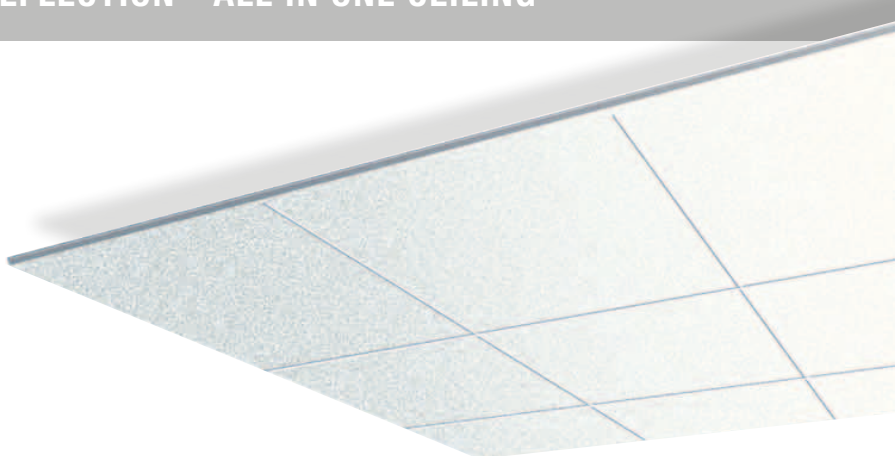
PERFORMANCE CEILINGS

More scope for innovation

NEW
in Acoustic Range
THERMATEX Alpha ONE & HD
THERMATEX Silence
THERMATEX SF Acoustic

THERMATEX ACOUSTIC CEILING RANGE

ABSORPTION, INSULATION AND REFLECTION - ALL IN ONE CEILING



DER BLAUE ENGEL
weil emissionsarm
schützt die GESUNDHEIT

MADE IN GERMANY

KNAUF

THERMATEX ACOUSTIC CEILING RANGE - PERFORMANCE CHOICE WITH A UNIFORM APPEARANCE

The AMF THERMATEX Acoustic Range offers a totally new concept for suspended ceiling systems. The tissue-faced tiles cover different levels of sound absorption while displaying the same appearance.

Starting with reflecting tiles, through absorption to panels with high absorption values - AMF covers the complete performance range. Exceptional sound insulation is also achieved: with up to 44 dB room-to-room attenuation, THERMATEX Silence gives a very high performance for a suspended ceiling with an open void.

The AMF THERMATEX Acoustic Range can provide solutions for almost every application. The key properties of the range ensure that not only a single product can be used, but also a combination of products giving different performance characteristics and the same appearance (e.g. THERMATEX Alpha and THERMATEX Acoustic RL).

CONTENTS

APPLICATIONS

OFFICE BUILDINGS

- Individual offices
- Open-plan offices
- Conference rooms
- Cafeterias
- Storage areas
- Corridors & circulation areas

PUBLIC BUILDINGS

- Assembly halls
- Conference rooms
- Counter halls
- Dining rooms
- Foyers
- Technical service rooms
- Corridors & circulation areas

SCHOOLS

- Classrooms
- Lecture theatres
- Staff rooms
- Auditoriums
- Student refectories
- Work rooms
- Changing rooms
- Corridors & circulation areas
- Assembly halls

HEALTHCARE

- Intensive care
- Laboratories
- Consultation rooms
- Patient rooms
- Toilets rooms
- Kitchen areas
- Wet areas
- Offices / Administration
- Foyer
- Corridors & circulation areas

SPECIAL APPLICATIONS

Special acoustic requirements for buildings such as cinemas can be achieved by using a suspended ceiling. AMF THERMATEX Alpha black, with its high level of sound absorption, can meet these stringent requirements.

Even bowling alleys that have high noise levels can be treated to achieve optimal room acoustics.

WHY THE THERMATEX ACOUSTIC RANGE?

PLUS POINTS

- White smooth surface with a variety of acoustic properties
- Flexibility of use within the room, to meet acoustic standards and changes of function
- Ideal adaptation of both sound absorption and sound attenuation to meet the room´s requirements
- Improvement of speech intelligibility through both sound absorption and reflection with a single visual tile finish
- Fire protection requirements and hygiene requirements combined with the acoustic performance of a ceiling system
- THERMATEX ceiling tiles are only slightly air permeable due to their high density. Thus, only a small amount of dust particles are deposited on the ceilings surface – the ceiling remains clean.

The THERMATEX Acoustic Range offers a combination of design and performance benefits in a single product line. All the ceiling tiles within the THERMATEX Acoustic Range have a white tissue-face that gives a smooth, elegant surface finish. The products cover the range of low to high sound absorption (in accordance with VDI 3755) as well as achieving sound attenuation values of 28 to 44 dB. Both visual and performance solutions can be met by THERMATEX Acoustic ceilings.

MATERIAL DESCRIPTION

THERMATEX Acoustic ceiling tiles are made from a mineral baseboard manufactured by the wet-felt process. This baseboard has different perforations depending on the acoustic performance that is required. The tile is then finished with an acoustic fleece, giving a smooth, white elegant appearance.

New generation technology from AMF has created high absorption products from wet-felt mineral tiles, with α_w values of 0.15 to 1.00 from one surface design.

THERMATEX Acoustic ceiling tiles are made from new generation bio-soluble mineral wool, clay, starch and perlite, and are therefore based on natural raw materials. The RAL Quality Mark guarantees the quality and safety of mineral wool products.

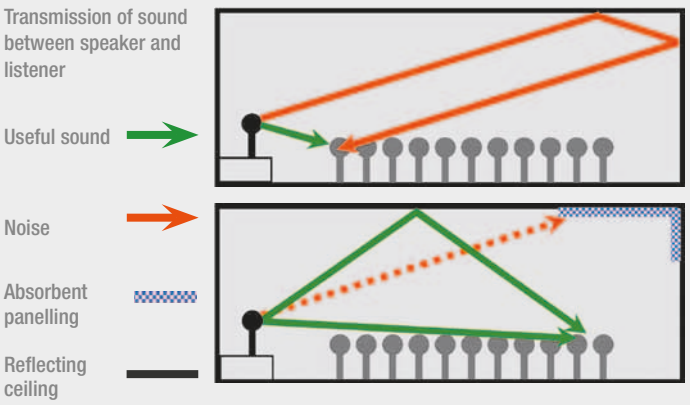
OVERVIEW THERMATEX ACOUSTIC RANGE

					Edges							
THERMATEX ceiling tile	Thickness (mm)	α_w-Values EN ISO 11654	*NRC* ASTM C423	$D_{n,c,w}$ = (EN 20140-9) $D_{n,f,w}$ = (EN 10848)	SK	VT 15/24	VT-S 15/24	VT-S 15F	AW/SK	GN/SK	AW/GN	SF
Alpha ONE	24	1.00	1.00	29 dB	✓	✓	✓					
Alpha	19	0.95	0.90	28 dB	✓	✓	✓					
Alpha HD	19	0.90	0.85	30 dB					✓	✓	✓	
Silence	43	0.85 (H)	0.90	44 dB	✓		✓					
Thermofon	15	0.80 (H)	0.85	28 dB	✓		✓					
SF Acoustic	24	0.65 (H)	0.70	38 dB								✓
Acoustic	19	0.65 (H)	0.70	38 dB	✓	✓	✓		✓	✓	✓	
dB Acoustic 24 mm	24	0.65 (H)	0.70	41 dB	✓	✓	✓		✓	✓		
dB Acoustic 30 mm	30	0.65 (H)	0.70	43 dB	✓		✓	✓				
Acoustic RL	19	0.15 (L)	0.15	38 dB	✓	✓						
Alpha black	19	1.00	0.90	28 dB	✓							
Alpha colored	19	0.90	0.95	28 dB	✓							

SOUND ABSORPTION

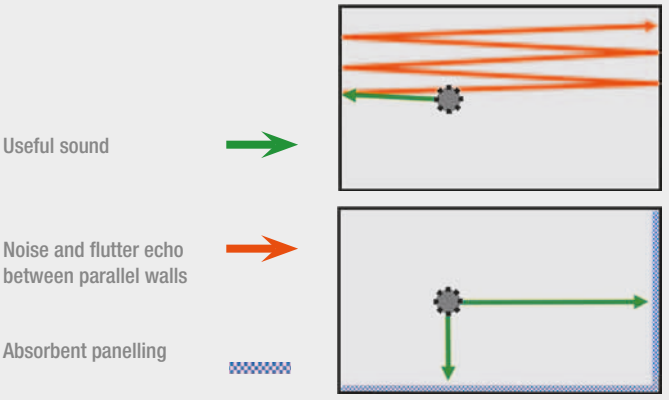
OPTIMAL DIRECTION OF SOUND

High sound absorption will dampen the sounds in a room: both unwanted sounds, such as noise and useful sounds, such as directed speech. However, a reverberation time calculation cannot be the sole assessment criterion used for speech intelligibility. Utilisation of both sound absorbing and sound reflecting zones within a space allows discrimination between those acoustic sources which are to be emphasized and those which are to be reduced. This is why the THERMATEX Acoustic Range has been developed.
The design challenge is to correctly direct sound waves from, for example, the speaker to the listener by using both absorbing and reflecting surfaces and elements. This will adjust the reverberation time in relation to both frequency and tolerances of speech intelligibility.



ABSORBERS, DIFFUSERS AND REFLECTORS

A combination of different absorbers such as acoustic ceilings, wall panels and rafts make acoustic correction of the room much easier. It must be ensured that the sound absorption covers the whole frequency range. Fixtures and fittings reflect sounds and this has a positive effect on sound distribution within a room. Individual elements such as sound absorbing ceiling rafts and wall panels are sophisticated solutions to reverberation time problems.
The THERMATEX Acoustic Range offers ceiling absorbers with a variety of performance characteristics. The absorbent properties of these products ensure that reverberation time targets are achieved- and with the same surface finish.



Acoustic Requirements for Education:

REVERBERATION TIMES AND SOUND INSULATION ACCORDING TO BUILDING BULLETIN 93

Building Bulletin 93 (BB93) aims to provide a guide for specifiers, contractors, clients and building control personnel involved in the design of new school buildings.
Building Control authorities are likely to require the following design information based on BB93 requirements.

- Performance standards for reverberation times in teaching and study areas
- Performance standards for airborne sound insulation between rooms and impact sound insulation of floors
- Absorption treatment for corridors, entrance halls and stairways.
- Performance standards for speech intelligibility (STI) in open plan spaces.

Speech intelligibility and sound clarity in classrooms are very important and the reverberation of sound in those areas can have a dramatic effect on the ability of both pupils and teachers to hear and distinguish sounds.

SOUND INSULATION

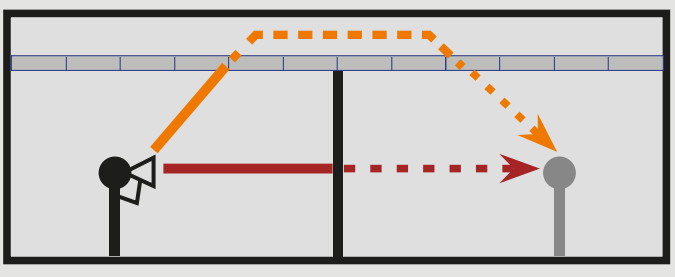
Sound is transmitted between rooms through both the partition wall and by flanking transmission through many sound leakage paths. THERMATEX dB Acoustic in 30 mm thickness achieves excellent sound attenuation of 43 dB which meets office privacy standards. No further cavity barriers above the partition, or mineral wool overlays, are needed. This means easy access to the ceiling void; continuity of the acoustic performance; and simpler, quicker maintenance of installed services.

Transmission Paths

Transmission of sound between rooms

Transmission of sound through the ceiling

Higher sound insulation
from the THERMATEX Acoustic Range



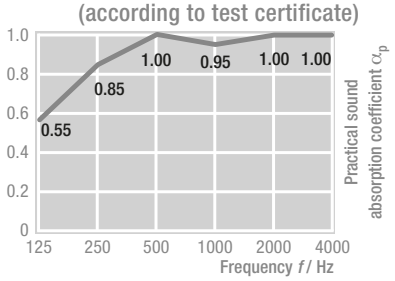
THERMATEX ACOUSTIC PRODUCT RANGE

THERMATEX Alpha ONE

THERMATEX Alpha ONE is a new wet-felt mineral tile which provides highest sound absorption values.

System: C
Edges: SK, VT 15/24, VT-S 15/24
Sizes: 600 x 600 mm,
625 x 625 mm,
Further sizes available to order
Thickness: 24 mm (c. 3.8 kg/m²)

α_w = 1.00 as per EN ISO 11654
NRC = 1.00 as per ASTM C 423
extremely absorbing
$D_{n,f,w}$= 29 dB as per EN 10848
(according to test certificate)



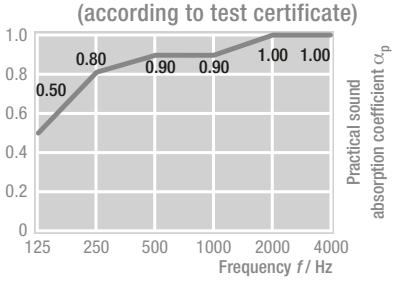
THERMATEX Alpha

THERMATEX Alpha is a high absorption mineral tile produced by the wet-felt process. In addition to Class A sound absorption THERMATEX Alpha also offers good fire protection and excellent handling.

System: C
Edges: SK, VT-S 15/24,
VT 15/24 on request
Sizes: 600 x 600 mm,
600 x 1200 mm,
625 x 625 mm,
Further sizes available to order
Thickness: 19 mm (c. 3.0 kg/m²)

New values

α_w = 0.95 as per EN ISO 11654
NRC = 0.90 as per ASTM C 423
extremely absorbing
$D_{n,f,w}$= 28 dB as per EN 10848
(according to test certificate)

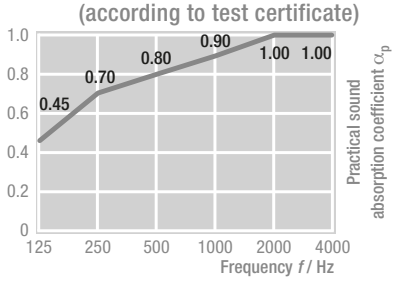


THERMATEX Alpha HD

THERMATEX Alpha HD offers the benefits of an extremely absorbing ceiling tile combined with a concealed grid construction.

System: F, I, A
Edges: AW/GN, AW/SK, GN/SK
Sizes: 300 x 1800 mm,
600 x 600 mm,
625 x 625 mm,
Further sizes available to order
Thickness: 19 mm (c. 3.6 kg/m²)

α_w = 0,90 as per EN ISO 11654
NRC = 0,85 as per ASTM C 423
extremely absorbing
$D_{n,f,w}$= 30 dB as per EN 10848
(according to test certificate)

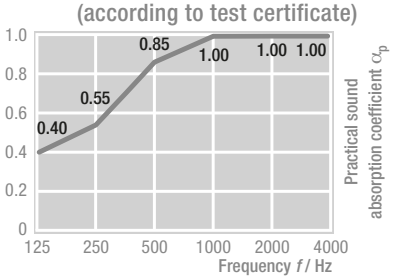


THERMATEX Silence

THERMATEX Silence is a fleece coated ceiling made from two mineral boards bonded together. The special construction provides excellent sound absorption as well as high sound attenuation.

System: C
Edges: SK, VT 15/24, VT-S 15/24
Sizes: 600 x 600 mm,
625 x 625 mm,
600 x 1200 mm,
625 x 1250 mm,
Further sizes available to order
Thickness: 43 mm (c. 10.8 kg/m²)

α_w = 0.85 (H) as per EN ISO 11654
NRC = 0.90 as per ASTM C 423
extremely absorbing
$D_{n,f,w}$= 44 dB as per EN 10848
(according to test certificate)

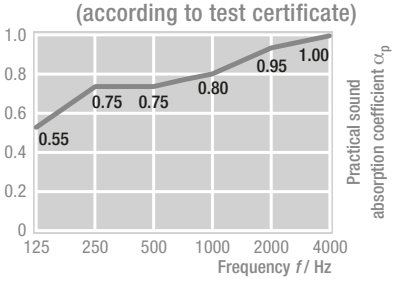


THERMATEX Thermofon

THERMATEX Thermofon is a low density wet-felt mineral tile that offers excellent sound absorption values.

System: C
Edges: SK , VT-S 15/24
Sizes: 600 x 600 mm,
600 x 1200 mm,
625 x 625 mm,
Thickness: 15 mm (c. 2.4 kg/m²)

α_w = 0.80 (H) as per EN ISO 11654
NRC = 0.85 as per ASTM C 423
extremely absorbing
$D_{n,c,w}$= 28 dB as per EN 20140-9
(according to test certificate)

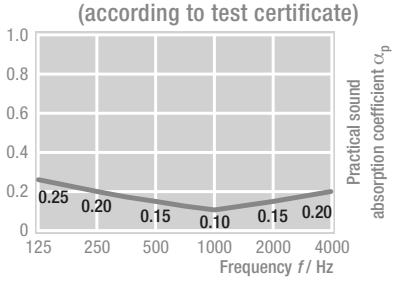


THERMATEX Acoustic RL

THERMATEX Acoustic RL completes the product range as a ceiling tile with special sound reflection properties.

System: C
Edges: SK, VT 15/24
Sizes: 600 x 600 mm,
625 x 625 mm,
Further sizes available to order
Thickness: 19 mm (c. 5.8 kg/m²)

α_w = 0.15 (L) as per EN ISO 11654
NRC = 0.15 as per ASTM C 423
hardly absorbing
$D_{n,c,w}$= 38 dB as per EN 20140-9
(according to test certificate)

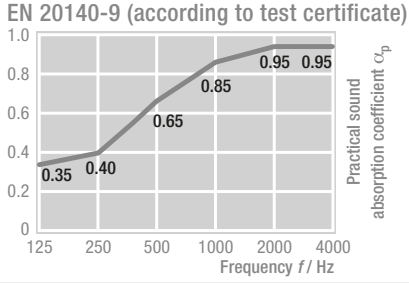


THERMATEX Acoustic

THERMATEX Acoustic combines excellent sound absorption and good sound attenuation to provide high performance requirements for acoustical comfort.

System: C, F, I, A
Edges: SK, VT 15/24, AW, GN
Sizes: 600 x 600 mm,
600 x 1200 mm,
625 x 625 mm,
300 x 1200 - 1800 mm,
Further sizes available to order
Thickness: 19 mm (c. 4.6 kg/m²)

α_w = 0.65 (H) as per EN ISO 11654
NRC = 0.70 as per ASTM C 423
highly absorbing
$D_{n,c,w}$= 38 dB (40 dB for planks) as per EN 20140-9 (according to test certificate)

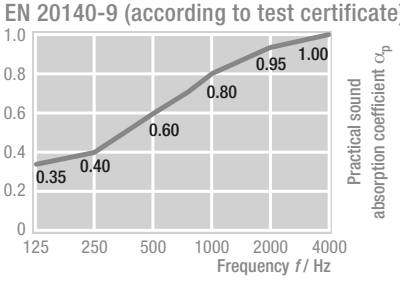


THERMATEX dB Acoustic 24 mm

THERMATEX dB Acoustic 24 mm is a ceiling tile that provides a high level of sound attenuation and insulation. The tissue-faced perforated baseboard also ensures good sound absorption.

System: C, F, I
Edges: SK, VT 15/24, AW/SK, GN/SK
Sizes: 600 x 600 mm,
625 x 625 mm,
300 x 1800 mm,
Further sizes available to order
Thickness: 24 mm (c. 8.4 kg/m²)

α_w = 0.65 (H) as per EN ISO 11654
NRC = 0.70 as per ASTM C 423
highly absorbing
$D_{n,c,w}$= 41 dB (43 dB for planks) as per EN 20140-9 (according to test certificate)

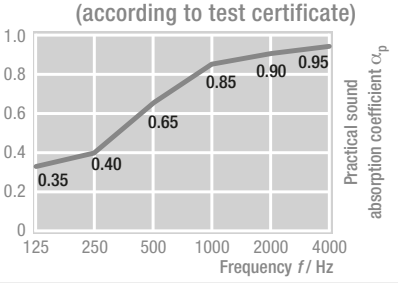


THERMATEX dB Acoustic 30 mm

For outstanding sound attenuation to an enhanced performance level, THERMATEX dB Acoustic 30 mm with its extra 6 mm baseboard thickness meets this demand.

System: C, F, I
Edges: SK, VT-S 15, AW/SK
Sizes: 600 x 600 mm,
625 x 625 mm,
300 x 1800 mm,
Further sizes available to order
Thickness: 30 mm (c. 10.5 kg/m²)

α_w = 0,65 (H) as per EN ISO 11654
NRC = 0,70 as per ASTM C 423
highly absorbing
$D_{n,c,w}$= 43 dB as per EN 20140-9 (according to test certificate)

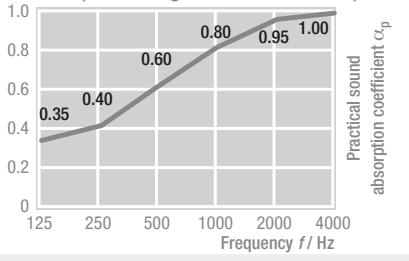


THERMATEX SF Acoustic

With the acoustic ceiling THERMATEX SF Acoustic, the grid is concealed by a special milled edge. In addition the ceiling scores well with an effortlessly easy installation as well as good acoustic properties.

System: C
Kante: SF*
Sizes: 600 x 600 mm,
625 x 625 mm,
Further sizes available to order
Thickness: 24 mm (c. 8.4 kg/m²)

α_w = 0.65 (H) as per EN ISO 11654
NRC = 0.70 as per ASTM C 423
highly absorbing
$D_{n,c,w}$= 38 dB as per EN 20140-9 (according to test certificate)



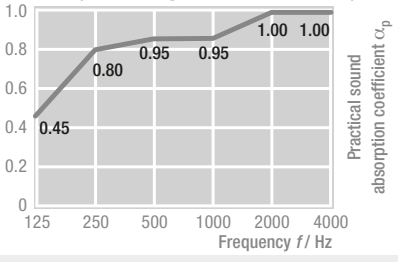
THERMATEX Alpha black

THERMATEX Alpha black was developed especially for cinema theatres or night clubs, amongst other, applications. With its black fleece facing, it not only creates an elegant look but also fulfils the highest acoustic requirements.

System: C
Kante: SK
Sizes: 600 x 600 mm,
625 x 625 mm,
Further sizes available to order
Thickness: 19 mm (c. 3.0 kg/m²)

New values

α_w = 1.00 (H) as per EN ISO 11654
NRC = 0.90 as per ASTM C 423
extremely absorbing
$D_{n,f,w}$= 28 dB as per EN 10848 (according to test certificate)



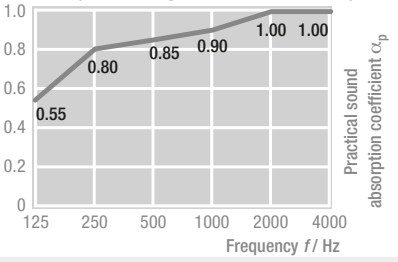
THERMATEX Alpha colored

You want more colour on the ceiling?
In addition to white or black acoustic ceilings we offer fleece faced ceilings in light blue, cream, and silver that at the same time offer the highest absorption.

System: C
Kante: SK
Sizes: 600 x 600 mm,
625 x 625 mm,
Further sizes available to order
Thickness: 19 mm (c. 3.0 kg/m²)

New values

α_w = 0.90 as per EN ISO 11654
NRC = 0.95 as per ASTM C 423
extremely absorbing
$D_{n,f,w}$= 28 dB as per EN 10848 (according to test certificate)



* For details see page 11

SYSTEM SOLUTIONS

VENTATEC
The bear and square T-grid from AMF

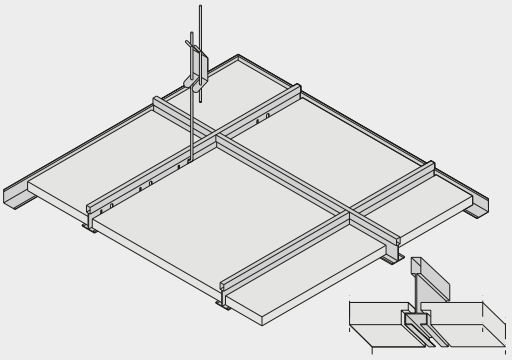
SYSTEM C - Exposed Grid System

- Exposed grid construction
- Square (SK) or recessed (VT) edges
- Quick, easy installation
- Simple demountability for access
- Tested and approved by international authorities

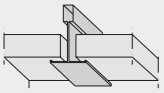
The following products are available:

THERMATEX

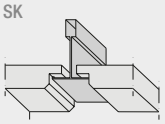
Alpha	Silence	dB Acoustic 24 mm
Alpha ONE	Thermofon	dB Acoustic 30 mm
Alpha black	Acoustic RL	SF Acoustic
Alpha colored	Acoustic	



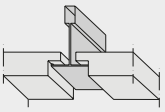
VT - S15 F



SK



VT 15 / 24



VT - S15 / 24

SYSTEM F - Free Span System

- Free span planks up to 1800 mm long
- The ideal solution for corridor ceilings
- Monolithic appearance through concealed suspension
- Quick, easy installation
- Straightforward access to the ceiling void

The following products are available:

THERMATEX

Alpha HD	dB Acoustic 24 mm
Acoustic	dB Acoustic 30 mm

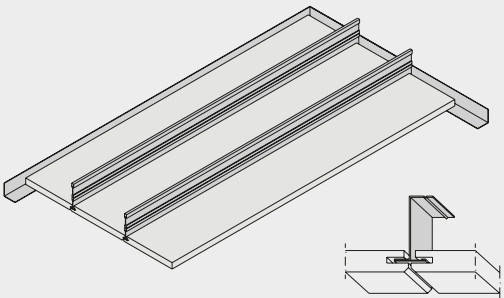
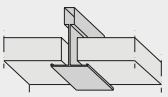
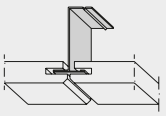


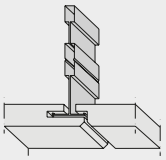
Illustration F2



SK (short edge square)



GN (long edge concealed)



AW (long edge shiplap)

SYSTEM I - Bandraster System

- Bold visual appearance
- Exposed grid sections
- Choice of exposed or concealed cross tees
- Flexible connection options for lightweight partitions
- Straightforward access to the ceiling void

The following products are available:

THERMATEX

Alpha HD	dB Acoustic 24 mm
Acoustic	dB Acoustic 30 mm

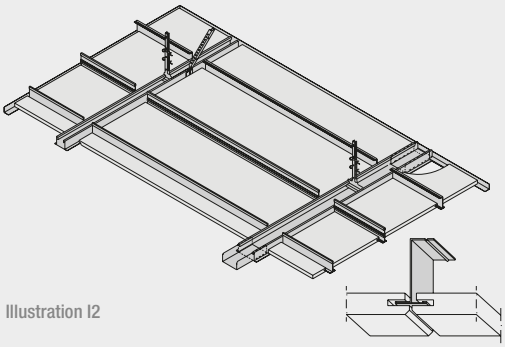
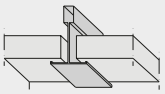
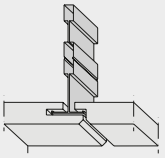


Illustration I2



SK (short edge square)

GN (long edge concealed)



AW (long edge shiplap)

SYSTEM A - Concealed System

- Concealed grid sections
- Smooth, monolithic appearance
- Different construction methods – demountable or non-accessible
- Ceiling accessibility optional

The following products are available:

THERMATEX

Alpha HD
Acoustic

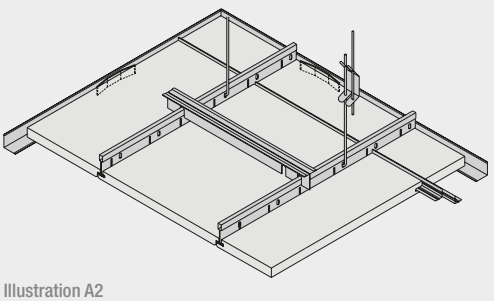
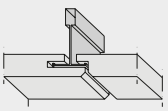
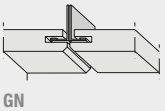


Illustration A2

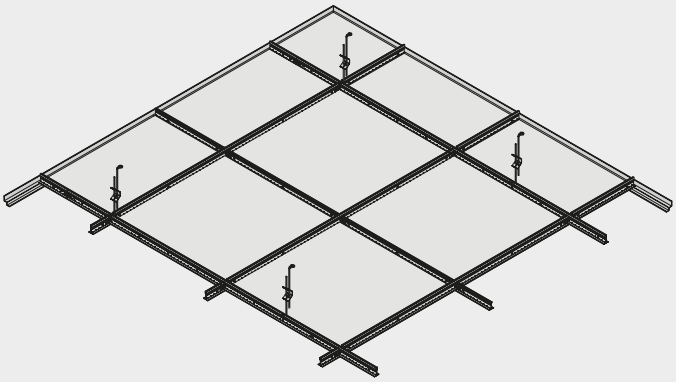


AW

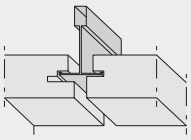


GN

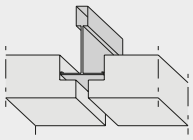
THERMATEX SF ACOUSTIC



Edge details

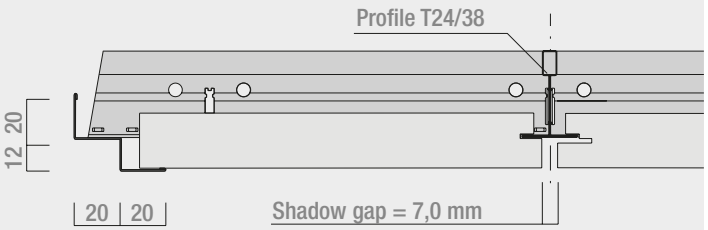


Edge SF long side



Edge SF short side

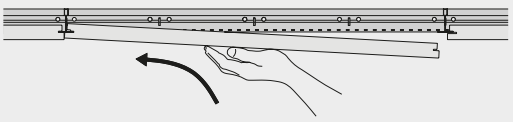
Cross-section wall connection and joint width



Step-by-step installation and demounting

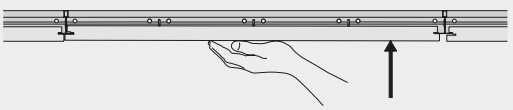
1. Step

Insert the edge with the double notch first.



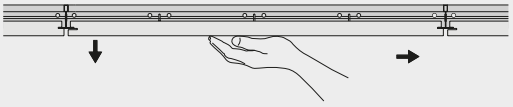
2. Step

Push up gently.



3. Step

Pull the tile across to lock it into place.



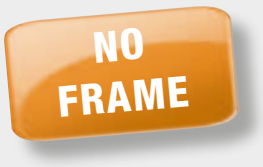
THERMATEX SONIC

Modern architecture uses hard reflective materials such as glass, steel and concrete. Only limited space is available for the acoustic absorption that is needed to provide a comfortable acoustic environment.
The **THERMATEX Sonic** raft offers a simple solution to optimise the acoustics of a space.

THERMATEX Sonic element

THERMATEX Sonic element is an excellent way to improve the design, as well as the acoustics of a room, using only small amount of material.

Flat rafts:
- Quick and easy installation
- Round and square elements
- Recessed fixing points
- Adjustable hangers



THERMATEX Sonic arc

Particularly elegant design possibilities are achievable by varying layouts of concave and convex elements with THERMATEX Sonic arc.

Flat rafts:
- Concave and Convex elements
- Large range of colours
- Adjustable hangers
- Quick and easy installation

THERMATEX Sonic sky

The flexible flat ceiling raft system THERMATEX Sonic sky offers architects and designers freedom with a large selection of colours and forms.

Flat rafts:
- Flexible Sizes
- Special shapes are available (Trapezoids, triangles etc.)
- Adjustable suspension system
- Large choice of faces
- Lights and services can be easily integrated

SPECIAL ACOUSTIC

AMF Baffles

Not enough sound absorption in a room? AMF baffles can provide the solution. The challenge of achieving a comfortable environment is met by the AMF BAFFLE system, offering a choice of methods to reduce reverberation times and improve speech intelligibility.
A range of AMF face patterns combined with a painted framing system offer design choices and functional performance. Suspended by a simple, discreet hanger cable, the individual panels create the impression of a weightless, elegant structure.

Sizes in mm:

- 1200 x 300
- 1200 x 600
- 1500 x 300
- 1800 x 300

Weight approx. 6kg/ panel (1200 x 600 mm)

Other sizes available to order.

AMF Wall Panels

The diffuse application of sound absorbing surfaces is an important aspect in acoustic planning. Theoretical values of optimum reverberation time calculations are of little use if the uniform distribution of sound absorbers is neglected. Supplementary sound absorbent wall panels can help to create better acoustic conditions, combined with an acoustic ceiling and the sound - dissipating effects of people and furniture. As a result flutter echo and reflected sounds can be successfully avoided. AMF provides various wall panel choices:

- High absorption, tissue-faced panels
- Robust, perforated boards
- Individual designs by printing
- Flexible, due to different sizes

CASE STUDY: SECONDARY SCHOOL PROJECT

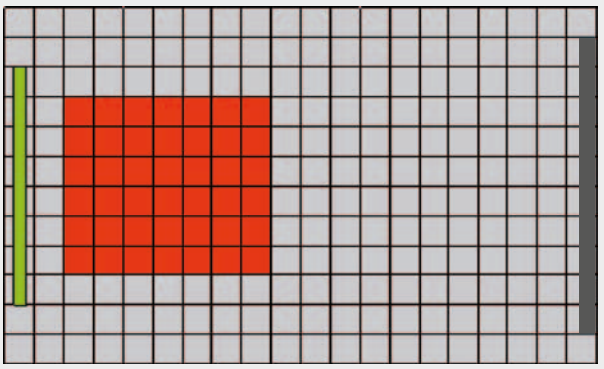
In the redevelopment of a secondary school one of the major issues related to the spatial acoustics, with overlong reverberation times in various classrooms.
An initial reverberation time calculation yielded an average value of approximately 1.8 seconds. Further measures conducted within the building confirmed that the reverberation time had a measured value of T_{mid} = 1.65 seconds.
To ensure accuracy of the tested values both microphone and loudspeaker positions were repeatedly relocated. Applying the criteria of the national standard to the reference room resulted in a reverberation time requirement of 0.6 seconds.

The proposed ceiling layout (see Illustration 1) was installed and supplemented with wall panels to provide an additional area of absorption. The ensuing reverberation time calculation provided an average reverberation time of 0.6 seconds, and this was confirmed by independent testing by the local Building Control official.
The test results are shown in Illustration 2 and yielded an average T_m of 0.6 seconds.

Illustration 1

Ceiling tile layout

- Highly absorbent
- Reflecting
- Blackboard
- Wall absorber



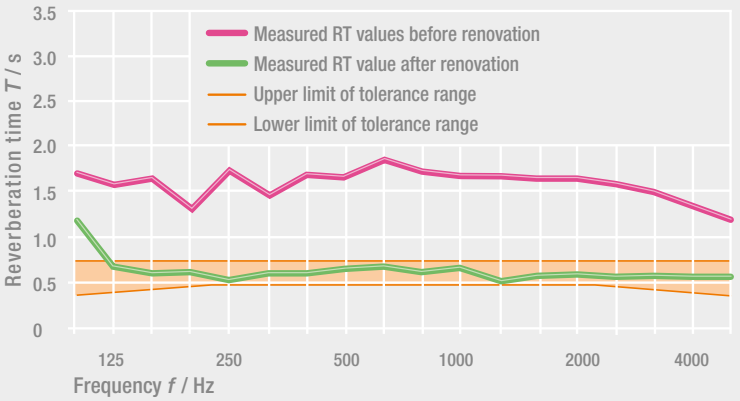
Cubical Classroom

DETAILED ROOM CONFIGURATION

The original classrooms were constructed with hollow block walls and a painted concrete ceiling: windows with curtains: linoleum flooring; and the usual classroom equipment - blackboard, desks and chairs.
Room renovation involved the installation of AMF THERMATEX Alpha together with a reflective segment of AMF THERMATEX Acoustic RL fixed over the speaking area of the teacher. A major benefit of this combination is that both tiles - the highly absorbing THERMATEX Alpha and the reflecting THERMATEX Acoustic RL - look identical.

Like all products in the THERMATEX Acoustic Range, the tile surface is smooth plain and white.
The AMF Wall Panels were installed to reduce sound reflections from the back wall. These panels were constructed from robust perforated metal frames with an acoustic insert, and are in daily use as a magnetic pinboard.

Illustration 2
Prismatically shaped classroom,
Measured RT values before,
and after renovation,
Unoccupied state



For further information please request the AMF Acoustic Catalogue Part 3.

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http://www.amfceilings.com

The Construction Products Directive (Council Directive 89/106/EEC), relevant for Suspended Ceilings, was converted to the European Standard EN 13964. It stipulates essential criteria for the CE labelling of ceiling products and ceiling systems.

The RAL- Quality Mark confirms the consistently high quality of the AMF mineral wool, as well as its biological solubility.

Knauf AMF GmbH & Co. KG. is certified according to ISO 9001 and ISO 14001.

Blue Angel for the AMF products
- THERMATEX (standard)
- THERMATEX ACOUSTIC RANGE
- ECOMIN

04/2012