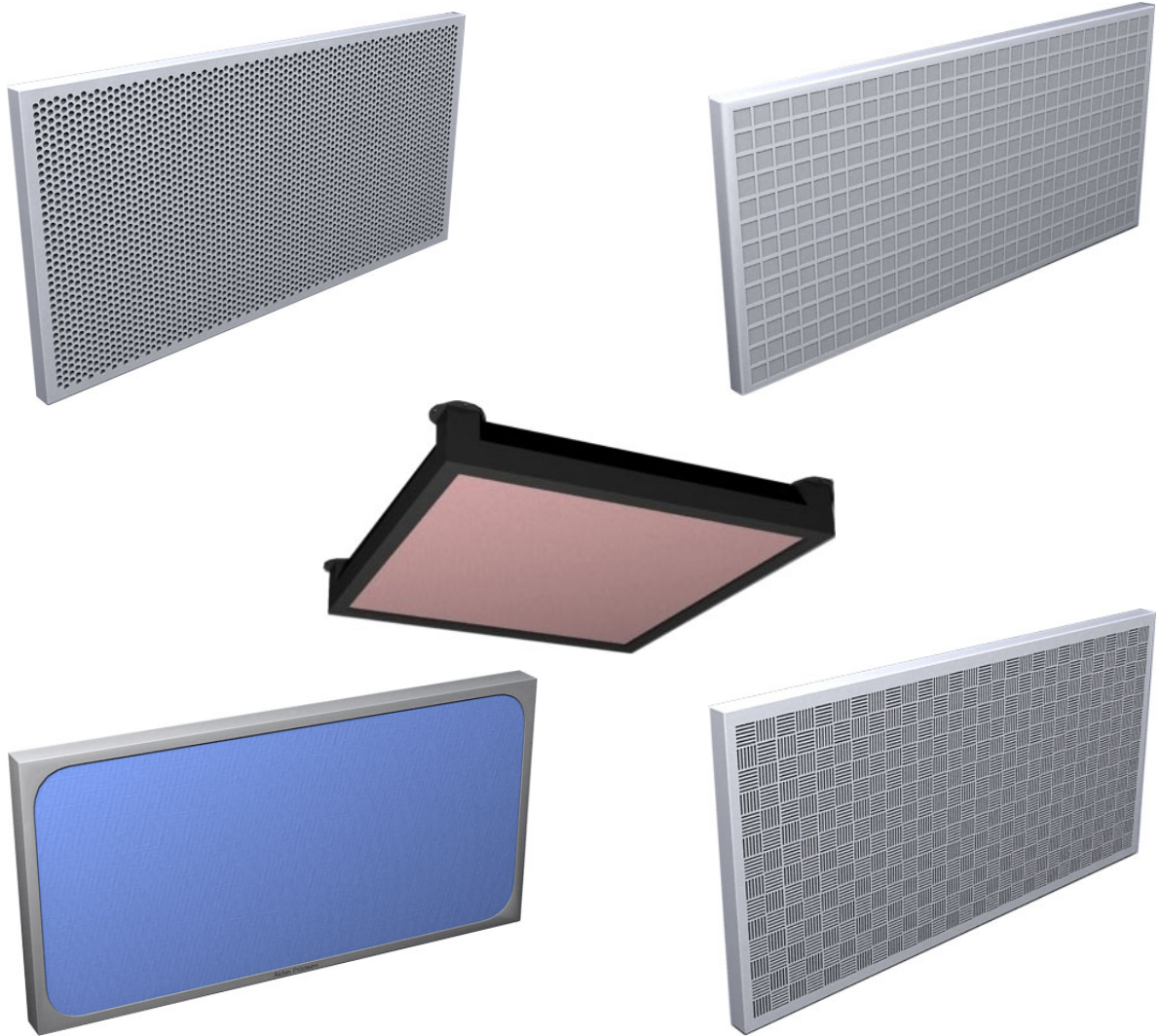


Room Acoustics Module

AUDIMIN



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Room acoustic module AUDIMIN

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Room acoustic module AUDIMIN

Description

The modern construction with fully glazed walls, concrete ceilings or fully fitted cooling ceilings and no carpets and curtains prevent optimum acoustics and give reverberant rooms.

According to room size and the available sources of sound, room resonances are generated, which must be muffled. The same is true for short-term reflections, which come from the periphery. To create the required acoustic result, it is important that an even re-percussion time over the whole frequency spectrum of approx. 30 Hz to 8 kHz is obtained, so that all modes can subside at the same time. Through the openings in the cover plates, the acoustic waves can enter the room acoustics module. In the room acoustics module, the acoustic energy is converted into heat and reduces the sound.

The efficiently operating room acoustics module fulfills the increased requirements of well balanced room acoustics in many areas, such as offices, recreation rooms, living rooms, production halls, firing ranges, etc., and can also be fitted at a later stage.

The AUDIMIN room acoustic module is also highly suitable for use in schools and kindergartens. The reduction of the sound power level in a room and the reduction of the reverberation time significantly reduce the noise level in a room. Owing to the lower noise level, the concentration of children and adolescents increases, children tire less quickly, and the readiness to learn increases. Thus, the requirements of DIN EN 18041 can be met. The organs of hearing develop in a child until it has become an adult. If the child is permanently exposed to a high noise level, the sensitivity of the hearing is reduced, which may go as far as the so-called adolescent hard of hearing. This makes it necessary to ensure that children and adolescents are not permanently exposed to high noise levels, in order to avoid the so-called adolescent hard of hearing.

The AUDIMIN room acoustics modules offer the advantage of not having to perform additionally a silencing function when used in a cooling ceiling. The cooling ceiling can therefore be optimised in terms of its cooling function.

The room acoustics modules are prepared for mounting in walls or ceilings.

Fitting a model office (of up to approx. 20 m²) with the base module AUDIMIN Standard-..., consisting of four acoustic elements 1200 x 800 mm, will already achieve a reduction of the reverberation time of approx. 2 sec. to 0.8 sec. Moreover, a room damping of approx. 4 dB was achieved.

The reverberation time is the time in which the sound level in a room decreases by 60 dB, after switching off the sources of sound. Accordingly, the reverberation is approximately the time in which the sound of loud clapping disappears and is no longer heard. This is based on the following physical fact: the longer the reverberation time, the louder a source of sound is heard. However, at the same time, it loses clearness. Reverberant rooms have a long reverberation time, maybe even an echo and thus less speech intelligibility.

The optimum values of reverberation times, in most cases at frequencies between 125 and 4000 Hz, are volume-dependent. The larger the room volume, the higher the reverberation times may be, without deterioration in the room acoustics quality. The

optimum values in rooms for use with speech are $T_{60} = 0.4 - 1$ s.

The usual reverberation times of rooms in seconds

Theatre	1,0
Concert halls	1 ... 2
Conference rooms	0.5 ... 1.5
Auditoriums	0.8 ... 1.5
Hotel rooms	1,0
Offices	0.5 ... 1.5

Calculation of the reverberation time: $T = 0.163 \times V / A$

T = Reverberation time in seconds

V = Room volume in m³

A = Equivalent absorption area in the room in m² sabine

Room acoustic module AUDIMIN

Sound absorption coefficients of different materials

Extract from DIN 18041

	Sound absorption coefficient α_s					
	Frequency in Hz					
	125	250	500	1000	2000	4000
Steel float finish	0,02	0,02	0,03	0,03	0,04	0,06
Gauged mortar finish	0,03	0,03	0,02	0,04	0,05	0,05
Wallpaper on gauged mortar finish	0,02	0,03	0,04	0,05	0,07	0,08
Plaster, common concrete	0,02	0,02	0,03	0,04	0,05	0,05
Marble, tiles, clinker	0,01	0,01	0,02	0,02	0,03	0,03
Parquetry floor, bonded	0,04	0,04	0,05	0,06	0,06	0,06
Parquetry floor, on subfloor	0,20	0,15	0,10	0,10	0,05	0,10
PVC floor covering (2.5 mm thick) on concrete floor	0,01	0,02	0,01	0,03	0,05	0,05
Linoleum on concrete	0,02	0,02	0,03	0,03	0,04	0,04
Carpeted floor, up to 6 mm of pile height	0,02	0,04	0,06	0,20	0,30	0,35
Carpeted floor, 7 to 10 mm of pile height	0,04	0,07	0,12	0,30	0,50	0,80
Gypsum plaster board, unperforated	0,25	0,12	0,10	0,05	0,05	0,10
Window (insulation glazing, box and countersash window)	0,28	0,20	0,10	0,06	0,03	0,02
Door, wood, painted	0,10	0,08	0,06	0,05	0,05	0,05
Gypsum plaster boards 9.5 mm thick, 60 mm wall distance, voids boxed	0,31	0,08	0,04	0,07	0,09	0,08
Veneered wood or chip boards tight on solid base	0,04	0,04	0,05	0,06	0,06	0,06
4 mm hard particle board, boxed without insulating material, wall distance 60 mm	0,22	0,19	0,14	0,07	0,05	0,05
4 mm hard particle board, boxed with 40 mm mineral wool boards, wall distance 60 mm	0,67	0,21	0,14	0,07	0,06	0,05

Upon request, the AUDIMIN room acoustics modules are available in different models.

For special requirements, we can design and measure the acoustics modules for you! Special designs are available upon request.

Special modules for industry and rooms of particular acoustic requirements upon request.

Room acoustic module AUDIMIN

Construction

Cover plate

- Steel sheet painted to RAL 9010 (white), other RAL colours (at an extra charge)
- Round holes (-R), offset layout, $\varnothing = 5$ mm, division 7 mm
- Square holes (-Q), straight layout, 20 x 20 mm, division 23 mm
- Chessboard holes (-S), 3 x 30 mm
- with cloth covering (-ST)

Acoustic panelAcoustic panelAcoustic insulating plate

- Construction material class B1 (standard) to DIN 4102
- Construction material class A2 (non-flammable) to DIN 4102

Frame

- Sheet steel painted to RAL 9010 (white), painted to a RAL special colour (at an extra charge)

Model

AUDIMIN Standard Wall-...

- including installation openings in the rear wall

AUDIMIN Standard Ceiling-...

- Ceiling module with mounting base

AUDIMIN Standard-...-R

- Cover plate with round holes

AUDIMIN Standard-...-Q

- Cover plate with square holes

AUDIMIN Standard-...-S

- Cover plate with holes in chessboard design

AUDIMIN Standard-...-ST

- Cloth covering made of flair (other fabrics upon request)

AUDIMIN ...-A2

- Available as in the AUDIMIN Standard-... models, but including a non-flammable acoustic insulating board (building material class A2 to DIN 4102)

Fastening

Wall mounting

- concealed mounting (-VM):
The modules are prepared for concealed wall mounting.

Ceiling mounting

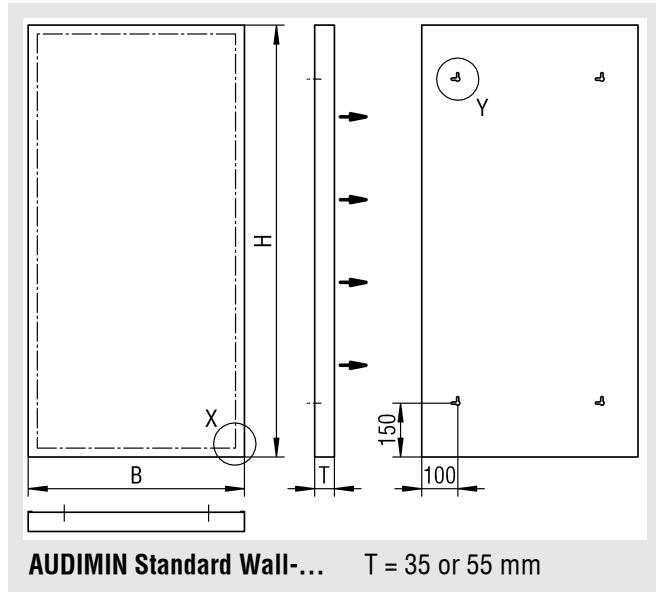
- visible screw mounting (-SM)
Screw mounting on the ceiling using approved dowelling technique (fastening material must be provided on site)

Room acoustic module AUDIMIN

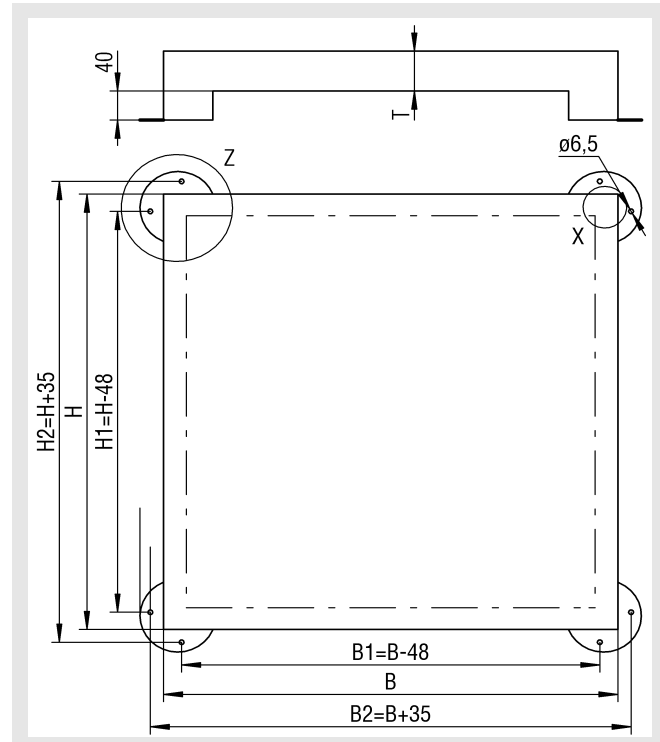
Models and dimensions

Dimensions

AUDIMIN Standard Wall-...



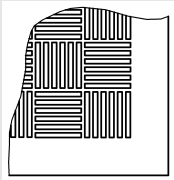
AUDIMIN Standard Ceiling-...



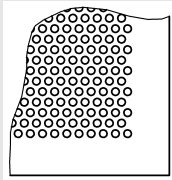
Cover plate design

Detail X

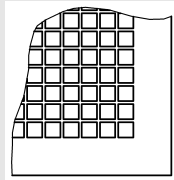
AUDIMIN Standard-...-S



AUDIMIN Standard-...-R

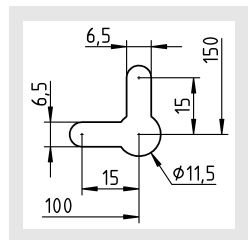


AUDIMIN Standard-...-Q



Mounting horizontal or vertical

Detail Y

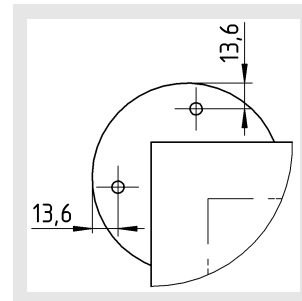


Available sizes

H	B	T
1000	500	35
1200	600	or
	800	55

All combined heights, widths and depths available!

Detail Z



Available sizes

B	H	T
600	500	35 or 55
800	600	
1000	800	
1200	1000	

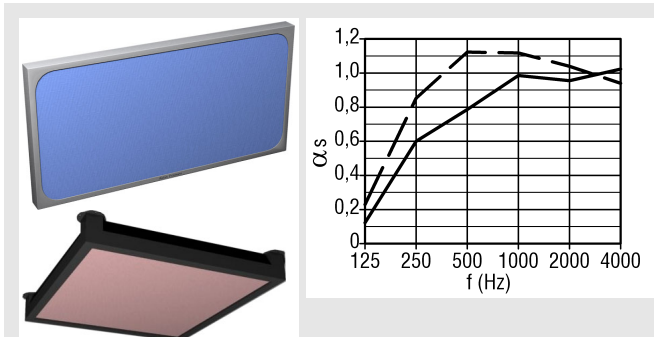
All combined heights, widths and depths available!

Room acoustic module AUDIMIN

Technical Data

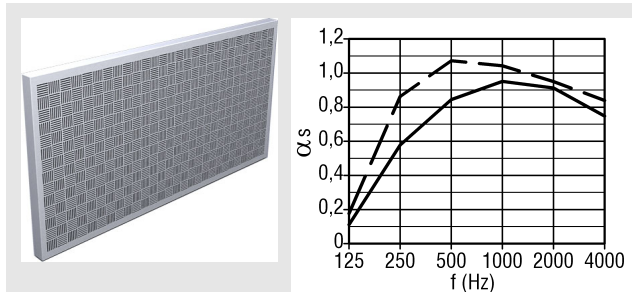
Sound absorption coefficient to DIN EN 20354

for room acoustic module AUDIMIN Standard...-ST



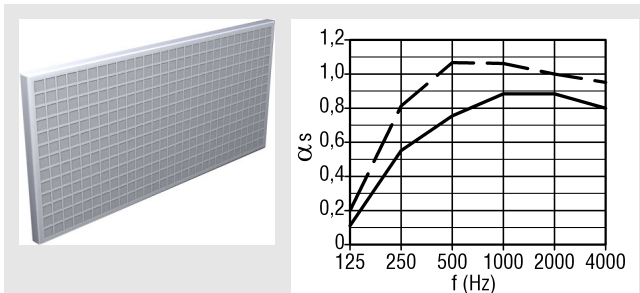
Frequency [Hz]	125	250	500	1000	2000	4000
Sound absorption coefficient AUDIMIN-...-ST 35 ____	0,12	0,60	0,79	0,99	0,96	1,01
Sound absorption coefficient AUDIMIN-...-ST 55 -----	0,22	0,85	1,12	1,11	1,03	0,94

for room acoustic module AUDIMIN Standard...-S



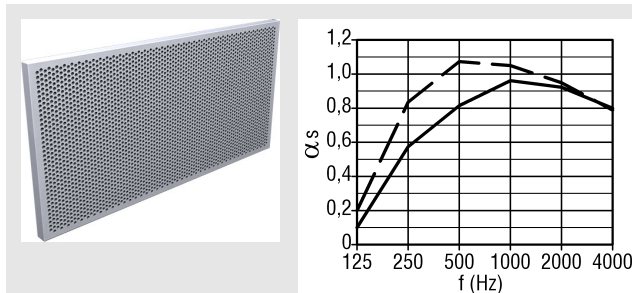
Frequency [Hz]	125	250	500	1000	2000	4000
Sound absorption coefficient AUDIMIN-...-S 35 ____	0,11	0,58	0,84	0,96	0,91	0,75
Sound absorption coefficient AUDIMIN-...-S 55 -----	0,18	0,86	1,08	1,04	0,95	0,83

for room acoustic module AUDIMIN Standard...-Q



Frequency [Hz]	125	250	500	1000	2000	4000
Sound absorption coefficient AUDIMIN-...-Q 35 ____	0,11	0,56	0,76	0,89	0,89	0,80
Sound absorption coefficient AUDIMIN-...-Q 55 -----	0,20	0,81	1,07	1,05	1,0	0,95

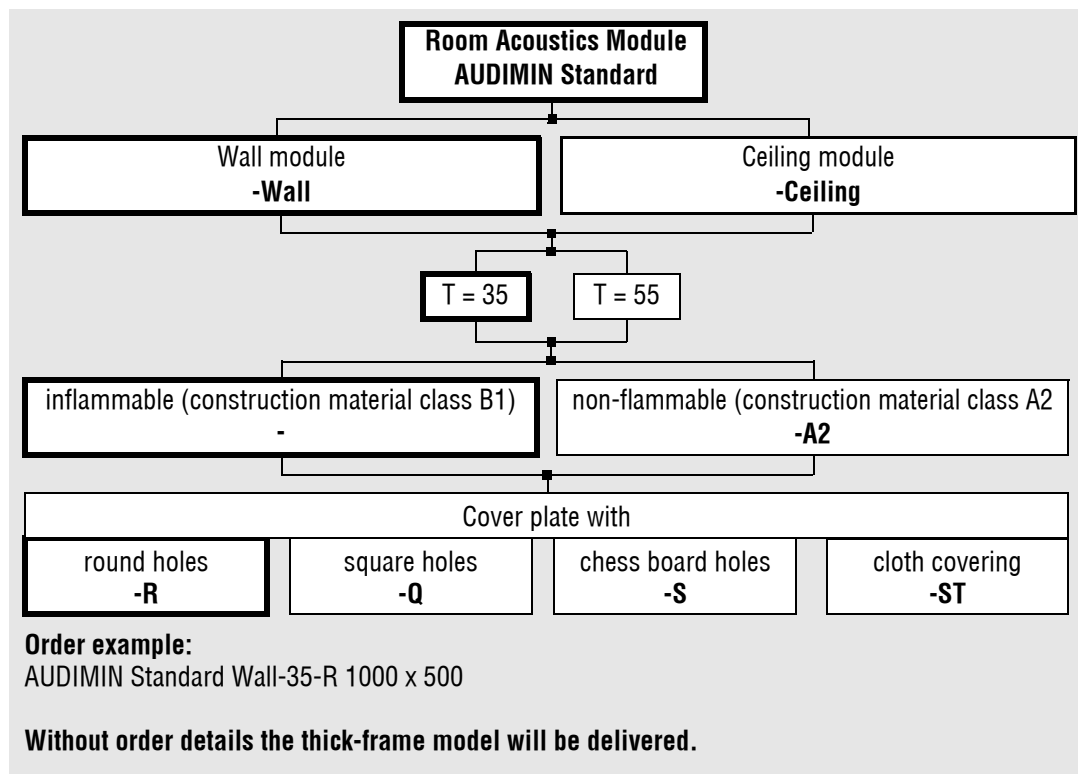
for room acoustic module AUDIMIN Standard...-R



Frequency [Hz]	125	250	500	1000	2000	4000
Sound absorption coefficient AUDIMIN-...-R 35 ____	0,1	0,58	0,81	0,96	0,92	0,80
Sound absorption coefficient AUDIMIN-...-R 55 -----	0,2	0,83	1,08	1,04	0,95	0,79

Room acoustic module AUDIMIN

Order details



Room acoustic module AUDIMIN

Specification texts

Room acoustic module for improving room acoustics, comprising frame and perforated front plate made of sheet steel painted to RAL 9010 (white). Fitted with rear cover made of sheet steel painted to RAL 9010 with integrated mounting bores for wall mounting. With integrated absorption material made of melamine-resin-based foam according to building material class B1 to DIN 4102, free of synthetic mineral fibres, halogen or FCCs. Temperature-resistant from -50 to +150° C. Tensile strength according to DIN 53571 100 kPa classification. Average sound absorption to DIN 20354 $\alpha_s \geq 0.5$ in the frequency range from 250 to 2000 Hz.

Product: SCHAKO type **AUDIMIN Standard Wall-...**

- Faceplate:
 - Perforated round holes
Product: SCHAKO type **AUDIMIN ...-R**
 - Perforated chessboard pattern
Product: SCHAKO type **AUDIMIN ...-S**
 - Perforated square holes
Product: SCHAKO type **AUDIMIN ...-Q**
 - painted to RAL special colour (at an extra charge)
- Absorber material non-flammable (...-A2) (building material class A2) (at an extra charge)

Room acoustic module for improving room acoustics, comprising frame made of sheet steel painted to RAL 9010 (white). Room-faced cloth covering (Trevira) in B 1 design with concealed mounting, with cloth stretching device integrated in the frame to prevent sagging of the cloth when mounted horizontally. Fitted with rear cover made of sheet steel painted to RAL 9010 with integrated mounting bores for wall mounting. With integrated absorption material made of melamine-resin-based foam according to building material class B1 to DIN 4102, free of synthetic mineral fibres, halogen or FCCs. Temperature-resistant from -50 to +150° C. Tensile strength to DIN 53571 100 kPa classification. Average sound absorption to DIN 20354 $\alpha_s \geq 0.5$ in the frequency range from 250 to 2000 Hz.

Product: SCHAKO type **AUDIMIN Standard Wall-ST**

- Faceplate:
 - Cloth covering made of Flair....
- Frame:
 - painted to RAL special colour (at an extra charge)
- Absorber material non-flammable (...-A2) (building material class A2) (at an extra charge)

Room acoustic module for improving room acoustics, comprising frame and perforated front plate made of sheet steel painted to RAL 9010 (white). With integrated mounting base for screw-type mounting to the ceiling using approved dowelling technology. With integrated absorption material made of melamine-resin-based foam according to construction material class B1 to DIN 4102, free of synthetic mineral fibres, halogen or FCCs. Temperature-resistant from -50 to +150° C. Tensile strength to DIN 53571 100 kPa classification. Average sound absorption to DIN 20354 $\alpha_s \geq 0.5$ in the frequency range from 250 to 2000 Hz.

Product: SCHAKO type **AUDIMIN Standard Ceiling-...**

- Faceplate:
 - Perforated round holes
Product: SCHAKO type **AUDIMIN ...-R**
 - Perforated chessboard pattern
Product: SCHAKO type **AUDIMIN ...-S**
 - Perforated square holes
Product: SCHAKO type **AUDIMIN ...-Q**
 - painted to RAL special colour (at an extra charge)
- Absorber material non-flammable (...-A2) (building material class A2) (at an extra charge)

Room acoustic module for improving room acoustics, comprising frame made of sheet steel painted to RAL 9010 (white), with integrated mounting base for screw-type mounting to the ceiling using approved dowelling technology. Room-faced cloth covering (Trevira) in B 1 design with concealed mounting, with cloth stretching device integrated in the frame to prevent sagging of the cloth when mounted horizontally. Fitted with rear cover made of sheet steel painted to RAL 9010. With integrated absorption material made of melamine-resin-based foam according to building material class B1 to DIN 4102, free of synthetic mineral fibres, halogen or FCCs. Temperature-resistant from -50 to +150° C. Tensile strength to DIN 53571 100 kPa classification. Average sound absorption to DIN 20354 $\alpha_s \geq 0.5$ in the frequency range from 250 to 2000 Hz.

Product: SCHAKO type **AUDIMIN Standard Ceiling-ST**

- Faceplate:
 - Cloth covering made of Flair....
- Frame:
 - painted to RAL special colour (at an extra charge)
- Absorber material non-flammable (...-A2) (building material class A2) (at an extra charge)