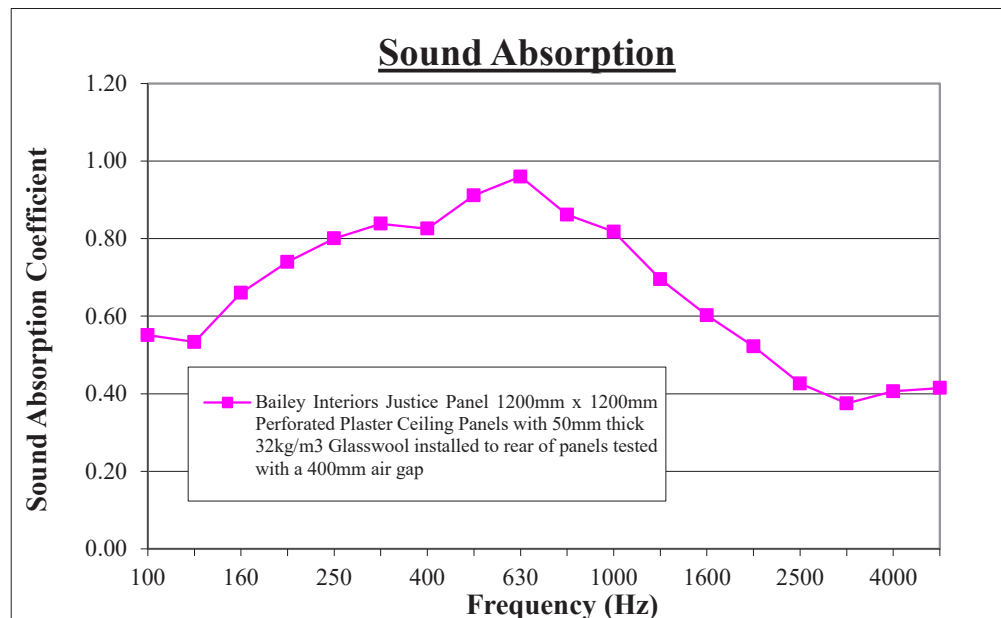
The Practical Sound Absorption Coefficients are detailed below in Table 2. These values have been determined in accordance with AS ISO 11654-1997 “Acoustics: Sound Absorbers for Use in Buildings - Rating of sound absorption”.

Table 2: Practical Sound Absorption Coefficients for the Sample

| Frequency (Hz) | 125 | 250 | 500 | 1000 | 2000 | 4000 |
|--|------|------|------|------|------|------|
| Practical Sound Absorption Coefficient, α_p | 0.60 | 0.80 | 0.90 | 0.80 | 0.50 | 0.40 |

N.R.C. of the sample calculated in accordance with ASTM C423-90A is: .0.75

Graph 1: Sound Absorption Coefficients of Bailey Interiors Justice Panel 1200mm x 1200mm Perforated Plaster Ceiling Panels with 50mm thick 32kg/m³ Glasswool installed to rear of panels tested with a 400mm air gap.





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**REPORT ON THE DETERMINATION OF SOUND ABSORPTION
COEFFICIENTS OF BAILEY INTERIORS JUSTICE PANEL 1100MM x
900MM PERFORATED PLASTER CEILING PANELS WITH A
GLASSWOOL BACKING (50MM @ 32KG/M³) TESTED WITH A 50MM AIR
GAP IN A REVERBERATION ROOM.**

Testing Procedure: AS ISO 354 - 2006

Testing Laboratory: Applied Acoustics Laboratory
School of Electrical and Computer Engineering
RMIT University
Melbourne, Victoria 3000, Australia
NATA Accreditation Number: 1421

Client: Bailey Interiors Pty. Ltd.
83-85 Boundary Road
Mortdale, New South Wales 2223
Australia

Date of Test: 18th of July 2013

Date of Report: 5th of September 2013

Report Number: 13-094/PD

Testing Officer: Peter Dale

Peter Dale
Approved NATA Signatory



Accredited for compliance with ISO/IEC 17025



The weighted sound absorption coefficient α_w of the sample determined in accordance with AS ISO 11654-1997 "Acoustics: Sound Absorbers for Use in Buildings - Rating of sound absorption" is:

$$\alpha_w = 0.55(\text{LM})$$

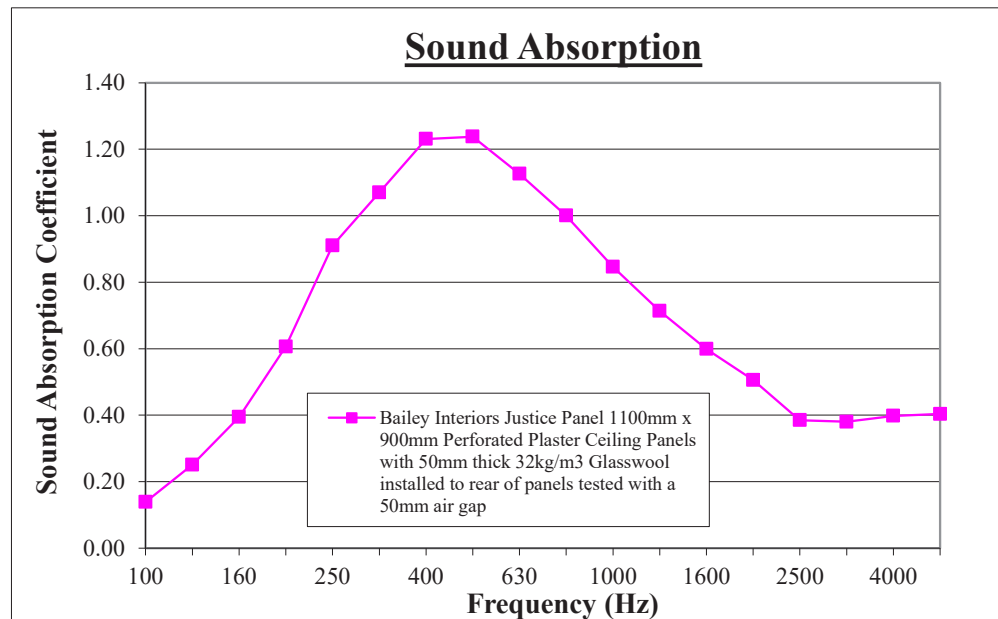
The Practical Sound Absorption Coefficients are detailed below in Table 2. These values have been determined in accordance with AS ISO 11654-1997 "Acoustics: Sound Absorbers for Use in Buildings - Rating of sound absorption".

Table 2: Practical Sound Absorption Coefficients for the Sample

| Frequency (Hz) | 125 | 250 | 500 | 1000 | 2000 | 4000 |
|--|------|------|------|------|------|------|
| Practical Sound Absorption Coefficient, α_p | 0.25 | 0.85 | 1.00 | 0.85 | 0.50 | 0.40 |

N.R.C. of the sample calculated in accordance with ASTM C423-90A is: 0.90

Graph 1: Sound Absorption Coefficients of Bailey Interiors Justice Panel 1100mm x 900mm Perforated Plaster Ceiling Panels with 50mm thick 32kg/m³ Glasswool installed to rear of panels tested with a 50mm air gap.



AWTA PRODUCT TESTING

Australian Wool Testing Authority Ltd - trading as AWTA Product Testing
A.B.N 43 006 014 106

1st Floor, 191 Racecourse Road, Flemington, Victoria 3031
P.O Box 240, North Melbourne, Victoria 3051
Phone (03) 9371 2400

Group Number Assessment

(In accordance with AS 5637.1-2015)

This is to confirm that the product as described below has been tested by AWTA Product Testing.

Testing was performed in accordance with AS/NZS 3837-1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.

As per AS 5637.1 Clause 9(n) it was valid to test this particular material / system in the cone calorimeter for the assignment of a NCC Group Number.

Test Sponsor : Bailey Interiors
83-85 Boundary Road
Mortdale NSW 2223

Test Number : 21-003623
Issue Date : 28/07/2021
Print Date : 11/08/2021

Sponsor Product Clients Ref : "Open Cell-Direct Fix/ Cell Sound/ Open Cell/ Super Diamond/ Shadex/ Cell Sound Panel/ Eco Check"
Pre-Insulated plaster cast tiles
Composite
Nominal Mass per Unit Area/Density : Approx 16kg/m²
Nominal Thickness : Approx 34mm

Product Group Number Classification : 1
Group Number derived from : Sample A: Complete Tile
Average Specific Extinction Area : 3.2 m²/kg



Fiona McDonald
Testing Technologist

52983

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TEST REPORT

Client : Bailey Interiors
83-85 Boundary Road
Mortdale NSW 2223

Test Number : 14-001048
Issue Date : 31/10/2014
Print Date : 1/10/2019

Sample Description Clients Ref : "New Shadex, Eco Check; Hush Tile; Shadex; Random"
White molded plaster ceiling tiles - pre insulated with glass fibre batt
Colour : White
End Use : Ceiling tiles
Nominal Composition : Plaster/fibreglass

ASTM C518-2010

Steady-State Thermal Transmission Properties by Means of the Heat Flow Apparatus

| | | |
|----------------------------------|-------------------|------------------------|
| Date of Testing | 20/10/2014 | |
| Test Date | 27/10/2014 | |
| Test Apparatus | Lasercomp Fox 600 | |
| Sample Orientation | Horizontal | |
| Mean Test Temperature | 23 | °C |
| Temperature Differential | 20 | ° |
| Estimated uncertainty in results | 3.9 | |
| Specimen | 1 | 2 |
| Specimen Thickness (as received) | 40 | 39 mm |
| Specimen Thickness (as tested) | 40 | 39 mm |
| Specimen Density (as tested) | 391 | 403 kg/m ³ |
| Test Duration | 01:55 | 02:00 hrs:mins |
| Measured Heat Flux | 26.0 | 27.8 W/m ² |
| Measured Thermal Conductivity | 0.0520 | 0.0544 W/m.K |
| Thermal Resistance | 0.8 | 0.7 m ² K/W |

181403

1202

Page 1 of 1

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Accredited for compliance with ISO/IEC 17025 - Testing
- Chemical Testing
- Mechanical Testing
- Performance & Approvals Testing

: Accreditation No. 983
: Accreditation No. 985
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0204/11/06

APPROVED SIGNATORY

MICHAEL A. JACKSON B.Sc.(Hons)
MANAGING DIRECTOR

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1st Floor, 191 Racecourse Road, Flemington, Victoria 3031
P.O Box 240, North Melbourne, Victoria 3051
Phone (03) 9371 2400 Fax (03) 9371 2499

TEST REPORT

Client : Bailey Interiors
83-85 Boundary Road
Mortdale NSW 2223

Test Number : 15-002457
Issue Date : 09/06/2015
Print Date : 29/06/2018

Replacement of Report dated :08/05/2018

Sample Description Clients Ref : "Shadex; Hush; Eco Check; New Shadex; Random; Casino; Open Cell; NUTR 2000 Super Diamond; Open Slot; Moon"
White molded plaster ceiling tiles
Colour : White
End Use : Acoustic paneling
Nominal Composition : Plaster
Nominal Thickness : 28mm

ISO 5660.1-2002

Reaction to Fire Tests - Heat Release Smoke Production and Mass Loss Rate Part 1: Heat Release Rate (Cone Calorimeter Method)

| | Specimen | | | Mean | |
|---|----------|-----|-----|------|--------------------|
| | 1 | 2 | 3 | fti | kW/m ² |
| Average Heat Release Rate | fti | fti | fti | fti | |
| Group Number Classification | 1 | 1 | 1 | | |
| (In Accordance with New Zealand Building Code Verification Method C/VM2 Appendix A) | | | | | |
| Average Specific extinction area | 0.2 | 0.1 | 1.4 | 0.6 | m ² /kg |

Test orientation : Horizontal

| | Specimen | | | Mean | |
|---------------------------|----------|------|------|------|-------------------|
| | 1 | 2 | 3 | | |
| Irradiance | 50 | 50 | 50 | 50 | kW/m ² |
| Exhaust flow rate | 24 | 24 | 24 | 24 | L/sec |
| Time to sustained flaming | fti | fti | fti | fti | sec |
| Test duration | 1800 | 1800 | 1800 | 1800 | sec |

15644

5140

Page 1 of 11

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MANAGING DIRECTOR

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P.O Box 240, North Melbourne, Victoria 3051
Phone (03) 9371 2400

TEST REPORT

Client : Bailey Interiors
83-85 Boundary Road
Mortdale NSW 2223

Test Number : 19-007603
Issue Date : 4/02/2020
Print Date : 4/02/2020

Sample Description Clients Ref : "Shadex, Hush,Eco Check,New Shades, Random, Casino,Open Cell, Nut R2000, Super Diamond, OpenSlot,Moon"
Moulded Plaster Ceiling Tiles

Dimensional Stability

| | | | |
|-----------------|------------|-----------|---------------|
| Date of Testing | | | 04/02/2020 |
| Change In | Length (%) | Width (%) | Thickness (%) |
| Specimen | | | |
| 1 | 0.0 | 0.0 | 0.0 |
| 2 | 0.0 | 0.0 | 0.0 |
| 3 | 0.0 | 0.0 | 0.0 |
| Mean | 0.0 | 0.0 | 0.0 |

Tested conditions: 168 hours at 50degC and 95% Relative Humidity
Observation: After exposure no change in dimension and appearance

192823

41504

Page 1 of 1

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0205/11/06

APPROVED SIGNATORY

MICHAEL A. JACKSON B.Sc (Hons)
MANAGING DIRECTOR



19 November 2019

BAILEY INTERIORS
 83 to 85 Boundary Road
 Mortdale NSW 2223

Attention: Roger Bailey

EFFECT OF INSULATION OVER PLASTER CEILING TILES ACOUSTIC OPINION

Dear Roger,

As requested, we provide an acoustic opinion on the improvement in the Ceiling Attenuation Class (CAC) performance of Bailey Interior Plaster Acoustic tiles resultant from an insulation blanket strip located above the ceiling tiles either side of the ceiling height partition wall.

1. BACKGROUND.

As discussed, an acoustic opinion provided by Gabriels Environmental Design dated 27 March 2015 indicated that In 2015, the Acoustic Laboratories Australia Pty Ltd carried out acoustic test of the Room-to-room sound insulation of Plaster Acoustic panels as manufactured by Bailey Interiors. The tests were carried out in accordance with the Australian Standard AS2499:2000, *Acoustics – Measurement of sound insulation in buildings and of building elements – Laboratory measurement of room-to-room airborne sound insulation of a suspended ceiling with a plenum above it*.

The room-to-room sound insulation tests was carried out on a typical Bailey Interior product "Old Shadex" plaster acoustic tile, and a second test was carried out of same ceiling with a 1.8m wide strip of R3.5 Earthwool insulation located both side of the separating wall below the ceiling.

The result of the above tests was a 4 dB improvement in the room-to-room sound insulation performance in terms of the the Weighted Suspended Ceiling Normalised Level ($D_{n,c,w}$).

Gabriels Hearne Farrell Pty Ltd have been requested by Bailey Interiors to provide an opinion of the expected improvement of providing a 1.8m wide strip of insulation on both sides of the separating partition wall in terms of the Ceiling Attenuation Class (CAC) performance; (ASTM E1414/E1414M – 11a *Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum*).

2. COMPARATIVE TEST PROCEDURES:

The test procedure for the Australian and American Standards are very similar. The laboratory set up at Acoustic Laboratories Australia can be set up to measure in accordance with both standards. The main difference in the two standards is that the Australian standard ($D_{n,c,w}$) requires acoustic absorption in the ceiling plenum space on the two end plenum walls and one side plenum wall. The American Standard (CAC) requires acoustic absorption on all four plenum walls.

PROJECT: Bailey Interiors
PROJ No: 19-023g-1

DATE: 19 Nov. 19
PAGE 2

3. ASSESSMENT

The effectiveness of the acoustic absorbent R3.5 Earthwool insulation installed as a 1.8m strip of insulation on both sides of the ceiling height partition wall is to a large extent dependant on the increase in the total absorption in the ceiling void. In the American (CAC) test method there is additional acoustic absorption in the ceiling void plenum space compared to the Australian ($D_{n,c,w}$) set up. It is therefore expected that the decibel (dB) improvement in sound insulation if tested in accordance with the American Standard would be less than when tested in the Australian standards.

Based on the above, it is our opinion that the improvement in the room-to-room CAC performance if the Bailey Interior "Old Shadex" plaster acoustic tile with strip acoustic absorption on either side of the partition were carried out to American Standard the improvement in Ceiling Attenuation Class (CAC) performance would be in the order of 2 to 3 dB

Conditions

The information given in this opinion represents extrapolation based on laboratory test carried out on Bailey Interiors plaster acoustic tile products. The assessment and opinions expressed refer to the expected comparative laboratory performance of the product when tested and rated in accordance with America Standard ASTM E1414/E1414M – 11a.

The assessment and opinions expressed refer to the expected laboratory performance of the product. It is assumed that when installed in the field the products are installed in accordance with manufacturer's instructions and installed with good workmanship. No allowance is made for flanking transmission and acoustic leakage via the construction, as these are construction and design issues that must be considered in the design and construction of individual projects.

This assessment is only valid for 5 years. It assumes there is no change in the construction of the material systems. This assessment addresses the acoustic performance only.

Where construction systems are to be extensively used, or are required to comply with specific or stringent specification requirements, it is strongly recommended that the product be laboratory tested. It must be noted that an acoustic opinion provides an estimate of performance and that the likely performance is usually within +/- 3 dB of the opinion.

We trust this proposal meets your requirements. Please call if you require any clarifications.

Yours Faithfully



Norbert Gabriels B.Arch F.A.A.S for

GABRIELS HEARNE FARRELL PTY LTD

Member Firm – Association of Australasian Acoustical Consultants

A Unit 3 / 2 Hardy St, SOUTH PERTH WA 6151 **P** (08) 9474 5966
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Architectural Plaster

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7 October 2015

Northern Territory Government
Department of Infrastructure
Level 5 Highway House
Palmerston Circuit
P O Box 61 Palmerstone N T 0831

Attention: Kurt Leerburg

**"ACOUSTIC CEILING PRODUCTS AS PROJECT SPECIFIC FACTORY
DIRECT PACKAGES "
"INCLUSIVE GRID WITH WARRANTY"**

Australian Plaster Acoustics has been developing these plaster tiles in conjunction with its parent company Bailey Interiors for the last 5 years.

The organisation has a strong commitment to innovation with major research and development programmes resulting in producing outstanding designs that are truly innovative, lightweight exceptionally high acoustic ratings (NRC) (CAC) and R values . The tiles are fire resistant, pre painted with anti mould paint, will not warp or buckle under humid conditions.

Big innovations have been

- 1) The reduction in weight of each tile bringing overall weight down from approx. 19.50 Kilos m2 - 12.75 kilos m2(in most cases)this has resulted in being able to use a lighter grid for installation as per Rondo Design confirmation REF 4562-15-001.
- 2) The introduction of silicone rubber moulds this has made it possible to create very strong, clean, and sharply designed undercut ceiling tiles which are truly innovative this has only been possible with our strong commitment to R & D.

Australian Plaster Acoustics warrants all plaster products in conjunction with Rondo grid systems from the date of purchase for a period of 10 years.

This warranty does not apply to damage caused by

- 1) Normal wear and tear.
- 2) The fitting of components not supplied by Australian plaster Acoustics /Bailey Interiors or Rondo.
- 3) Repair ,Maintenance or service by a person not authorised by Rondo /Bailey Interiors

We Rondo and Bailey Interiors are jointly marketing these products, plaster acoustic tiles and ceiling grid as a package directly to the builder after nomination from the Department of Infrastructure.

Yours Faithfully,

Bailey Interiors Pty Ltd

Roger Bailey
Managing Director
Phone 02 91539326
Fax 0295346532
Email: roger@baileyinteriors.com.au

RONDO®

Rondo Building Services Pty Limited
ABN 69 000 289 207

NATIONAL

57-87 Lockwood Rd, Erskine Park, NSW, 2759
(PO Box 324 St Marys NSW 1790)
TEL (02) 9912 7300 FAX: (02) 9912 7310

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1300-36-RONDO (1300-36-7663)

www.rondo.com.au

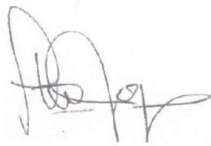
To whom It may concern

Rondo Building Services is Australasia's largest manufacturers of roll formed lightweight steel building products for internal and external use, from steel stud and track drywall systems to building board finishing sections and from exposed and concealed ceiling systems to access panels and other ancillary products.

Rondo has been producing product to serve the building industry for over 50 years and not only has manufacturing facilities in Australia but also New Zealand, Malaysia and India as well as JV's elsewhere.

During that period Bailey Interiors manufacturers of Australian Plaster Acoustics panels has been a valued customer of Rondo.

Rondo has been pleased to partner with Bailey Interiors in the development of its innovative plaster acoustic panels by providing specification assistance in the use of the Rondo Duo[®] Exposed Ceiling Grid System in conjunction with their panels, thereby ensuring their clients have a code compliant suspended ceiling grid system to support their plaster acoustic ceiling panels.



Steve Jupp
Product & Innovation Manager
Rondo Building Services Pty Ltd

AUSTRALIA • NEW ZEALAND • MALAYSIA • MIDDLE EAST • INDOCHINA



TO WHOM IT MAY CONCERN

Gyprock provides a comprehensive range of high performance plasterboard wall and ceiling lining solutions across all segments of the construction industry. Gyprock is also a supplier of casting plaster used in the manufacture of cast plaster products and decorative cornices. Gyprock is one of the many companies owned and operated by CSR Limited, one of Australia's oldest and most respected public companies founded in Sydney in 1855 as the Colonial Sugar Refining Company.

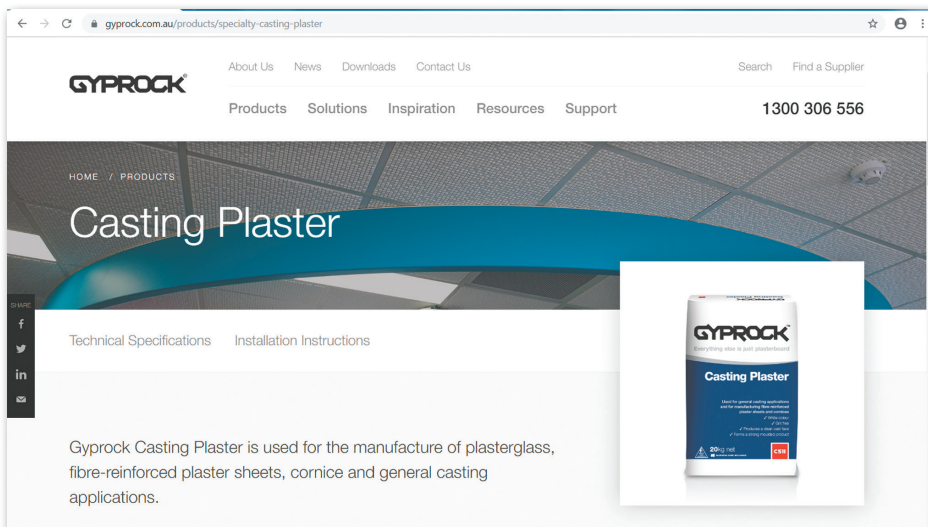
When Gyprock opened its Concord Plaster Mills in 1942, it soon became a supplier of casting plaster to Ernest Alfred Bailey who had established E. A. Bailey & Sons Pty Ltd in Boundary Road, Mortdale in 1938. Since that initial supply, Gyprock has maintained its long association with the Bailey family and continues today to supply its casting plaster to Bailey Interiors.

Over that time, Bailey Interiors has grown in significance to become the largest supplier of all types of architectural plaster products in Sydney and one of Gyprock's major customers for casting plaster. Bailey Interiors has always employed continuously innovative approaches to the manufacture of cast plaster products and demonstrates considerable expertise in moulding and casting from simple to complex shapes.

For over 80 years, CSR has manufactured glasswool insulation under the Bradford brand. Bradford is a supplier of insulation batts and acoustic fabrics used by Bailey Interiors in the manufacture of their exceptionally high performing plaster acoustic ceiling tiles namely for NRC and CAC.

CSR Building Products Limited ABN 55 008 631 356
Commercial Design Centre 7 Slough Avenue Silverwater NSW 2128
Mobile: 0419 477 359 Telephone: 02 8748 1450
Facsimile: 02 8748 1488 Email: aveling@csr.com.au





TO WHOM IT MAY CONCERN

Gyprock manufactures and supplies a comprehensive range of high performance plasterboard wall and ceiling lining solutions across all segments of the construction industry. Gyprock is one of the many companies owned and operated by CSR Limited, one of Australia's oldest and most respected public companies founded in Sydney in 1855 as the Colonial Sugar Refining Company.

Gyprock is the major supplier of casting plaster used by Australian Plaster Acoustics in the manufacture of their innovative plaster acoustic tiles. These exceptionally high performing plaster acoustic ceiling tiles are manufactured at Bailey Interiors' modern facility utilising the latest, innovative plaster tile manufacturing process. Gyprock has been a casting plaster supplier to Bailey Interiors for over 75 years.

CSR also manufactures Bradford glasswool insulation. Bradford is a supplier of insulation batts and acoustic fabrics used by Australian Plaster Acoustics. The resulting range of plaster acoustic tiles have exceptionally high performing acoustics for NRC and CAC with a modern architectural appearance.

Gyprock and Bradford are proud to be associated with Australian Plaster Acoustics and we feel confident that, based on our long association, Australian Plaster Acoustics will provide a high level of product quality, reliable service, trusted performance and industry compliance associated with their large range of plaster acoustic tiles.

Antoine Veling
NSW Commercial Segment Manager
CSR Lightweight Systems

CSR Building Products Limited ABN 55 008 631 356
Commercial Design Centre 7 Slough Avenue Silverwater NSW 2128
Mobile: 0419 477 359 Telephone: 02 8748 1450
Facsimile: 02 8748 1488 Email: aveling@csr.com.au



MATERIAL SAFETY DATA

Product Name: FBS-1 Glasswool Insulation

is classified as **Non-Hazardous** according to the criteria of the Australian Safety and Compensation Council ASCC (formerly NOHSC) Approved Criteria For Classifying Hazardous Substances. FBS-1 Glasswool Insulation is classified as **Non-Dangerous Goods** according to the Australian Code for the Transport of Dangerous Goods by Road and Rail.

- Full test results of each product for acoustic NRC can be viewed online at www.australianplasteracoustics.com.au.
- All ceiling grid and steel support systems by Rondo can be viewed from PDF files on request.
- All acoustic test are NATA approved

DISCLAIMER

Products manufactured and systems designed by Bailey Interiors are produced in accordance with the building code of Australia and New Zealand Building Code and also relevant Australian and New Zealand standards.

All acoustic testing for NRC - (Noise Reduction Coefficients) was carried out in accordance with these standards at RMIT University, Melbourne, Australia and CSIRO, Melbourne, Australia.


All sharing common ceiling testing CAC - (Ceiling Attenuation Class) was also carried out in accordance to Australian and New Zealand standards at Acoustic Laboratories Australia Pty Ltd.

All fire resistance Group 1, thermal resistance testing were also carried out to the latest Australian and New Zealand standards at AWTa a product testing in Melbourne, Australia.

All light reflective tests carried out by Light Lab International, QLD Australia in accordance with NATA accreditation.

All these products received excellent results in all instances they were tested in true laboratory situations which may differ to readings recorded on site.

Australian Plaster Acoustics will not be held responsible for any claims resulting from installation of its products not in accordance with manufacturers recommendations or relevant Australian and New Zealand standards.



Bailey Interiors has been supplying the building and architectural industry with the finest quality acoustic tiles for nearly eighty years. The Acoustic Tile Range features outstanding quality, elegant style, finish and functionality.

Green Product Sheet

Made to last a lifetime

Bailey Interiors Architectural products are made of the finest Gypsum. They have timeless features and built for longevity.

Made of natural Gypsum

Bailey Interiors Architectural products are a unique blend of at least 75% naturally occurring Gypsum.

Energy and water-efficient

Bailey Interiors Architectural products are more energy and water-efficient than alternative acrylic and resin based products. Bailey Interiors have installed a unique water recycling process whereby excess water from the production runs are recycled and used again in further production. The high Gypsum content also outperforms acrylic, which quickly dissipates water heat, resulting in reduced use of water.

Minimal manufacturing impact

Bailey Interiors Architectural products are created by a combination of machine made and hand made production methods. This combination allows for a better quality product as compared with acrylic, and composite products.

Bailey Interior's Architectural products also use significantly less energy than electrically high – heat ovens. They use a combination of natural drying and gas operated ovens.

Additionally Bailey Interiors Architectural products are hand finished by craftsmen, further reducing reliance on non renewable resources.

Minimal impact on the environment

Bailey Interiors Architectural Products are made of the finest Gypsum.

Bailey Interiors have installed two filtration units on top of the bulk silo bin. These units absorb any excess plaster dust from going in to the atmosphere whilst the plaster silo is being loaded with plaster which is pumped by compressed air from the bulk plaster truck. These filtration units allow for the air to remain clean and clear which does not impact on the environment.

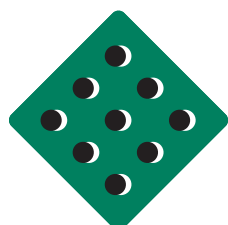
Recycled Shipping

Bailey Interiors Architectural products are shipped on pallets made of reclaimed wood, with strapping made from recycled bottles.

Recycled Waste Plaster

Bailey Interiors have a special method of recycling excess casting plaster and fibre glass reinforcement. This material is transported from Bailey's current work place to be recycled as part of road base material.

Customers who choose Bailey Interiors Architectural products know they are making an environmentally good choice because they are making a purchase lasting a lifetime.



AUSTRALIAN PLASTER ACOUSTICS

Innovative Sound Solutions

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