MAXXI Museum, Rome (Zaha Hadid Architects, London); Photo: Roland Halbe

Acoustics
Systems overview

Contents

Sound design

Visual and acoustic impressions induce moods and feelings and have a special influence on the way we experience our surroundings. Our senses determine whether we feel at home in a room.

Hearing involves interpreting sound waves, and our ears are often simultaneously exposed to a broad array of different sound waves at a wide spectrum of frequencies. As sound acts directly on our central nervous systems, factors such as volume, frequency and number of sound sources influence our sense of well-being and our powers of concentration.

A room's acoustic properties – the audibility of the spoken word or the purity of a sound - are dependent on the sound reflection and absorption characteristics of the flooring, walls, ceiling and fixtures in the room. Long reverberation times result in undesirable acoustics – sounds become unclear and speech becomes incomprehensible.

Sto acoustic systems have a positive influence on room acoustics, at the same time offering much more: interior design solutions ranging from seamless ceilings to suspended modular panels, acoustic spray plasters and more.

Royal Botanic Gardens, Kew (Edward Cullinan Architects)

The Sto approach to acoustics

Form and function, beautifully matched

Whether creating a state-of-the-art concert venue or refurbishing a school classroom, Sto has an acoustic system developed to meet the most challenging acoustic requirements.

Sto will help you to manage the performance requirements of your project so you can concentrate on creating an award-winning interior, like a number of our recent clients.

Several StoSilent systems have been developed for retrofitting rooms quickly and easily to effectively manage an unforseen acoustical issue and to keep disruption to a minimum.

Developed from 96% recycled glass, the remarkable StoSilent board provides sound absorption levels of up to 85%, and thanks to its low weight, it minimises loads.

Every StoSilent acoustic system has been tested in accordance with EN ISO 354. Test data is available on request.

Fire performance
All StoSilent systems have been tested for fire safety to the European system EN13501-1.

**Westfield Shopping Centre,
White City, London
The Buchan Group**

Ideal solutions for a wide range of applications

Leisure

- Private and public swimming pools
- Activity/sports centres
- Theatres
- Museums and public galleries
- Multiplex cinemas
- Auditoria
- Music and dance studios
- Restaurants and cafés

Education

- Classrooms & lecture theatres
- Museums
- Libraries

Retail

- Shopping centres
- Retail outlets

Commercial offices

- Office spaces
- Call centres
- Conference rooms
- Corridors
- Foyers and atria

Industry

- Pharmaceutical
- Electronic

Healthcare

- Doctors' surgeries and healthcare clinics
- Nursing homes
- Hospital wards

Achieving ambitious acoustic designs

Flexible board options for unrestricted creativity

Designing a simple ceiling can be incredibly challenging. While we desire a functional and attractive solution, there are numerous other design considerations, such as the integration of ducting, lighting and other features.

The ceiling is a key interior element requiring the coordination of all the technical services from the very beginning. The Sto acoustics team is on hand to support designers in the creation and application of bespoke acoustic details, including:

- Upstands and bulkheads
- Three-dimensional curves & radii
- Recessed or perimeter luminaires
- Ventilation integration
- Sprinkler systems
- Access panels
- Wall-applied acoustics when the ceiling fabric is not available

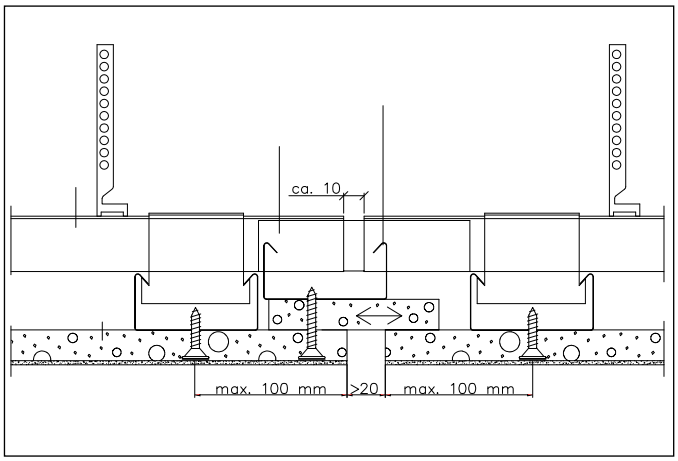
Swimming pools and plenums:
A challenging acoustic environment
Acoustics within typical swimming pools are notoriously problematic. Smooth, sound-reflecting surfaces such as glass and tiles are particularly prevalent, and the surface of the water represents an additional sound-reflecting body. The pool also creates humidity, which can cause staining of typical acoustic boards due to air filtration.

StoSilent Panel Alu acoustic boards feature a factory-applied backing laminate, preventing the problems usually associated with humidity, while simultaneously offering outstanding acoustic performance. The Alu board is also the correct choice for plenum spaces where air circulation is prevalent.

Our Dynamic Earth, Edinburgh

Roughwood Park, Buckinghamshire

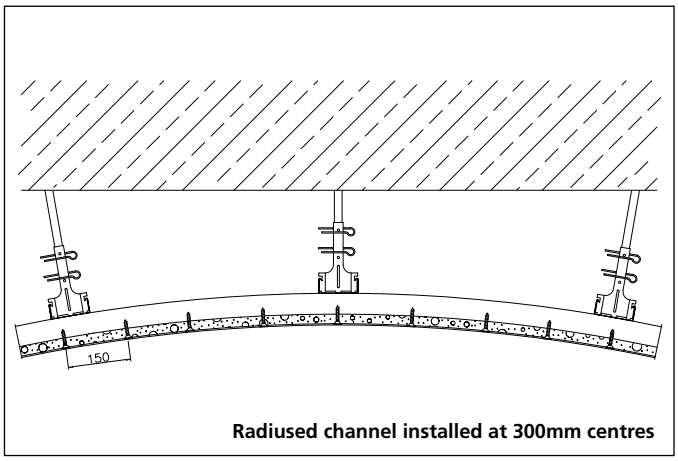
The Walbrook (StoSilent Top)



Seamless & monolithic

The StoSilent seamless acoustic board systems can be realised as beautiful, monolithic expanses of up to 200m² or 20m in length.

Kew Gardens (StoSilent Panel Robust)



Radiused channel installed at 300mm centres

Radii and curves

With StoSilent Panel Robust reinforced acoustic board, flowing transitions can be created between surfaces of differing heights, and arches or circular segments can be realised.

Note: These details are general and non-binding proposals, which are only schematic in nature.

Acoustics and the environment

Improving one shouldn't affect the other

As you'd expect from an organisation environmentally certified in accordance with ISO 14001, we have endeavoured to manufacture all of our acoustic system components with minimal impact upon the environment.

For example, StoSilent acoustic boards are made from 96% recycled glass. It is not only our boards that are recyclable, even the gridwork and acoustic accessories are designed to be reused or recycled.

Growing numbers of our products, like the StoSilent Superfine coating for example, bear the international naturePlus quality mark. This is a seal of approval for health, environmental and functional aspects. For more information on naturePlus, please visit their website at www.natureplus.org

Other environmental benefits:

- Cost and energy saving benefits with StoSilent Cool when compared to traditional heating and cooling systems.
- Modular acoustic systems for use in thermal mass buildings.
- VOC Free acoustic coatings in accordance with the 2010 legislation, with no solvent content to negatively affect health.
- Even the packaging and installation requirements are specifically designed to minimise any negative environmental impact.

CERTIFICATE

DQS GmbH
Deutsche Gesellschaft zur Zertifizierung von Managementsystemen

hereby certifies that the company

Sto Aktiengesellschaft

Ehrenbachstraße 1
D-79780 Stühlingen

with the sites

August-Fischbach-Straße 4	D-78166 Donaueschingen
Eisenstraße 38	D-65428 Rüsselsheim
Karl-Pieper-Straße 1	D-06231 Tollwitz
Ehrenbachstraße 1	D-79780 Stühlingen
Gutenbergstraße 6	D-65830 Kriftel

for the scope

Development, production and distribution of External Wall Insulation Systems, renders and plasters, paints, decorative coatings, acoustic systems, products for concrete restoration and floor coating

has implemented and maintains an

Environmental Management System.

An audit, documented in a report, has verified that this environmental management system fulfills the requirements of the following standard:

EN ISO 14001 : 2004
November 2004 edition

This certificate is valid until	2012-05-13
Certificate Registration No.	003651 UM
Frankfurt am Main	2009-05-14

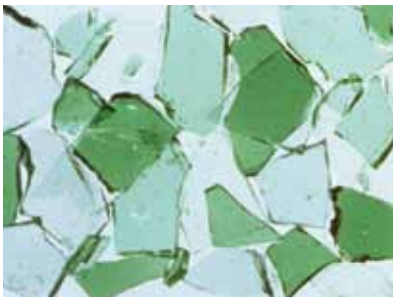
[redacted] [redacted]

MANAGING DIRECTORS

D-60433 Frankfurt am Main, August-Schanz-Straße 21

natureplus
No. 0300-0502-046-I

Left: EN ISO 14001: 2004 certification
Main: Underhill House, Gloucestershire StoSilent Modular used for thermal mass ceiling



StoSilent Superfine

Fine texture acoustic finish

Developed for the most demanding acoustic needs, StoSilent Superfine offers improved acoustic transparency whilst maintaining an attractive, lightly textured finish. StoSilent Superfine is available in natural white and an additional 465 colours from the StoColor System, our widest colour offering. In addition, StoSilent Superfine is our most sustainable surface coating and has been awarded the Natureplus quality mark.

Product information

Luminous reflectance	Lightness value	Whiteness	Colour choice	Max. dimensions	Material properties	System availability
90%	83%	66%	Natural white or 465 colours	Seamless up to 200m^2 or 20 linear metres	Synthetically bound, acoustically transparent, lightly textured	StoSilent Panel StoSilent A-Tec StoSilent Cool StoSilent Modular

StoSilent Top

Very fine acoustic finish with crystalline shimmer

StoSilent Top offers a very fine surface texture that glistens in certain light conditions, making for a very sophisticated and highly attractive finish. Combined with excellent acoustic properties, StoSilent Top is an ideal choice for our range of seamless acoustic systems.

Product information

Luminous reflectance	Lightness value	Whiteness	Colour choice	Max. dimensions	Material properties	System availability
75.4%	77%	69%	Natural white or 380 colours	Seamless up to 200m² or 20 linear metres	Synthetically bound, acoustically transparent, extremely fine texture	StoSilent Top StoSilent Top A-Tec StoSilent Cool Top StoSilent Modular

Acoustic systems overview table

Finding the right system for you

Overview of acoustic board systems

	Acoustic properties			Finishes			Grid	
System name	**Absorption (αw)**	**NRC**	**Sound absorption**	**Surface finish options**	**Colour availability**	**Light reflectance**	**Accessibility**	**Grid**
StoSilent Panel	0.80	0.82	Class C	Superfine	465	90%	Not demountable / access hatch	Concealed grid
StoSilent Panel Robust	0.75	0.77	Class C	Superfine	465	90%	Not demountable / access hatch	Concealed grid
StoSilent A-Tec	0.85	0.86	Class B	Superfine	465	90%	Not demountable / access hatch	Concealed grid
StoSilent Top	0.65	0.63	Class C	Top	380	75.4%	Not demountable / access hatch	Concealed grid
StoSilent Top A-Tec	0.80	0.79	Class B	Top	380	75.4%	Not demountable / access hatch	Concealed grid
StoSilent Cool	0.60	0.60	Class C	Superfine	465	90%	Not demountable / access hatch	Concealed grid
StoSilent Cool Top	0.50	0.49	Class C	Top	380	75.4%	Not demountable / access hatch	Concealed grid
StoSilent Modular	0.80	0.80	Class B	Superfine, Top	white	90%	Free Standing	Visible wire suspension
StoSilent Alpha	0.80	0.82	Class B	Ultrafine	white	90%	Demountable	Recessed visible grid
Sto-Acoustic Plaster	0.45	0.58	Class D	-	white	82%	-	-
Sto-Acoustic Spray Plaster	0.50	0.51	Class D	-	white	71%	-	-

	Board			Solution						
	Panel size	**Thickness (mm)**	**Board weight (kg/m²)**	**Area of application**		**Fire safety DIN 4102**	**Curves**	**Climatic conditions criteria**	**Cooling/ heating**	**'Alu' variant***
				Ceiling	Wall					
	1200 x 800 2400 x 1200	15 mm	5 kg/m²	✓	✓	Class B1		75% RH @ 12°C		✓
	1200 x 800 2400 x 1200	15 mm	5 kg/m²	✓	✓	Class B1	✓	75% RH @ 12°C		✓
	1200 x 625	25 mm	7 kg/m²	✓	✓	Class A2		75% RH @ 12°C		✓
	1200 x 800 2400 x 1200	15 mm	5 kg/m²	✓	✓	Class B1		75% RH @ 12°C		✓
	625x1200	25 mm	7 kg/m²	✓	✓	Class A2		75% RH @ 12°C		✓
	1200 x 800	15 mm	5.4 kg/m²	✓	✓	Class B1		75% RH @ 12°C	✓	✓
	1200 x 800	15 mm	5.4 kg/m²	✓	✓	Class B1		75% RH @ 12°C	✓	✓
	1200 x 1200 2400 x 1200 (2x) 2400 x 1200 (4x) 1200 x 1200 Other sizes available	15 mm	5 kg/m²	✓		Class B1		75% RH @ 12°C		
	1200 x 1200 Corridor tile available	15 mm	5 kg/m²	✓		Class B1		75% RH @ 12°C		
	-	17 mm	-	✓		Class B1		70% RH @ 12°C		
	-	15 mm	-	✓		Class A2	✓	70% RH @ 5°C		✓

*For challenging environments, including plenums

StoSilent Panel & StoSilent Top

Seamless acoustic systems with a choice of fine or ultra-fine finish

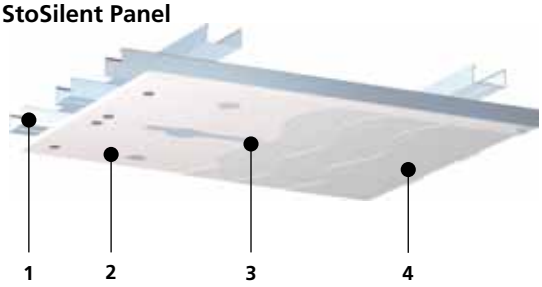
Providing classically seamless acoustic ceiling and atrium linings, StoSilent Panel is the core product in our acoustic portfolio and the system of choice for most applications. StoSilent Panel provides sound absorption values which average at an impressively high 0.65 α_w for the 15mm thick board.

The StoSilent Panel acoustic system features a high performance, suspended, recycled glass acoustic board for high acoustic performance. The system is finished in StoSilent Superfine or StoSilent Top acoustically transparent plaster.

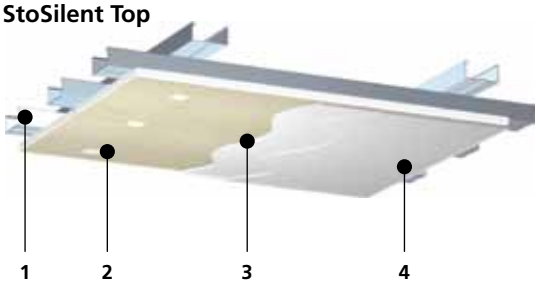
London Metropolitan University

1. Grid system
2. Acoustic board
3. Bonding & Jointing
4. Finish

StoSilent Panel



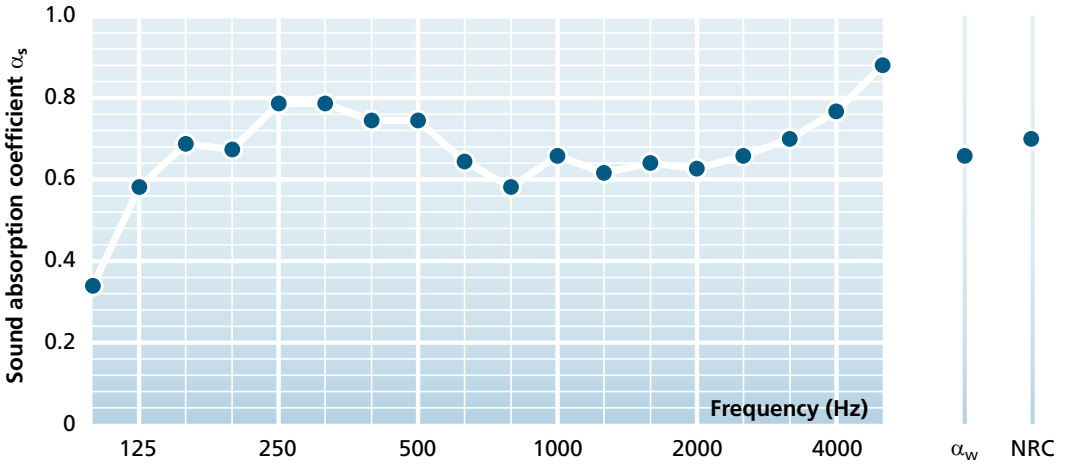
StoSilent Top



System Build-Up

	StoSilent Panel	StoSilent Top
1. Grid system	Galvanised steel suspension system	Galvanised steel suspension system
2. Acoustic board	StoSilent Panel, StoSilent Panel Alu StoSilent Panel Robust, StoSilent Panel Robust Alu	StoSilent Top Panel, StoSilent Top Panel Alu
3. Bonding & Jointing	StoSilent Fix & StoSilent Plan	StoSilent Fix
4. Finish	StoSilent Superfine	StoSilent Top Basic & StoSilent Top Finish

Acoustic performance:
StoSilent Panel with 245mm void and StoSilent Superfine finish



	125			250			500			1000			2000			4000			α_w	NRC
α_s	0.35	0.59	0.69	0.68	0.79	0.79	0.76	0.76	0.64	0.59	0.65	0.61	0.63	0.62	0.65	0.70	0.77	0.84	0.65	0.70
α_p	0.55			0.75			0.70			0.60			0.65			0.75			Absorb. Class: C	

Sound absorption has been measured in accordance with ISO 354. Sound absorption coefficient data and class calculated in accordance with ISO 11654. Noise reduction coefficient calculated in accordance with ASTM C423.

Board dimensions
1200 x 800 x 15 mm
2400 x 1200 x 15 mm

Board weight
5 kg/m²

Minimum void depth
51mm with Sto-Direct Fix Brackets

Light reflectance

StoSilent Superfine	90%
StoSilent Top	75.4%

Cleaning
Clean with a soft brush or vacuum cleaner with brush head attachment.

Climatic conditions
75% RH @ 12°C

Fire performance
Building material Class B1
(limited combustibility)
in accordance with DIN 4102

Environment
StoSilent Panel acoustic board consists of 96% recycled glass.
International naturePlus certified finish

StoColor Range

StoSilent Superfine	white, 465 colours
StoSilent Top	white, 380 colours

StoSilent A-Tec Panel & StoSilent Top A-Tec

Seamless acoustic system for areas requiring high performance

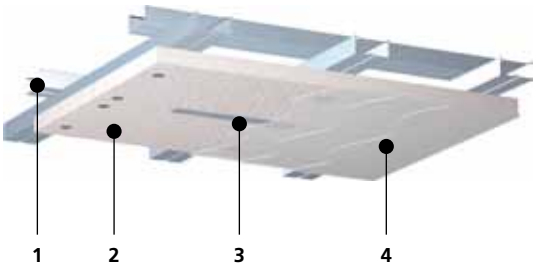
A seamless suspended acoustic system with a deep 25mm board for high mean sound absorption. Designed for rooms with very high levels of background noise and reverberation.

The system is finished in the smooth, ultra-fine finish StoSilent Top or StoSilent Superfine, providing a crisp, contemporary design.

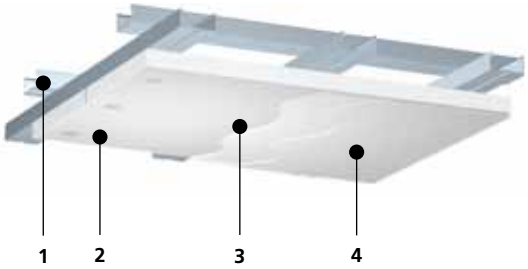
The Walbrook, London

1. Grid system
2. Acoustic board
3. Bonding & Jointing
4. Finish

StoSilent A-Tec Panel



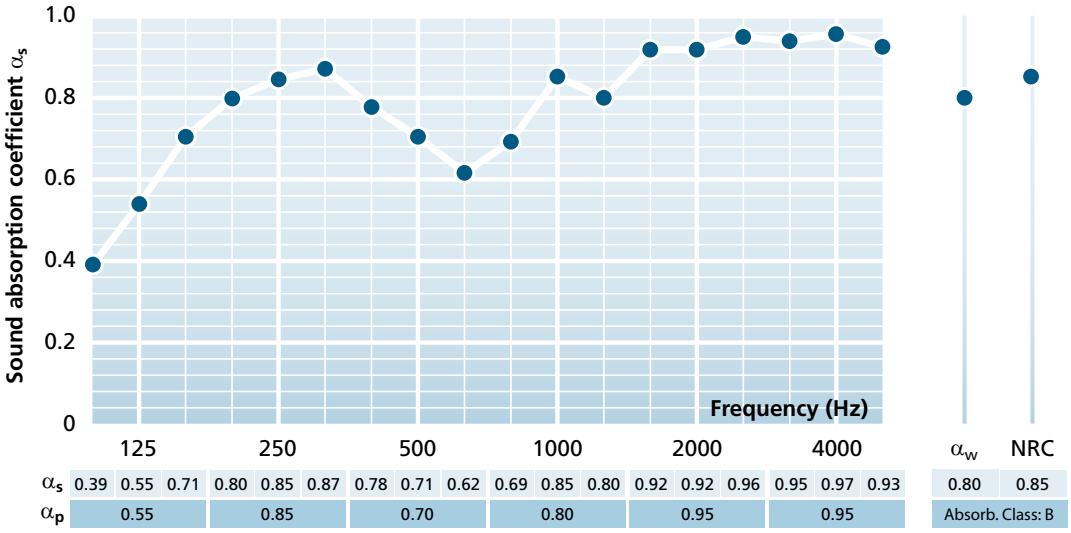
StoSilent Top A-Tec



System Build-Up

	StoSilent A-Tec Panel	StoSilent Top A-Tec
1. Grid system	Galvanised steel suspension system	Galvanised steel suspension system
2. Acoustic board	StoSilent A-Tec Panel, StoSilent A-Tec Panel Alu	StoSilent Top A-Tec Panel, StoSilent Top A-Tec Panel Alu
3. Bonding & Jointing	StoSilent Fix & StoSilent Plan	StoSilent Fix
4. Finish	StoSilent Superfine	StoSilent Top Basic & StoSilent Top Finish

Acoustic performance:
StoSilent A-Tec Panel with 233mm void and StoSilent Superfine finish



α_s	0.39	0.55	0.71	0.80	0.85	0.87	0.78	0.71	0.62	0.69	0.85	0.80	0.92	0.92	0.96	0.95	0.97	0.93	0.80	0.85
α_p	0.55			0.85			0.70			0.80			0.95			0.95			Absorb. Class: B	

Sound absorption has been measured in accordance with ISO 354. Sound absorption coefficient data and class calculated in accordance with ISO 11654. Noise reduction coefficient calculated in accordance with ASTM C423.

Board dimensions
1200 x 625 x 25 mm

Board weight
5 kg/m²

Minimum void depth
60mm with Sto-Direct Fix Brackets

Light reflectance

StoSilent Superfine	90%
StoSilent Top	75.4%

Cleaning
Clean with a soft brush or vacuum cleaner with brush head attachment.

Climatic conditions
75% RH @ 12°C

Fire performance
Building material Class B1 (limited combustibility) in accordance with DIN 4102

Environment
StoSilent Panel acoustic board consists of 96% recycled glass. International naturePlus certified finish

StoColor Range

StoSilent Superfine	white, 465 colours
StoSilent Top	white, 380 colours

StoSilent Cool & StoSilent Cool Top

Seamless acoustic chilled ceiling system

StoSilent Cool is an energy-efficient climatic ceiling system that allows the room to be heated or cooled, providing a comfortable temperature all year round. The system is equipped with a capillary tubing grid that can be connected to any water supply.

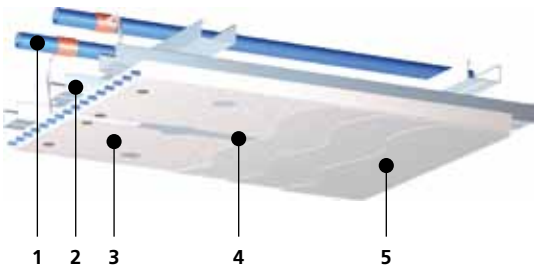
As a seamless Sto acoustic board system, StoSilent Cool also boasts exceptional acoustic performance and a wide range of design options, including seamless expanses of up to 150m².

StoSilent Cool has been designed to meet the design standard EN ISO 7730.

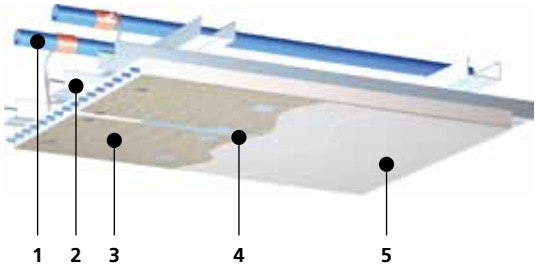
StoSilent Cool pipework is integrated into the system.

1. Pipework
2. Grid system
3. Acoustic board
4. Bonding & Jointing
5. Finish

StoSilent Cool



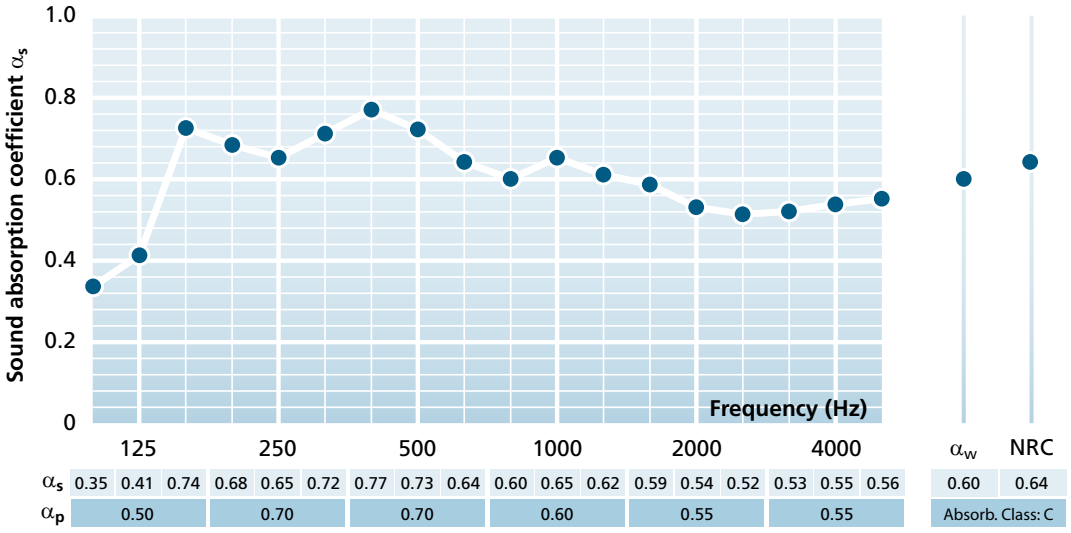
StoSilent Cool Top



System Build-Up

	StoSilent A-Tec Panel	StoSilent Top A-Tec
1. Pipework	Integrated pipework	Integrated pipework
2. Grid system	Galvanised steel suspension system	Galvanised steel suspension system
3. Acoustic board	StoSilent Cool Panel, StoSilent Cool Panel Alu	StoSilent Cool Top Panel, StoSilent Cool Top Panel Alu
4. Bonding & Jointing	StoSilent Fix & StoSilent Plan	StoSilent Fix
5. Finish	StoSilent Superfine	StoSilent Top Basic & StoSilent Top Finish

Acoustic performance:
StoSilent Cool with 245mm void and StoSilent Superfine finish



	125			250			500			1000			2000			4000			α_w	NRC
α_s	0.35	0.41	0.74	0.68	0.65	0.72	0.77	0.73	0.64	0.60	0.65	0.62	0.59	0.54	0.52	0.53	0.55	0.56	0.60	0.64
α_p	0.50			0.70			0.70			0.60			0.55			0.55			Absorb. Class: C	

Sound absorption has been measured in accordance with ISO 354. Sound absorption coefficient data and class calculated in accordance with ISO 11654. Noise reduction coefficient calculated in accordance with ASTM C423.

Board dimensions
1200 x 800 x 15 mm

Board weight
5 kg/m²

Minimum void depth
Dependent on pipework

M&E Performance
Cooling capacity: 75 W/m² (polypropylene tubing system in accordance with DIN 4715)
Heating capacity: 90 W/m² (polypropylene tubing system in accordance with DIN 4706)

StoColor Range

StoSilent Superfine	white, 465 colours
StoSilent Top	white, 380 colours

Climatic conditions
75% RH @ 12°C

Fire performance
Building material Class B1 (limited combustibility) in accordance with DIN 4102

Environment
StoSilent Panel acoustic board consists of 96% recycled glass. International naturePlus certified finish

Light reflectance

StoSilent Superfine	90%
StoSilent Top	75.4%

Cleaning
Clean with a soft brush or vacuum cleaner with brush head attachment.

StoSilent Alpha

Demountable acoustic grid system

StoSilent Alpha is our approach to an acoustic, demountable grid system, aimed at specifiers wanting to bridge the gap between restrictive budgets and aesthetic ideals. The system combines the flexibility of a semi-concealed accessible grid acoustic panel system with the enhanced aesthetics of a large format 1200 x 1200 mm tile.

Acoustic grid systems are popular within the industry due to being an affordable, familiar and comparatively easy system to install. They are the perfect partner for the StoSilent Panel system.

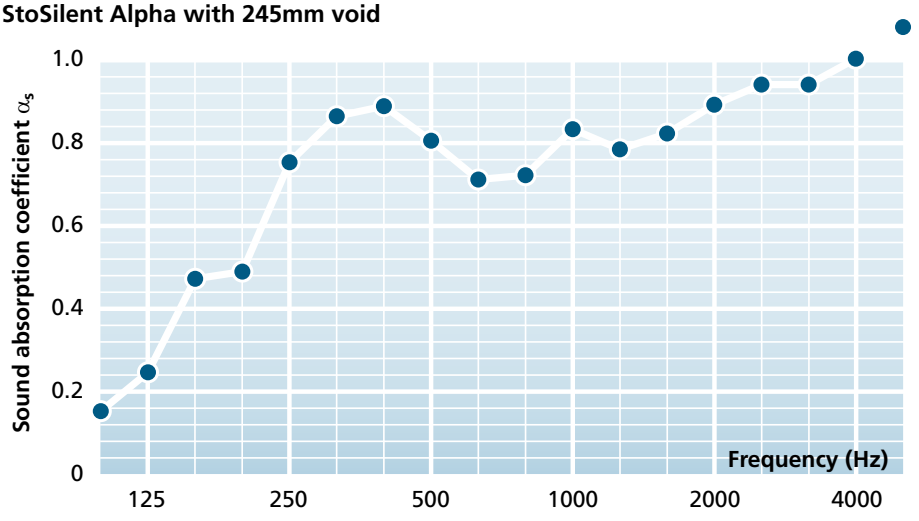
Lightweight and easy to handle, the StoSilent Alpha tiles are quick and easy to install. Made of 96% recycled glass, each tile combines acoustic performance with sustainable manufacturing processes. The large format tiles also minimise unwanted overhead lines and present a far superior aesthetic.

The tiles are rigid and stable, and do not sag or deflect over time. The system is capable of withstanding significant loads.

An economical, high performance option offering the system designer an easy access solution combined with an attractive finish.

StoSilent Ultrafine
The extremely light texture of the StoSilent Ultrafine finish is used exclusively on the StoSilent Alpha range of suspended acoustic canopies.

Acoustic performance:
StoSilent Alpha with 245mm void



α_s	0.17	0.25	0.47	0.49	0.77	0.86	0.89	0.81	0.72	0.73	0.84	0.79	0.83	0.89	0.95	0.95	1.01	1.11	0.85	0.80
α_p	0.30			0.70			0.80			0.80			0.90			1.00			Absorb. Class: B	

Sound absorption has been measured in accordance with ISO 354. Sound absorption coefficient data and class calculated in accordance with ISO 11654. Noise reduction coefficient calculated in accordance with ASTM C423.

Board dimensions
1200 x 1200 x 15 mm
Corridor tile available (300mm wide)

Board weight
5 kg/m²

Minimum void depth
130mm (allows for easy demountability)

Light reflectance
StoSilent Ultrafine 90%

Cleaning
Clean with a soft brush or vacuum cleaner with brush head attachment.

Climatic conditions
75% RH @ 12°C

Fire performance
Building material Class B1 (limited combustibility) in accordance with DIN 4102

Environment
Acoustic board consists of 96% recycled glass. International naturePlus certified finish

StoColor Range
StoSilent Ultrafine white

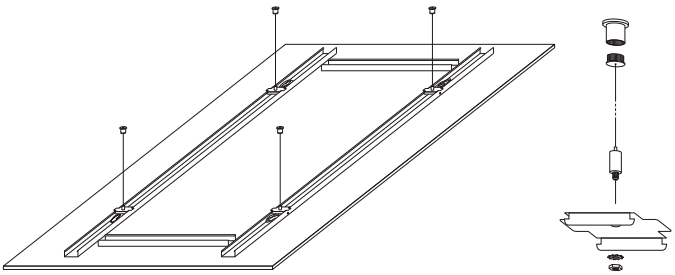
StoSilent Modular

Suspended acoustic canopies

StoSilent Modular versatile ceiling elements can be integrated into new or existing room concepts to provide a marked improvement in acoustic performance. A range of design options provide for astounding aesthetics.

The simple method of installation, suspended on wire hangers, allows the system to be removed and installed elsewhere.

Improved acoustics for CCA buildings
The variability of the void depth from the soffit and the minimal contact area of the mounting points mean that the ceiling element is an ideal means of improving acoustics in concrete core activated or thermal mass buildings.



European Investment Bank, London

StoSilent Modular ceiling canopies are available in four standard formats:

StoSilent Modular 50
1200 x 1200 mm

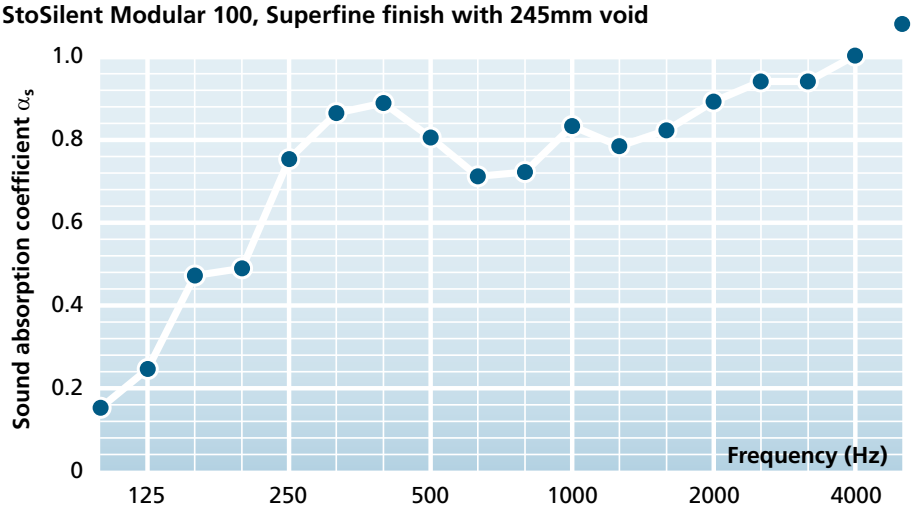
StoSilent Modular 100
with optional luminaire tubular light.
2400x1200 mm

StoSilent Modular 200
with luminaire and optional glass surround
(2x) 2400 x 1200 mm

StoSilent Modular 400
with four integrated luminaire elements.
(4x) 1200 x 1200 mm

All StoSilent Modular options are available with a StoSilent Superfine or StoSilent Top finish and optional MHS acoustic foam backing. Bespoke StoSilent Modular designs are also available on request.

Acoustic performance:
StoSilent Modular 100, Superfine finish with 245mm void



α_s	0.17	0.25	0.47	0.49	0.77	0.86	0.89	0.81	0.72	0.73	0.84	0.79	0.83	0.89	0.95	0.95	1.01	1.11
α_p	0.30			0.70			0.80			0.80			0.90			1.00		

0.85	0.80
Absorb. Class: B	

Sound absorption has been measured in accordance with ISO 354. Sound absorption coefficient data and class calculated in accordance with ISO 11654. Noise reduction coefficient calculated in accordance with ASTM C423.

Board dimensions
1200 x 1200 x 15 mm
2400 x 1200 x 15 mm
(2x) 2400 x 1200 x 15 mm
(4x) 1200 x 1200 x 15 mm
Bespoke sizes available on request

Board weight
5 kg/m²

Minimum void depth
100 mm

Light reflectance

StoSilent Superfine	90%
StoSilent Top	75.4%

Cleaning
Clean with a soft brush or vacuum cleaner with brush head attachment.

Fire performance
Building material Class B1 (limited combustibility) in accordance with DIN 4102

Climatic conditions
75% RH @ 12°C

Environment
Acoustic board consists of 96% recycled glass. International naturePlus certified finish

StoColor Range

StoSilent Superfine	white, 465 colours
StoSilent Top	white, 380 colours

Acoustic Plaster Systems

Perfect solutions for special requirements

In certain building scenarios, it is not possible to use a suspended acoustic ceiling system. For example, cross vaults in listed historical buildings require direct coating.

For these cases, Sto has developed acoustic plaster systems for direct application to ceilings and walls. Sto acoustic plasters enable curves in two directions and minimal radii, and are suitable for use in areas of high humidity.

Sto acoustic plasters are suited for new build and refurbishment projects where acoustic performance is required without diminishing floor-to-ceiling height.

1. Substrate preparation
2. Bonding
3. Finish

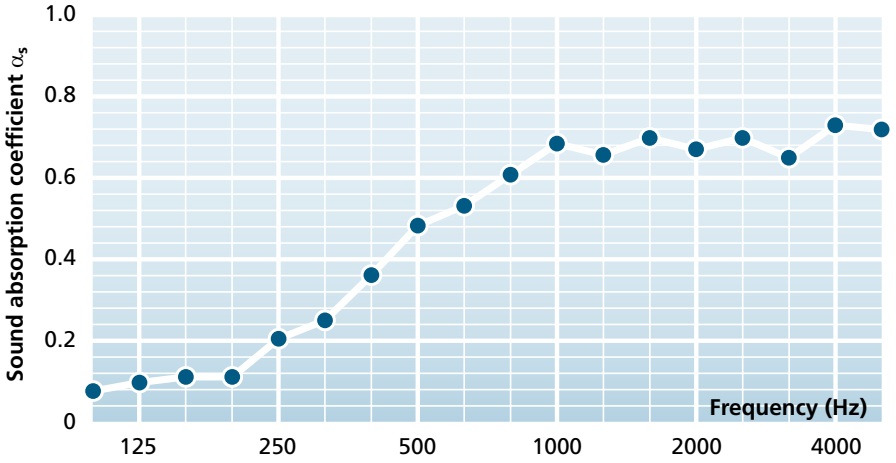
Sto-Acoustic Spray Plaster

Sto-Acoustic Plaster

System Build-Up

	Sto-Acoustic Spray Plaster	Sto-Acoustic Plaster
1. Substrate preparation	StoLevell In Z levelling coat & StoSilent Prim	StoSilent Prim
2. Bonding	StoSilent Quartz	StoSilent Quartz
3. Finish	Sto-Acoustic Spray Plaster Apply in 5 coats	Sto-Acoustic Plaster 3-component finish. – apply each component as a separate coat

Acoustic performance: Sto-Acoustic Spray Plaster



α_s	0.07	0.10	0.12	0.12	0.21	0.26	0.37	0.47	0.54	0.61	0.68	0.66	0.70	0.67	0.70	0.65	0.74	0.73	0.45	0.51
α_p	0.10			0.20			0.45			0.65			0.70			0.70			Absorb. Class: D	

Sound absorption has been measured in accordance with ISO 354. Sound absorption coefficient data and class calculated in accordance with ISO 11654. Noise reduction coefficient calculated in accordance with ASTM C423.

Fire performance
Building material Class A2 (limited combustibility) in accordance with DIN 4102

Climatic conditions
Spray Plaster: 70% RH @ 5°C
Acoustic Plaster: 70% RH @ 12°C

Light reflectance
71% Sto-Acoustic Spray Plaster
82% Sto-Acoustic Plaster

StoColor Range
White or 800 colours when overpainted with StoSilent Color paint.

Cleaning
Clean with a soft brush or vacuum cleaner with brush head attachment.

Simple Precision

StoSilent acoustic systems are simple to install, thanks to their low board weight, high rigidity and resistance to humidity. Sto provides clear, easy-to-follow installation guidelines for all StoSilent systems.

All Sto acoustic systems should be installed by Sto applicators at the correct point in the building programme. On-site assistance from Sto Technical Advisors is available if required.

The boards are easily cut with a knife or saw, and because they are almost entirely free of fibres, they pose no health risk to the installer.

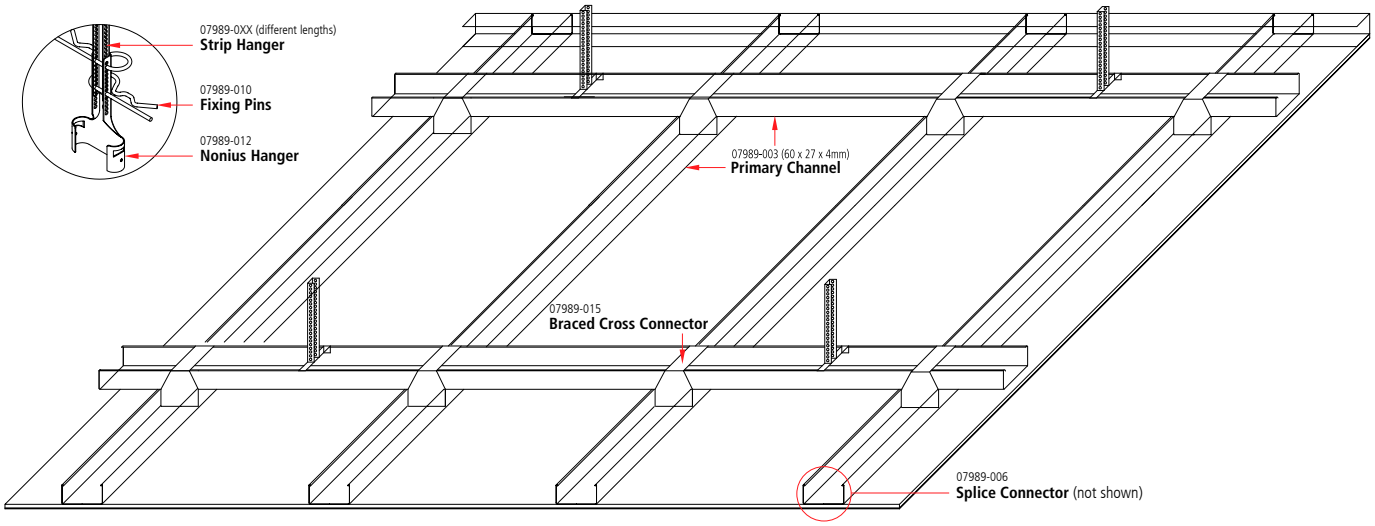
Climatic conditions
Sto acoustic systems must be applied in dry buildings and protected from damp during installation.

Room and substrate temperatures must be above +5°C with max. 70% relative humidity (RH). Drying times of materials are affected by climatic conditions in the room.

Maintenance and cleaning
General cleaning of loose dust and dirt from StoSilent systems can be easily achieved using a soft brush or vacuum cleaner.

Re-decoration and repairs
If necessary, can be performed by using an industrial vacuum cleaner with brush fitting to remove built-up dust from the surface. Spray StoSilent Color paint crosswise 1-2 times at low pressure.

The boards can be rasped back and re-sprayed with StoSilent Superfine. Care must be taken not to reduce the acoustic absorption properties.






Detailing in abundance

To enhance any particular environment, the specifier may wish to choose any number of different ways of detailing the perimeter of the StoSilent ceiling.

In all cases, it is important that the StoSilent ceiling is not mechanically fixed to the wall, to prevent cracking in the acoustic lining from movement of dissimilar substrates.

Installing a slight perimeter gap between the ceiling and the wall also allows for pressure equalisation. This simple detail stops undesirable surface marks appearing due to high air pressure forcing dirt particles through to the surface.

Detail design is included as part of the technical support from Sto.

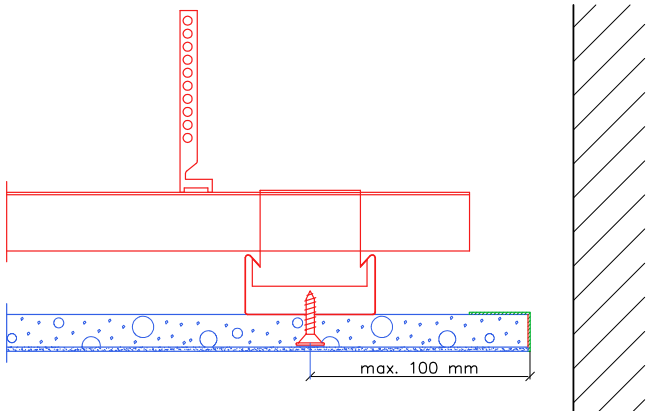


Fig A. Typical perimeter detailing – Return air with no exposed trim.
Choices of bead:
04075-004 – StoSilent Top Bead 16.5mm (StoSilent Panel)
04075-001 – StoSilent Top Edge Bead
04075-006 – StoSilent Stop Bead 26.5 mm (StoSilent A-Tec Panel)

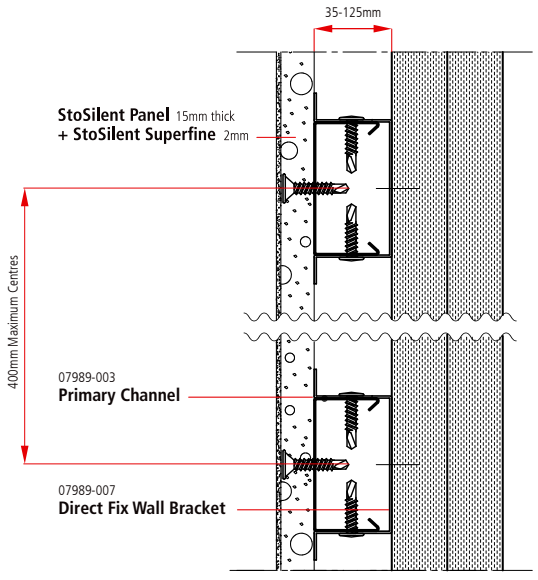


Fig B. Typical wall mounted acoustic solution by Sto-Direct Fix Wall Brackets.

Note: These details are general and non-binding proposals, which are only schematic in nature.

Glossary of acoustic terminology

Sound

An oscillation of pressure transmitted as a wave and composed of frequency (Hz) and sound pressure level (dB).

Sound is perceived by the human ear in the decibel range of 0 to 120 dB, and the frequency range of 20 to 20,000 Hz.

Frequency (Hz)

The number of cycles per second of a sound wave, measured in hertz (Hz). Frequency is perceived as pitch, with higher frequencies as higher pitch sounds.

The average adult human can perceive frequencies between 20 and 16,000 Hz, while young children can perceive frequencies between 20 and 20,000 Hz.

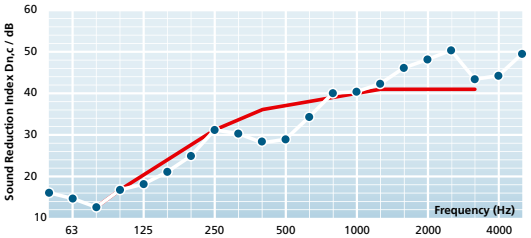
Sound Pressure Level (SPL/dB)

The pressure of a sound, measured in decibels (dB). Sound pressure is perceived as loudness. 0 dB is known as the threshold of human hearing, while 120 dB is the pain threshold.

Sound insulation (Dn,c,w)

The ability of a building element to reduce sound transmission through it, typically measured at frequencies 100-4000 Hz.

Airborne sound insulation is expressed by the value Dn,c,w, in accordance with ISO 140-9.



Graph showing the sound insulation performance of StoSilent Panel, Dn,c,w = 37dB

Reverberation Time (RT60)

The time required, in seconds, for the average sound in a room to decrease by 60 dB after the source stops emitting sound. Reverberation Time is affected by the size of the space and the amount of reflective or absorptive surfaces within that space.

Highly sound absorbent surfaces will prevent it from reflecting back into the space, providing shorter reverberation times. Reflective surfaces will reflect the sound and increase the reverberation time within the space.

Larger spaces generally have longer reverberation times than smaller spaces and require more sound absorbent materials to achieve the same reverberation time as a smaller space.

Speech intelligibility

The clarity of speech in a room is dependent on the level of background noise, reverberation time and room shape.

Speech intelligibility is typically measured in rooms using the Rapid Speech Transmission Index (RASTI). A transmitter broadcasts a modulated noise signal from a loudspeaker, and a microphone receiver measures the clarity of the noise at the receiver position and gives a read-out of the RASTI value.

Sound absorption (α)

The sound absorption properties of a material are expressed as a sound absorption coefficient α at specific frequencies. The α value is a ratio between 1 (all sound absorbed) and 0 (no sound absorbed).

Sound absorption coefficient (α_s)

The sound absorption coefficient at ⅓ octave band centre frequencies, measured in accordance with ISO 354. The results provide the most detailed values for sound absorption, and form the basis for the simplified sound absorption classifications.

Practical sound absorption coefficient (α_p)

The average of the three α_s values centred on the ⅓ octave band centre frequency, measured in accordance with EN ISO 11654.

A simplified, yet accurate measurement of the sound absorption coefficient for practical use.

Weighted sound absorption coefficient (α_w)

Measured in accordance with ISO 11654. Practical sound absorption coefficient α_p values at given standard frequencies are compared with reference curve α_w.

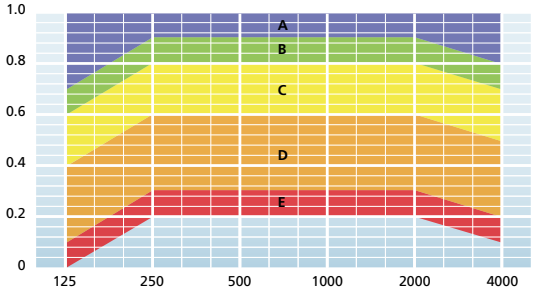
The reference curve is shifted downwards in increments of 0.05 to the point where the sum of the negative deviations from the measured values is ≤ 0.10. The α_w value is then recorded as the value of the reference curve at 500 Hz.

α_w has been adopted as the European standard measurement for suspended ceilings.

Sound Absorption Class A-E

Weighted sound absorption coefficient α_w values are compared to a series of fixed reference curves, providing a general indication of the sound absorption capability of the material.

Absorption classes A to E are described in international standard EN ISO 11654.



Graph showing the fixed reference curves for calculating the Sound Absorption Classes A-E

Noise Reduction Coefficient (NRC)

A single value for sound absorption calculated in accordance with ASTM C423. The NRC is the mean average α_s value at frequencies 250, 500, 1000 and 2000 Hz.

Sabin

A unit of sound absorption. One square metre of 100% absorbing material has a value of one metric Sabin. The unit is named in honour of Wallace Clement Sabine.

The total absorption in sabins can be calculated by:

$A = S1\alpha1+S2\alpha2+...+Sn\alpha n = \Sigma Si\alpha i$

where:

A = the absorption of the room (m^2 sabin)

Sn = area of the actual surface (m^2)

αn = absorption coefficient of the actual surface

Head Office
Sto Ltd.
2 Gordon Avenue
Hillington Park
Glasgow G52 4TG
Tel +44 (0)141 892 8000
Fax +44 (0)141 404 9001
info.uk@sto.com
www.sto.co.uk

Southern Office & Distribution Centre
Sto Ltd.
Antura
Kingsland Business Park
Wade Road
Basingstoke RG24 8EN
Tel +44 (0)1256 332770
Fax +44 (0)1256 810887

Midlands Training & Distribution Centre
Sto Ltd.
Unit 700
Catesby Park
Kings Norton
Birmingham B38 8SE
Tel +44 (0)121 459 5149
Fax +44 (0)121 459 0632

Ireland Office & Distribution Centre
Sto Ltd.
Unit 69
Western Parkway Business Park
Lower Ballymount Road
Dublin 12
Tel +353 (0)1460 2305
Fax +353 (0)1460 2455
info.ie@sto.com
www.sto.ie