

DONN[®] Brand Grid Suspension Systems



General Offices

DONN brand suspension systems are the original exposed grid system developed in the 1950's and still a world leader in technology and innovation.

Hotels

Retail Malls

Banks

Covering almost every conceivable application, the designer and contractor alike have the choice of the traditional 24mm DONN DX system, or the more sophisticated appearance of the 15mm DONN Centricitee.

Reception/lobbies

Board Rooms

Showrooms

Either system integrates seamlessly with USG Boral's acoustical ceiling panels to provide an extensive range of options, whether it is for acoustic, aesthetic or budget reasons. Additionally as a total ceiling system, USG Boral's exposed grid and acoustic ceiling panels are covered by a Lifetime Warranty (up to a maximum of 30 years).

Education

Medical

Industrial

Food Preparation Areas

For fire protection and safety, DONN DXL can provide a number of different Fire Resistant Rating (FRR/FRL) ceiling design options combined with the appropriate USG Boral Firecode acoustical ceiling panel.

Fire rated areas



Two systems, multiple applications

Standards and Building Codes

USG Boral uses the following Standards in its manufacturing, testing and marketing policies for compliance with the respective Building Codes of Australia and New Zealand

AS/NZS 2785	- Suspended Ceilings, Design and Installation
ASTM C635	- Standard Specification for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
AS 1397	- Steel Sheet and Strip
ISO 5660	- Reaction to fire test. (Cone Calorimeter method)
AS 1530.4	- Fire Resistance of Elements of Building Construction
AS/NZS 3837	- Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter (cone test)
AS/NZS 4600	- Cold Formed Steel Structures Code
AS/NZS 1170	- Structural Design Actions
AS 1170.4	- Earthquake Loads (Australia)
NZS 1170.5	- Earthquake Loads (New Zealand)
NZS 4219	- Specification for Seismic Resistance of Engineered Systems in Buildings
AS 2946	- Suspended Ceilings, Recessed Luminaires and Air Diffusers Interface
NZBC – B1/VM1	- NZ Building Code Verification Method B1/VM1 Clause 2
NZBC – B2 Durability	- DONN DX and DONN Centricitee will have a minimum serviceable life of 15 years when installed in a dry, non-corrosive, interior installation

ISO 9000 Quality Assurance

USG Boral Building Products NZ certified ISO 9001 – 2008 manufacturer

No. QEC 5044 by Telarc SAI



Quality
ISO 9001



User's Guide

ADVANTAGES of DONN Brand Grid

- A wide product range ensures appropriate load carrying capabilities for acoustical ceiling panels and other in-ceiling services
- High tensile QUICK-RELEASE clips on cross tee ends provide fast, easy, positive lock insertion for quick installation
- Unique DONN Brand QRC design permits quick, easy release of components without the need for tools
- QUICK-RELEASE cross tee clips reduce the need for additional wires, clips or fasteners even when designing for seismic requirements
- For safety and installation speed, cross tees may cantilever and will not drop out
- Lay-on cross tees resist twist and gapping
- Fire Resistant Ratings available on the DONN DX 24mm system
- DONN Centricitee's slim 15mm visual face creates a less dominant grid line than 24mm grid, and is an ideal, cost-effective compromise between a fully concealed system and easy access to plenum services
- Unique patented centering devices are formed into each Centricitee cross tee, ensuring rebated and square edged acoustical panels install square

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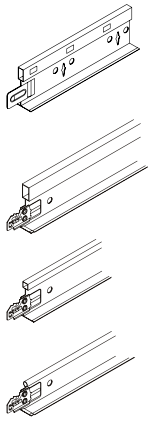
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System Components DONN® Brand Exposed Grid

DONN® DX®
24mm Exposed Grid



24mm Tee System



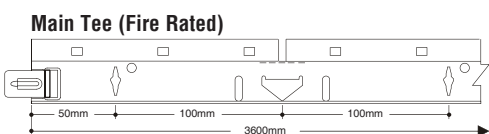
	Profile	Product	Profile Height	Component Length ¹	Code	Panel Edge Options
Main Tee	Deep	Standard	38mm	3600mm	DX30D-3600	A, B, C, D
		Heavy	38mm	3600mm	DX38D-3600	A, B, C, D
		Fire Rated	38mm	3600mm	DXL38D-3600	A, B, C, D
		WideSpan™ <small>* To special order</small>	38mm	3600mm	DX55D-3600*	A, B, C, D
Cross Tee	Deep	Standard	38mm	1200mm	DX30D-1200	A, B, C, D
		Fire Rated	38mm	1200mm	DX38D-1200	A, B, C, D
		Fire Rated	38mm	600mm	DX30D-0600	A, B, C, D
	Medium	Standard	32mm	1200mm	DX30M-1200	A, B, C, D
	Shallow	Standard Standard	25mm 25mm	1200mm 600mm	DX30S-1200 DX30S-0600	A, B, C, D A, B, C, D

	A Square Edge (SQ)	B Shadowline Tapered (SLT)	C Shadowline (SL)	D Shadowline Bevel (SLB)
USG Acoustical Panel Edge Detail				

1. Imperial and non-standard lengths/modules available subject to minimum order quantities and lead times.

Fire Rated Option

DONN DX is available as a Fire Rated option providing protection up to 1 hour, subject to assembly design. Refer to USG Fire Rated Exposed Grid brochure.

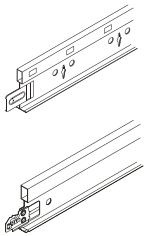




	Profile	Product	Profile Height	Component Length	Code	Panel Edge Options
Deep	Main Tee (Fire Rated)		38mm	3600mm	DXL38D-3600	A, B, C, D
	Cross Tee (Fire Rated)		38mm	1200mm	DX38D-1200	A, B, C, D
	Cross Tee (Fire Rated)		38mm	600mm	DX30D-0600	A, B, C, D





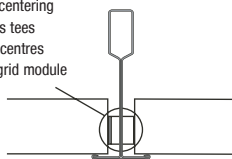
DONN[®] CENTRICITEE[®]
15mm Exposed Grid



15mm Tee System



	Profile	Product	Profile Height	Component Length ¹	Code	Panel Edge Options
Main Tee	 Deep	Main Tee (Standard)	38mm	3600mm	DXT30D-3600	A, B, C, D
		Main Tee (Heavy)	38mm	3600mm	DXT38D-3600	A, B, C, D
Cross Tee	 Deep	Cross Tee (Standard)	38mm	1200mm	DXT30D-1200	A, B, C, D
		Cross Tee (Standard)	38mm	600mm	DXT30D-0600	A, B, C, D
		Cross Tee (Heavy)	38mm	1200mm	DXT38D-1200	A, B, C, D

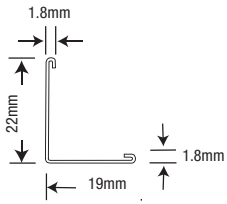
	A Square Edge (SQ) ²	B Fineline Bevel Edge (FLB)	C Fineline (FL)	D Interline Tapered (ILT)	Patented self centering device in cross tees automatically centres ceiling panel grid module
USG Panel Edge Detail					

1. Imperial and non-standard lengths/modules available subject to minimum order quantities and lead times.

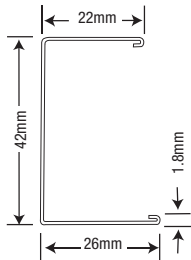
2. Limited suitability. Refer to individual acoustical panel brochures

Donn Brand Wall Angles are formed from prepainted, hot dipped galvanised steel. Ends are all square cut

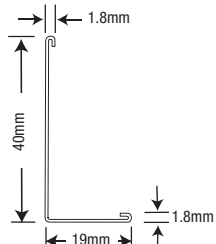
Standard MT45-3600/MT55-3600



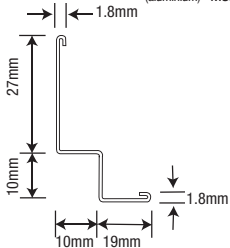
Seismic Wall Channel US45-3600



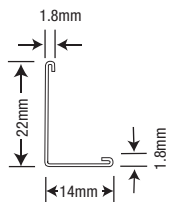
Long Leg ML45-3600



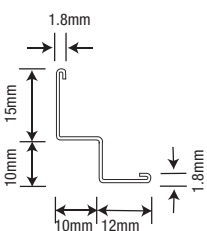
Shadowline Long Leg (steel) MSL45-3600
(aluminium) MSL60-3600



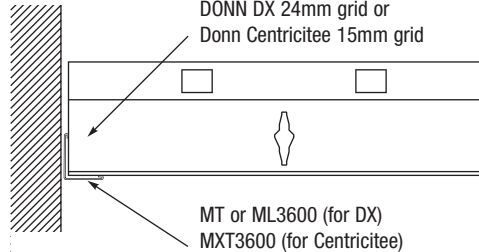
Centricitee MXT45-3600



Shadowline MS45-3000

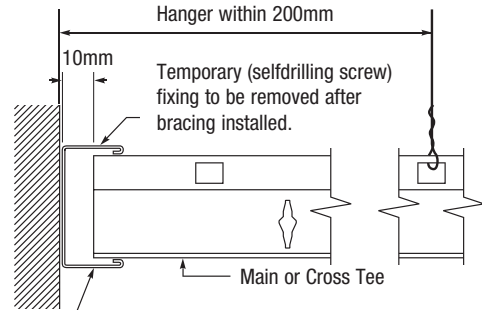


Standard



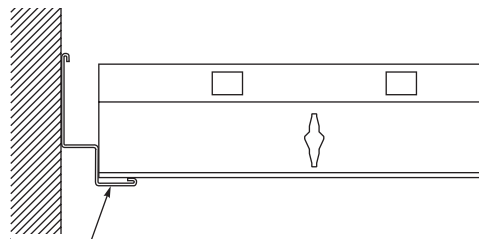
Trim to be fixed to wall, max 600mm centres. Fixing to be relevant to wall strata eg plug and screw or suitable nail type fixings. Seismic requirements may take precedence of type and quantity of fixing.

Seismic



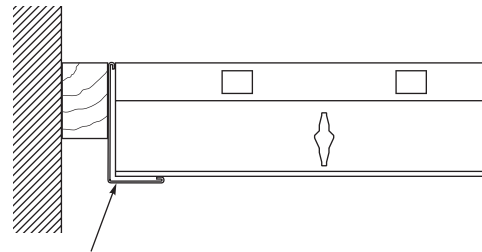
US3600
Wall Channel to be fixed at max 600mm centres

Shadowline



MSL 3600
Shadowline trim fixed to the perimeter wall, max 600mm centres as for standard trim

Shadow Edge

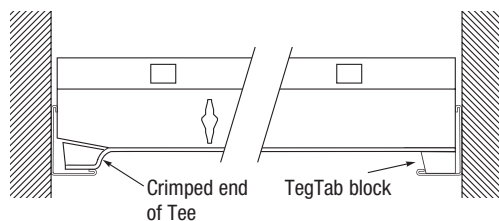


ML3600
Perimeter angle to be fixed to black painted timber batten to form shadowedge detail.

Crimping Option

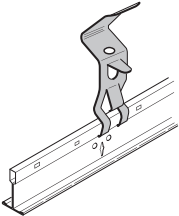
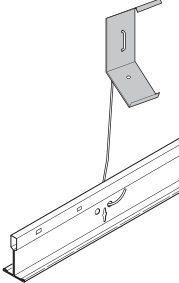
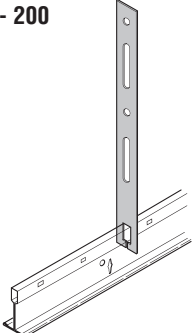
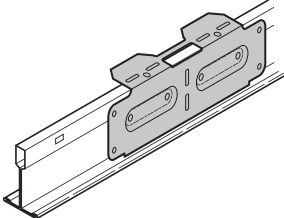
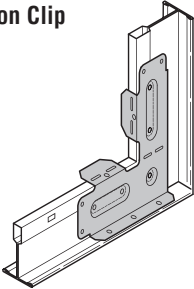
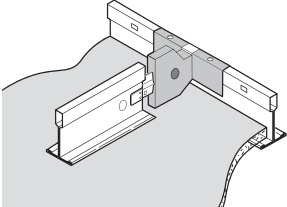
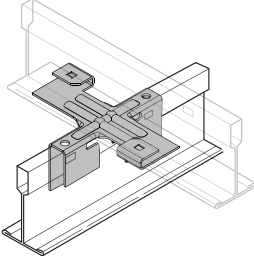
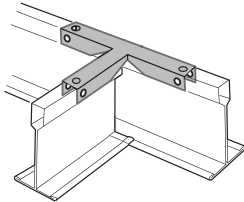
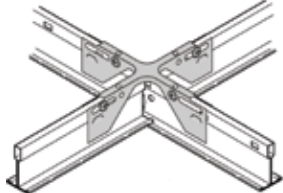
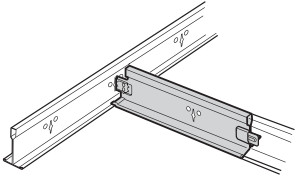
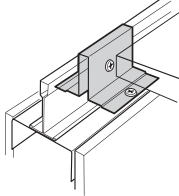
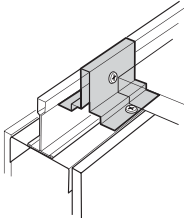
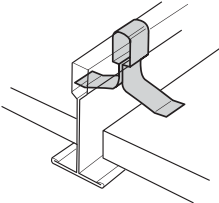
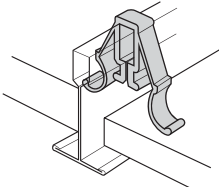
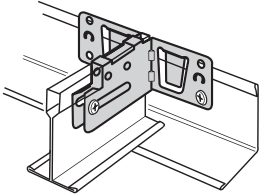
Teg Tab block option

Field Cutting Option



Cut, then form end with 6mm or 10mm crimping tool to suit depth of rebate on ceiling panel. When setting out ceiling plane, lower wall angle accordingly to allow for these.

Trimmed perimeter panels hand rebated to match original rebate

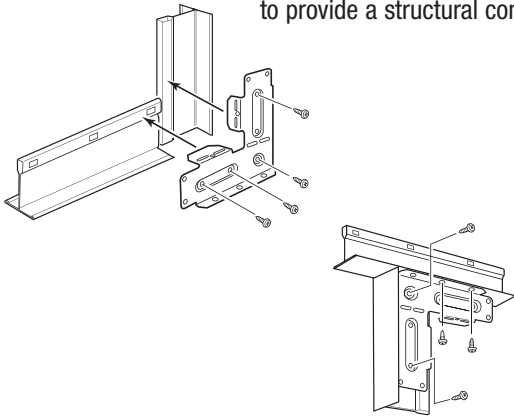
<p>Suspension Clips</p>	<p>CL315</p> 	<p>CL2424 (Atkar)</p> 	<p>DFS - 200</p> 
<p>Joining Components</p>	<p>DGSC-180 Splice Clip</p> 	<p>DGTC-90 Transition Clip</p> 	<p>DG-DX Acoustical Transition Clip</p> 
	<p>DGMT Strongback Clip</p> 	<p>DH3 3-Way Off-Module Connector</p> 	<p>DH4 Seismic Separation Joint Clip</p> 
	<p>MT/CT Converter Joins Main Tees at 90°</p> 	<p>WSC18 (for SQ edge panels) Revoe Partition Attachment Clip</p> 	<p>WSC38 (for rebated 24mm) WSC38-9 (for rebated 15mm)</p> 
<p>Retention Clips</p>	<p>L15 Hold Down Clip-Fire Rated Grid</p> 	<p>PMP (by others) Plastic Multi Clip - 8mm-19mm</p> 	<p>ACM7 Seismic Clip - Grid to Wall Angle</p> 

The following information will help you select and use the appropriate accessories. Many of the accessories are multifunctional. Transitions from soffits or flat surfaces can be easier with the use of accessories.

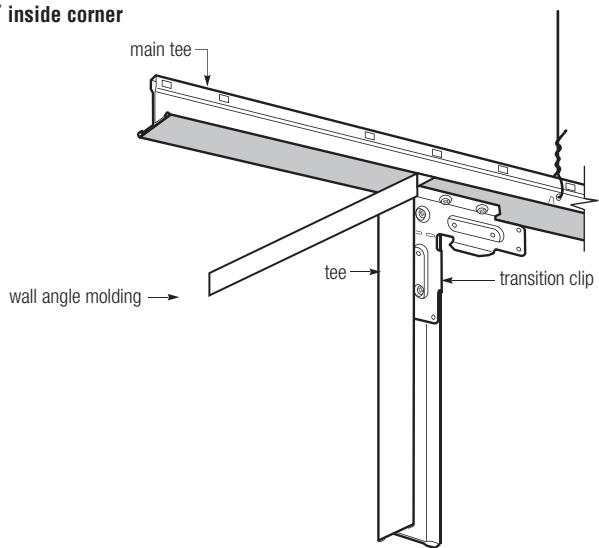
- Transition Clip joints require at least one (1) hanger within 300mm.
- Splice Clip joints require one (1) hanger within 150mm of splice.

**DGTC-90°
Transition Clip
Application**

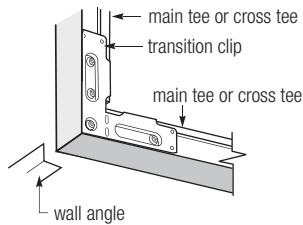
The Transition Clip securely joins two tier grid components, regardless of face width, at a 90° angle. Bend down tabs secure the clip to the grid. Screws are required to provide a structural connection.



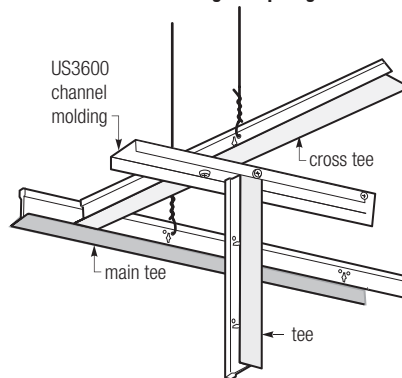
90° inside corner



90° outside corner using Transition Clip



90° inside corner with channel molding at top edge

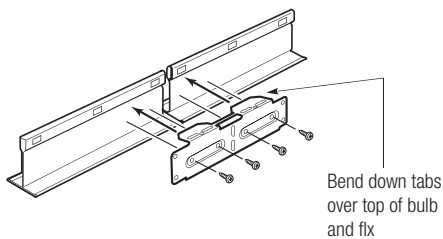


NOTE: At least one (1) hanger is required within 300mm of a Transition Clip or Channel Molding intersection.

**DGSC-180
Splice Clip
Application A**

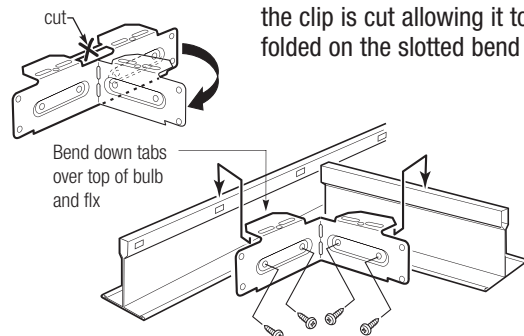
The primary purpose of the Splice Clip is to join two field cut to length in-line main tees.

Splice Clip (A)



**DGSC-180
Splice Clip
Application B**

Another common use of the Splice Clip is joining two grid tees that are intersecting off module, such as a utility opening. The link joining the bend down tabs on the clip is cut allowing it to be folded on the slotted bend line.



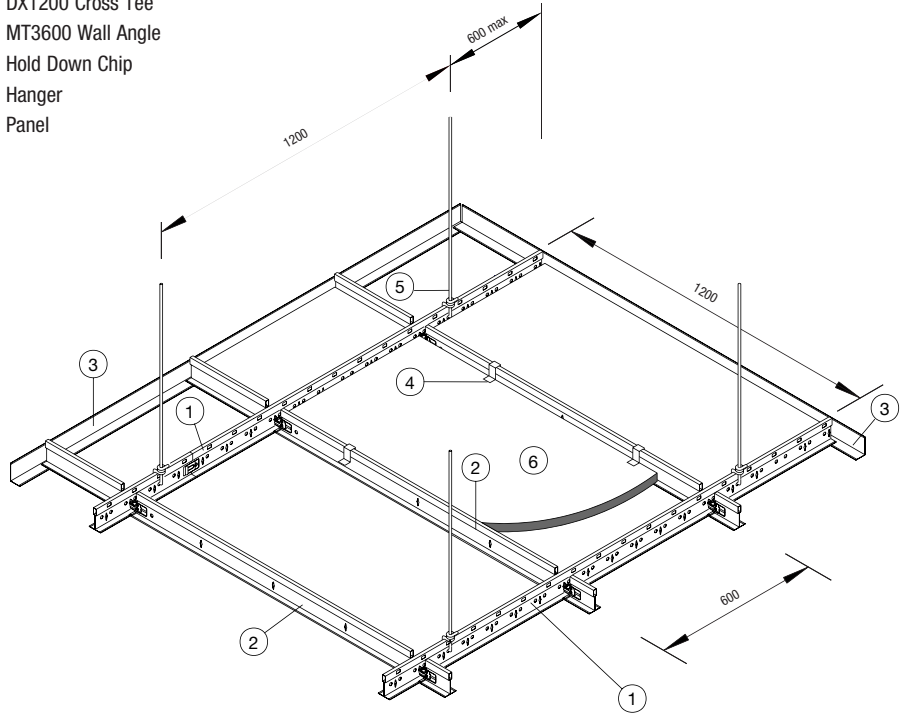
DONN® DX®
24mm Exposed Grid

Cross Tee
QRC
tab



Components

- ① DX3600 Main Tee
- ② DX1200 Cross Tee
- ③ MT3600 Wall Angle
- ④ Hold Down Chip
- ⑤ Hanger
- ⑥ Panel



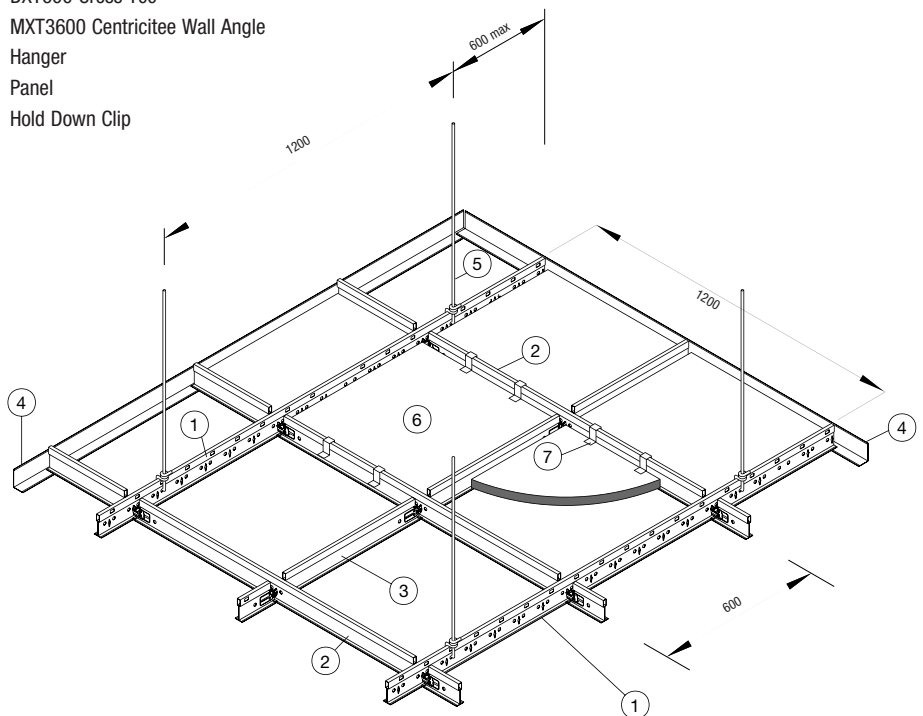
DONN® CENTRICITEE®
15mm Exposed Grid

Cross Tee
QRC
tab



Components

- ① DXT3600 Main Tee
- ② DXT1200 Cross Tee
- ③ DXT600 Cross Tee
- ④ MXT3600 Centricitee Wall Angle
- ⑤ Hanger
- ⑥ Panel
- ⑦ Hold Down Clip



Suspended ceilings are finished products intended for interior use and should be treated accordingly.

Delivery, Storage and Handling

- All materials shall be delivered in their original, unopened packages and stored for as short a time as possible, in an enclosed shelter providing protection from exposure to the elements and damage by/to other trades. Damaged, deteriorated or obviously faulty material is not to be installed and shall be removed from the premises.
- Materials should be handled in such a manner as to prevent racking distortion or physical damage.

Installation

- Ceiling layout should be planned prior to installation to determine grid configuration, direction etc. and to ensure that all fixing points are compatible with structural members and/or other services.
- Installation of exposed grid shall not begin until the building is closed in, fully glazed, roof watertight and residual moisture from wet trades such as plaster, concrete and terrazzo has dissipated.
- Mechanical and electrical ductwork above the suspension system shall be completed before installation of the suspension system.

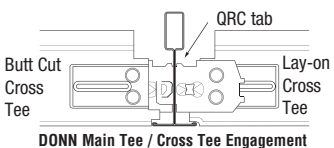
Seismic Bracing Requirements

Consult the *USG Boral Seismic Design Guide*.

Main Tee

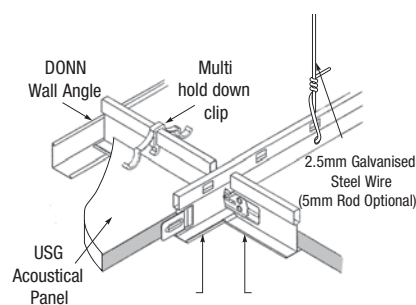
- For standard installations Main Tees are spaced at 1200mm centres.
- Where heavy ceiling panels are used, close Main Tees in to 600mm centres. Refer *Loadings* pages 12-15
- Main Tee integral splices are to be offset from each other across the ceiling. Where this cannot be avoided, aligned splices shall be mechanically fastened with a pop-rivet, tek screw or similar.

Cross Tee

- Cross Tees interlock with opposing Cross Tees through the Main Tee web slots to form the required module.
- 
- A positive “click” is heard when the DONN QRC tab correctly engages.
 - The Cross Tee being installed should be inserted on the **left side** of the already **installed Cross Tee**.
 - Slots are punched along the Main Tee for convenience at 100mm centres for metric systems and 6” for imperial systems.
- Main and Cross Tees can be arranged in a variety of module configurations - see *Loadings* pages 12-15 for standard common layouts.

Suspension

- Main Tee hangers are spaced at 1200mm centres, no more than 600mm from the perimeter Wall Trim or 150mm from the Main Tee splice or 200mm from the Main Tee / Cross Tee joint. For heavier ceilings closer spacings may be required and/or hangers provided through the Cross Tee. Wider spacing may be allowable - see *Loadings* pages 12-15 or contact your USG Boral Ceiling Specialist.
- For Cross Tees not directly attached to walls and where building movement may be anticipated and there is a risk of them losing support, provide extra hangers or suitable restraint to the Cross Tees. (eg ACM7 Seismic Clip)
- Where ceilings are back-braced for seismic restraint, do not attach grid to walls. Provide one hanger within 200mm of the end of every Main Tee and Cross Tee, or suitable support to allow for movement. (eg ACM7)



Suspension methods include:

- 2.5mm diameter straightened galvanised wire located through the pre punched convenience holes in the Main Tee bulb or web and secured with three tight 360° turns.
 - 2.5mm wire or 5mm galvanised rod with the DONN CL315 suspension clip over the bulb.
 - 5mm rod with the CL2424 clip through prepunched hole in the web or bulb of DONN Centricitee or DONN DX grid.
 - A system of flat steel strip or Wall Angle secured to the tee web with fasteners. The system shall be fully compliant with AS/NZS 2785, Section 3.
- DONN Direct Fixing Clips **between bulb holes only** (no closer than 10mm to the bulb holes).
 - Hangers are not to be bent or kinked as a means of levelling the grid or for any other reason.
 - Hangers or bracing are not to be fixed to, or closer than 150mm to plenum building services e.g. ducting, sprinkler pipes.
 - Fixing of the hanger to the structure above with proprietary fasteners shall be installed in accordance with their manufacturers recommendations, be suitable for the structure material and comply with any required Standards. Such fasteners shall be fully compliant with AS/NZS 2785, Section 3.
 - Hangers using the CL315 clip shall not vary from the vertical by more than 5°.
 - Where hangers are splayed up to a maximum of 45° to the vertical, they should always have an equally applied hanger in the opposite direction.
 - Suspension method and position may be dependant on load requirements. See *Step 3* tables pages 13 and 15.

<p>Suspension cont.</p>	
<p>Wall Perimeter</p>	<p>A variety of different Wall Angle profiles are available to suit the Donn Brand systems and designer's requirements. See <i>Wall Angles</i> page 6 for details.</p> <ul style="list-style-type: none"> - Typically fix trim to walls or bulkheads up to 600mm centres maximum.
<p>Panel Hold Down Clips</p>	<p>Clips may be required for seismic restraint, fire ratings or wind uplift on ceiling panels.</p> <ul style="list-style-type: none"> - Typically install 2 Hold Down Clips (steel or other) per parallel tee (Cross or Main). This will give four points per panel restraint. - Where frequent access in to the plenum is anticipated, some clips can have one side removed to allow clipping one side of the tee but access on the other. - Ensure clips are of a type suitable for DONN DX or DONN Centricitee and for the thickness of acoustical panel being clipped.
<p>Plenum Depths</p>	<p>Minimum plenum depths for the ease of removal of</p> <ul style="list-style-type: none"> - 600 x 600mm panels = 150mm - 1200 x 600mm panels = 200mm <p>Where lesser plenum depth is required, particularly under non-continuous structure or services, like joists/purlins or ducts, side loading of ceiling panels can further reduce the depth in these areas to 70mm (subject to panel thickness).</p>
<p>Cutting</p>	<p>DONN Grid and Wall Angle systems are easily cut on site with aviation snips or fine toothed band or hack saws.</p>
<p>Ceiling Acoustics</p>	<p>Acoustical absorption and sound transmission can be controlled to desired levels with the appropriate selection from the extensive range of USG Boral acoustical ceiling panels. See page 22 for an overview selection. Consult your USG Boral Ceiling Specialist for advice on a total acoustical ceiling system.</p>
<p>Fire Rating</p>	<p>Main, Cross Tees and perimeter trims are non-combustible (BS476 Part 4). DONN DXL grid system and appropriate USG Boral Firecode acoustical ceiling panel provide floor/ceilings, roof/ceilings assembly Fire Ratings up to 1 hour. Refer to <i>USG Boral Fire Rated Grid</i> brochure for full details. Please consult USG Boral for regional compliance and availability.</p>
<p>Lighting/Air Handling</p>	<p>Most standard luminaires, louvres, grills and linear diffusers integrate with the standard module configurations. Refer <i>Lighting Installation</i> pages 16-17 for specific details.</p>
<p>Thermal Properties</p>	<p>DONN suspension systems are unaffected by thermal movement between ambient temperature variations of 10° to 30°C.</p>
<p>Health and Safety</p>	<p>The material composition represents no health hazard. When handling, take care and ensure that safe work practices are adhered to at all times. Some products may have surface treatments and sharp edges/ends. All reasonable care should be taken when handling or installing to avoid any potential injury to self or others. Users should be properly trained and supervised in the use and handling of these materials. Appropriate personal protective equipment should be used when necessary eg: gloves/glasses etc. to avoid any potential injuries.</p>
<p>Maintenance</p>	<ul style="list-style-type: none"> - Cleaning - Remove ceiling panels, then perform necessary cleaning of the grid with non-solvent based commercial cleaner. - Painting - Repainting of grid system members should be with a high quality solvent based paint for use over metal surfaces and applied as recommended by the paint manufacturer. - Paint colour - Powder coating: PPG Industries - Product Code PE522 polyester matt Colour Code 9249AN ANOGRain Pacific White - Wet spray PPG Industries - Product Code 262 Speedlac (nitro-cellulose lacquer) Colour Code 34063 Pacific White NZ
<p>Materials</p>	<p>Main and Cross Tees are a double web design, roll formed from hot dipped galvanised steel with prepainted galvanised steel cap. Cross Tees have a DONN QRC high tensile steel tab clinched to each end, zinc chromate finish.</p>
<p>Partitions</p>	<p>A partitions mass may impact on the installation requirements of a suspended ceiling due to seismic movement. Partitions should not be rigidly fixed to the suspended ceiling where possible, but can be fixed with provision for seismic or other building movement.</p>

Loadings - Maximum Allowable

To determine which is the most appropriate and cost effective grid combination compliant with AS/NZS 2785:2000 Suspended Ceilings - Design and Installation, use the following calculations.

Step 1

Maximum Load Calculations Ultimate Limit State

1.1 Factored Dead Load

(A)

$G = \text{Grid Weight} + \text{Panel Weight} + \text{Lights/Fixtures/Insulation etc Weight}$

$G = \frac{\quad}{\quad} + \frac{\quad}{\quad} + \frac{\quad}{\quad} = \quad \text{kg/m}^2$

(A) = $\frac{\quad}{\quad} \times 1.4$

Therefore **Maximum Load** (A) = kg/m²

1.2 Factored Dead Load

(A)

plus

(B)

Factored Service Load

From 1.1 above (A) kg/m²

+

$U^* \times 1.7 =$ (B) kg/m²

Therefore **Maximum Load** (A) + (B) = kg/m²

* Where U is 3.0 kg/m² minimum unless specified otherwise

If required under AS/NZS 2785:2000 Clause 3.2.2(b)


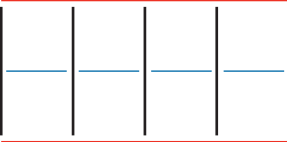
Notes:

- Load calculations 1.1 and 1.2 are based on AS/NZS 2785:2000 Clause 3.3.5(a). Load calculation 1.2 is based on a minimum Service Load of 3.0 kg/m² as required by the Standard. The contractor is to confirm that this load will not be exceeded, or alter the calculation accordingly. If Service Load U is NOT a requirement, use calculation 1.1 values only.
- These tables apply to areas of buildings that have **no openings to the outside**, such as doors, windows, ducts etc. In all other cases the appropriate design loading must be determined by the project structural engineer in accordance with AS/NZS 2785:2000 Clauses 3.3.5(b) or (c).
- Standard testing and installation for suspension is at 1200mm centres. Wider centres may be allowable - refer to respective grid combination tables. Hangers must be within 200mm maximum of Main Tee / Cross Tee connection.
- Heavy lighting or other mechanical services shall be supported on the main tees, included in the dead load 1.1 above, able to be supported by the selected grid combination, and/or should be independently supported if greater than 10kg (NZS4219).
- All point loads shall be fixed under suspension point on Main Tees only and hanger capacity should be checked against Step 3.
- Loadings are laboratory tested in accordance with AS/NZS 2785 with a deflection limit of L/360. Maximum allowable system loads take into account continuous spans and are applicable for ceilings 2.4 metres or longer. For ceilings shorter than 2.4 metres use a minimum of two hangers
- Seismic considerations for in-plane loads may take precedence in determining the required grid combination (refer to the USG Seismic Design Guide)
- Not all products may be available in all areas.
- For non-standard modules eg. 750 x 750mm etc. contact USG for availability and lead times prior to specification.

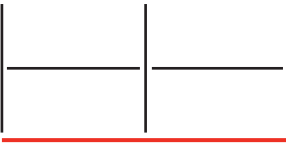
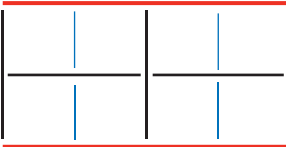


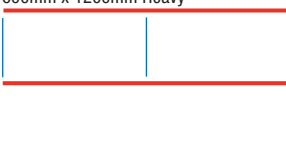
Step 2

Alternative Grid Layouts

From the grid diagrams below and opposite, select a ceiling layout and hanger spacing where the **Maximum Load** (from Step 1, above) **is less than or equal to the Maximum Allowable Load** from the Tables. This will guide you as to the minimum grid combinations to use to fully comply.

	Grid Combinations			Hanger Spacing (mm)						System Weights kg/m ²
	Main Tee	Cross Tee	Cross Tee	1000	1100	1200	1350	1500	1800	
Standard 1200mm x 600mm 	DX30D-3600	DX30S-1200		11.6	11.6	11.6	11.6	11.6	N/A	0.76
	DX30D-3600	DX30M-1200		23.5	23.5	19.7	15.5	11.6	N/A	0.79
	DX30D-3600	DX30D-1200		31.3	25.9	19.7	15.5	11.6	N/A	0.87
	DXL38D-3600 Fire Rated Grid	DX38D-1200		19.0	19.0	14.5	N/A	N/A	N/A	1.00
	DX38D-3600	DX30D-1200		31.8	31.8	30.1	21.3	15.4	N/A	0.92
	DX55D-3600* (to special order)	DX30D-1200		31.8	31.8	31.8	28	20.4	11.8	1.05
Standard 600mm x 600mm 	DX30D-3600	DX30M-1200	DX30S-600	23.5	23.5	19.7	15.5	11.6	N/A	1.00
	DX30D-3600	DX30D-1200	DX30S-600	31.3	25.9	19.7	15.5	11.6	N/A	1.11
	DXL38D-3600 Fire Rated Grid	DX38D-1200	DX30D-600	19.0	19.0	14.5	N/A	N/A	N/A	1.29
	DX38D-3600	DX30D-1200	DX30D-600	31.8	31.8	30.1	21.3	15.4	N/A	1.21
	DX55D-3600* (to special order)	DX30D-1200	DX30D-600	31.8	31.8	31.8	28	20.4	11.8	1.34

Loadings - Maximum Allowable

Alternative Grid Layouts	Grid Combinations			Hanger Spacing (mm)						System Weights kg/m ²	
	Main Tee	Cross Tee	Cross Tee	1000	1100	1200	1350	1500	1800		
	DX30D-3600	DX30M-1200		Maximum allowable load kg/m ²	11.7	11.7	11.7	11.7	11.6	N/A	0.79
	DX30D-3600	DX30D-1200			15.9	15.9	15.9	15.5	11.6	N/A	0.87
	DX38D-3600	DX38D-1200			21.9	21.9	21.9	21.3	15.4	N/A	1.00
	DX55D-3600* <small>*(to special order)</small>	DX38D-1200			21.9	21.9	21.9	21.9	20.4	11.8	1.13
	DX30D-3600	DX30M-1200	DX30S-600	Maximum allowable load kg/m ²	11.7	11.7	11.7	11.7	11.6	N/A	1.00
	DX30D-3600	DX30D-1200	DX30S-600		15.9	15.9	15.9	15.5	11.6	N/A	1.10
	DX38D-3600	DX38D-1200	DX30D-600		21.9	21.9	21.9	21.3	15.4	N/A	1.30
	DX55D-3600* <small>*(to special order)</small>	DX38D-1200	DX30D-600		21.9	21.9	21.9	21.9	20.4	11.8	1.42
	DX30D-3600	DX30M-1200		Maximum allowable load kg/m ²	11.7	11.7	11.7	11.7	11.6	N/A	0.54
	DX30D-3600	DX30D-1200			15.9	15.9	15.9	15.5	11.6	N/A	0.58
	DX38D-3600	DX38D-1200			21.9	21.9	21.9	21.3	15.4	N/A	0.67
	DX55D-3600* <small>*(to special order)</small>	DX38D-1200			21.9	21.9	21.9	21.9	20.4	11.8	0.80
	DX30D-3600		DX30D-600	Maximum allowable load kg/m ²	51.7	51.7	39.5	31.0	23.3	13.5	1.17
	DXL38D-3600 <small>Fire Rated Grid</small>		DX30D-600		29.1	29.1	29.1	N/A	N/A	N/A	1.25
	DX38D-3600		DX30D-600		60.2	60.2	60.2	42.9	30.8	17.8	1.25
	DX55D-3600* <small>*(to special order)</small>		DX30D-600		77.8	77.8	77.8	56.2	40.7	23.6	1.52
	DX30D-3600		DX30D-600	Maximum allowable load kg/m ²	51.7	51.7	39.5	31.0	23.3	13.5	0.87
	DXL38D-3600 <small>Fire Rated Grid</small>		DX30D-600		29.1	29.1	29.1	N/A	N/A	N/A	0.96
	DX38D-3600		DX30D-600		60.2	60.2	60.2	42.9	30.8	17.8	0.96
	DX55D-3600* <small>*(to special order)</small>		DX30D-600		63.6	63.6	63.6	56.2	40.7	23.6	1.23

STEP 3 Maximum Allowable Loads (kg/m²) with Main Tees at 1200mm spacing.

(if at 600mm spacing double the Allowable Load)

Use a hanger type and location greater than the Maximum Allowable Loads from the tables above. Use of these tables must take into account any point loads.

Hanger spacing	Using a bulb hole			Using a web hole			Using a CL315 Clip			Using a DFS200 Strap		
	1200	1350	1500	1200	1350	1500	1200	1350	1500	1200	1350	1500
DX30D-3600	N/A	N/A	N/A	33.3	29.6	26.6	40.8	36.3	32.6	N/A	N/A	N/A
DX38D-3600	31.5	28.0	25.2	48.7	43.3	38.9	49.0	43.6	39.2	37.6	33.4	30.1
DXL38D-3600 <small>(Ø 2.5 wire only)</small>	N/A	N/A	N/A	48.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DX55D-3600	46.2	41.1	37.0	45.1	40.1	36.1	62.5	55.6	50.0	78.0	69.3	62.4

Loadings - Maximum Allowable

To determine which is the most appropriate and cost effective grid combination compliant with AS/NZS 2785:2000 Suspended Ceilings - Design and Installation, use the following calculations.

Step 1

Maximum Load Calculations

Ultimate Limit State

1.1 Factored Dead Load

(A)

$$G = \text{Grid Weight} + \text{Panel Weight} + \text{Lights/Fixtures/Insulation etc Weight}$$

$$G = \frac{}{} + \frac{}{} + \frac{}{} = \frac{}{} \text{ kg/m}^2$$

$$(A) = \frac{}{} \times 1.4 \quad \text{Therefore Maximum Load (A) = } \frac{}{} \text{ kg/m}^2$$

1.2 Factored Dead Load

(A)

plus

(B)

If required under AS/NZS 2785:2000 Clause 3.2.2(b)

$$\text{From 1.1 above (A) } \frac{}{} \text{ kg/m}^2$$

$$+ \text{ Factored Service Load (B) } \frac{}{} \text{ kg/m}^2$$

$$U^* \times 1.7 = (A) + (B) = \frac{}{} \text{ kg/m}^2$$

* Where U is 3.0 kg/m² minimum unless specified otherwise



Notes:

1. Load calculations 1.1 and 1.2 are based on AS/NZS 2785:2000 Clause 3.3.5(a). Load calculation 1.2 is based on a minimum Service Load of 3.0 kg/m² as required by the Standard. The contractor is to confirm that this load will not be exceeded, or alter the calculation accordingly. If Service Load U is NOT a requirement, use calculation 1.1 values only.
2. These tables apply to areas of buildings that have **no openings to the outside**, such as doors, windows, ducts etc. In all other cases the appropriate design loading must be determined by the project structural engineer in accordance with AS/NZS 2785:2000 Clauses 3.3.5(b) or (c).
3. Standard testing and installation for suspension is at 1200mm centres. Wider centres may be allowable - refer to respective grid combination tables. Hangers must be within 200mm maximum of Main Tee / Cross Tee connection.
4. Heavy lighting or other mechanical services shall be supported on the main tees, included in the dead load 1.1 above, able to be supported by the selected grid combination, and/or should be independently supported if greater than 10kg (NZS4219).
5. All point loads shall be fixed under suspension point on Main Tees only and hanger capacity should be checked against Step 3.
6. Loadings are laboratory tested in accordance with AS/NZS 2785 with a deflection limit of L/360. Maximum allowable system loads take into account continuous spans and are applicable for ceilings 2.4 metres or longer. For ceilings shorter than 2.4 metres use a minimum of two hangers
7. Seismic considerations for in-plane loads may take precedence in determining the required grid combination (refer to the USG Seismic Design Guide)
8. Not all products may be available in all areas.
9. For non-standard modules eg. 750 x 750mm etc. contact USG for availability and lead times prior to specification.

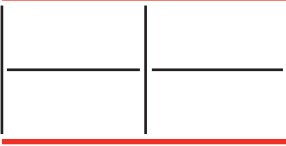
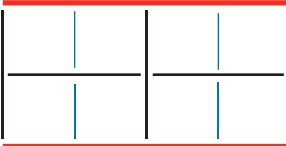

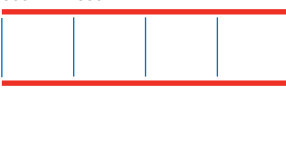

Step 2

Alternative Grid Layouts

From the grid diagrams below and opposite, select a ceiling layout and hanger spacing where the :
Maximum Load (from Step 1, above) **is less than or equal to the Maximum Allowable Load** from the Tables.
This will guide you as to the minimum grid combinations to use to fully comply .

	Grid Combinations			Maximum allowable load kg/m ²	Hanger Spacing (mm)						System Weights kg/m ²
	Main Tee	Cross Tee	Cross Tee		1000	1100	1200	1350	1500	1800	
Standard 600mm x 600mm 	DXT30D-3600	DXT30D-1200	DXT30D-600	17.6	14.5	11.1	N/A	N/A	N/A	0.93	
	DXT38D-3600	DXT38D-1200	DXT30D-600	28.2	23.3	17.8	14.1	11.3	N/A	1.10	
Standard 1200mm x 600mm 	DXT30D-3600	DXT30D-1200		17.6	14.5	11.1	N/A	N/A	N/A	0.70	
	DXT38D-3600	DXT38D-1200		28.2	23.3	17.8	14.1	11.3	N/A	0.85	

Loadings - Maximum Allowable

Alternative Grid Layouts	Grid Combinations			Maximum allowable load kg/m ²	Hanger Spacing (mm)						System Weights kg/m ²
	Main Tee	Cross Tee	Cross Tee		1000	1100	1200	1350	1500	1800	
Cross Nogged 1200mm x 600mm 	DXT30D-3600	DXT30D-1200		12.8	12.8	11.1	N/A	N/A	N/A	0.70	
	DXT38D-3600	DXT38D-1200		17.1	17.1	17.1	14.1	11.3	N/A	0.85	
Cross Nogged 600mm x 600mm 	DXT30D-3600	DXT30D-1200	DXT30D-600	12.8	12.8	11.1	N/A	N/A	N/A	0.93	
	DXT38D-3600	DXT38D-1200	DXT30D-600	17.1	17.1	17.1	14.1	11.3	N/A	1.10	
1200mm x 1200mm 	DXT30D-3600	DXT30D-1200		12.8	12.8	11.1	N/A	N/A	N/A	0.47	
	DXT38D-3600	DXT38D-1200		17.1	17.1	17.1	14.1	11.3	N/A	0.57	
600mm x 600mm 	DXT30D-3600		DXT30D-600	35.2	29.1	22.2	17.6	14.2	N/A	0.93	
	DXT38D-3600		DXT30D-600	56.5	46.7	35.7	28.3	22.6	13.1	1.00	
600mm x 1200mm 	DXT30D-3600		DXT30D-600	35.2	29.1	22.2	17.6	14.2	N/A	0.70	
	DXT38D-3600		DXT30D-600	51.3	46.7	35.7	28.3	22.6	13.1	0.80	

STEP 3

Maximum Allowable Loads (kg/m²) with Main Tees at 1200mm spacing.

(if at 600mm spacing double the Allowable Load)

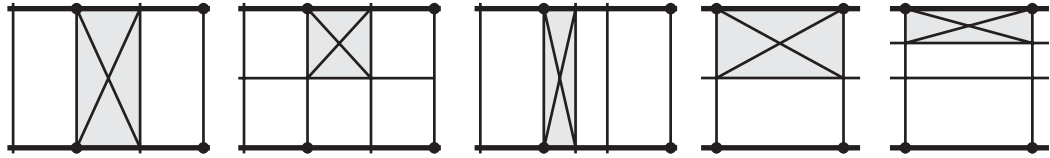
Use a hanger type and location greater than the Maximum Allowable Loads from the tables above. Use of these tables must take into account any point loads.

Hanger spacing	Using a bulb hole			Using a web hole			Using a CL315 Clip			Using a DFS200 Strap		
	1200	1350	1500	1200	1350	1500	1200	1350	1500	1200	1350	1500
DXT30D-3600	N/A	N/A	N/A	33.3	29.6	26.6	40.8	36.3	32.6	N/A	N/A	N/A
DXT38D-3600	31.5	28.0	25.2	48.7	43.3	38.9	49.0	43.3	39.2	37.6	33.4	30.1

As worldwide leaders in acoustical ceiling systems, USG Boral works with the major lighting manufacturers to ensure system compatibility is maintained. The following guidelines are designed to assist in the correct specification and installation of light fittings in DONN Brand Exposed Grid and acoustical ceiling systems.

Luminaire Positioning

Typical recessed pan fitting arrangements are shown below. Main Tees at 1200mm centres are shown horizontal, with suspension at 1200mm centres.

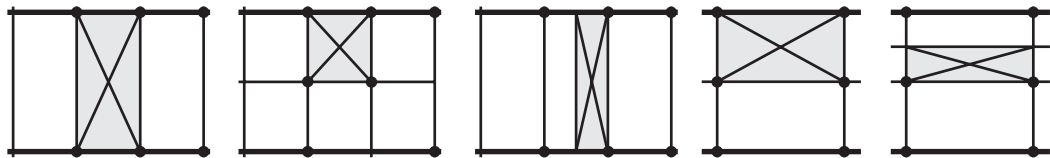


• Indicates Suspension Points

Refer to *Loadings* (pages 12-15) for maximum allowable gross ceiling loads depending on type of luminaire and DONN grid selected.

Where luminaire weight exceeds uniform load maximums consider:

- a) A higher specification DONN Brand grid option if applicable (Refer to *Loadings* pages to ensure compliance).
- b) Independent support from structure.
- c) Additional suspension points as shown below, or similar.



DONN BRAND Grid Profiles

When recessed pan fittings use the top of the DONN tee bulb for support, use the same height tee profiles for even support

Profile	D Main Tee	S Cross Tee	M Cross Tee	D Cross Tee
DONN CENTRICITEE				
DONN DX				

Attachment of Light Fittings

Fluorescent Recessed Pans / Troffer Packs

Fittings occupying a full ceiling module e.g 1200 x 600 / 600 x 600 etc. locate on the bulb of the tee or sit inside the tee and rest on the flange. With either method a positive fixing to the grid is recommended for safety reasons. This is required by the NZ Standard NZS 4219 (see over). For Australia ref. AS2946 for interface compatibility.

Fluorescent Surface Fittings / Battens

Surface mounted luminaires require a minimum of two fasteners to attach to the grid. Wherever possible, attach to the main tee. Where this is not possible and cross tees have to be used, keep fasteners as close as possible to main tee intersection for greatest strength. Proprietary fasteners are available that snap on to DONN DX 24mm grid profiles.

Where a fitting's weight exceeds maximum allowable loads for a particular grid type, any of the following methods may be used:

- use a proprietary fastener that fully surrounds the grid and is independently supported from the structure above.
- provide additional suspension points to the grid directly above the fixing point, ensuring each suspension is in compliance with AS/NZS 2785 Clause 3.2.2 (c) (50kg minimum).

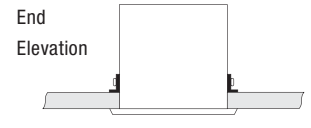
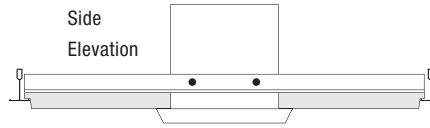
Construction Details

Lighting Installation

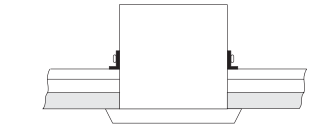
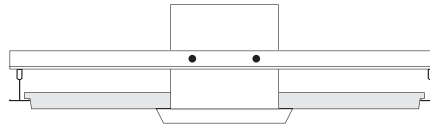
Ceiling Panel Mounted Fittings

Light fittings mounted through USG Boral acoustical ceiling panels shall not rely on the ceiling panel for support. Their weight shall be transferred back to the grid by:

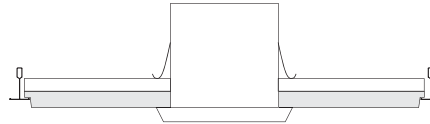
a) Simple supports across the back of the ceiling panel



b) Simple supports onto the top of the tee bulb



c) An additional rigid panel across the back of the ceiling panel



NB: This method will affect the acoustic properties of the ceiling panel

Common Recessed Luminaire Options

This table is intended as a general guide only. All products may not be available in all areas. Local manufacturers may also provide compatible options. For full luminaire details and options, contact the nearest Lighting Company office.

Company	Type	Module	Grid Type
GEC	Troffer - Lay-in Diffuser	1200 x 600* 600 x 600 1200 x 300	DONN DX and DONN Centricitee
Philips			
Thorn	Framed Diffuser	1200 x 600 600 x 600 1200 x 300	DONN DX and DONN Centricitee

*These options may be used with DONN Centricitee when used in conjunction with a 3.5mm prismatic diffuser.

TIP: When specifying lighting, ensure the grid type is clearly identified in the lighting section

e.g. DONN Centricitee 15mm exposed grid
DONN DX 24mm exposed grid.

Standards

Australia - AS2946 - 1991 Suspended Ceilings, Recessed Luminaires and Air Diffusers - Interface Requirements for Physical Compatibility. This standard details primarily the dimensional limitations and how they suit different ceiling grid system types.

New Zealand - NZS 4219 - 2009 Seismic Resistance of Engineering Systems in Buildings. This standard covers building services in close proximity, attached to, or passing through suspended ceilings. Relevant clauses pertaining to lighting are paraphrased below:

5.13 Equipment supported by the ceiling, such as air distribution grilles, diffusers, and other fittings and not exceeding 10kg mass, shall be positively fixed to the ceiling suspension system, but not supported by the ceiling panels or tiles. Service connections from ceiling supported equipment to ducts, pipes or cables, independently supported from the structure, shall be flexible. Where additional backup supports are used which are not normally under tension, they should not allow the equipment to drop more than 100 mm.

Equipment exceeding 10kg mass in the ceiling void or at ceiling level shall be independently fixed to the structure in accordance with this clause.

Equipment supported independently of the ceiling, and in accordance with this clause, shall have a clearance of 25 mm all round to allow independent movement between component and ceiling.

Electrical (or other) cables/fixtures shall not be attached to suspended ceiling hanger supports, but shall be independently supported in accordance with clearances illustrated in table 15.

5.13 All fixings, including those for detachable accessories (such as diffusers, light controllers), shall be of a positive locking type designed to prevent disengagement under earthquake action.

Where luminaires are recessed or surface-mounted on suspended ceilings, they shall be positively clamped to the ceiling suspension main runners (T-rails) or to cross runners having the same carrying capacity. Clamping shall be by means of screws and nuts or locking type clamping devices.

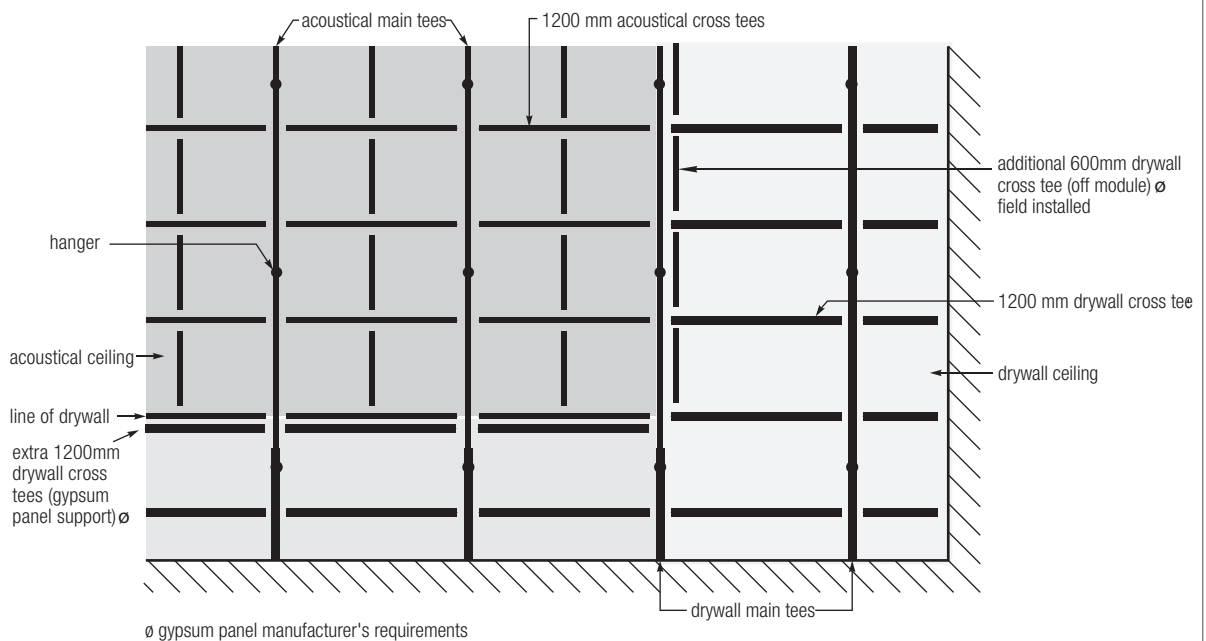
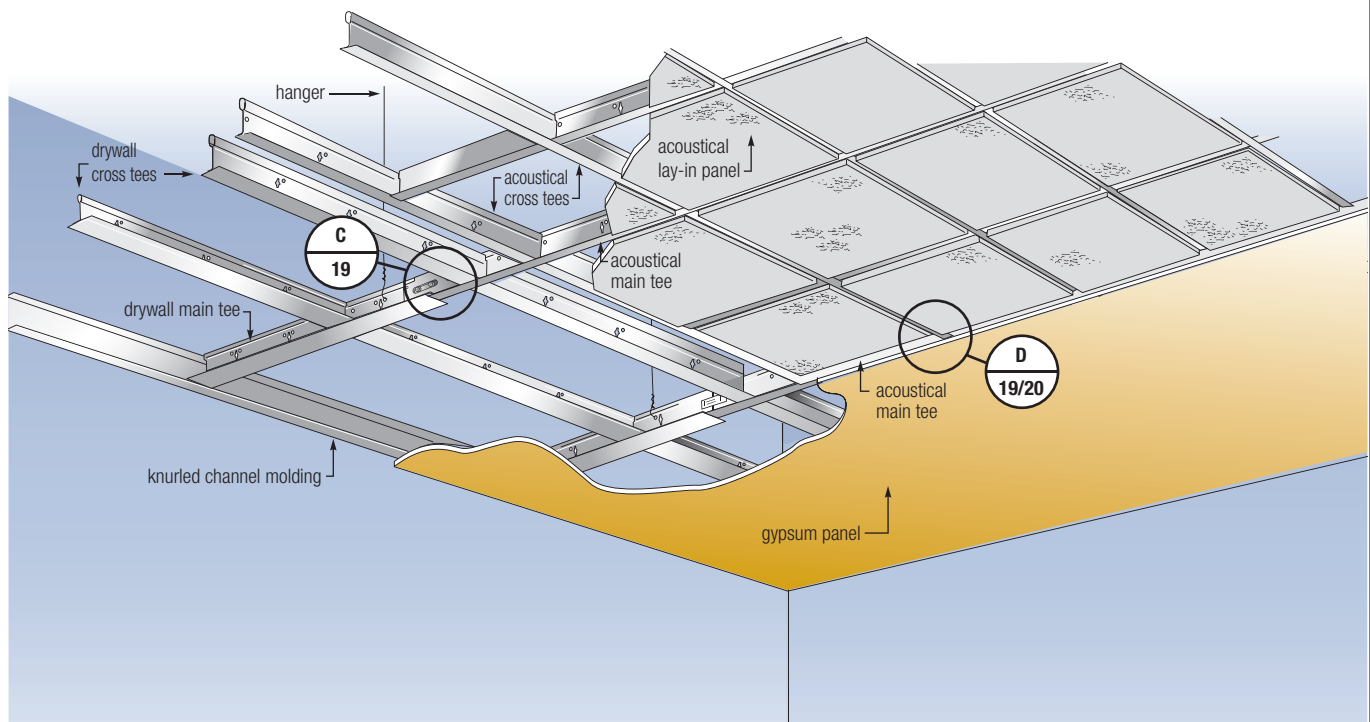
The contents of this section have been compiled in good faith based on current industry information at time of printing. Whilst USG Boral has taken all care to ensure accuracy, it cannot be held liable for information that is: inappropriate for its application; changed after publication or availability of all products in all areas.

For additional help contact your nearest Lighting Company office or USG Boral.

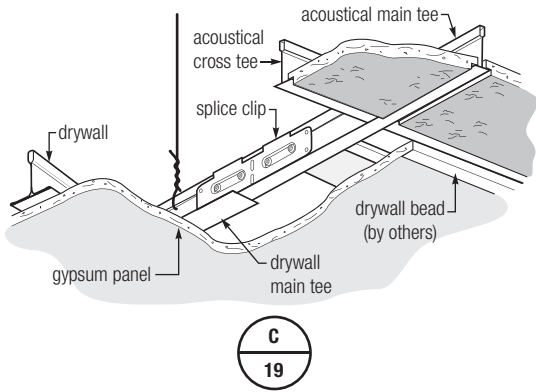
Transition to a Plasterboard Ceiling

The Donn® DX® and CENTRICITEE® acoustical suspension systems are totally compatible with our USG Boral Drywall Grid Suspension System making it easy to transition between flat drywall and acoustical ceilings.

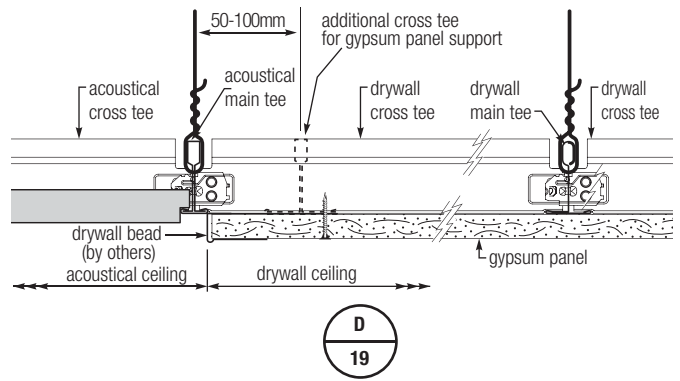
Flush or offset transitions are possible. Additional cross tees are necessary at drywall edge to provide adequate support (as shown on plan view).



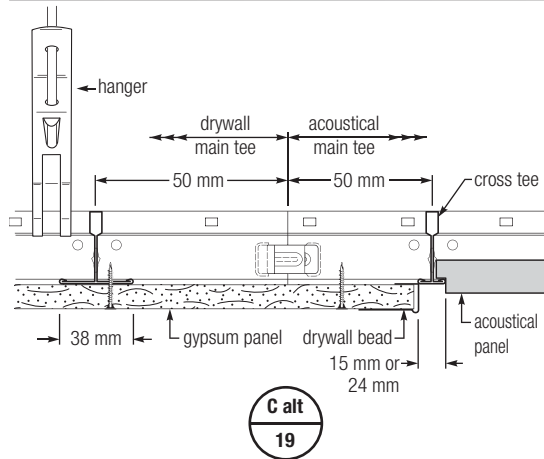
Drywall to acoustical transition--field cut connection



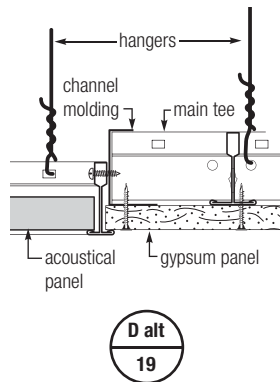
Drywall to acoustical transition



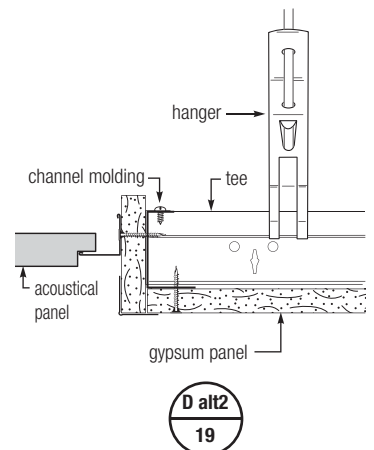
Drywall to acoustical transition--factory end connection



Flush transitions

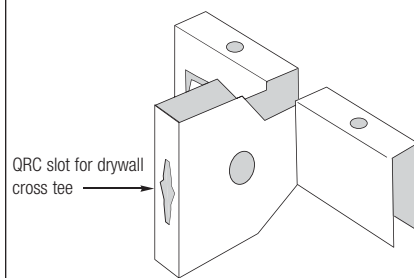


Standard offset

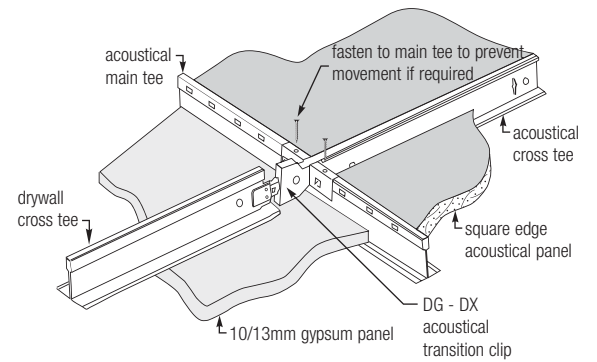


Flush Acoustical Transition Clip

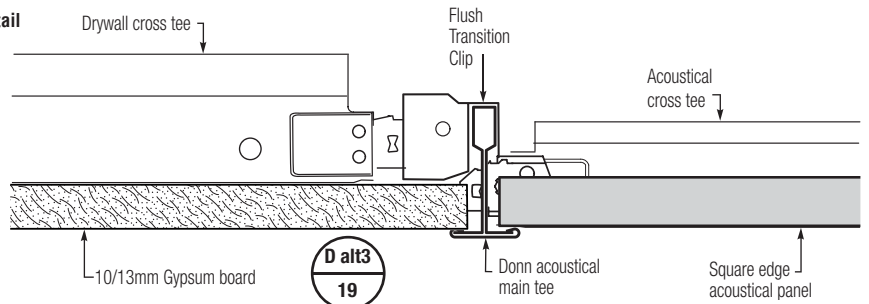
DG - DX Flush Acoustical Transition clip



Assembled



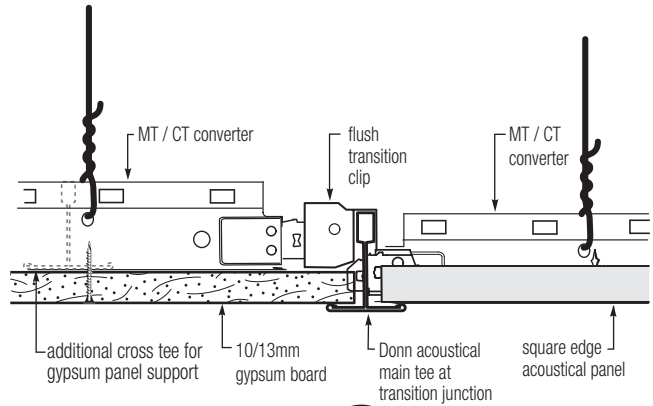
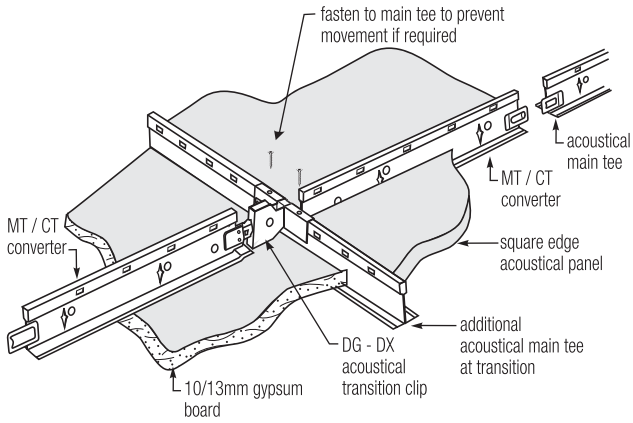
Intersection Detail



Transition to a Plasterboard Ceiling

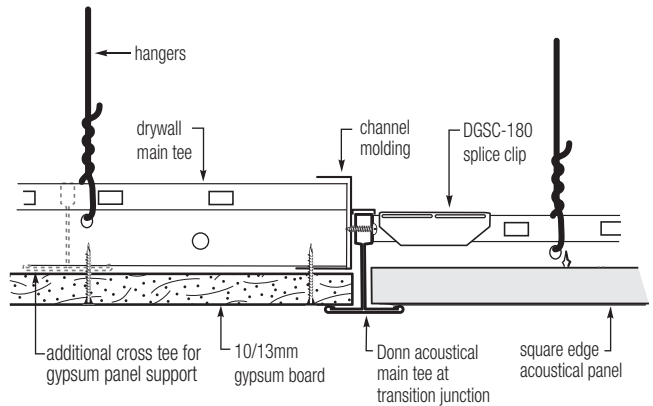
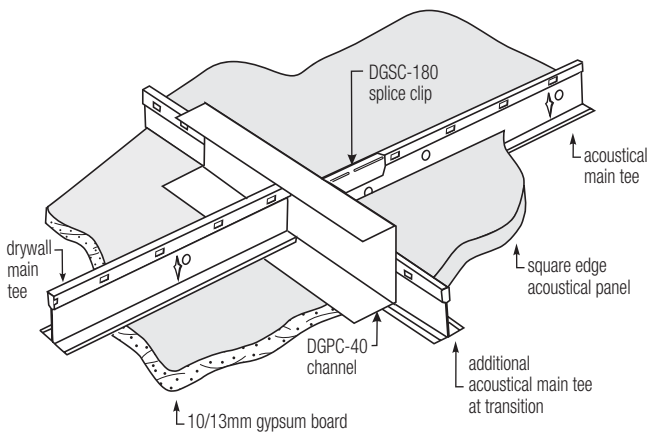
Main Tee Direction - keep acoustical and drywall main tees in line

Option 1



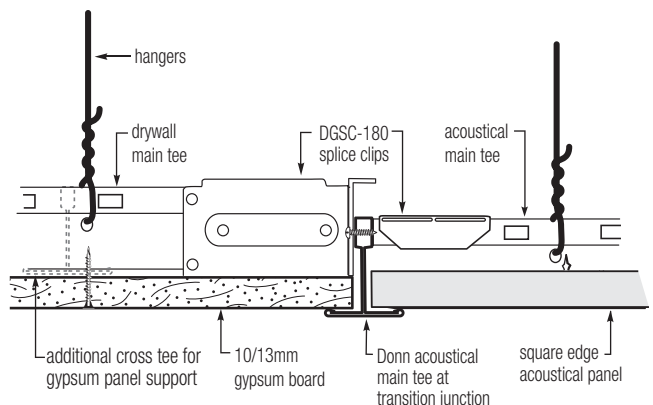
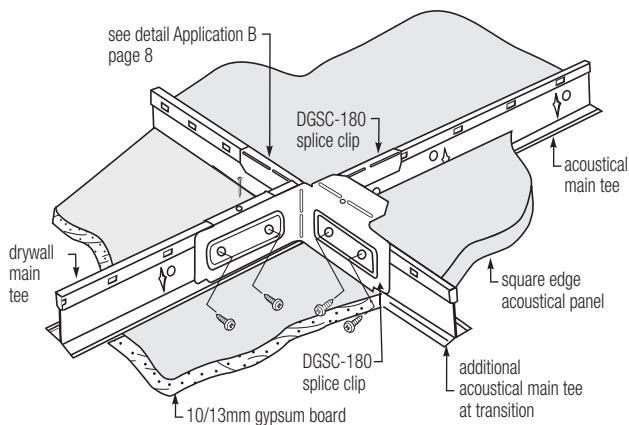
C alt 2
20

Option 2



C alt 3
20

Option 3



C alt 4
20

-Fire Rating -Seismic Installation

Fire Rating - USG Boral
Acoustical Ceiling System
24mm Exposed Grid

USG Boral acoustical ceiling systems can provide a FRR/FRL (Fire Resistant Rating) up to 60/60/60 as well as the benefits of acoustical control while still allowing easy plenum access to services, particularly compared to plasterboard options.



A fire rated ceiling helps prevent fire and/or heat from reaching a floor or roof above a room that is on fire. This allows time for evacuation of the floors above and protects against property damage. A fire rated ceiling system is part of a total fire rated assembly, which includes approved beams, joists and floor or roof assemblies.

- BRANZ Tested to AS1530.4 Fire Resistant Tests of Elements of Building Construction
- Exclusive expansion notch formed into the main tee is designed for controlled collapse in the event of a fire, ensuring integrity of the ceiling plane
- Heavy weight tees resist buckling, longer
- Visually identical to DONN Brand 24mm exposed grid where the same image is required in non-fire rated areas
- High density USG Boral Firecode ceiling panels provide choices of size, appearance and acoustical properties to suit a range of applications
- Plus all the fast easy installation features of standard DONN DX exposed grid systems

**For fire rating options and full construction details please refer to our main brochure :
USG Boral Fire Rated Exposed Grid System** or visit our website at www.usgboral.com

Seismic Installation

DONN Brand grid systems are world leaders in engineering technology to resist earthquake destruction and the compromise of human safety under suspended ceilings. Accordingly USG Boral have invested significantly in steel engineering, testing and using expert seismic consulting engineers in preparing the :


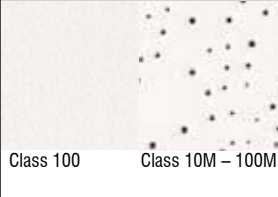

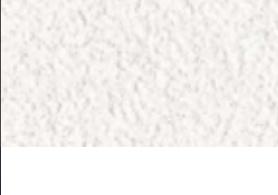









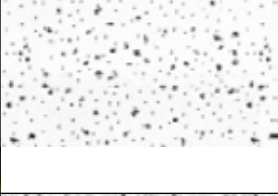

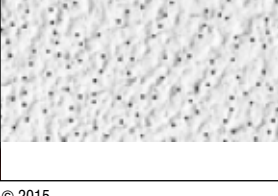
USG Boral Seismic Design Guide
for correct installation of ceilings in compliance with AS/NZS 1170. Please contact USG Boral for the full Design Guide




USG Boral

Acoustical Ceiling Panels

Whether for acoustical, aesthetic, budgetary or performance reasons, USG Boral has a range of panels to suit most applications. ClimaPlus branding ensures resistance to high temperature and humidity and combined with USG Boral DONN brand grid are covered by a Lifetime Warranty (up to a maximum of 30 years). The acoustical ceiling panels have been the subject of reports by BRANZ to ascertain their performance in compliance with : The BCA deemed to satisfy provisions of Specification C1.10a – 3 (a) (ii). All panels achieve a Group 1 rating to AS/NZS 3837 The NZBC Verification method C/VM2 Appendix A for the Classification of Fire Performance of Wall and Ceiling Lining Materials. All panels achieve a Group 1-S rating to ISO 5660. Full copies of the individual Test Reports are available on request. (Note: some panel options may not be available in all areas)

	Panel Texture	Description	NRC/CAC	Classification	Report #
Clean Room™ CLIMAPLUS 	 Class 100 Class 10M – 100M	White vinyl laminated surface with special edge and back coating control airborne particles for stringent clean air environments	Class 100 N/A 35 – 39 Class 10M – 100M 0.55 – 0.65 35 - 39	BCA Group 1 Sprinklered NZBC Group 1-S	FH 3618 FAR 4030
Eclipse™ CLIMAPLUS 		Non-perforated, high NRC and stain resistant through patented technology. Medium texture for added visual appeal	0.65 – 0.75 35 - 39	BCA Group 1 Unsprinklered NZBC Group 1-S	FH 3619 FAR 4030
Impressions™ CLIMAPLUS 		Light micro-fissures for a cleaner whiter appearance. Good mid-range acoustics at an economical price.	0.50 – 0.60 33 - 39	BCA Group 1 Unsprinklered NZBC Group 1-S	FH 3621 FAR 4030
Mars™ CLIMAPLUS Mars™ CLIMAPLUS Healthcare 		Excellent combination of high NRC, good CAC and a smooth white non-perforated finish. Ideal for open plan and closed plan projects and matching into plasterboard ceilings	0.70 + 35 - 39	BCA Group 1 Unsprinklered NZBC Group 1-S	FH 3622 Assessment FAR 2781 FAR 4030
Olympia Micro™ CLIMAPLUS 		Micro pin perfs provide a minimalist look combined with a fine sand-like texture for a cleaner whiter appearance. Good mid-range acoustics.	0.50 – 0.60 30 - 39	BCA Group 1 Unsprinklered NZBC Group 1-S	FH 3623 FAR 4030
Olympia II Micro™ CLIMAPLUS 		Micro pin perfs provide a minimalist look combined with a fine sand-like texture for a cleaner whiter appearance. Higher NRC of 0.65	0.65 35 - 39	BCA Group 1 Unsprinklered NZBC Group 1-S	FH 4901
Radar™ Radar Firecode Radar High NRC/CAC Radar Ceramic CLIMAPLUS 		Micro-fissures provide a true non-directional texture allowing installation in any direction. Options include panels with higher NRC, CAC or Firecode™ performance.	0.50 – 0.60 33 –39 0.50 – 0.60 35 –39 0.70 40 0.50 40	BCA Group 1 Unsprinklered NZBC Group 1-S	FH 3621 FH 3625 FH 3625 FH 3626 FAR 4030
Rock Face™ CLIMAPLUS 		Hard textured surface on a Firecode basemat offer an abuse resistant panel with good mid-range acoustics.	0.50 – 0.60 35 - 39	BCA Group 1 Unsprinklered NZBC Group 1-S	FH 3627 FAR 4030

Quantities	Approximate linear metres of product required in standard metric layout*		
	Component	Linear Metres	Pieces
	Main Tee @ 1200mm ctrs	m ² x 0.833	
	1200mm Cross Tee @ 600mm ctrs	m ² x 1.667	
	600mm Cross Tee (for 600mm x 600mm module)	m ² x 0.833	
	Hold Down Clips (if required)		m ² x 2.778 (1200 x 600) m ² x 5.555 (600 x 600)
	Top Fixings / Suspension Clips @ 1200mm ctrs		m ² x 0.694
	Wire @ 1200mm ctrs	m ² x .694 x (plenum depth + 400mm)	
- Alternative Layouts •	For alternative construction layouts use the following formulate to calculate linear metres (LM) or pieces (pcs) per square metre (m ²)		
Main Tee -	1 ÷ Main Tee centres eg. if MT at 1350mm centres	$\frac{1}{1.35}$	= 0.74 LM/m ²
Cross Tee -	1 ÷ Cross Tee centres eg. if CT at 400mm centres	$\frac{1}{0.4}$	= 2.5 LM/m ²
Top Fixings or Suspension Clips -	1 ÷ span along the Main Tee X span between the Main Tees eg. if along = 1200mm centres and between = 1350mm centres	$\frac{1}{1.2 \times 1.35}$	= 0.617 pcs (fixing or clips)/m ²
	* Note: These calculations do not allow for wastage, damage or irregularities, but are intended as an informative guideline to assist with the calculation of product required for a given area (in m ²).		
Warranty	 <p>#Warranty covers USG Boral acoustical ceiling panel and USG Boral DONN® Brand grid systems against defects in material or manufacturing workmanship for the useful life of the ceiling system, up to a maximum of 30 years. See your regional USG Boral Ceiling Systems Specialist for full warranty details.</p>		
Short Specification	<p>Supply and install a USG Boral suspended ceiling system as manufactured and supplied by USG Boral. System shall comprise of :</p> <ul style="list-style-type: none"> • (DONN DX 24mm) / (DONN DXT Centricitee 15mm) two way exposed grid system • Module shall be (600 x 600) / (1200 x 600) / (other) • Grid shall have minimum tension values of ____kg and compression values of ____kg • Wall Angle shall be (MT/ML/MS/MSL/MXT/US 3600) fixed at 600 mm centres maximum • Installation shall comply with AS/NZS 2785 – Suspended Ceilings - Design and Installation • Seismic installation shall comply with AS 1170.4 or NZS 1170.5 and USG Boral Seismic Design Guide • Colour shall be (Pacific White) / (other) • USG Boral () ClimaPlus Acoustical ceiling panel, NRC 0. __ and CAC __ - __ minimum • Colour shall be (Standard White) / (other) • Plasterboard suspension shall be USG Boral Drywall Grid System 		
Web Site	<p>For other USG Boral product information, and contacts please visit our web site at :</p> <p style="text-align: center;">www.usgboral.com</p>		



To request literature, samples, a visit from a
USG Boral Ceilings specialist, or for all technical
questions, call your nearest USG Boral office below.