



KALNAKMENS



In 2008 a two-function hall with a transformable acoustics was put into operation in Latvia – the renovated theatre house “Juras varti” in Ventspils. The hall functions in two regimes: one regime for speeches and chamber music, other - for electrically equipped sound (concerts, conferences etc.) The acoustically essential wall area is equipped with panelling and motorised double-sided wall panels.

Introduction

There are various natural veneer decorative surfaces available to be chosen from by architect and acoustic engineer, allowing for a perfect marriage between acoustic and aesthetic qualities, and providing a suitable breadth of choice.

“Kalnakmens” series sound absorption panels have a “keel-and-clip” installation system. The clipping connection system is adopted for the whole wall and ceiling installation procedure and the panels are put together one by one. The panels are also decorative. The panels are suitable for any situation which involves strict acoustic requirements, such as the acoustic and aesthetic design of a music hall, cinema, conference room, multi-function auditorium, gymnasium, or high-class dining hall, open-air stages.

Since 2005 Kalnakmens Ltd. has implemented various acoustic projects by installing 1D Diffusers, Schroeder acoustic panels and motorised double-sided wall panels produced by Kalnakmens Ltd. The acoustic wall panels are produced of solid wood, plywood, veneered plywood.

SOUND ABSORPTION PANELS

Perforated Panels

Ingenious 60x60/60x120/244x12.8cm modules, for completing and furnishing any space with the utmost versatility and ease-of-installation for walls, ceiling, or floor. An acoustic panel with a simple and innovative design which possesses specific sound-absorption characteristics. The panels are made of MDF with a melamine or veneer lacquer finish.

Application:

- Conference rooms
- Airport waiting areas
- Classrooms
- Kindergartens
- Mastering Studios
- Home theatre
 - Theatre
 - Offices
 - Public spaces requiring sound absorption

Perforated panels - 32/32/8	Size:	Weight per square metre (kg)
Fire-resistant red MDF, with a mahogany veneer. Not fire-resistant with veneer.	600mm x 600mm x 15mm	16.70
	600mm x 1200mm x 15mm	
	600mm x 1800mm x 15mm	
	600mm x 2400mm x 15mm	



Ø8mm, Distance between centres 32x32mm

Perforated panels- 8/8/1.2mm	Size:	Weight per square metre (kg)
Fire-resistant with a cherry or different veneer.	600mm x 600mm x 15mm	16.70
	600mm x 1200mm x 15mm	
	600mm x 1800mm x 15mm	
	600mm x 2400mm x 15mm	



Ø1.2mm, Distance between centres 8x8mm

Perforated panels - 16/16/12-3mm	Size:	Weight per square metre (kg)
Fire-resistant with a cherry or other veneer.	600mm x 600mm x 15mm	15.90
	600mm x 1200mm x 15mm	
	600mm x 1800mm x 15mm	
	600mm x 2400mm x 15mm	



Ø3mm, Distance between centres 16x16mm

ARTWOOD-4L	Size:	Weight per square metre (kg)
Fire-resistant MDF, with veneer.	600mm x 600mm x 18mm	11.10



Perforated Panels

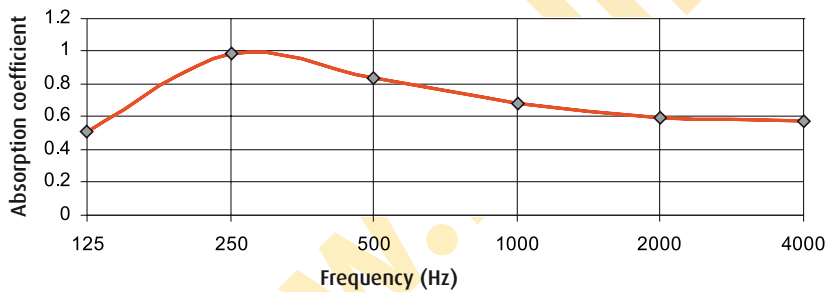
Application:

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Perforated panel 28/4	Size:	Weight per square metre (kg)
MDF with bamboo melamine surface (not fire-resistant)	600mm x 600mm x 15mm 600mm x 1200mm x 15mm 600mm x 1800mm x 15mm 600mm x 2400mm x 15mm	15.90



Perforated Panel 28/4

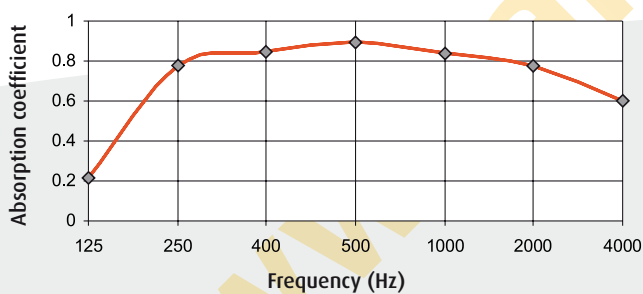


Slotted Sound Absorption Panel 16/50/8, 32/50/6	Size:	Weight per square metre (kg)
Fire-resistant MDF with beech melamine or veneer surface	600mm x 600mm x 15mm or 18mm 600mm x 1200mm x 15mm or 18mm 600mm x 1800mm x 15mm or 18mm 600mm x 2400mm x 15mm or 18mm	12



Slotted Sound Absorption panel 32/50/6

Slotted Sound Absorption Panel 16/50; 32/50

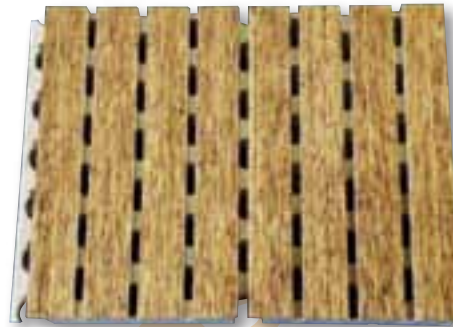


Slotted Sound Absorption panel 16/50/8

Sound Absorption Panel

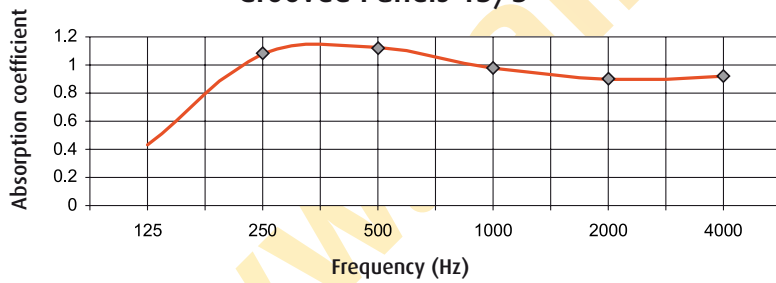
Application:

- Conference rooms
- Airport waiting areas
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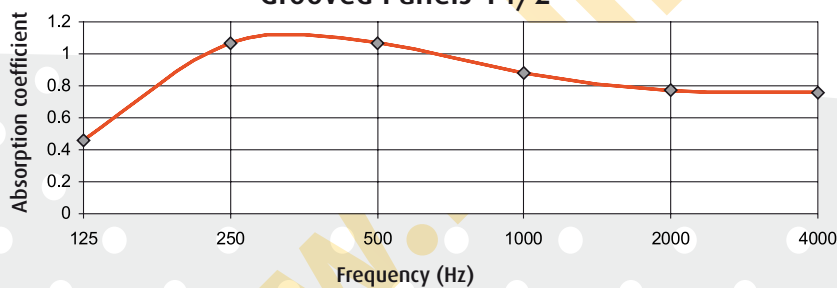
Grooved Sound Absorption Panel 13/3	Size:	Weight per square metre (kg)
MDF with melamine surface (not fire-resistant)	128mm x 2440mm x 15mm	10.94

Grooved Panels 13/3



Grooved Sound Absorption Panel 14/2	Size:	Weight per square metre (kg)
MDF with melamine or veneer surface (not fire-resistant)	128mm x 2440mm x 15mm	9.38

Grooved Panels 14/2



SOUND DIFFUSERS

To diffuse the sound in a room, the sound energy in the field must be distributed evenly. The direction of propagation is random. Sound diffusers are used to distribute and scatter sound waves and therefore contribute to reducing static sound waves and reverberation. Sound or acoustic diffusers are used to help provide greater sound coverage for speech and music and contribute to improving speech intelligibility and music clarity, particularly in large rooms and halls.

There are many different ways in which to absorb sound, but the result is always the same:

Transforming or dissipating the energy through heat.

Reduce the reverberation time in the frequency bandwidth of the material used.

Application

- Quadratic Residue sound diffusion
- Recording Studios
- Post Production Studios
- Practice Rooms
- Home Theatres

• Mastering Studios

- Theatres
- Concert hall
- All the music on the premises provided



1 D Diffuser	Size:	Weight per square metre (kg)
Fire resistant, made from red MDF with a painted finish;	600mm x 600mm x 150mm 600mm x 1200mm x 150mm	25
Plywood with lacquered finish or structural paint (not fire-resistant)	600mm x 600mm x 150mm 600mm x 1200mm x 150mm	25

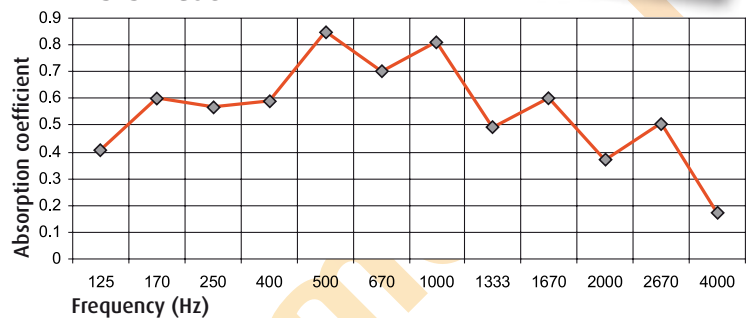
Diffusion

Compared to a flat reflector panel, the 1 D DIFFUSER offers significant diffusion above the diffraction limit of 565Hz, which is equal to the speed of sound (1130ft/sec) divided by the 2' dimension of the panel. As the frequency increases above 565Hz, the graph indicates how the reference reflector becomes more and more specular, whereas the 1 D DIFFUSER provides a uniform diffusivity.

Absorption

The wooden 1 D DIFFUSER contributes minimal absorption.

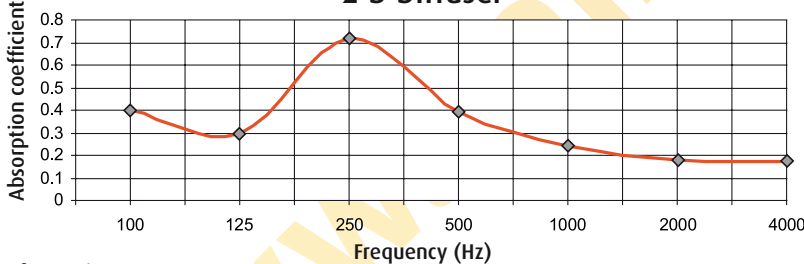
1 D Diffuser



2 D Diffuser	Size:	Weight per square metre (kg)
Hardwood beech, clear lacquer	600mm x 600mm x 100mm	35.90



2 D Diffuser



Absorption

While the primary function of the 2 D Diffuser is to provide broad bandwidth diffusion, it also offers a modest and beneficial amount of absorption across the frequency spectrum with a small emphasis at about 800Hz.

Diffusion

The 2 D Diffuser offers significant diffusion compared to a flat reflector panel above the diffraction limit of 565 Hz, which is determined by the dimensions of the panel. Above this frequency, the graph indicates how the reference reflector becomes more and more specular as the frequency increases, whereas the 2 D Diffuser provides a constant diffusivity.

SOLID WOOD SCHROEDER DIFFUSER

Schroeder diffuser is a reflector constructed using a series of wells with different well depths. Such diffusers are one-dimensional in that if the wells run vertically, the sound is diffused only in the horizontal direction.(and vice versa). The differing distances to the reflecting surfaces give the reflected wave a variety of phase shifts designed so the total reflected wave has desired directional properties.

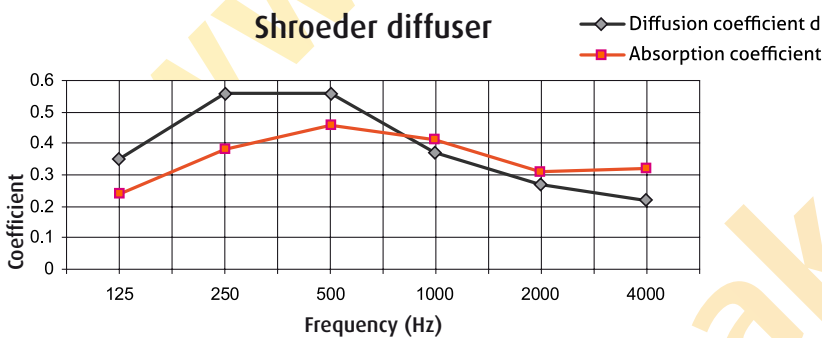
The Schroeder diffuser is very efficient because the sound is distributed both in space and in time.

Space: this means that the sound is distributed throughout 180° or 360° with 2D Schroeder panels.

Time: this means that the energy will be slightly delayed. Schroeder showed that the quadratic residue sequence could be used to get more or less uniform scattering over a relatively wide range of audio frequencies. That is, a wall which used to be acoustically like a mirror becomes a wall which is acoustically painted white. Hence, much of the energy (the "brightness") remains, however the "house of mirrors" effect from the strong echoes is reduced.

Limitations: excellent sound will require great quantities of diffuser elements. So if you want to get good efficiency with Schroeder Diffusers, you must always install a large quantity in close proximity.

Massive wood panel	Size:	Weight per square metre (kg)
Made from solid wood with painted finish or lacquer (not fire-resistant)	560 x 600 x 160mm	44.80
	560 x 1200 x 160mm	44.80



Application:

- Open-Air Stage
- Recording Studios.
- Post Production Studios.
- Mastering Studios





Mezparks' Open-Air Stage in Riga



KALNAKMENS

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