

KNAUF



C L E A N E O

**ACOUSTIC CEILING AND WALL LINING SYSTEM
WITH BUILT-IN AIR PURIFICATION**

Contents

Disclaimer

Products manufactured and systems designed by Knauf are produced in accordance with the Building Code of Australia and relevant Australian Standards. Cleaneo installation and construction details are a guide only as many aspects of construction are not comprehensively covered. Knauf Plasterboard Pty Ltd will not be held responsible for any claims resulting from the installation of its products not in accordance with the manufacturer's technical literature or relevant Australian Standards.

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Version 2

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Project: Slättäng School, Kristianstad, Sweden

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Quality
ISO 9001
SAI GLOBAL



Project: Bürgersaal, Germany

Cleaneo brings a fresh perspective to acoustic wall and ceiling linings by delivering excellent acoustic performance.

It is manufactured in a variety of patterns with high quality, ultra-sharp perforations including continuous perforated panels for a seamless finish. It meets the high level of acoustic performance required for commercial areas such as offices, hospitals, gymnasiums and restaurants. It is also the world's first acoustic wall and ceiling lining with built-in air purification.

Cleaneo incorporates dehydrated zeolite, an aggregate mineral with a nanoporous structure in the patented

manufacturing process. Zeolite, together with gypsum, creates a large inner layer of plaster surfaces within the board itself. This inner layer works to reduce both smells and airborne pollutants such as volatile organic compounds (VOCs) e.g. formaldehyde, benzene and ammonia.

Excellent acoustic performance, a range of seamless aesthetic designs to choose from and a unique air purifying technology are the key benefits of using Cleaneo.

Cleaneo System



PERFORATION PATTERNS

The selection incorporates Standard Circular, Alternating Circular, Standard Square and Random Plus circles. These perforation patterns are available in two different edge types, FF and Linear.

STANDARD CIRCULAR 6/18 R

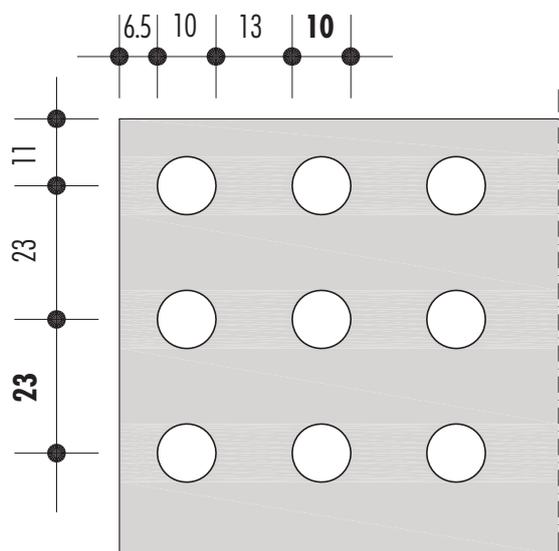
Thickness (mm)	Width (mm)	Length (mm)	Weight* (kg/m ²)	Open Area (%)
13	1188	1998	10.7	8.7

STANDARD CIRCULAR 8/18 R

Thickness (mm)	Width (mm)	Length (mm)	Weight* (kg/m ²)	Open Area (%)
13	1188	1998	9.9	15.5

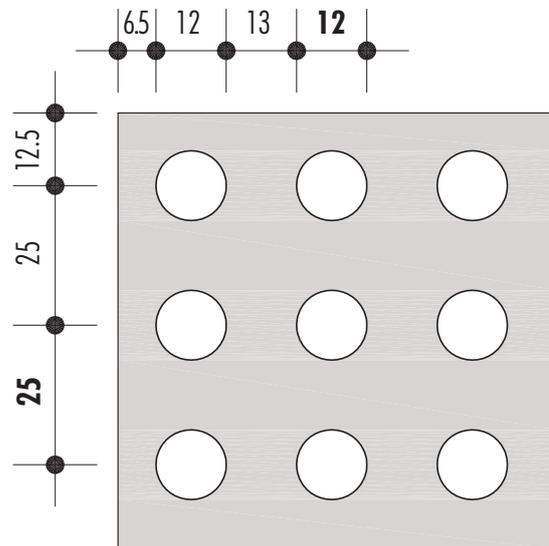
*Weights indicated are nominal

STANDARD CIRCULAR 10/23 R



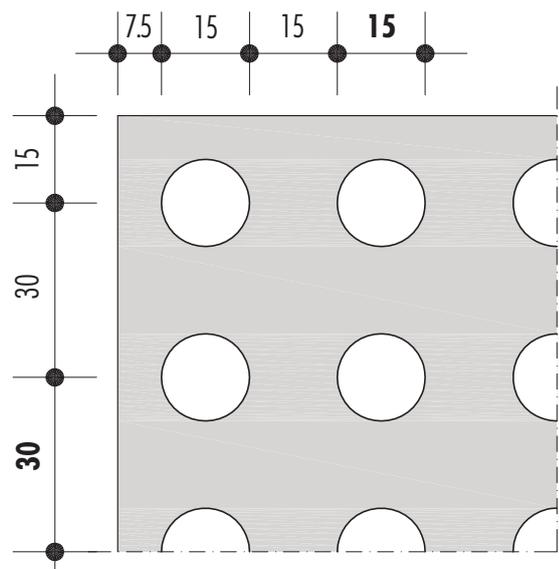
Thickness (mm)	Width (mm)	Length (mm)	Weight* (kg/m ²)	Open Area (%)
13	1196	2001	9.9	14.8

STANDARD CIRCULAR 12/25 R



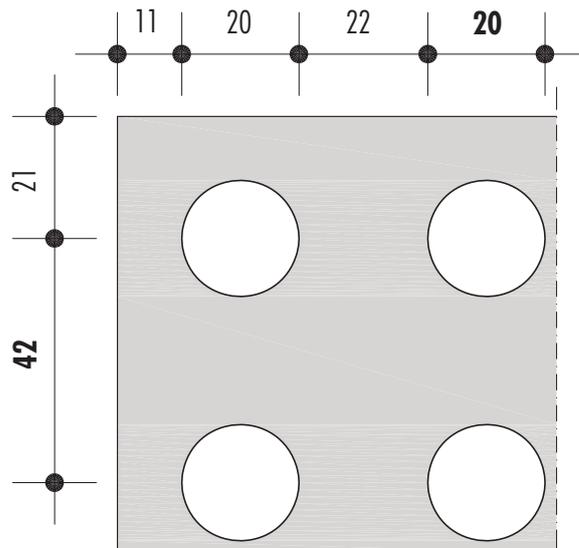
Thickness (mm)	Width (mm)	Length (mm)	Weight* (kg/m ²)	Open Area (%)
13	1200	2000	9.6	18.1

STANDARD CIRCULAR 15/30 R



Thickness (mm)	Width (mm)	Length (mm)	Weight* (kg/m ²)	Open Area (%)
13	1200	1980	9.3	19.6

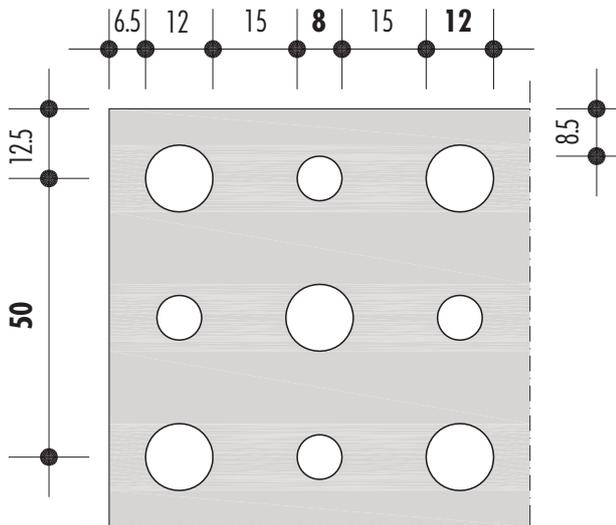
STANDARD CIRCULAR 20/42 R



Thickness (mm)	Width (mm)	Length (mm)	Weight* (kg/m ²)	Open Area (%)
13	1176	1974	9.7	17.8

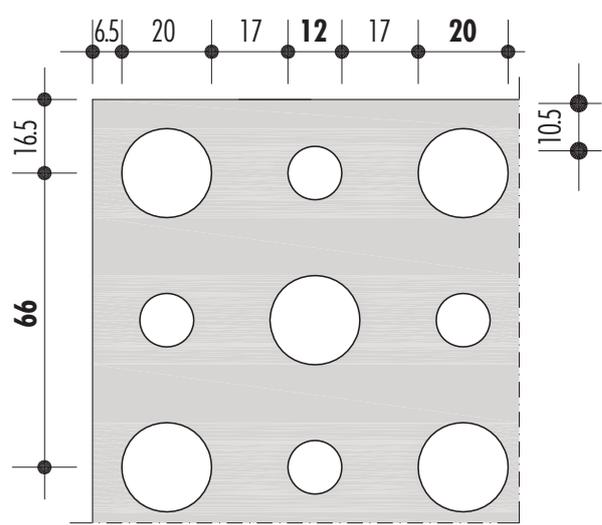
*Weights indicated are nominal

ALTERNATING CIRCULAR 8/12/50 R



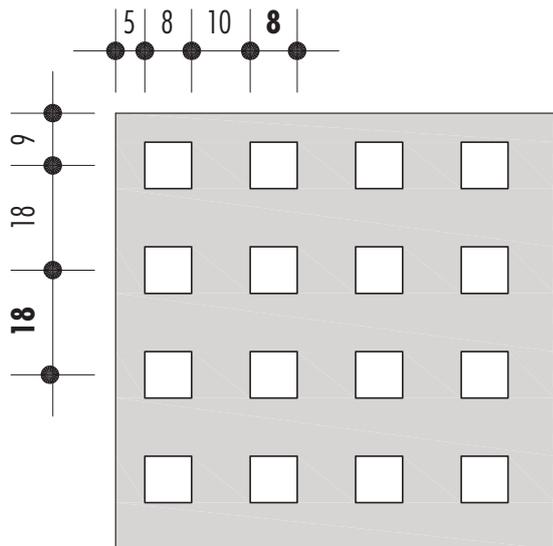
Thickness (mm)	Width (mm)	Length (mm)	Weight* (kg/m ²)	Open Area (%)
13	1200	2000	10.2	13.1

ALTERNATING CIRCULAR 12/20/66 R



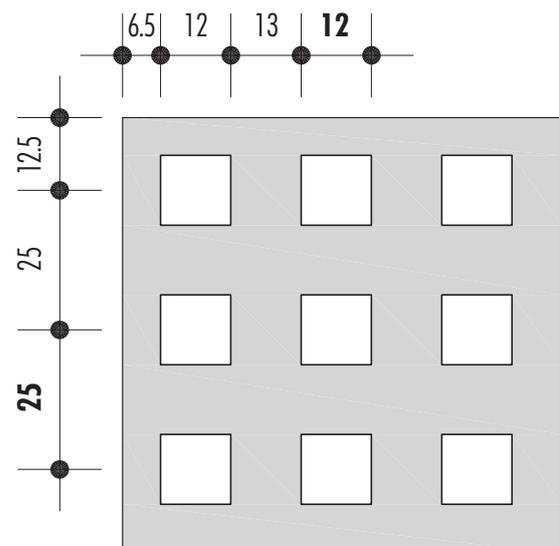
Thickness (mm)	Width (mm)	Length (mm)	Weight* (kg/m ²)	Open Area (%)
13	1188	1980	9.4	19.6

STANDARD SQUARE 8/18 Q



Thickness (mm)	Width (mm)	Length (mm)	Weight* (kg/m ²)	Open Area (%)
13	1188	1998	9.4	19.8

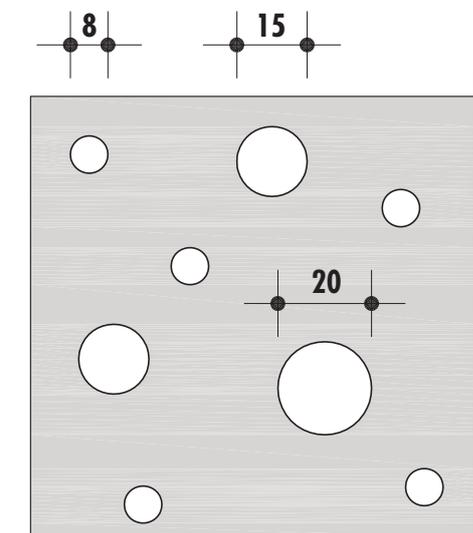
STANDARD SQUARE 12/25 Q



Thickness (mm)	Width (mm)	Length (mm)	Weight* (kg/m ²)	Open Area (%)
13	1200	2000	9.2	23.0

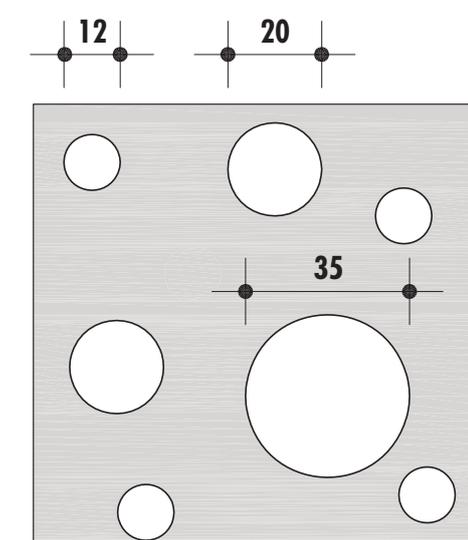
*Weights indicated are nominal

RANDOM PLUS 8/15/20 R



Thickness (mm)	Width (mm)	Length (mm)	Weight* (kg/m ²)	Open Area (%)
13	1200	1875	10.5	9.9

RANDOM PLUS 12/20/35 R



Thickness (mm)	Width (mm)	Length (mm)	Weight* (kg/m ²)	Open Area (%)
13	1200	1875	10.5	9.8

ACCESSORIES

To achieve the unique appearance of Cleaneo, there are some products which are required as part of the system. There is also a wider range of optional accessories available. These make installation easier, helping installers achieve the perfect finish.

SYSTEM ACCESSORIES

UNIFLOTT JOINTING COMPOUND

Uniflott is a jointing compound used to deliver a strong, seamless finish. Uniflott must be used for the installation of Cleaneo.

As an approximate guide a 5kg bag will cover 50m² of installed Cleaneo.



5kg bag
25kg bag

TIEFENGRUND PRIMER

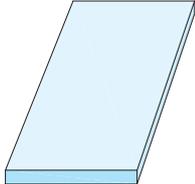
Silicone based primer used only on plasterboard edges cut on site to assist adhesion of Uniflott.



10L

*Weights indicated are nominal

OPTIONAL ACCESSORIES

<p>Cleaneo Cap Screws</p> <p>Screw and cap for easy screw fixing through round perforated areas. They remove the need for setting screw heads with screw fixings hidden in perforations which improves appearance of the final finish. Available in 8, 10, 12mm diameter cap.</p>	
<p>Jet Spatula with Raised Edge</p> <p>Very useful tool for 'chipping' off excess filler from joints once Uniflott hardens. This helps to reduce damage to perforations.</p>	
<p>Jet Trowel with Punch</p> <p>Trowel which can be used to easily cover screw heads in Cleaneo with finishing compound thus maintaining a higher level of cleanliness.</p>	
<p>Trenn-Fix Adhesive Strip</p> <p>65mm wide self-adhesive glass paper tape for use on ceiling to wall junctions. Creates a neat, square junction that offers protection from building movement.</p>	
<p>Jet Gun with Nozzle</p> <p>Compressed air gun for faster, easier application of Uniflott. Maximum air pressure 115psi (8 bars). Uniflott adapter set and extra jet nozzles are also available.</p>	
<p>Pilot Wheel</p> <p>Pilot wheel and handle for easy removal of jointing compounds from perforations.</p>	
<p>Caulking Gun</p> <p>Manual caulking gun which can be used for applying Uniflott. Cartridge with nozzle and spare nozzles available.</p>	
<p>Access Panels</p> <p>A range of patterns and sizes matched to the Cleaneo board perforations to maintain a seamless finish over access points in the wall or ceiling system.</p>	
<p>Frieze Pre-Cut Strips</p> <p>Pre-cut plasterboard strips with on SK edge for joining to Cleaneo tiles to form a border around the edge of the installation.</p>	

Performance



Project: Wales Millennium Centre, Cardiff, Wales

SOUND OF CLEAN

Whilst Cleaneo has unique air purifying capabilities, its main function is as an acoustic lining.

When designing restaurants, offices, hospitals and other public buildings, good acoustics help create a comfortable environment. In a classroom it is important that low frequencies are well absorbed, so that excessive noise does not distract the pupils from learning. At the same time, the high consonant frequency range should be well reflected since this is essential for good speech intelligibility.

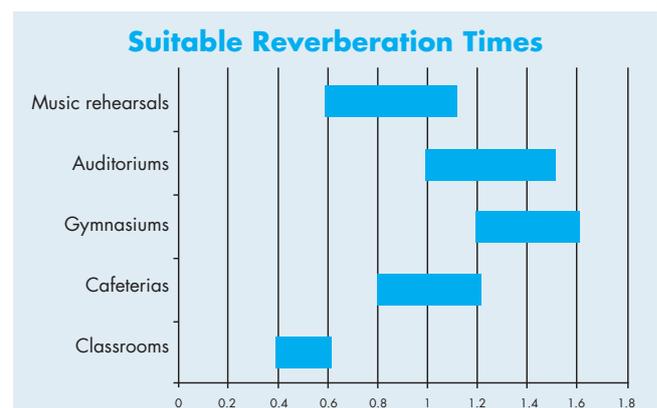
In restaurants large glass facades and hard materials on floors and walls amplify the noise, therefore it is important, even in lively restaurants, to spread and dampen the sound in selected places.

The degree to which sound is reflected or absorbed can be described by "reverberation time", i.e. echo within a room. The α_w rating, or NRC to a more limited extent, of a product describes how well it absorbs sound and therefore controls the reverberation time. Well designed acoustic products absorb sound evenly across the frequency range, therefore no area

of the frequency range has low sound absorption and high reverberation. By using Cleaneo, it is not necessary to compromise acoustic performance.

Cleaneo lining has excellent sound absorption values across the frequency range and achieves an α_w or NRC rating of up to 0.8*.

The ideal reverberation time depends on the use of the space. The graph below highlights some suggested reverberation times to optimise the acoustic environment.



*Standard Square pattern 12/25 Q, 65 or 112.5mm cavity with 50mm EarthWool (min 14kg/m³)

AIR CLEANING

The quality of the air we breathe has a profound effect on human health and wellbeing.

Increasingly, the quality of indoor air at home, work, school and leisure is being assessed and improved. However, it is also being potentially compromised as buildings are made more airtight in the pursuit of energy efficiency.

When it comes to improving indoor air quality, the most efficient method is to improve ventilation and restrict the source of fumes and VOCs emitted by furniture, paints, floor coverings, glues, cleaning agents and other products.

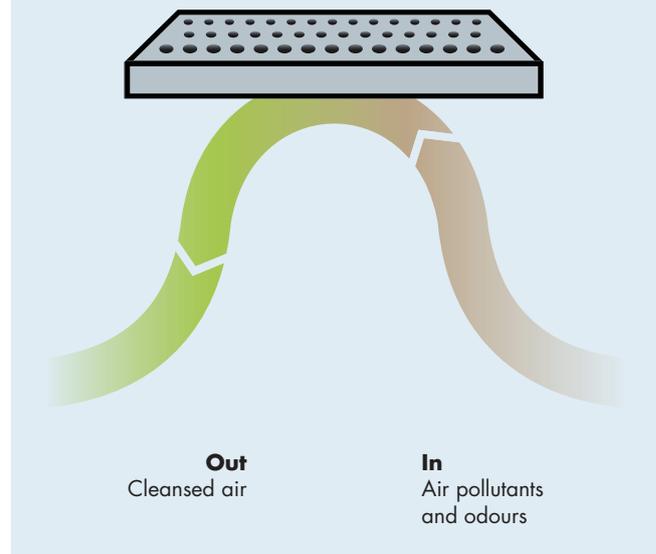
Cleaneo lining provides another solution. In most commercial buildings, ceilings provide the greatest surface area interacting with indoor air. When the ceiling is lined with Cleaneo, a lining with the hydroscopic properties of plasterboard as well as its own built-in air purification additive, cleaner air as well as a major impact on wellbeing can be achieved.

HOW IT WORKS

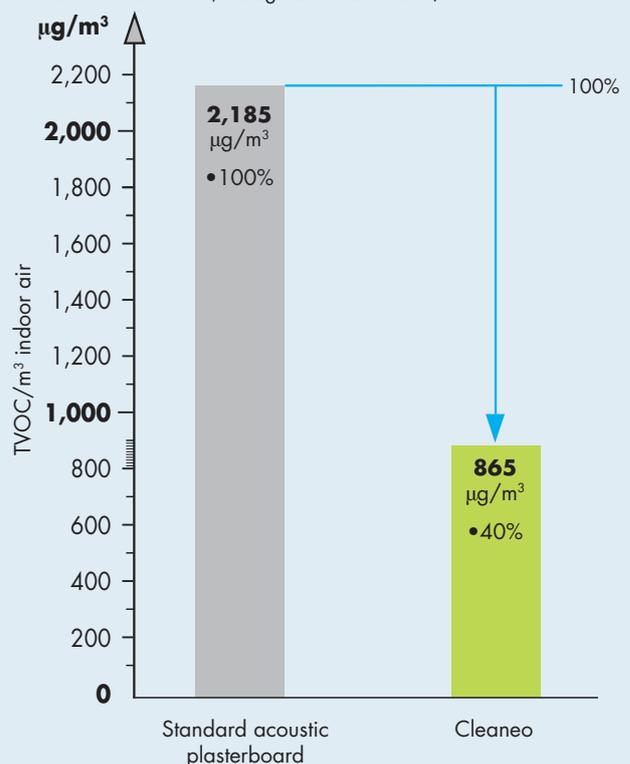
Cleaneo contains zeolite which absorbs and eliminates a host of environmental air pollutants including VOCs such as formaldehyde. With pore diameters of less than one millionth of a millimetre, the zeolites help create a gigantic inner surface layer which acts as a naturally occurring 'sieve'. This sieve effect occurs because the zeolite has a three dimensional pore system which is capable of adhering gas and liquid impurities and removing them from the air.

Tests have shown that Cleaneo reduces the airborne levels of a number of pollutants including tobacco smoke, triethylamine, ammonia, formaldehyde, benzene, aromatic hydrocarbons and chlorinated hydrocarbons*. The causes of these include cleaning agents, organic decomposition, paints and other common chemicals.

How Cleaneo Works



Example*: **Reduction TVOC in room for smokers** comparing measurements with samples from passive accumulations, room volume 75m³, configuration rate 0.3m²/m³



*Source: Stuttgart College of Technology with supporting measurements and tests undertaken by Stuttgart Central Laboratory, University of Kaiserslautern and others.



Project: Slättäng School, Kristianstad, Sweden

LOOK OF CLEAN

Cleaneo provides excellent noise absorption with an aesthetic finish.

The Cleaneo range has twelve different styles including square, circular and random designs all of which are continuous seamless perforations. This seamless flow of pattern throughout the room is achieved with the

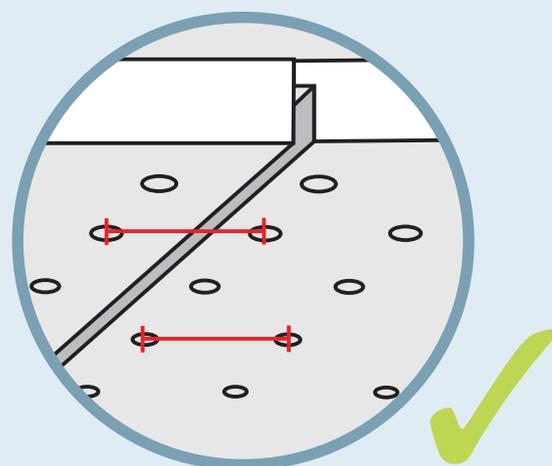
combination of Cleaneo's four precision-cut edges and carefully designed patterns to match that of adjoining panels to ensure any joints in the system are almost invisible.

Continuous Perforations

- > Standard Circular (six designs)
- > Alternating Circular (two designs)
- > Random Plus (two designs)
- > Standard Square (two designs)



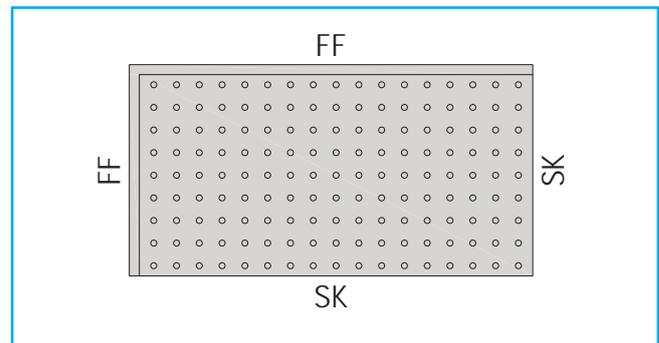
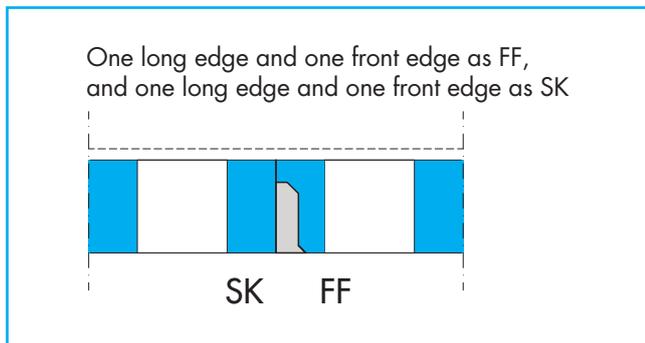
Precise Perforation Distance



CONTINUOUS PERFORATION

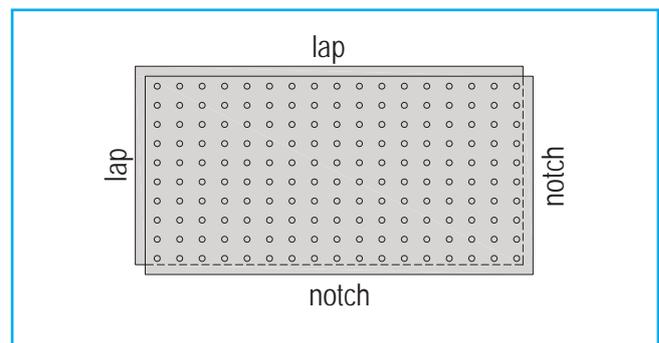
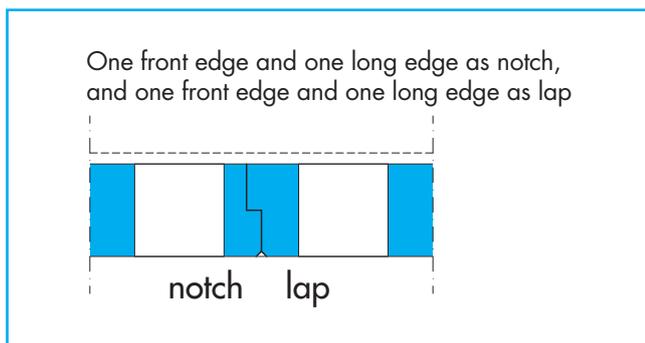
FF Edge

Continuous perforation patterns are available in FF edge. This means machined lip edges on one long and one short side, ensuring that the boards are straight and the perforation pattern matches perfectly. FF edge is used when a totally jointless appearance is required. Joints are almost invisible when finished with Uniflott jointing compound.



Linear Edge

Linear edge can be installed without jointing compounds, resulting in a 1 mm bevelled V joint all around each sheet. Linear edge Cleaneo has a lap and notch cut pattern on one long and one short side allowing for a precise fit. This V joint will become almost invisible when painted. Linear edge boards are easily removable and reusable.



Case Study

PROJECT: Audi Forum, Piccadilly, London, United Kingdom

PATTERN: Alternating Circular

Cleaneo, a main specification feature in all Audi showrooms, has been installed in 40 locations around the UK, including its flagship, the Audi Forum in Piccadilly, London. Chosen for its aesthetics as well as its acoustic performance, Cleaneo provides a unique seamless ceiling that not only looks good but also significantly reduces reverberated sound.

The Audi Forum was created as part of a total refurbishment of an existing building and also contains an exhibition centre, a conference venue and an internet cafe.



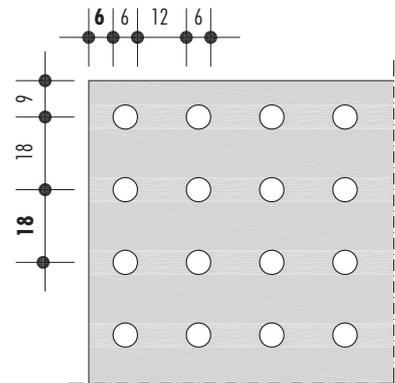
Acoustic Performance

STANDARD CIRCULAR 6/18 R

Maximum Furring Channel Centres: 333mm

	Ceiling Cavity (mm)	α_p Frequency (Hz)						α_w	NRC
		125	250	500	1000	2000	4000		
Without Insulation	65	0.2	0.3	0.45	0.55	0.45	0.45	0.5	0.45
	200	0.4	0.45	0.5	0.45	0.4	0.5	0.45	0.45
	400	0.4	0.45	0.45	0.45	0.45	0.5	0.45	0.45
50mm EarthWool 14kg/m ³ or 75mm EarthWool 11kg/m ³	65	0.35	0.45	0.5	0.5	0.45	0.5	0.5	0.5
	200	0.4	0.45	0.5	0.45	0.45	0.5	0.5	0.45
	400	0.4	0.45	0.45	0.5	0.45	0.5	0.5	0.45

Open Area: 8.7%

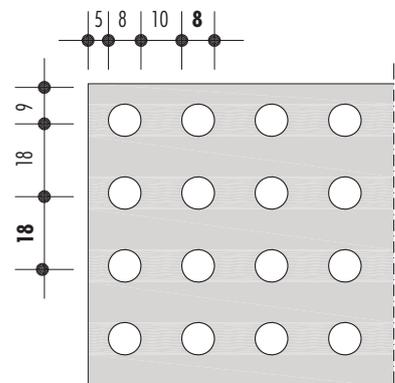


STANDARD CIRCULAR 8/18 R

Maximum Furring Channel Centres: 333mm

	Ceiling Cavity (mm)	α_p Frequency (Hz)						α_w	NRC
		125	250	500	1000	2000	4000		
Without Insulation	65	0.15	0.3	0.6	0.75	0.65	0.6	0.6	0.6
	200	0.45	0.6	0.7	0.6	0.55	0.65	0.6	0.6
	400	0.55	0.65	0.6	0.6	0.55	0.65	0.6	0.6
50mm EarthWool 14kg/m ³ or 75mm EarthWool 11kg/m ³	65	0.35	0.55	0.7	0.75	0.65	0.65	0.7	0.65
	112.5	0.45	0.65	0.7	0.7	0.6	0.65	0.7	0.65
	200	0.5	0.65	0.7	0.65	0.6	0.7	0.65	0.65
	400	0.55	0.65	0.6	0.7	0.6	0.65	0.65	0.65

Open Area: 15.5%

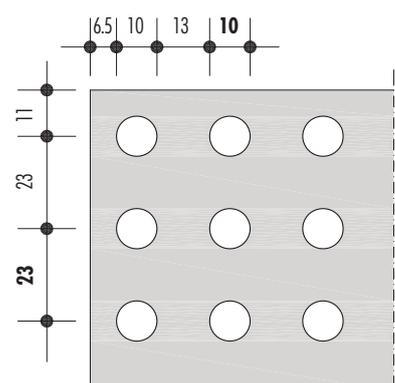


STANDARD CIRCULAR 10/23 R

Maximum Furring Channel Centres: 333.5mm

	Ceiling Cavity (mm)	α_p Frequency (Hz)						α_w	NRC
		125	250	500	1000	2000	4000		
Without Insulation	65	0.15	0.3	0.6	0.7	0.65	0.6	0.6	0.55
	200	0.45	0.6	0.65	0.6	0.55	0.6	0.6	0.6
	400	0.55	0.65	0.6	0.6	0.55	0.6	0.6	0.6
50mm EarthWool 14kg/m ³ or 75mm EarthWool 11kg/m ³	65	0.35	0.55	0.7	0.7	0.6	0.65	0.7	0.65
	200	0.5	0.65	0.7	0.65	0.6	0.65	0.65	0.65
	400	0.55	0.65	0.6	0.65	0.6	0.65	0.65	0.65

Open Area: 14.8%

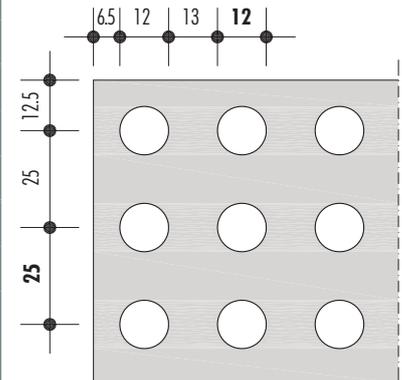


STANDARD CIRCULAR 12/25 R

Maximum Furring Channel Centres: 333.3mm

	Ceiling Cavity (mm)	α_p Frequency (Hz)						α_w	NRC
		125	250	500	1000	2000	4000		
Without Insulation	65	0.15	0.3	0.6	0.8	0.7	0.55	0.6	0.6
	200	0.45	0.65	0.75	0.65	0.6	0.6	0.65	0.65
	400	0.55	0.7	0.65	0.65	0.6	0.6	0.65	0.65
50mm EarthWool 14kg/m ³ or 75mm EarthWool 11kg/m ³	65	0.3	0.55	0.75	0.8	0.7	0.6	0.75	0.7
	112.5	0.45	0.7	0.75	0.7	0.65	0.6	0.7	0.7
	200	0.5	0.7	0.75	0.7	0.65	0.65	0.7	0.7
	400	0.55	0.65	0.7	0.75	0.65	0.65	0.7	0.7

Open Area: 18.1%

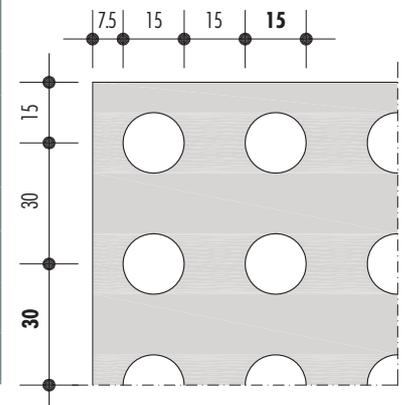


STANDARD CIRCULAR 15/30 R

Maximum Furring Channel Centres: 330mm

	Ceiling Cavity (mm)	α_p Frequency (Hz)						α_w	NRC
		125	250	500	1000	2000	4000		
Without Insulation	65	0.15	0.3	0.6	0.8	0.65	0.6	0.6	0.6
	200	0.45	0.65	0.75	0.65	0.6	0.6	0.65	0.65
	400	0.55	0.7	0.65	0.65	0.6	0.6	0.65	0.65
50mm EarthWool 14kg/m ³ or 75mm EarthWool 11kg/m ³	65	0.3	0.55	0.8	0.8	0.65	0.65	0.75	0.7
	200	0.5	0.7	0.75	0.7	0.65	0.65	0.7	0.7
	400	0.55	0.7	0.65	0.75	0.65	0.65	0.7	0.7

Open Area: 19.6%

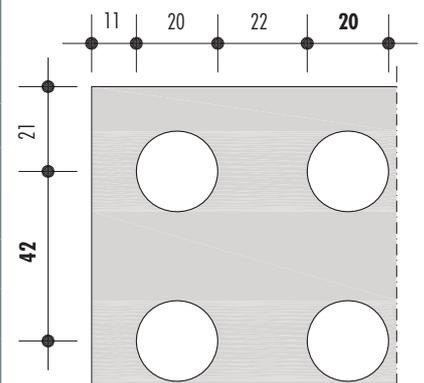


STANDARD CIRCULAR 20/42 R

Maximum Furring Channel Centres: 329.3mm

	Ceiling Cavity (mm)	α_p Frequency (Hz)						α_w	NRC
		125	250	500	1000	2000	4000		
Without Insulation	65	0.15	0.3	0.6	0.75	0.5	0.5	0.55	0.55
	200	0.5	0.65	0.75	0.6	0.45	0.55	0.55	0.6
	400	0.55	0.7	0.7	0.6	0.5	0.55	0.6	0.65
50mm EarthWool 14kg/m ³ or 75mm EarthWool 11kg/m ³	65	0.3	0.55	0.8	0.8	0.5	0.55	0.6	0.65
	200	0.55	0.7	0.8	0.7	0.5	0.6	0.6	0.7
	400	0.55	0.65	0.7	0.75	0.5	0.6	0.6	0.65

Open Area: 17.8%

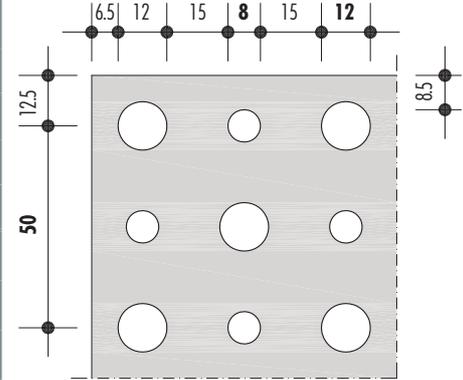


ALTERNATING CIRCULAR 8/12/50 R

Maximum Furring Channel Centres: 333.3mm

	Ceiling Cavity (mm)	α_p Frequency (Hz)						α_w	NRC
		125	250	500	1000	2000	4000		
Without Insulation	65	0.15	0.3	0.6	0.7	0.6	0.5	0.6	0.55
	200	0.45	0.6	0.65	0.6	0.5	0.55	0.6	0.6
	400	0.55	0.65	0.6	0.6	0.55	0.55	0.6	0.6
50mm EarthWool 14kg/m ³ or 75mm EarthWool 11kg/m ³	65	0.35	0.55	0.7	0.7	0.6	0.5	0.65	0.65
	200	0.5	0.65	0.65	0.65	0.55	0.55	0.65	0.65
	400	0.55	0.65	0.6	0.65	0.55	0.55	0.6	0.6

Open Area: 13.1%

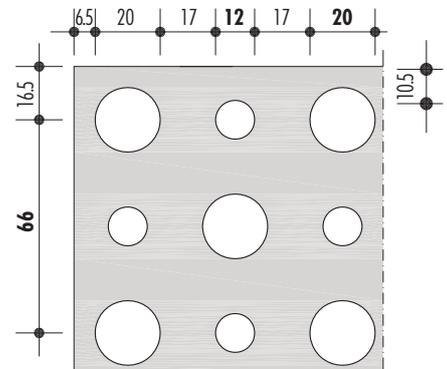


ALTERNATING CIRCULAR 12/20/66 R

Maximum Furring Channel Centres: 330mm

	Ceiling Cavity (mm)	α_p Frequency (Hz)						α_w	NRC
		125	250	500	1000	2000	4000		
Without Insulation	65	0.1	0.3	0.6	0.8	0.6	0.55	0.6	0.6
	200	0.45	0.65	0.8	0.65	0.5	0.6	0.6	0.65
	400	0.6	0.7	0.65	0.65	0.55	0.6	0.65	0.65
50mm EarthWool 14kg/m ³ or 75mm EarthWool 11kg/m ³	65	0.3	0.55	0.8	0.85	0.6	0.65	0.7	0.7
	112.5	0.45	0.7	0.8	0.8	0.6	0.65	0.7	0.75
	200	0.55	0.7	0.8	0.75	0.6	0.65	0.7	0.7
400	0.6	0.7	0.7	0.8	0.6	0.65	0.7	0.7	

Open Area: 19.6%

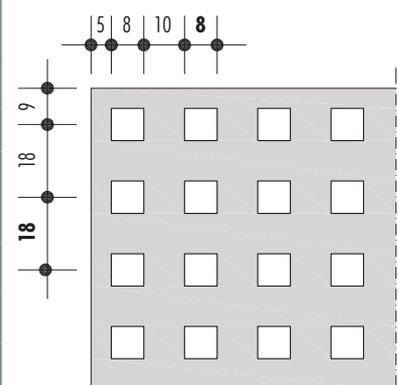


STANDARD SQUARE 8/18 Q

Maximum Furring Channel Centres: 333mm

	Ceiling Cavity (mm)	α_p Frequency (Hz)						α_w	NRC
		125	250	500	1000	2000	4000		
Without Insulation	65	0.1	0.3	0.6	0.8	0.7	0.65	0.6	0.6
	200	0.45	0.65	0.75	0.65	0.6	0.7	0.65	0.65
	400	0.55	0.7	0.65	0.65	0.6	0.7	0.65	0.65
50mm EarthWool 14kg/m ³ or 75mm EarthWool 11kg/m ³	65	0.3	0.55	0.8	0.8	0.7	0.75	0.75	0.7
	200	0.55	0.7	0.75	0.7	0.7	0.75	0.75	0.7
	400	0.6	0.7	0.7	0.75	0.7	0.75	0.75	0.7

Open Area: 19.8%

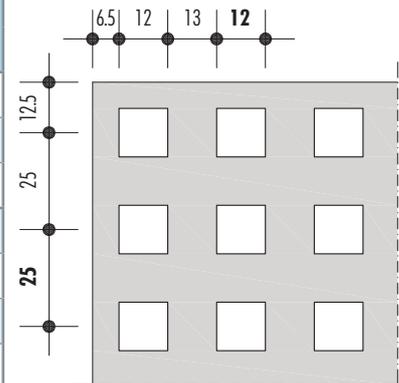


STANDARD SQUARE 12/25 Q

Maximum Furring Channel Centres: 333.3mm

	Ceiling Cavity (mm)	α_p Frequency (Hz)						α_w	NRC
		125	250	500	1000	2000	4000		
Without Insulation	65	0.1	0.3	0.6	0.8	0.75	0.6	0.6	0.6
	200	0.5	0.7	0.8	0.7	0.65	0.65	0.7	0.7
	400	0.6	0.75	0.65	0.7	0.65	0.6	0.7	0.7
50mm EarthWool 14kg/m ³ or 75mm EarthWool 11kg/m ³	65	0.3	0.6	0.85	0.9	0.75	0.7	0.8	0.8
	112.5	0.45	0.7	0.85	0.8	0.75	0.7	0.8	0.8
	200	0.55	0.75	0.8	0.75	0.75	0.75	0.8	0.75
	400	0.6	0.75	0.7	0.8	0.75	0.7	0.75	0.75

Open Area: 23.0%

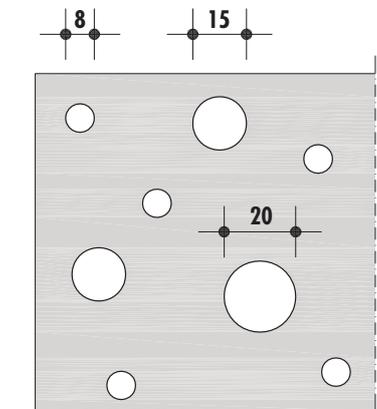


RANDOM PLUS 8/15/20 R

Maximum Furring Channel Centres: 312.5mm

	Ceiling Cavity (mm)	α_p Frequency (Hz)						α_w	NRC
		125	250	500	1000	2000	4000		
Without Insulation	65	0.15	0.3	0.5	0.6	0.45	0.45	0.5	0.45
	200	0.4	0.5	0.55	0.5	0.4	0.45	0.5	0.5
	400	0.45	0.5	0.5	0.5	0.4	0.45	0.5	0.5
50mm EarthWool 14kg/m ³ or 75mm EarthWool 11kg/m ³	65	0.35	0.45	0.55	0.55	0.4	0.45	0.5	0.5
	112.5	0.4	0.5	0.55	0.55	0.4	0.45	0.5	0.5
	200	0.45	0.5	0.55	0.5	0.4	0.5	0.5	0.5
	400	0.45	0.5	0.5	0.55	0.45	0.45	0.5	0.5

Open Area: 9.9%

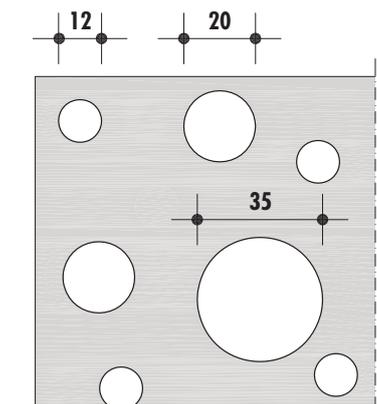


RANDOM PLUS 12/20/35 R

Maximum Furring Channel Centres: 312.5mm

	Ceiling Cavity (mm)	α_p Frequency (Hz)						α_w	NRC
		125	250	500	1000	2000	4000		
Without Insulation	65	0.15	0.3	0.55	0.55	0.4	0.35	0.45	0.45
	200	0.4	0.5	0.6	0.45	0.35	0.35	0.45	0.45
	400	0.45	0.55	0.55	0.45	0.35	0.35	0.45	0.5
50mm EarthWool 14kg/m ³ or 75mm EarthWool 11kg/m ³	65	0.35	0.5	0.65	0.55	0.35	0.35	0.45	0.5
	200	0.45	0.55	0.6	0.5	0.35	0.4	0.45	0.5
	400	0.45	0.5	0.55	0.5	0.35	0.4	0.45	0.5

Open Area: 9.8%



Installation



CARE AND USE

SAFETY

Cleaneo is not classified as hazardous according to the criteria of the National Occupational Health and Safety Commission (NOHSC). It is non-toxic and non-flammable.

Material Safety Data Sheets (MSDS) for the Cleaneo system are available at knaufplasterboard.com.au or by calling **1300 724 505**.

HANDLING, DELIVERY AND STORAGE

To ensure Cleaneo remains in the best condition prior to installation it is important to follow these key recommendations. Generally the board should be protected from any damage or conditions which could affect the final appearance or performance.

- Cleaneo must be kept dry and should be stacked clear of the floor, fully protected from the weather and delivered to sites when lock up stage is complete.
- To reduce the possibility of damage, delivery to site should occur immediately before installation.

- Care should be taken not to damage edges or the surface of the board.
- Exposure to excessive humidity during storage can result in plasterboard becoming damp and soft, and may appear defective. In this case the plasterboard should be allowed to dry out and handled with care during installation.
- Cleaneo is UV resistant and will not become discoloured if exposed to direct sunlight or fixed and left standing unpainted for long periods.

To help protect plasterboard from absorbing humidity:

- Avoid open sources of water such as wet floors
- Wrap the plasterboard with plastic
- Provide ventilation
- Install soon after delivery
- Install during dry weather for best results.

GENERAL REQUIREMENTS

Install control joints in plasterboard ceilings at:

- 12m maximum intervals
- All control joints in the structure
- Any change in the substrate material
- At the junction of a large room and passageway

Separate plasterboard from building elements made with other materials, such as columns by creating control joints that allow for movement, e.g. utilising a shadow line profile or incorporating Trenn-Fix Adhesive Strip.

All ceilings in this section are non-trafficable. Do not walk on plasterboard ceilings!

Attach ceiling fixtures to framing members only. Ensure the framing is designed to carry any additional load.

FRAMING

- Cut Top Cross Rail (TCR) and furring channel to leave 20mm expansion gaps at each wall
- Stagger joints in TCR and furring channel by 1200mm
- Install additional framing members around openings
- Fix short edges of Cleaneo boards to wide Furring Channel (Rondo No.155).

- Steel framed ceiling systems must be designed by an engineer according to the relevant Australian Standard.
- Framing members in this section are designed using either steel or timber joists, Lipped C type steel studs or a furring channel system.

The framing tables in this section apply to Rondo steel components. Alternative components may only be used:

- In accordance with the manufacturer's literature, or
- If their performance is equivalent or better and they comply with the relevant standard.

More ceiling framing combinations are available than those described in this section.

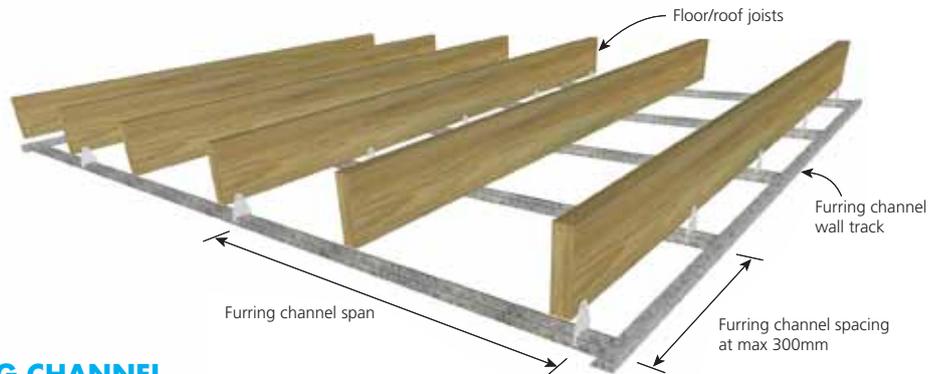
[Refer to Rondo building services literature or equivalent]

FURRING CHANNEL SPACING FOR CLEANEO

Perforation	Furring Channel Spacing
Random Plus 8/15/20 R	312.5mm
Standard Square 8/18 Q	333mm
Standard Circular 8/18 R	333mm
Alternating Circular 12/20/66 R	330mm

For Furring Channel spacing for other perforation patterns, refer to Acoustic Performance section.

FIGURE 1 Furring Channel Span and Spacing



MAXIMUM SPAN OF FURRING CHANNEL

Plasterboard	28mm Furring Channel Rondo No.129 at 300mm spacing		28mm Furring Channel Rondo No.155* at 300mm spacing	
	Single Span (mm)	Continuous Span (mm)	Single Span (mm)	Continuous Span (mm)
1 layer of 13mm Cleaneo	1300	1540	1300	1540

* Fix short edges of Cleaneo to wide furring channel (Rondo No. 155).

¹ If furring channel track is not used, the furring channel must be supported 200mm from ends.

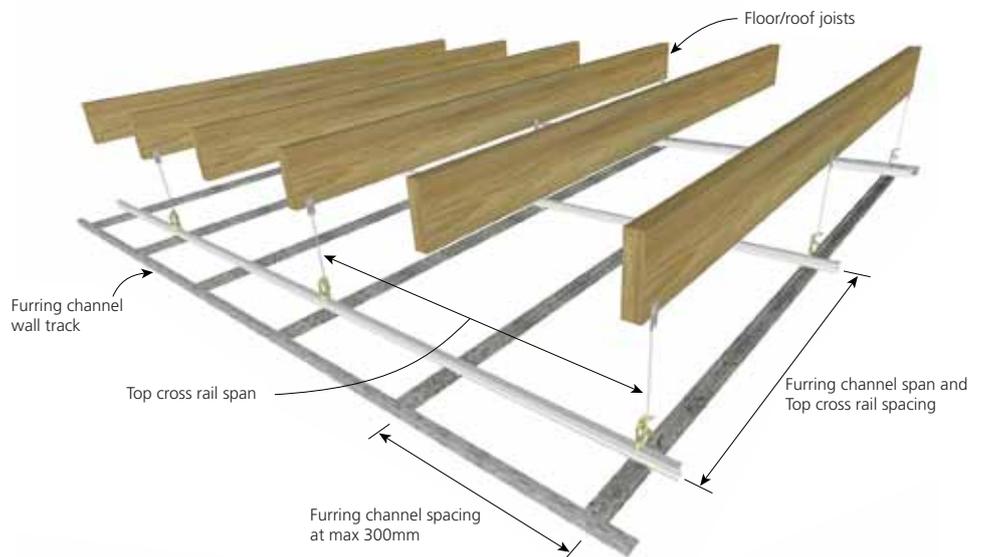
² $W_{ultimate} = 0.5 \text{ kPa}$, Strength Load Case: $1.2G + W_u$

³ $W_{serviceability} = 0.325 \text{ kPa}$, Serviceability Load Case 1: G [Limit is $L/600$], Serviceability Load Case 2: $G + W_s$ [Limit is $L/200$].

⁴ Strength check of unrestrained flange in compression.

⁵ Connections to be independently checked.

FIGURE 2 Top Cross Rail and Furring Channel Span and Spacing



SELECTED TOP CROSS RAIL (TCR) AND FURRING CHANNEL FRAMING OPTIONS

System	TCR Rondo No.	TCR span	TCR spacing	Furring Channel Rondo No. at 300mm spacing
1 Layer of 13mm Cleaneo	127	1200	1200	155*/129

* Fix short edges of Cleaneo to wide furring channel (Rondo No. 155).

¹ If furring channel track is not used, the furring channel must be supported 200mm from ends.

² $W_{ultimate} = 0.5 \text{ kPa}$, Strength Load Case: $1.2G + W_u$

³ $W_{serviceability} = 0.325 \text{ kPa}$, Serviceability Load Case 1: G [Limit is $L/600$], Serviceability Load Case 2: $G + W_s$ [Limit is $L/200$].

⁴ Strength check of unrestrained flange in compression.

⁵ Connections to be independently checked.

LAYOUT

- Start sheeting from the centre of the room. [Figure 3]
- Sheet ceilings perpendicular to framing members.
- All short edges must be over a wide furring channel. (Rondo No.155)

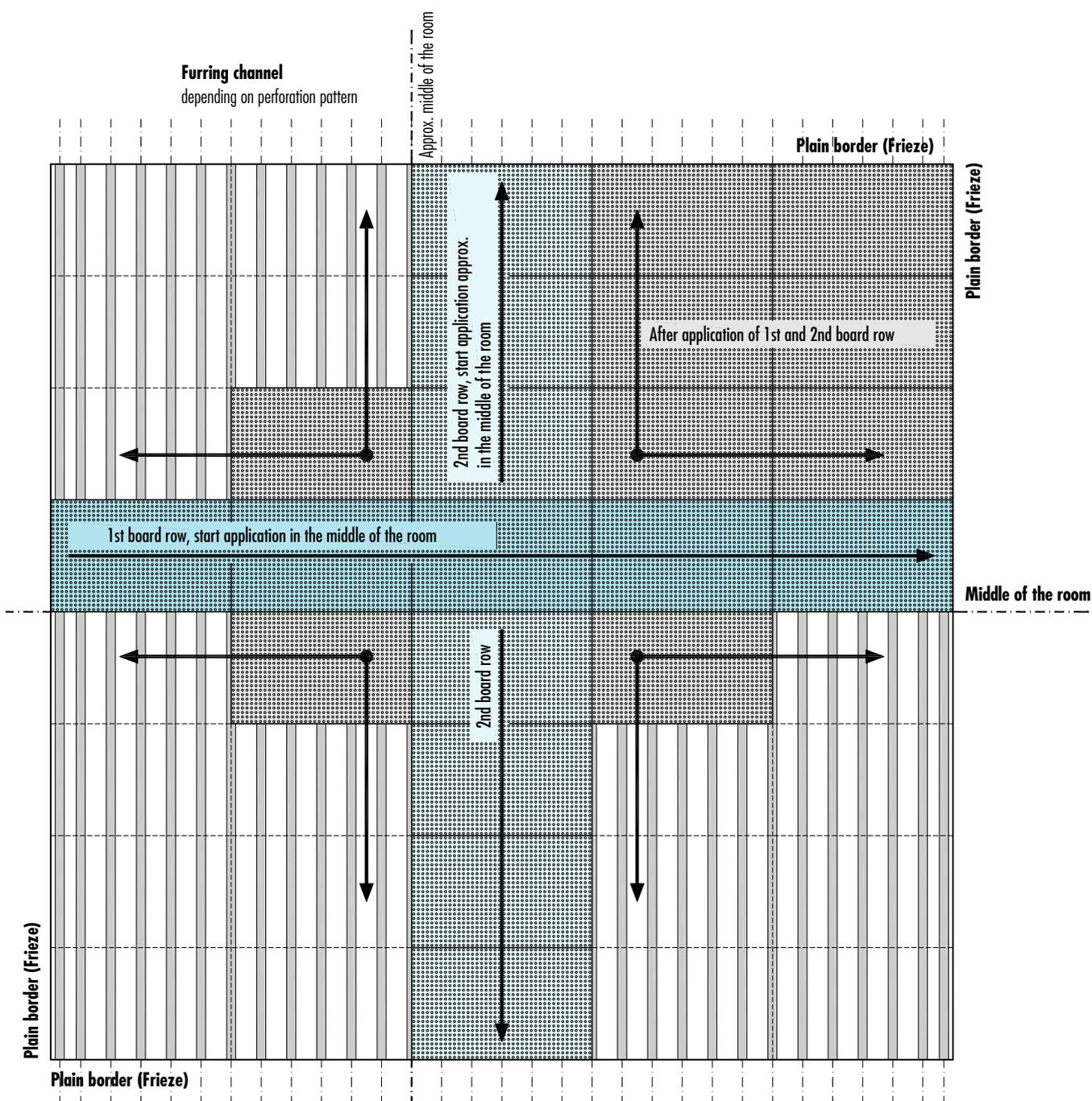


FIGURE 3 Installation Scheme

CLEANEO ALIGNMENT

- Place FF edge adjacent to SK edge along short and long edges. [Figure 4]
- Place linear notch edge adjacent to linear lap edge along short and long edges. [Figure 5]

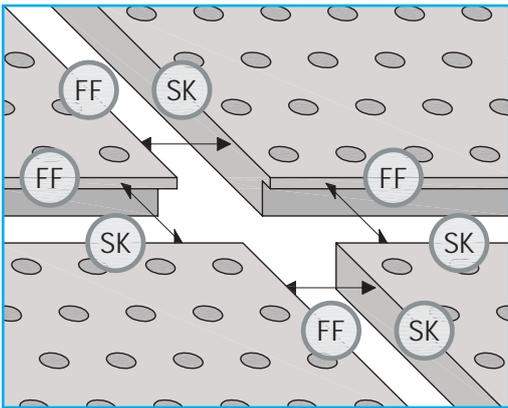


FIGURE 4 FF Edges Alignment

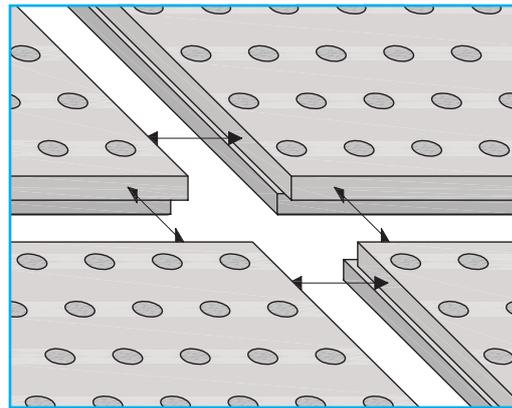


FIGURE 5 Linear Edges Alignment

Constantly check overall appearance of the ceiling via the straights and diagonals of the perforation rows during installation. [Figure 6]

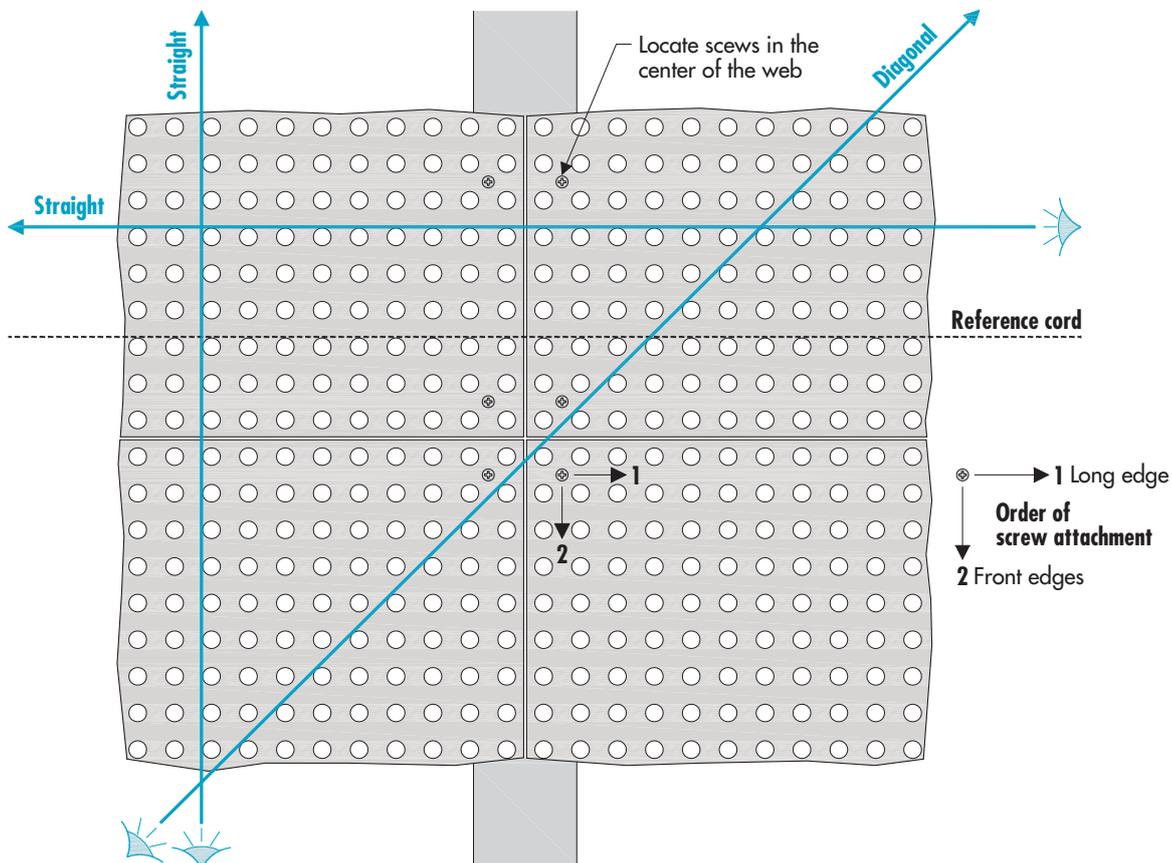


FIGURE 6 Board Application

FIXING

- Use fasteners only. Adhesive is not permitted.
- Use 25mm 6g plasterboard screws into metal furring channels.
- Drive fasteners to just below the sheet surface, taking care not to break the paper linerboard.
- Maximum screw spacing is 200mm along short edges and 300mm in the field of the boards.
- Press Cleaneo firmly on to the grid when screwing.
- Start fastening from the corner, where the board meets previously attached boards.
- Fasten long edge first and then short edge.
- Use Caps for easy installation. Caps remove the need for finishing screw heads. *[Figure 7]*

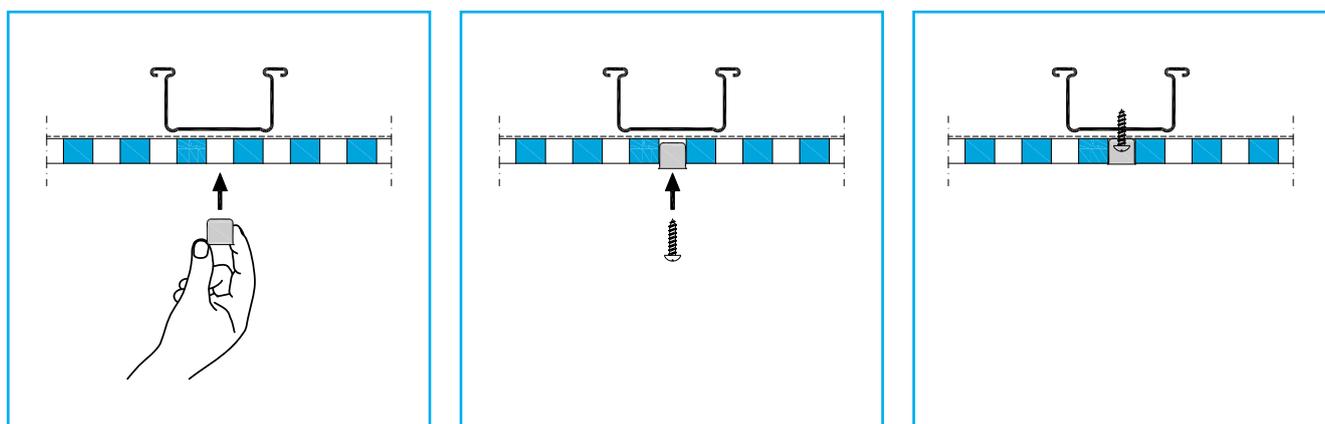


FIGURE 7 Cap Installation

JOINTING AND FINISHING

FF EDGE

- Only use Uniflott for jointing.
- Clean dust from joints after fixing the boards. Use a wet brush. *[Figure 8]*
- Prime site cut edges before jointing with Tiefengrund Primer.
- The edges of Cleaneo FF and Linear boards are already bevelled and primed off-the-shelf.
- Fill joints fully with Uniflott using the Uniflott Caulking Gun, Jet Gun or Cartridge. *[Figure 9]*
- Scrape off excess Uniflott after hardening. *[Figure 10]*
- Use MastaLite for finishing joints and screw heads. *[Figure 11 and 13]*

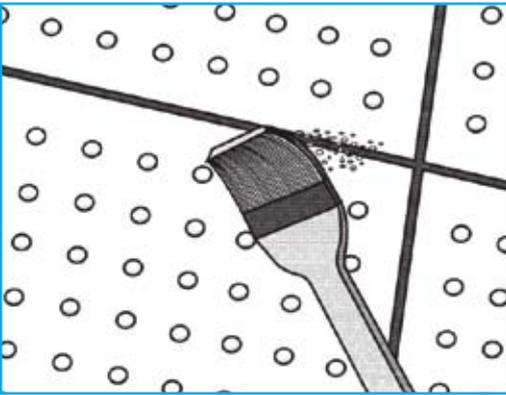


FIGURE 8 Cleaning of Joints

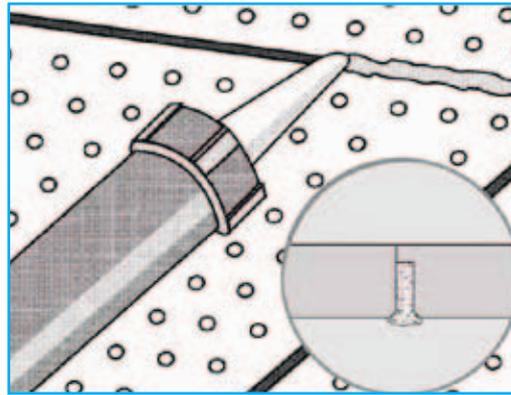


FIGURE 9 Joint Filling (with Uniflott)

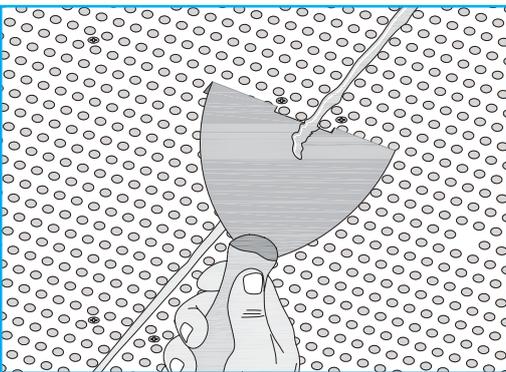


FIGURE 10 'Chipping' Off Excess Filler

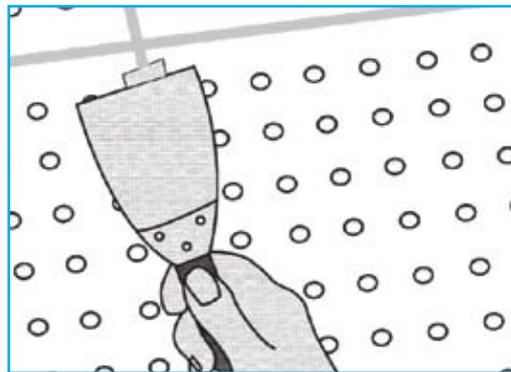


FIGURE 11 Finishing

LINEAR EDGE

- Adjust notch and lap edges (no compounds required). [Figure 12]
- Fill screw heads with MastaLite. [Figure 13]

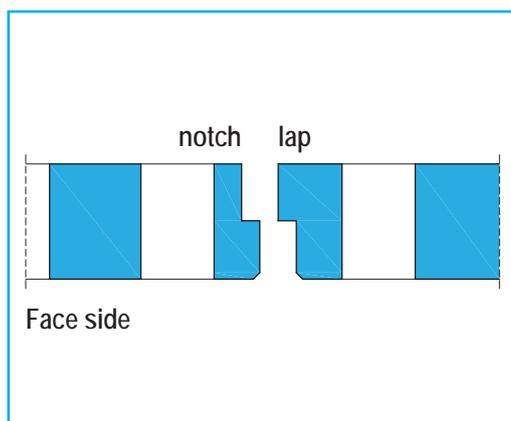
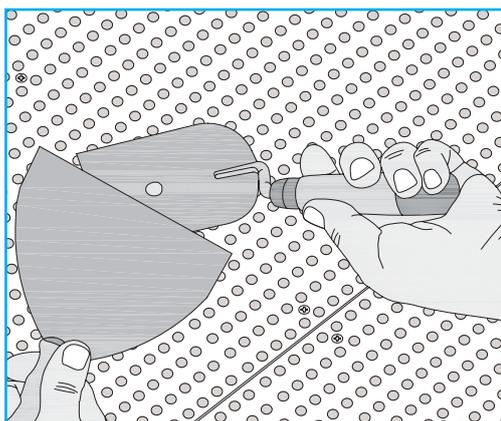


FIGURE 12 Linear Edge



**FIGURE 13 Filling of Screw Heads
(if no Caps used)**

PAINTING

A three coat paint system must be applied in accordance with Australian Standard AS/NZS 2311, *Guide to the painting of buildings*. Both the quality of the paint and how it is applied have a large effect on the finished appearance of the plasterboard.

The paint manufacturer's instructions for application must be followed. Only use roller application for painting Cleaneo. Roller application applies a uniform texture over the entire surface and ensures the paint does not contact the protective mat fixed to the back of the plasterboard. Spray application of paint is not permitted.

For more information, contact Technical Services on **1300 724 505** or visit **knaufplasterboard.com.au**

Construction Details

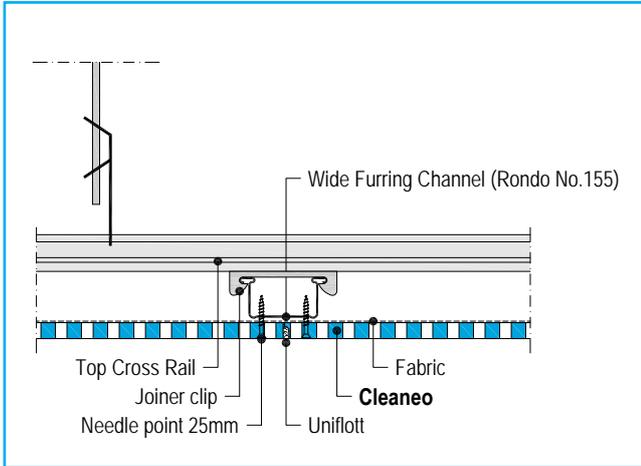


FIGURE 14 Short Edge Joint FF

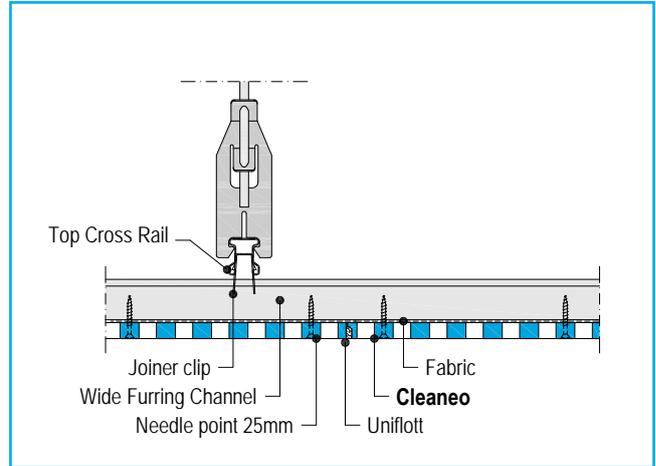


FIGURE 15 Long Edge Joint FF

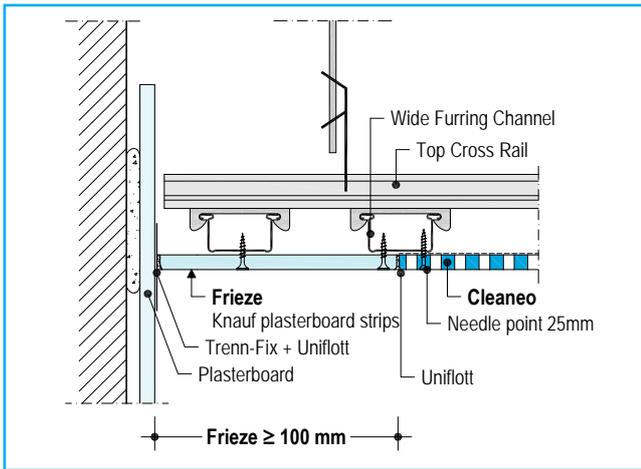


FIGURE 16 Connection to Wall

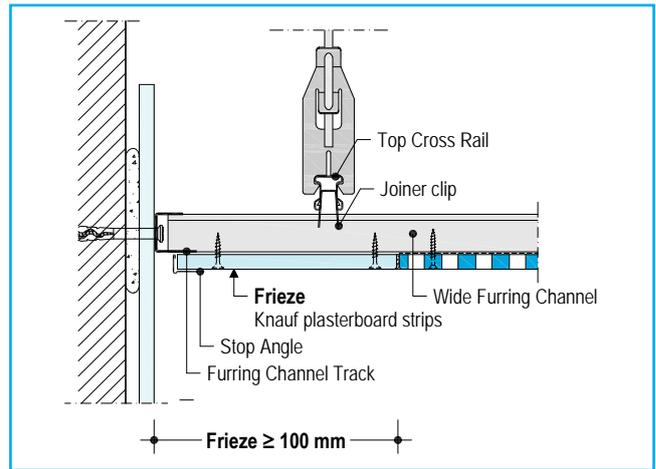


FIGURE 17 Connection to Wall with Exposed Joint

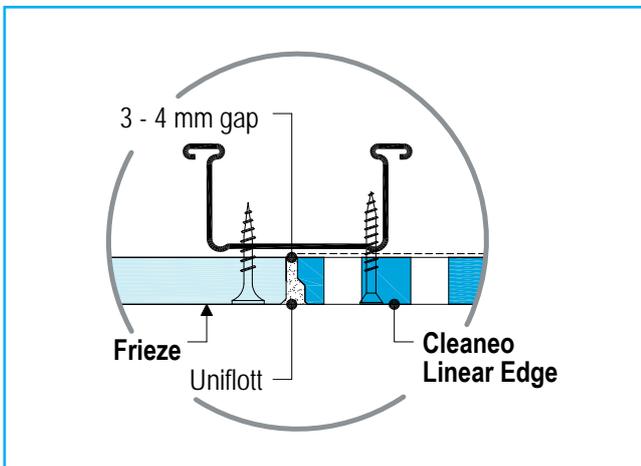


FIGURE 18 Connection to Frieze with Cleaneo Linear Edge

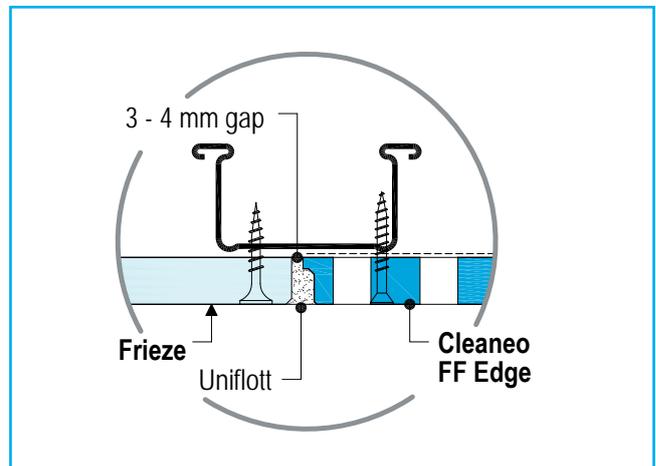


FIGURE 19 Connection to Frieze with Cleaneo FF Edge

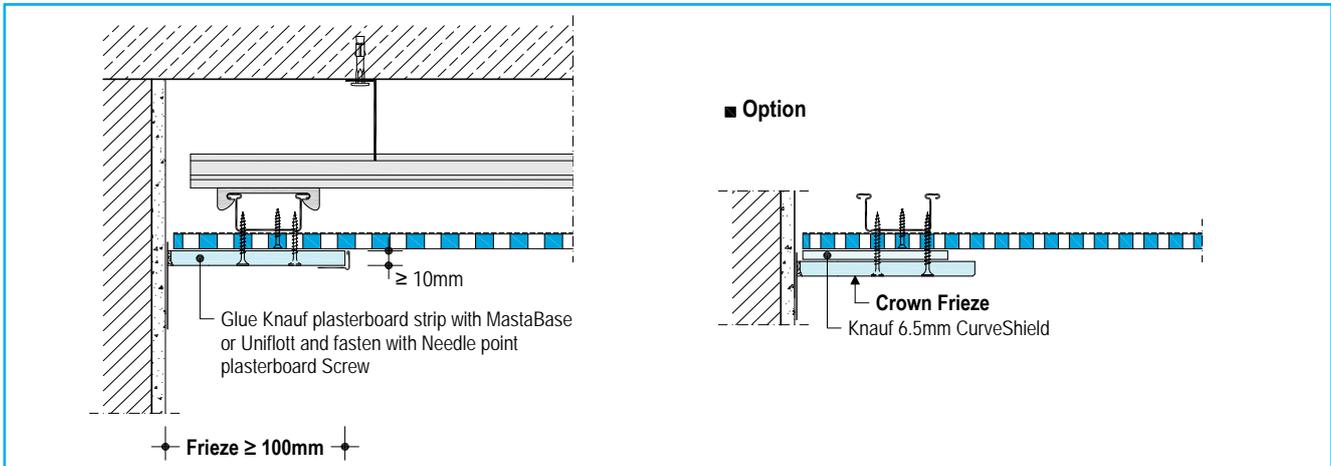


FIGURE 20 Crown Frieze

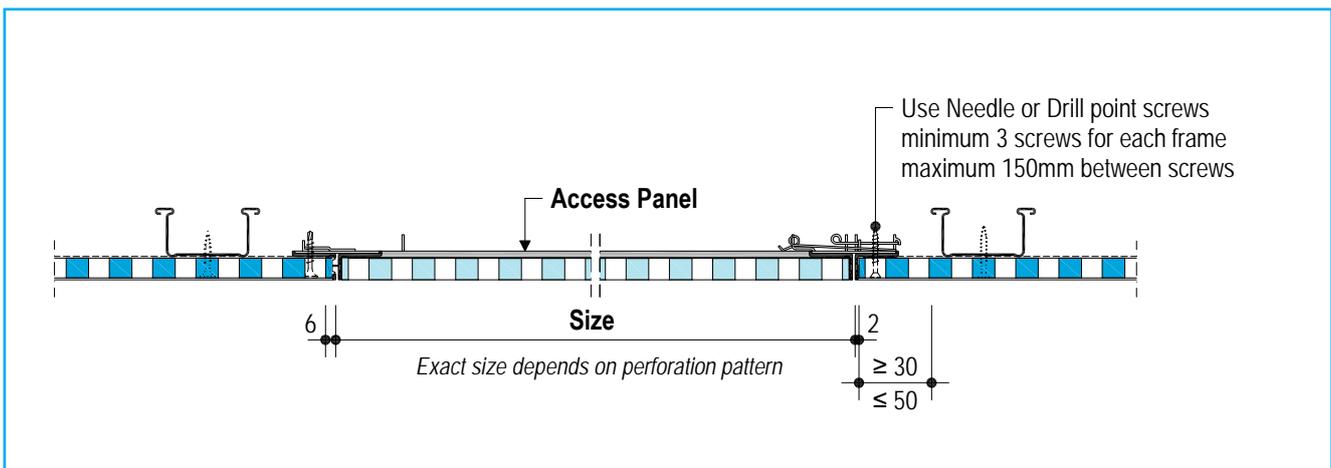


FIGURE 21 Access Panel (with Seal)

Design	Curving Radius -r- Dry Curving - Concave or Convex
Standard Circular R	≥ 3000 mm
Alternating Circular R	
Standard Square Q	≥ 3500 mm
Random Plus R	

It is recommended to pre-curve the boards on a curving device before application (preferably with a slightly smaller radius) in order to reduce tensions in the structure.

Inside arch (concave)

Outside arch (convex)

≤ 286 mm
Channel spacing
(depending on perforation layout and board dimensions)

FIGURE 22 Curving Cleaneo



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