



Room acoustics solutions from Rigips

Perfect form and function



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Today dry construction is an inherent part of modern building and intelligent architecture. Rigips supplies professional users with system solutions for all imaginable applications of interior building including all necessary components. We supply high-quality systems for sound insulation and fire protection, heat insulation and room acoustics amongst others. The Saint-Gobain Rigips GmbH therefore is your competent partner for modern interior building solutions which fulfil highest requirements in design, comfort and safety.

Take advantage of the knowledge and experience of the Construction Professional!

How may we help you?



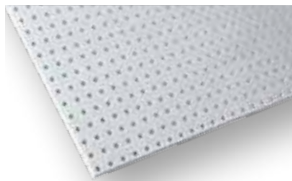
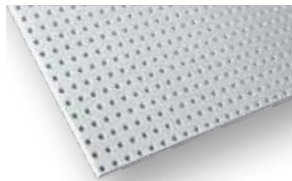
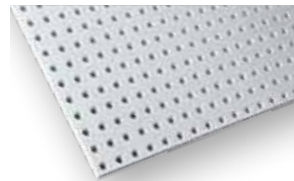
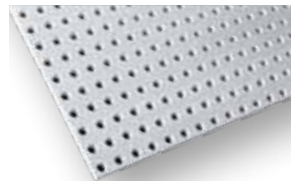
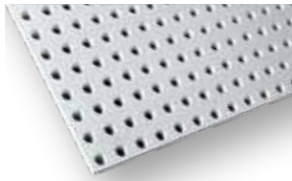
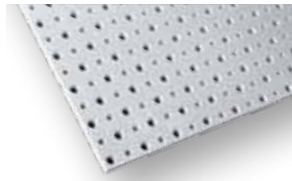
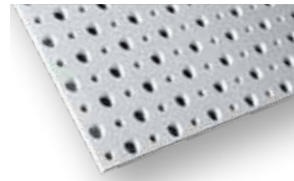
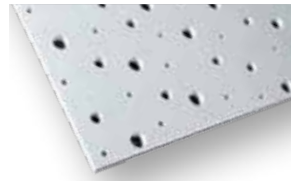
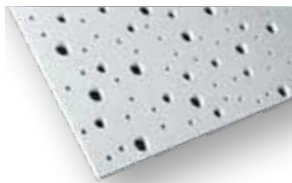
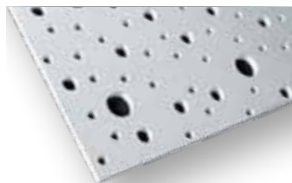
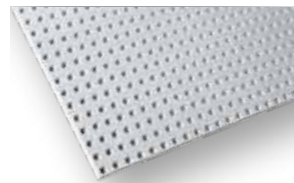
Rigips. Future friendly.

Using natural, human and economic assets and resources responsibly is a guiding principle of our thoughts and actions. We have a long-standing tradition of manufacturing particularly eco-friendly construction materials from the tried and tested raw material gypsum. We are therefore also constantly striving to offer new solutions for maximum comfort, safety and well-being, thereby sustainably improving people's quality of life and the intrinsic value of their living spaces. From generation to generation.

Today and tomorrow.



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Functional and aesthetic living spaces





The modern acoustic systems from Rigips offer optimum solutions for acoustic ceilings and walls which perform two key functions. On the one hand, the broad spectrum of acoustic boards offers virtually unlimited design scope for creating highly attractive rooms and buildings. On the other hand, the acoustic quality of the boards are ideal for planning and designing optimum room acoustics. Rigips acoustic systems meet the most demanding requirements in terms of material properties, variety of shapes and acoustic results.

Whether jointless and continuous or in the form of a suspended ceiling – perfect solutions are available for all applications in many appealing designs and edge shapes, for lay-in installation, invisible rail systems and the particularly cost-effective visible rail systems for lay-in installation. In combination with non-perforated Rigips boards, Rigips acoustic ceilings offer unlimited options for customized design.

Gyptone planks round out the ceiling range. They are used in particular in halls and corridors. Various perforation patterns also offer a number of possible designs here.

The Rigips acoustic ceiling range combines functionality and aesthetics in the modern design of walls and ceilings. Integrating lighting, ventilation systems, loudspeakers, etc. is straightforward and simple.

Rigips acoustic boards also have a long lifetime and can be renovated at any time without altering the acoustic properties of the ceilings. In addition, they have a positive effect on room climate as they absorb and release moisture, as well as removing pollutants from room air.

Rigips acoustic solutions meet the many requirements of modern construction equally – aesthetics, individuality, eco-friendliness, safety and long lifetime.

Gain an insight into the variety of aesthetic and functional living spaces which can be created.

Numerous reference projects reflect the broad spectrum of Rigips acoustic ceiling systems which can be used e.g. in a variety of educational (schools, universities, etc.), administrative and cultural buildings (museums, concert halls, etc.), leisure facilities – such as sports centres, cinemas or youth centres – and public buildings such as shopping centres, galleries, public health facilities, airports and railway stations, as well as in residential construction.

References



Ebertplatz station, Cologne – Rigitone 12-20-35



Atrium at the Helmholtz Centre, Braunschweig – Rigitone 10/23



Burgwiese school, Oberursel – Rigitone 8/18 Q



Orthodontic practice, Montabaur – Rigitone 8-15-20 super



Free evangelical church, Bonn – Rigitone 15/30



NRW orchestral centre, Dortmund – Rigitone 12/25



Café & restaurant "Der kleine Prinz", Duisburg – Rigitone 8-15-20



GFW Technocenter, Rennerod – Rigitone Big Sixto 63



Co-operative bank, Stadthagen – Rigitone 8/18



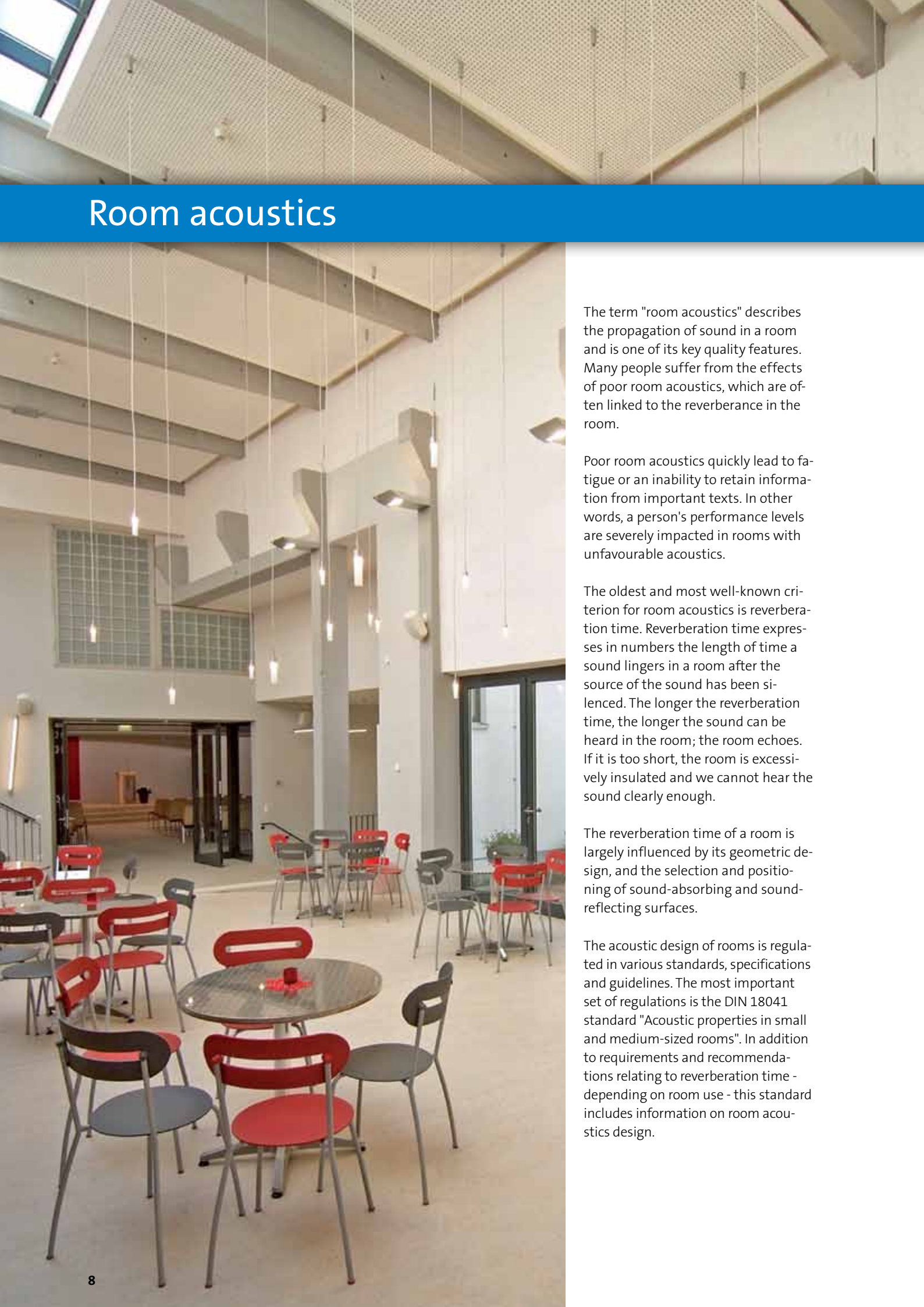
Kronthal school, Kronberg – Rigitone Clima Top Air 8/18



Rheinzink GmbH & Co. KG, Datteln – Rigitone with an acoustic plaster coating



Hotel Don Bosco, Burgstädt – Rigitone 8-15-20



Room acoustics

The term "room acoustics" describes the propagation of sound in a room and is one of its key quality features. Many people suffer from the effects of poor room acoustics, which are often linked to the reverberance in the room.

Poor room acoustics quickly lead to fatigue or an inability to retain information from important texts. In other words, a person's performance levels are severely impacted in rooms with unfavourable acoustics.

The oldest and most well-known criterion for room acoustics is reverberation time. Reverberation time expresses in numbers the length of time a sound lingers in a room after the source of the sound has been silenced. The longer the reverberation time, the longer the sound can be heard in the room; the room echoes. If it is too short, the room is excessively insulated and we cannot hear the sound clearly enough.

The reverberation time of a room is largely influenced by its geometric design, and the selection and positioning of sound-absorbing and sound-reflecting surfaces.

The acoustic design of rooms is regulated in various standards, specifications and guidelines. The most important set of regulations is the DIN 18041 standard "Acoustic properties in small and medium-sized rooms". In addition to requirements and recommendations relating to reverberation time - depending on room use - this standard includes information on room acoustics design.



Sound absorption

Sound absorption describes the removal of sound energy from a room or section of a room by converting it into another form of energy (e.g. heat: "dissipation").

Sound absorption is the most important tool in acoustic room design. Absorbing and reflecting surfaces determine the acoustic properties of a room.

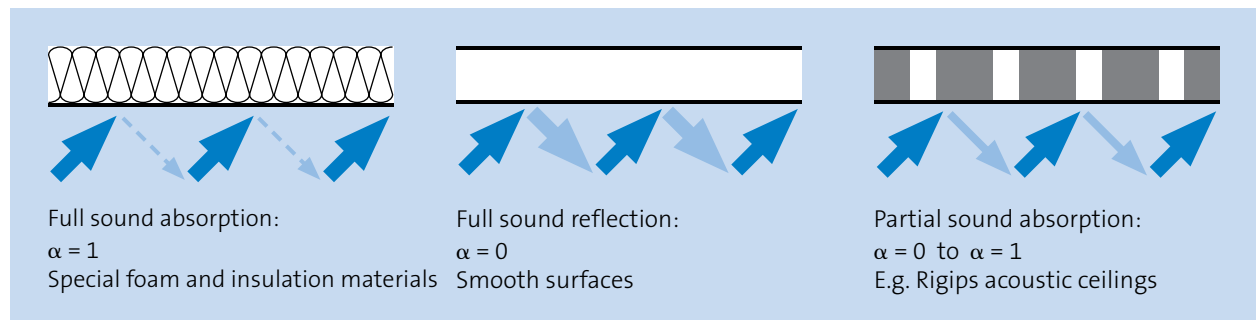
Strictly speaking, there is no such thing as "good" or "poor" absorption - this is why no standardized absorption requirements have been defined for individual surfaces. The total amount of absorption required is determined by the structural properties, fittings and planned use of the room.

Sound absorption coefficients α and α_s

The sound absorption coefficient defines the ratio of the sound energy not reflected from a surface to the incident sound energy:

- Full sound reflection: $\alpha = 0$
- Full sound absorption: $\alpha = 1$.

The sound absorption coefficient α is the frequency-dependent value of the sound absorption capacity of a material. α_s is measured in third octave bands by means of acoustic testing in a reverberation chamber in accordance with DIN EN ISO 354.



Practical sound absorption coefficient α_p

The practical sound absorption coefficient α_p is the frequency-dependent value of the absorption capacity in octave bands. The α_p is determined by converting the α_s values to octave bands in accordance with DIN EN ISO 11654:

$$\text{Example for 250 Hz: } \alpha_{p250} = \frac{\alpha_{s200} + \alpha_{s250} + \alpha_{s315}}{3}$$

The practical sound absorption coefficient α_p is rounded in 0.05 (5%) increments to a maximum of 1.00.

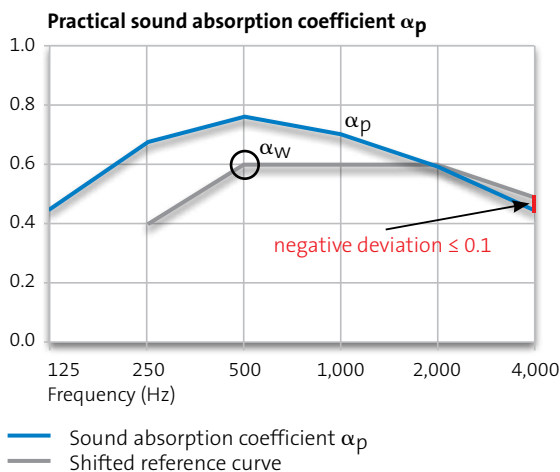
Room acoustics - technical terms and parameters

Rated sound absorption coefficient α_w

The rated sound absorption coefficient α_w is a frequency-independent single value for the sound absorption capacity of a material and is calculated in accordance with DIN EN ISO 11654.

The α_w is determined by laying a reference curve over the α_p values and shifting it until the total negative deviation is ≤ 0.1 .

The rated sound absorption coefficient α_w corresponds to the value of the shifted reference curve at 500 Hz.

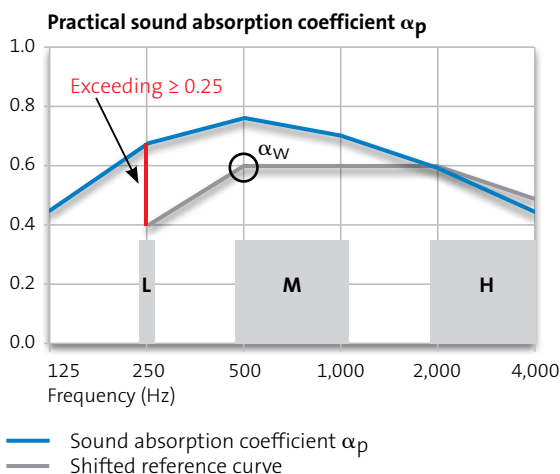


If the practical sound absorption coefficient α_p exceeds the reference curve value by ≥ 0.25 , one or more shape indicators must be used in addition to the α_w value:

- (L) = exceeds at 250 Hz
- (M) = exceeds at 500 or 1,000 Hz
- (H) = exceeds at 2,000 or 4,000 Hz

Example (250 Hz): $0.65 - 0.40 = 0.25 (\geq 0.25) = (L)$

$\Rightarrow \alpha_w = 0.60 (L)$



! Rigips note

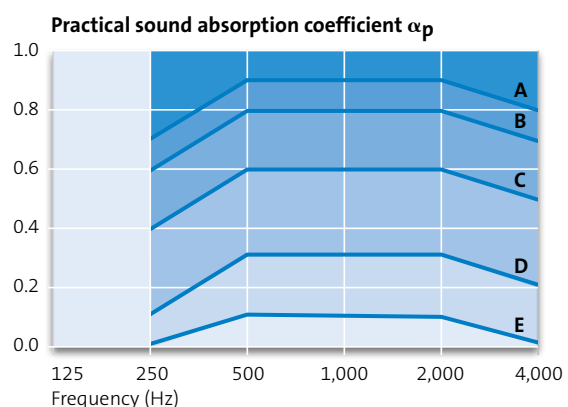
If the rated sound absorption coefficient α_w is given together with one or two shape indicators, the complete sound absorption curve should be applied to obtain a value.

Sound absorber classes

The rated sound absorption coefficient α_w can be used to determine the sound absorber class in accordance with DIN EN ISO 11654:

Sound absorber class	Rated sound absorption coefficient α_w
A	0.90; 0.95; 1.00
B	0.80; 0.85
C	0.60; 0.65; 0.70; 0.75
D	0.30; 0.35; 0.40; 0.45; 0.50; 0.55
E	0.25; 0.20; 0.15
Non-classified	0.10; 0.05; 0.00

Diagram showing the sound absorber classes



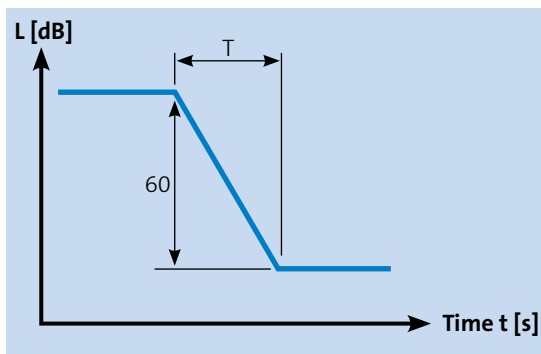
Equivalent sound absorption area

Multiply the absorption coefficient (α) of a material by its surface (S) to obtain the equivalent sound absorption area (A):

$$A = \alpha \cdot S \text{ [m}^2\text{]}.$$

Reverberation time T

The reverberation time is the time in seconds required for the sound pressure level to fade by 60 dB after the source of the sound has been silenced.



The reverberation time can be calculated for the majority of room situations using the "Sabine formula":

$$T = 0.163 \cdot \frac{V}{A}$$

T = reverberation time [s]

V = room volume [m^3]

A = Equivalent sound absorption area [m^2]



Factors influencing absorption behaviour

The wide range of Rigips acoustic ceilings can meet virtually all acoustic requirements. The sound-absorbing properties of Rigips acoustic ceilings are influenced by the following factors:

Perforated area/hole shape

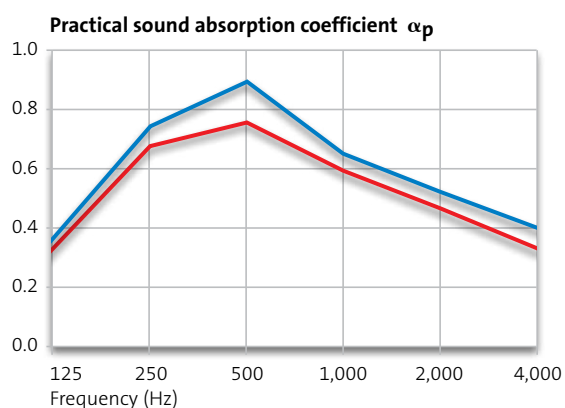
The perforation pattern selected usually also has an influence on the acoustic properties of the ceiling structure. For example, an increase in the perforated area usually increases the level of sound absorption.

However, any changes in value are minimal where the perforated area exceeds 25%.

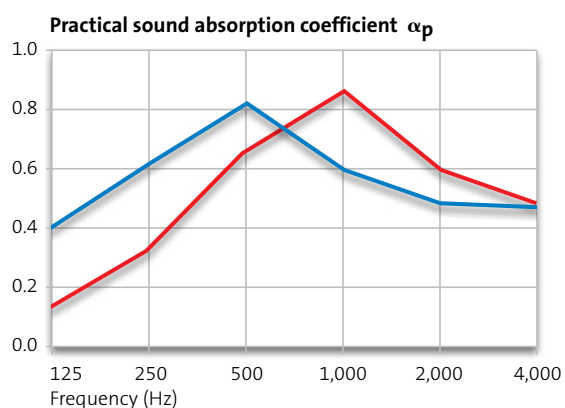
Plenum depth/air cavity

In addition to the perforation pattern, the plenum depth – the distance between the slab and the top edge of the acoustic ceiling – also has a decisive influence on the acoustic properties of the ceiling.

At low plenum depths < 100 mm, the sound absorption curve shifts towards the medium- and high-frequency range (to the right). Increasing the plenum depth will in turn increase the sound absorption in the low-frequency range. This effect is lost at plenum depths ≥ 500 mm.



- Example showing a perforated area of 8.7 %
- Example showing a perforated area of 18.1 %



- Plenum depth of 50 mm
- Plenum depth of 200 mm

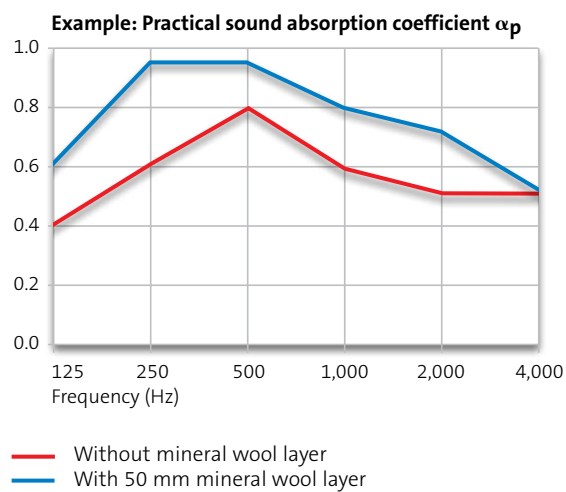


Acoustic tissue

All Rigips acoustic ceiling systems are fitted with acoustic tissue on the reverse as standard, ensuring optimum acoustics in virtually all rooms in which noise is primarily caused by people's voices, e.g. offices, schools, kindergartens, lecture halls and assembly rooms.

Mineral wool layer

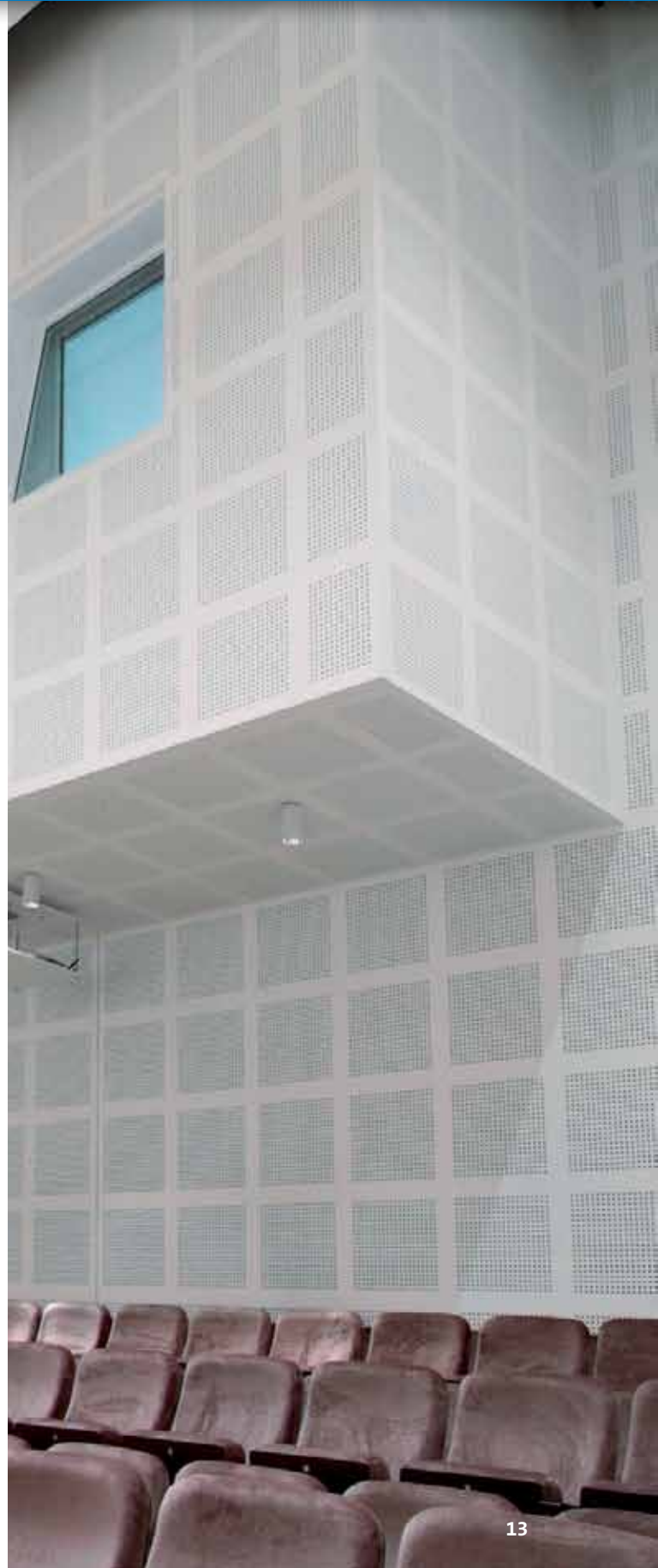
A mineral wool layer increases sound absorption – in particular in the deep-frequency range. Ceiling structures with a low plenum depth and wall absorbers should therefore always be fitted with a mineral wool layer.



Wall absorbers

In order to further improve room acoustics, supplementary absorber surfaces can be added to bordering wall surfaces. To ensure optimum sound absorption across the entire frequency range in this instance, the following points should be observed

- A perforated board with the largest possible perforated area and an acoustic tissue should be used
- A mineral wool layer should be included



DIN 18041 regulates the acoustic planning of rooms in Germany. It applies for small to medium-sized rooms with a volume of up to approx. 5.000 m³, and for sports halls and swimming baths without audiences up to 8.500 m³. This standard defines the acoustic requirements and planning regulations for ensuring acoustic quality, primarily for speech communication, including measures needed to achieve this.³

Standards for room acoustics planning

DIN 18041 "Acoustic quality in small and medium-sized rooms"

Acoustic quality refers to how well a room renders specific sounds depending on what it is used for. It relates primarily to the acceptable quality of speech communication and musical performances. It is largely influenced by the geometry of a room, the distribution of sound-absorbing/sound-reflecting surfaces and the reverberation time.

DIN 18041 divides rooms into two different room/usage types:

- Group A rooms
Acoustic quality over medium and long distances
- Group B rooms
Acoustic quality over short distances

Beginning with group A rooms, concrete requirements exist for acoustic quality over medium and long distances.

Group A rooms

- Conference rooms
- Courtrooms, council chambers and ballrooms
- Classrooms
- Seminar rooms
- Lecture theatres
- Meeting rooms
- Interaction rooms
- Group rooms in kindergartens and day nurseries
- Senior citizens' centres
- Community halls
- Sports halls and swimming baths

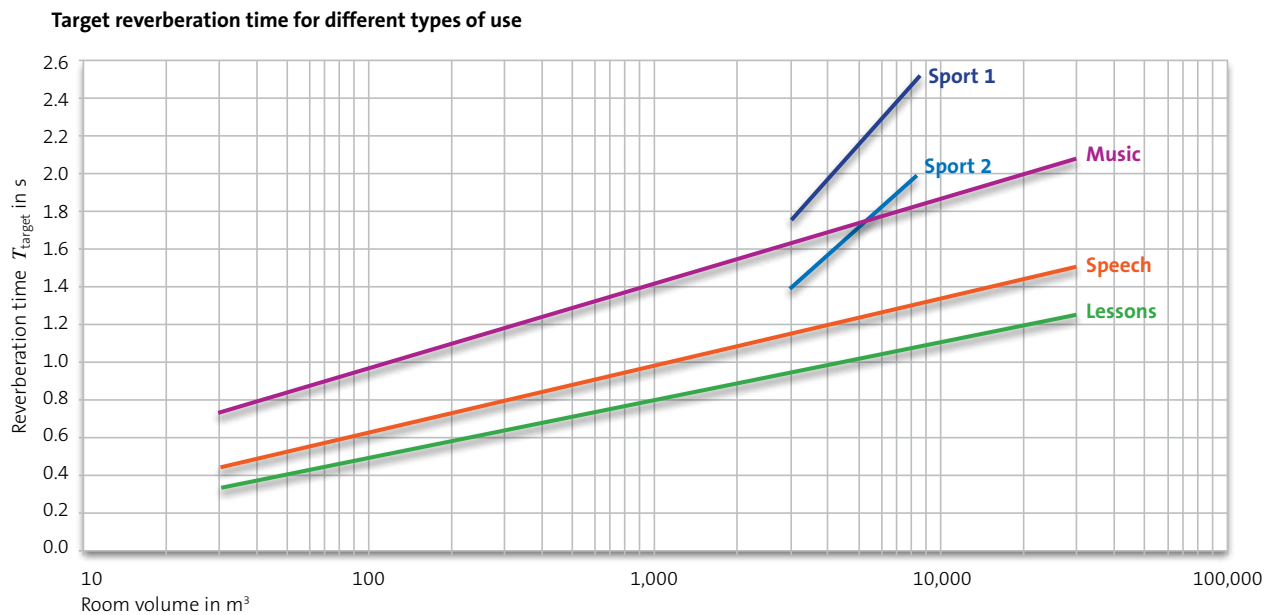




Optimum reverberation time – group A rooms

Group A rooms

In group A rooms, the target reverberation time (T_{target}) should be calculated depending on the type of use and effective room volume (V). The target curves for "music", "speech" and "lessons" apply for occupied rooms.



Target reverberation time T_{target} for different types of use.

Music: $T_{\text{target}} = \left(0.45 \lg \frac{V}{m^3} + 0.07 \right) [s]$

Speech: $T_{\text{target}} = \left(0.37 \lg \frac{V}{m^3} - 0.14 \right) [s]$

Lessons: $T_{\text{target}} = \left(0.32 \lg \frac{V}{m^3} - 0.17 \right) [s]$

Sport 1: $T_{\text{target}} = \left(1.27 \lg \frac{V}{m^3} - 2.49 \right) [s]$

Sport 2: $T_{\text{target}} = \left(0.95 \lg \frac{V}{m^3} - 1.74 \right) [s]$

For $2,000 \text{ m}^3 \leq V \leq 8,500 \text{ m}^3$

Where rooms are used for multiple purposes, the target values should be calculated on the basis of the priorities of the various uses.

Sport 1: Sports halls and swimming baths without audiences for normal use and/or one class at a time (one class or sports group, uniform lesson content).

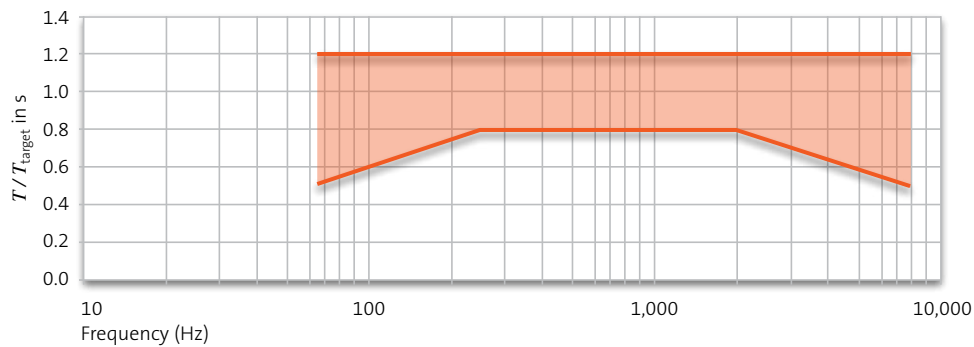
Sport 2: Sports halls and swimming baths without audiences for multiple classes at a time (several classes or sports groups in parallel with varying lesson content).



Optimum reverberation time – group A rooms

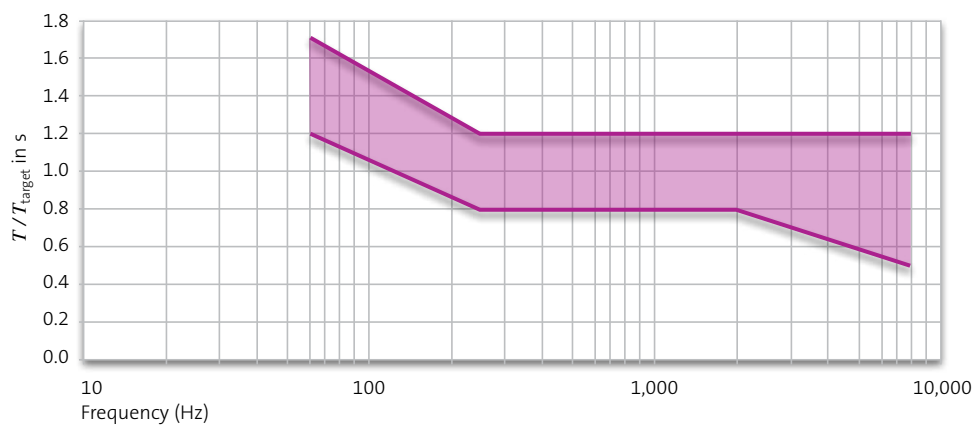
Reverberation time range for speech

The target reverberation time range depends on the frequency in rooms used for speech communication.



Reverberation time range for music

The target reverberation time range depends on the frequency in rooms used for music.



Absorber positioning in small rooms

Small rooms up to 250 m³

In addition to the appropriate selection of absorbers, their arrangement is also of decisive importance in acoustic planning for small rooms.

In right-angled rooms where the walls are flat and not broken up by furniture, shelves, window recesses or e.g. black boards/notice boards with a large surface area, there is a risk of flutter echoes occurring if the ceiling is fully covered with sound-absorbing elements.

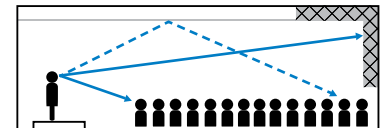
This risk can be avoided by including a sound-reflecting area in the middle of the ceiling.

As there is virtually no risk of excessive acoustic insulation in small rooms, the ceiling can be fully covered with sound-absorbing elements in combination with a sound-absorbing rear wall as an alternative.

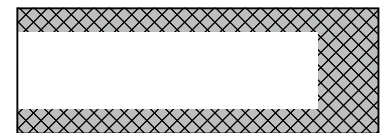


Example A:

Appropriate absorber arrangement



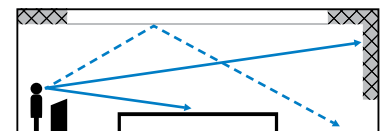
Side view



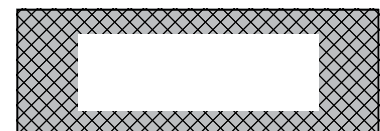
View of the ceiling from below

Example B:

Appropriate absorber arrangement



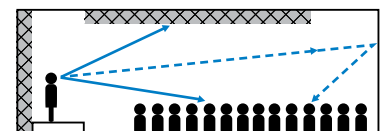
Side view



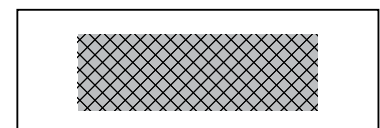
View of the ceiling from below

Example C:

Inappropriate absorber arrangement

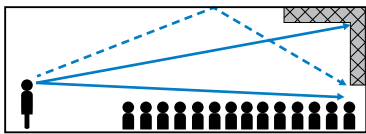


Side view

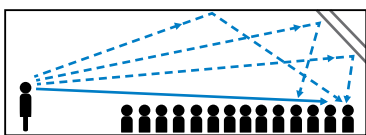


View of the ceiling from below

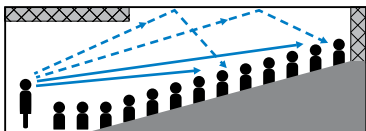
Absorber positioning in medium-sized rooms



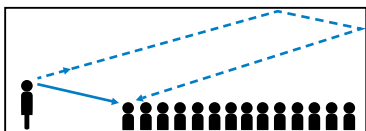
Appropriate absorber arrangement



Appropriate absorber arrangement



Appropriate absorber arrangement



Inappropriate absorber arrangement

Medium-sized rooms and small halls between 250 and 5,000 m³

Rooms of this size are usually larger classrooms/seminar rooms or lecture theatres.

Due to their size, in addition to the appropriate arrangement of sound-absorbing materials, it should be ensured that beneficial reflections are directed and prolonged, and consequently, that detrimental reflections are avoided.

In order to strengthen beneficial sound over greater distances and thus improve speech intelligibility, it is necessary to arrange and orient reflecting surfaces appropriately.

In the case of larger and more complex rooms it is expedient to involve a specialist planner.



Group B rooms

Group B rooms

By contrast to the requirements for group A rooms, recommendations are made for group B rooms which enable speech communication appropriate to the purpose of the rooms over short distances:

- Sales premises
- Restaurants, canteens
- Public areas for public transport
- Ticket and bank counters, call centres
- Lawyers' and doctors' consulting rooms
- Municipal offices
- Operating theatres, treatment and rehabilitation rooms, wards
- Public areas
- Public access areas
- Reading rooms, lending desks in libraries, lending libraries
- Stairwells, foyers, heavily frequented exhibition rooms

It is not essential to observe a target reverberation time for group B rooms.

Increasing the sound absorption reduces both overall background noise levels and reverberation time. Sound-absorbing materials for covering surfaces as well as furnishings can be used for this purpose. Sound absorbers should be used where:

1. additional sound absorbers are needed to reduce the ΔL of the sound pressure level by at least 3 dB compared to the untreated room.
The existing equivalent sound absorption area in the octave bands which determine the sound pressure level must be at least doubled here.
2. the degree of sound absorption expected as a result of the sound absorption measures and calculated on the basis of the surface area of the room does not exceed the value of 0.35 between the octave band mid-band frequencies of 250 Hz to 2,000 Hz.
Although greater sound absorption is expedient, the technical feasibility and cost-effectiveness of further measures should be reviewed.



Planning support

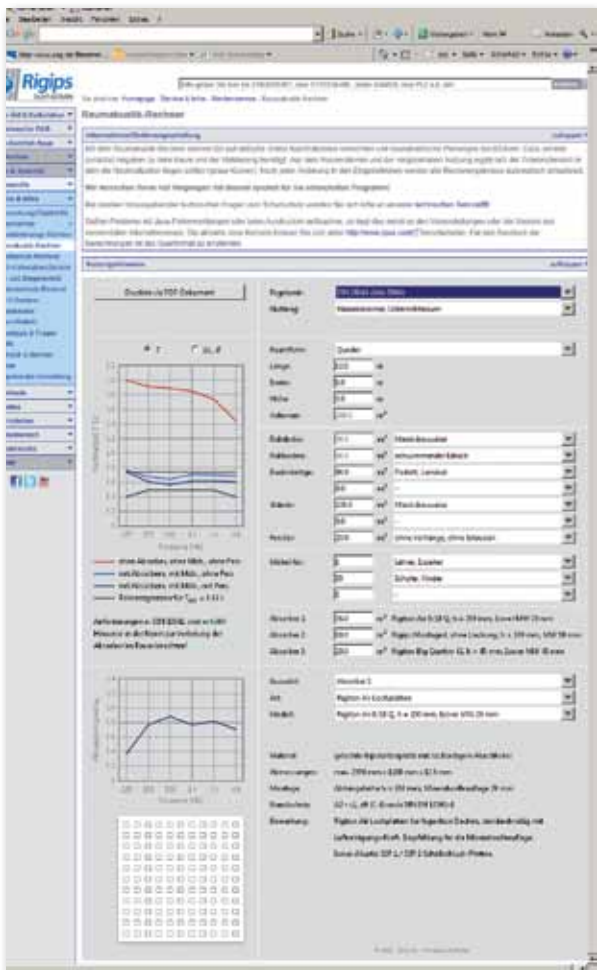
Room acoustics calculator

With its room acoustics calculator program, Rigips offers you an easy way to calculate reverberation times and plan room acoustics. Simply enter information about room geometry and fittings. The appropriate tolerance range for the reverberation times is then calculated from the room volume and intended use (grey curves). All results are automatically recalculated if you amend any of the entry fields.

Use this powerful tool at

www.rigips.de/raumakustik-rechner

(Please note that this program is in German).



Offer texts/CAD details

In particular in major construction projects, structures which can meet high structural and fire/sound protection requirements far in excess of those set out in drywall construction standards are preferred. Specially coordinated systems, with outstanding properties verified by certified testing institutes, are needed to meet these high requirements. Detailed offer texts are a key aid to clear description and safe installation. In many cases, a precise description of specific details is also only possible in the form of diagrams.

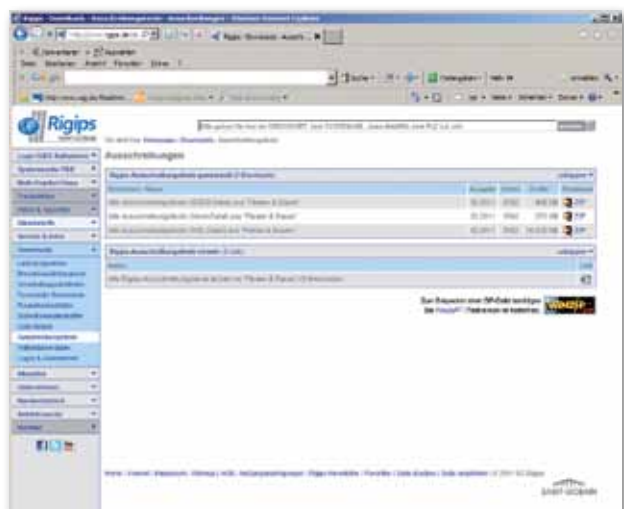
Ausschreibungstexte wie auch CAD-Details stehen Ihnen online zur Verfügung. Die einzelnen Rigips-Ausschreibungstexte in sieben verschiedenen Dateiformaten (HTML, PDF, DOC, GAEB, ÖNORM, Text, XML) finden Sie auf der jeweiligen Ergebnisseite, zu der Sie über die Rigips-Systemsuche gelangen. Zusammengefasst zum vollständigen Download erhalten Sie alle Ausschreibungstexte in drei Dateiformaten (XML, Word, GAEB).

The CAD details from brochures and technical guidelines can also be easily accessed in five different CAD formats (PDF, 2 DWG variants, DXF, JPG) at

www.rigips.de/downloads_cad_details.asp

(Please note that this information is in German).

In addition to texts for tenders and CAD details, you can also find the latest relevant extracts from "Planen und Bauen" ("Planning and construction" - German only) and order the corresponding inspection certificate via the web form.



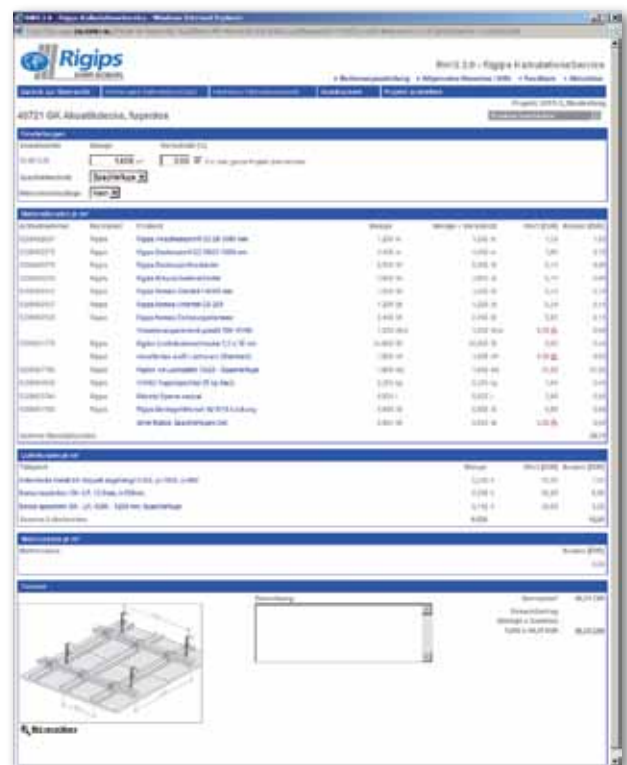


RiKS 2.0 – Rigips costing service

You can easily calculate material requirements/costs and the time needed to complete your projects with the enhanced RiKS 2.0 costing software from Rigips. (Please note that this software is in German).

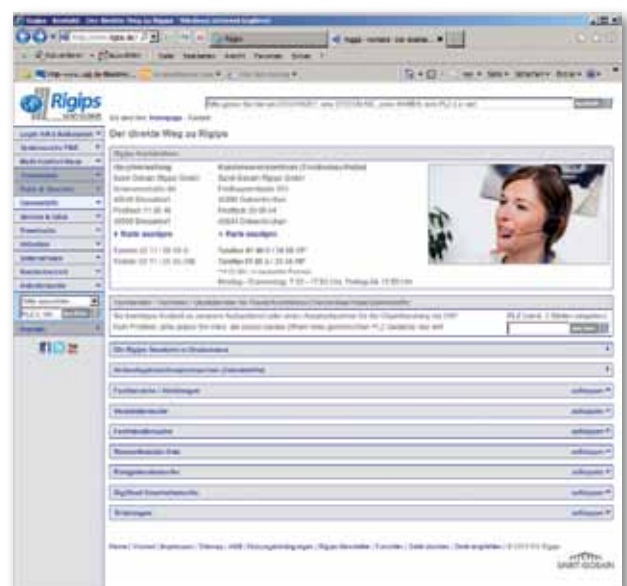
RiKS 2.0 offers the following advantages:

- Straightforward registration free of charge at **www.rigips.de**
- Online and local saving functionality
- Specification of installation times
- Output of complete bills of materials including article numbers/names, consumption volumes and list prices
- System search via system number/keyword entry or property selection
- Individual customizing options for all values with learning function
- Calculation of necessary activities with corresponding processing times in hours or minutes
- Automatic calculation of wage costs on entry of an hourly wage
- Output of a costing sheet with the results and system drawings
- Output of a material requirements list
- Output of a material order list
- Output of a schedule list
- Simple offer preparation
- Full project costing



Rigips project consulting

It is rare that the requirements of modern construction projects can be met with standard systems. The development of individual solutions tailored to the specific situation is a challenge which should not be underestimated, particularly with respect to fire/sound protection and acoustic room design. With the Rigips project consulting service, we have created a point of contact for planners and architects which offers technical and economic advantages and solutions based on project-specific research. The potential for savings is greatest and can be realised most effectively in the early planning phases, thus optimizing your design scope.



Room design for eyes and ears





The comprehensive Rigitone range from Rigips comprises high-quality acoustic perforated boards made from gypsum, which is a natural raw material. This range enables the creation of jointless ceiling systems with harmonious and architecturally appealing ceiling patterns, and outstanding acoustic properties. Why not take a look at the wide range available.



Rigitone Air

boards are premium-quality perforated plasterboards with detailed designs which combine function and aesthetics: In addition to their wide range of perforation patterns, Rigitone Air boards also demonstrate optimum acoustic properties, particularly in the frequency range of the human voice. All Rigitone Air boards also include highly effective air cleaning power as standard, ensuring the sustainable reduction of air pollutants and effective minimization of unpleasant odours.

Rigitone Climafit

are graphite-modified perforated plasterboards with outstanding thermal conductivity of over $0.5 \text{ W}/(\text{m} \cdot \text{K})$. They are used as high-performance panelling for modern temperature control systems such as heating or cooling ceilings. The innovative combination of gypsum - an attractive material for interior use - and highly thermally conductive graphite ensure efficient temperature control and thus an ideal and natural indoor climate. Rigitone Climafit boards are available in a total of ten different perforation designs.

Rigitone Clima Top Air

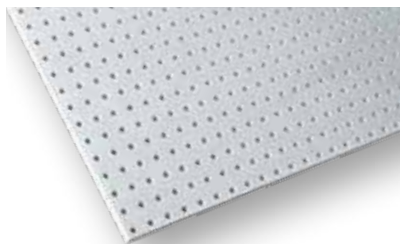
are perforated plasterboards which, in addition to air cleaning power as standard, also offer increased thermal conductivity. This makes them suitable for the panelling of cooling/heating systems in walls and ceilings, and allows gentle climate control in rooms.

Architects and planners can select from a wide variety of different perforation patterns across the entire Rigips offering. The range comprises designs with regular or regularly staggered round perforations, irregular scattered perforations and regular square perforations. On request, Rigitone boards can also be supplied for acoustic plaster coating on site.

The ideal combination of aesthetics and acoustics

Rigitone perforated boards are the preferred choice of architects and planners for high-quality acoustic ceilings thanks to their continuous perforation, jointless installation and outstanding acoustic properties. The wide variety of different perforation designs, excellent acoustic properties, high level of environmental compatibility and many other positive properties make these ceilings particularly attractive and sustainable.

Product range: Rigitone Air · Rigitone Climafit · Rigitone Clima Top Air



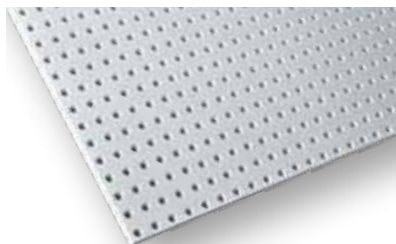
6/18

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Regular round perforation

Width x length: 1,188 x 1,998 mm

Perforated area: 8.7 %



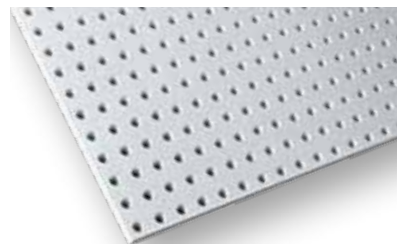
8/18

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Regular round perforation

Width x length: 1,188 x 1,998 mm

Perforated area: 15.5 %



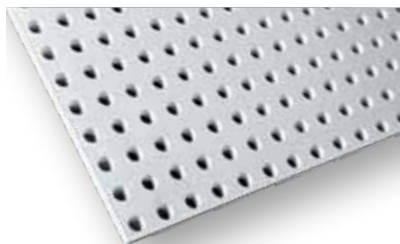
10/23

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Regular round perforation

Width x length: 1,196 x 2,001 mm

Perforated area: 14.8 %



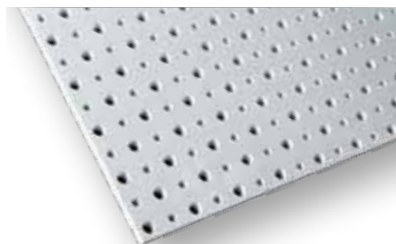
15/30

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Regular round perforation

Width x length: 1,200 x 2,010 mm

Perforated area: 19.6 %



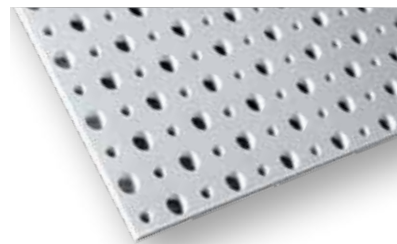
8-12/50

Rigitone Air

Regularly staggered round perforation

Width x length: 1,200 x 2,000 mm

Perforated area: 13.1 %



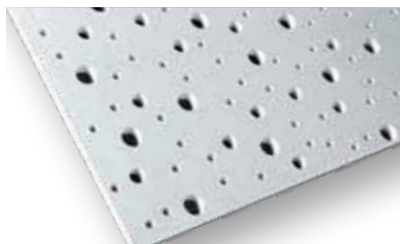
12-20/66

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Regularly staggered round perforation

Width x length: 1,188 x 1,980 mm

Perforated area: 19.6 %



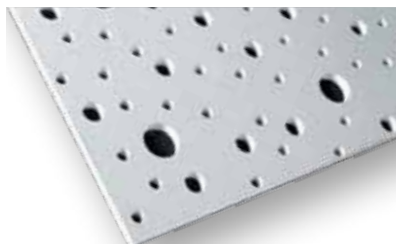
8-15-20 super

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Irregular scattered perforation

Width x length: 1,200 x 1,960 mm

Perforated area: 10.0 %



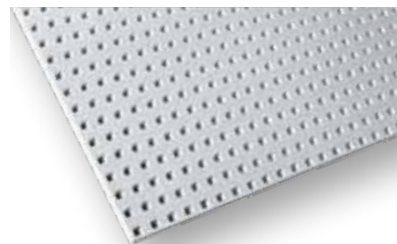
12-20-35

Rigitone Air

Irregular scattered perforation

Width x length: 1,200 x 2,000 mm

Perforated area: 11.0 %



8/18 Q

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Regularly squared perforation

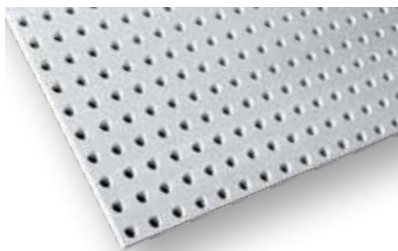
Width x length: 1,188 x 1,998 mm

Perforated area: 19.8 %

* 8-15-20 super board size (see page 42)



Fitted with acoustic tissue as standard



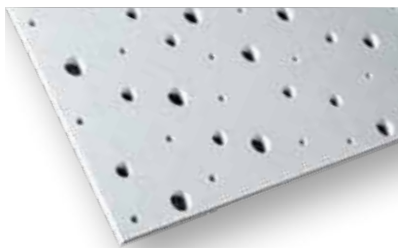
12/25

Rigitone Air, Rigitone Climafit, Rigitone Clima Top Air

Regular round perforation

Width x length: 1,200 x 2,000 mm

Perforated area: 18.1 %



8-15-20

Rigitone Air, Rigitone Climafit, Rigitone Clima Top Air

Irregular scattered perforation

Width x length: 1,200 x 2,000 mm

Perforated area: 6.0 %



12/25 Q

Rigitone Air, Rigitone Climafit, Rigitone Clima Top Air

Regularly squared perforation

Width x length: 1,200 x 2,000 mm

Perforated area: 23.0 %

Product properties

The Rigitone board range comprises perforation designs with regular and regularly staggered round perforations, irregular scattered perforations and square perforations. They are fitted with white or black acoustic tissue as standard and demonstrate very good sound-absorbing properties, particularly in the frequency range of the human voice.

Surface finish

The surfaces of Rigitone boards are untreated. After installation and joint filling, the boards should be primed on site and then painted with a paint roller. Paint should not be applied using a spray diffuser.

Reaction to fire

Rigitone boards are designated as A2-s1, d0 (C.4) - non-combustible - in accordance with DIN EN 13501-1.

Installation instructions

The Joint Filling or Adhesive Joint Technique should be employed for the jointless installation of Rigitone perforated boards with continuous perforation.

Structural prerequisites

Rigitone boards can be used in all rooms where the relative humidity does not exceed 70%. There should be a constant board and room temperature of at least 5 °C during joint filling.

Renovation

The board surface can easily be re-painted during any renovation work without impacting the properties of the boards. However, paint should not be applied using a spray diffuser.

Board dimensions for joining techniques

Adhesive joint



Nominal size - 1 mm = actual size

Filled joint

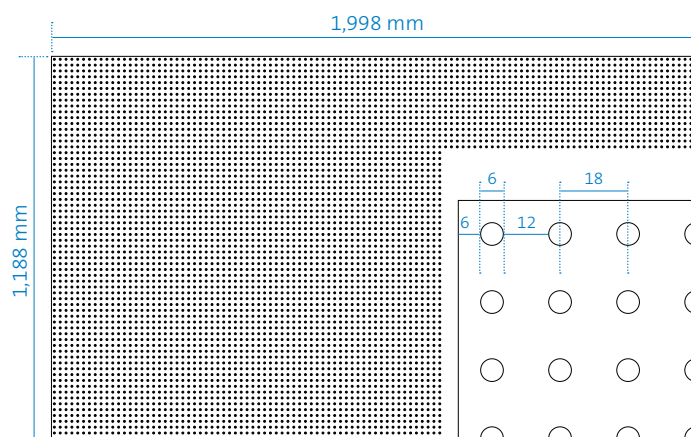


Nominal size - 3,6 mm = actual size

For the irregular scattered perforation pattern 12-20-35, the nominal size is the same as the actual size.

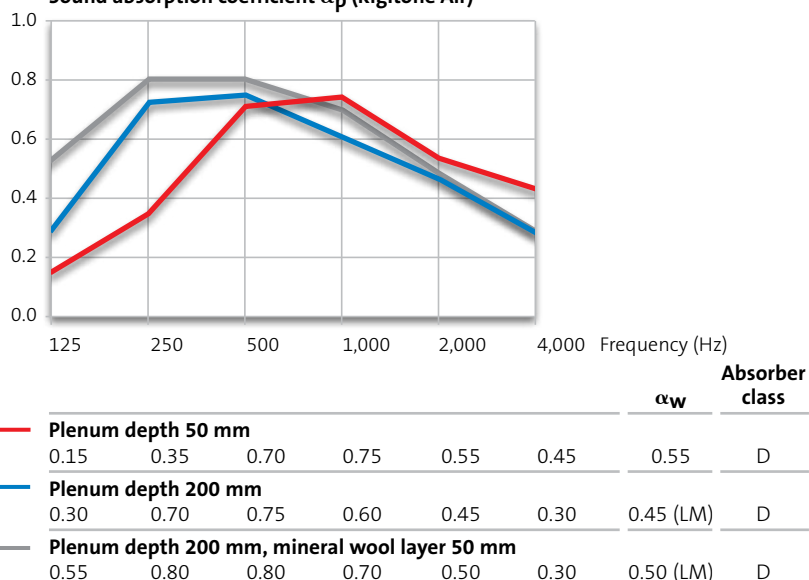
* 8-15-20 super board size (see page 42).

Rigitone Air · Climafit · Clima Top Air 6 / 18



	Rigitone Air	Rigitone Climafit	Rigitone Clima Top Air
 System number	4.07.21	—	—
 Board thickness in mm	12.5	10	10
 Weight in kg/m²	approx. 10	approx. 8.5	approx. 8.5
 Perforated area in %	8.7	8.7	8.7
 Centre-to-centre distance between support profiles in mm	333	333	333
 Air cleaning power	✓	—	✓
 Reaction to fire in accordance with DIN EN 13501	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)

Sound absorption coefficient α_p (Rigitone Air)





6 / 18

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Regular round perforation

Width x length: 1,188 x 1,998 mm

Perforated area: 8.7 %

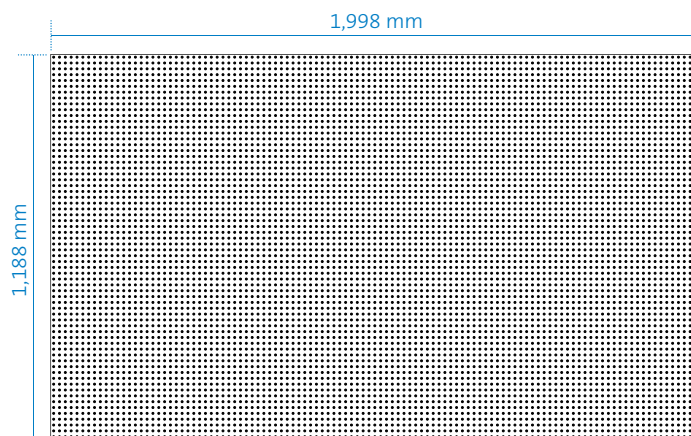
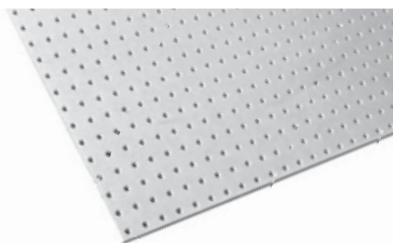
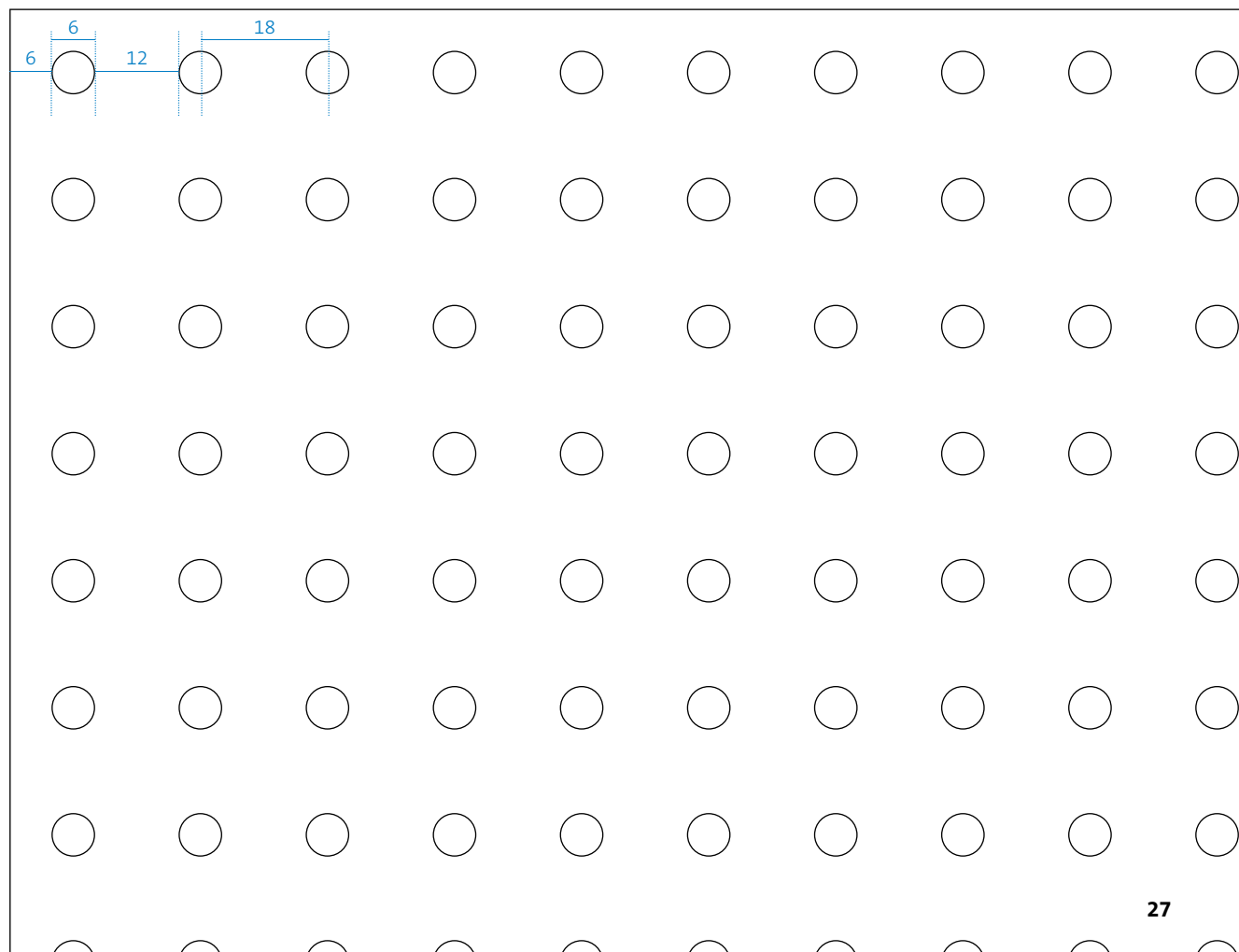
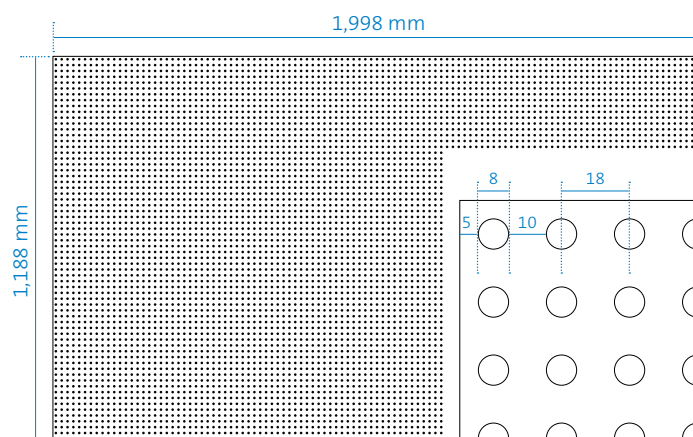


Diagram scale 1:1

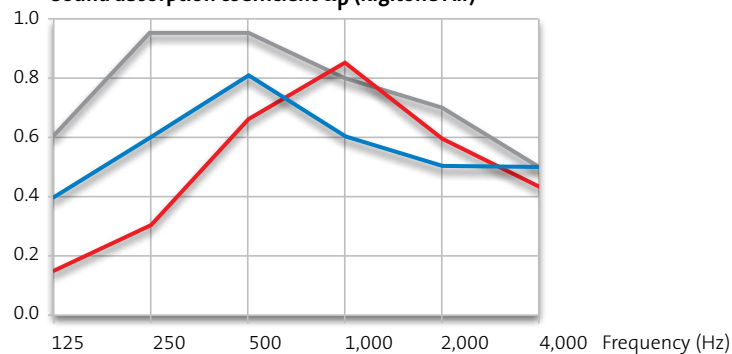


Rigitone Air · Climafit · Clima Top Air 8 / 18



	Rigitone Air	Rigitone Climafit	Rigitone Clima Top Air
 System number	4.07.21	—	—
 Board thickness in mm	12.5	10	10
 Weight in kg/m²	approx. 9.5	approx. 8.0	approx. 8.0
 Perforated area in %	15.5	15.5	15.5
 Centre-to-centre distance between support profiles in mm	333	333	333
 Air cleaning power	✓	—	✓
 Reaction to fire in accordance with DIN EN 13501	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)

Sound absorption coefficient α_p (Rigitone Air)



	125	250	500	1,000	2,000	4,000	Frequency (Hz)	Absorber class
							α_w	
	Plenum depth 50 mm							
	0.15	0.30	0.65	0.85	0.60	0.45	0.55 (M)	D
	Plenum depth 200 mm							
	0.40	0.60	0.80	0.60	0.50	0.50	0.60	C
	Plenum depth 200 mm, mineral wool layer 50 mm							
	0.60	0.95	0.95	0.80	0.70	0.50	0.70 (LM)	C



Regular round perforation

Width x length: 1,188 x 1,998 mm

Perforated area: 15.5 %

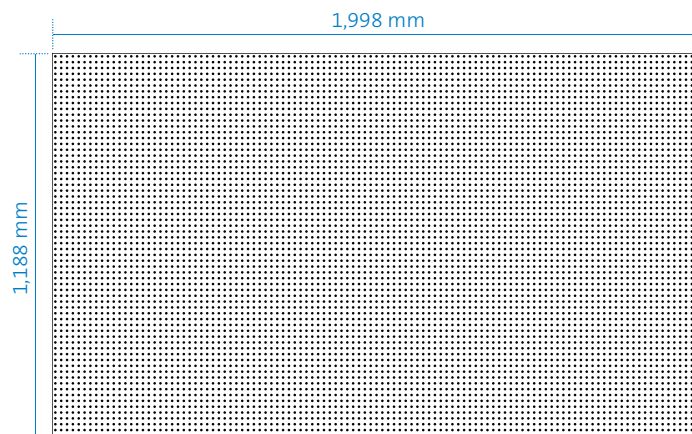
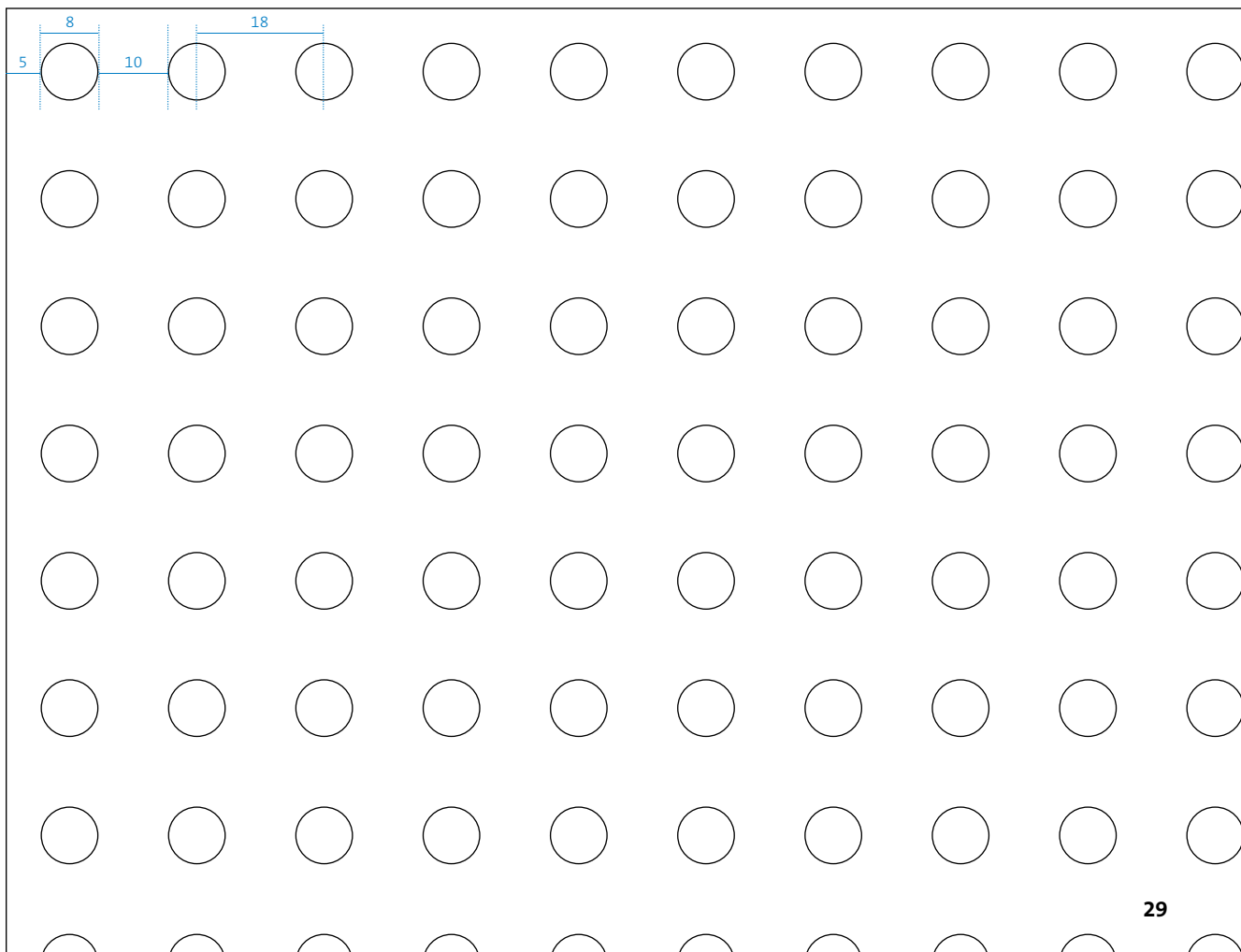
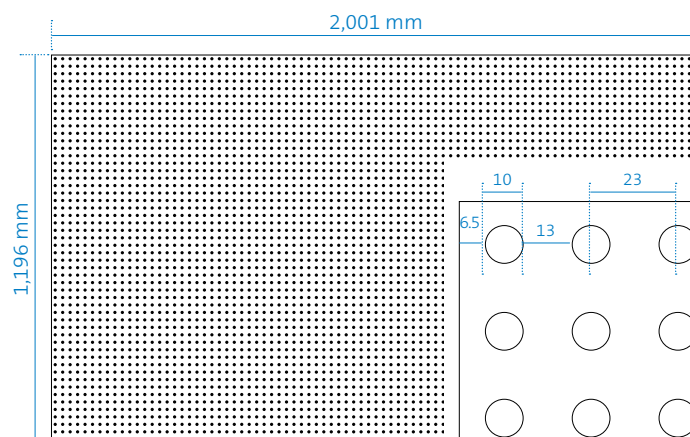


Diagram scale 1:1

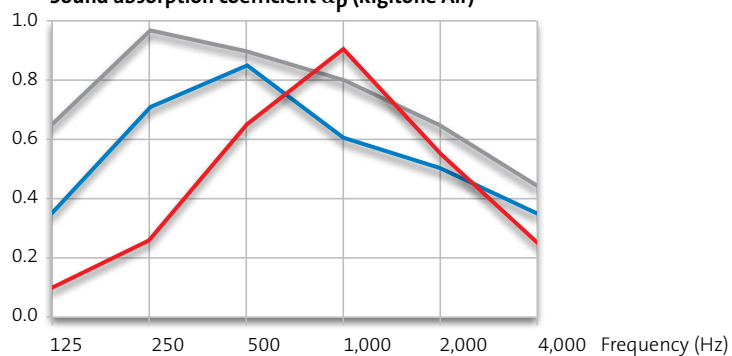


Rigitone Air · Climafit · Clima Top Air 10/23



	Rigitone Air	Rigitone Climafit	Rigitone Clima Top Air
 System number	4.07.21	—	—
 Board thickness in mm	12.5	10	10
 Weight in kg/m²	approx. 9.5	approx. 8.0	approx. 8.0
 Perforated area in %	14.8	14.8	14.8
 Centre-to-centre distance between support profiles in mm	333	333	333
 Air cleaning power	✓	—	✓
 Reaction to fire in accordance with DIN EN 13501	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)

Sound absorption coefficient α_p (Rigitone Air)



							α_w	Absorber class
—	Plenum depth 50 mm							
	0.10	0.25	0.65	0.90	0.55	0.25	0.45 (M)	D
—	Plenum depth 200 mm							
	0.35	0.70	0.85	0.60	0.50	0.35	0.50 (LM)	D
—	Plenum depth 200 mm, mineral wool layer 50 mm							
	0.65	0.95	0.90	0.80	0.65	0.45	0.65 (LM)	C

10 / 23

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Regular round perforation

Width x length: 1,196 x 2,001 mm

Perforated area: 14.8 %

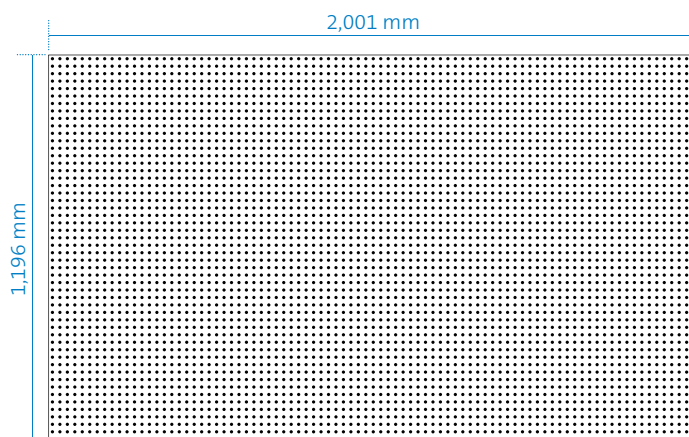
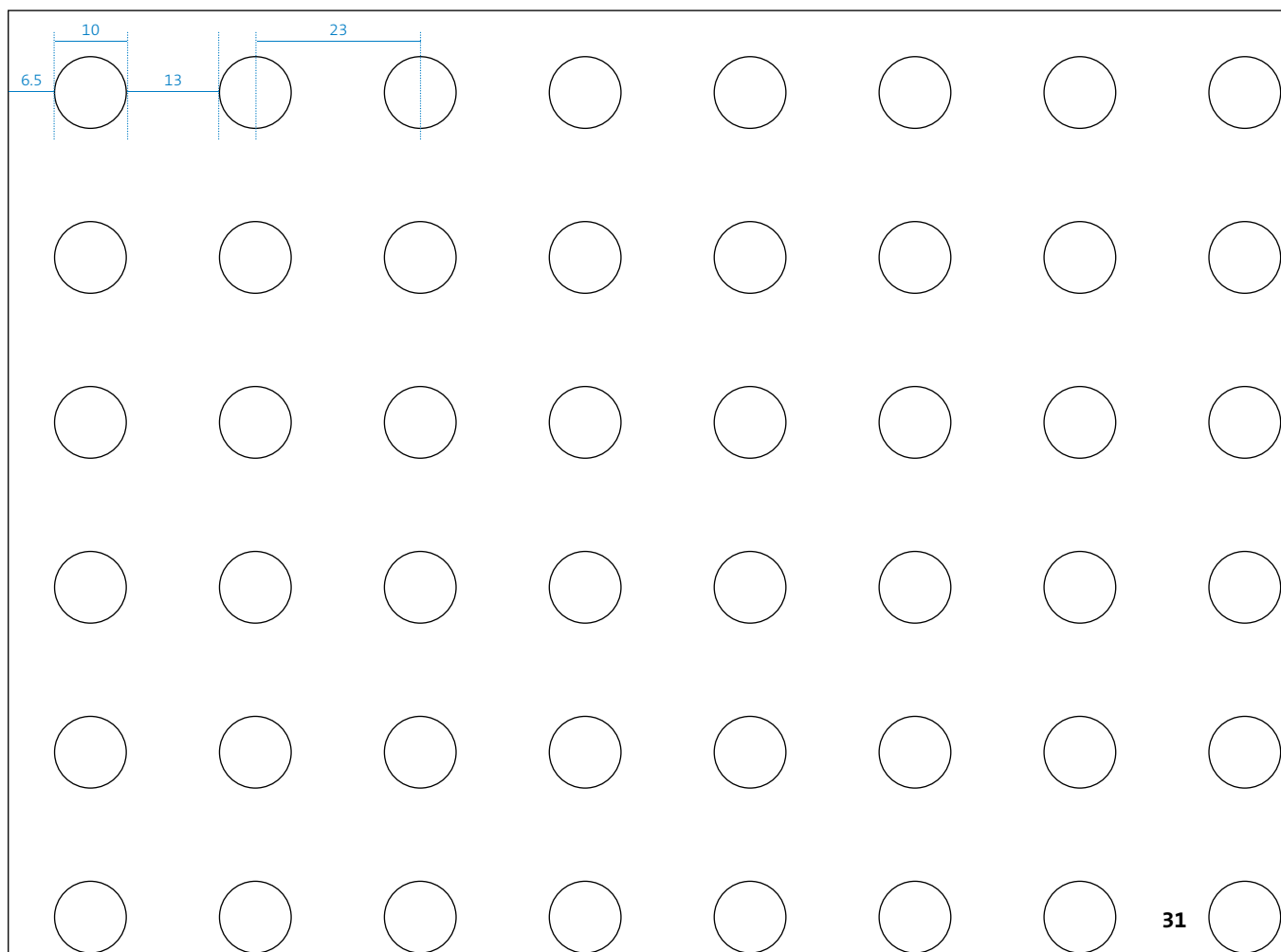
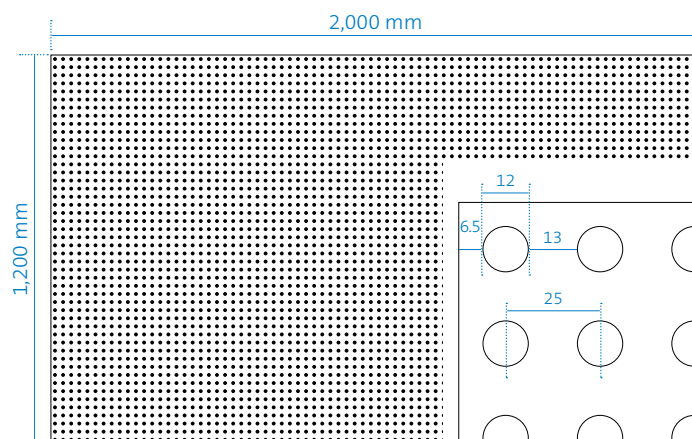


Diagram scale 1:1

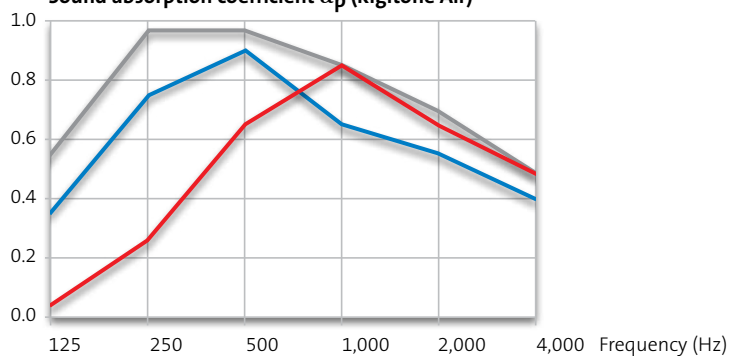


Rigitone Air · Climafit · Clima Top Air 12 / 25

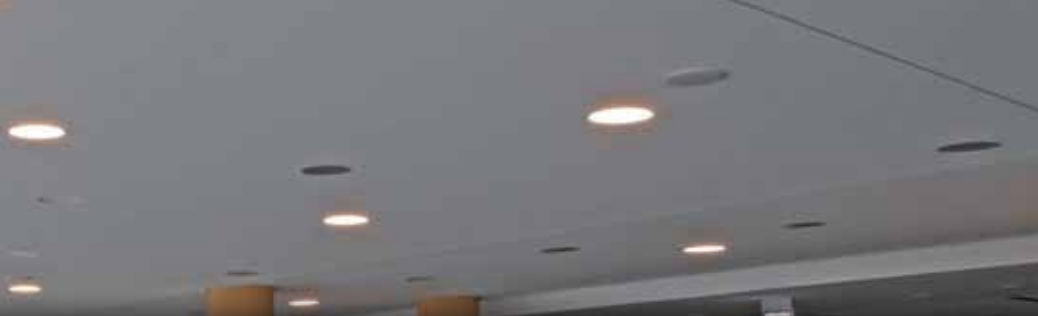


	Rigitone Air	Rigitone Climafit	Rigitone Clima Top Air
 System number	4.07.21	—	—
 Board thickness in mm	12.5	10	10
 Weight in g/m²	approx. 9.0	approx. 7.5	approx. 7.5
 Perforated area in %	18.1	18.1	18.1
 Centre-to-centre distance between support profiles in mm	333	333	333
 Air cleaning power	✓	—	✓
 Reaction to fire in accordance with DIN EN 13501	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)

Sound absorption coefficient α_p (Rigitone Air)



							α_w	Absorber class
—	Plenum depth 50 mm							
	0.05	0.25	0.65	0.85	0.65	0.50	0.55 (M)	D
—	Plenum depth 200 mm							
	0.35	0.75	0.90	0.65	0.55	0.40	0.55 (LM)	D
—	Plenum depth 200 mm, mineral wool layer 50 mm							
	0.55	0.95	0.95	0.85	0.70	0.50	0.70 (LM)	C



12 / 25

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Regular round perforation

Width x length: 1,200 x 2,000 mm

Perforated area: 18.1 %

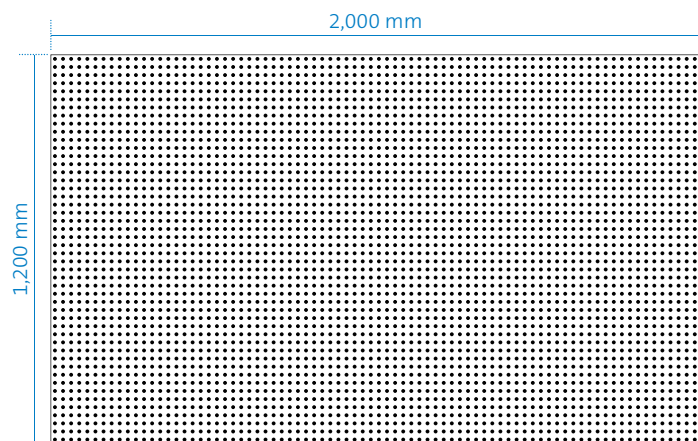
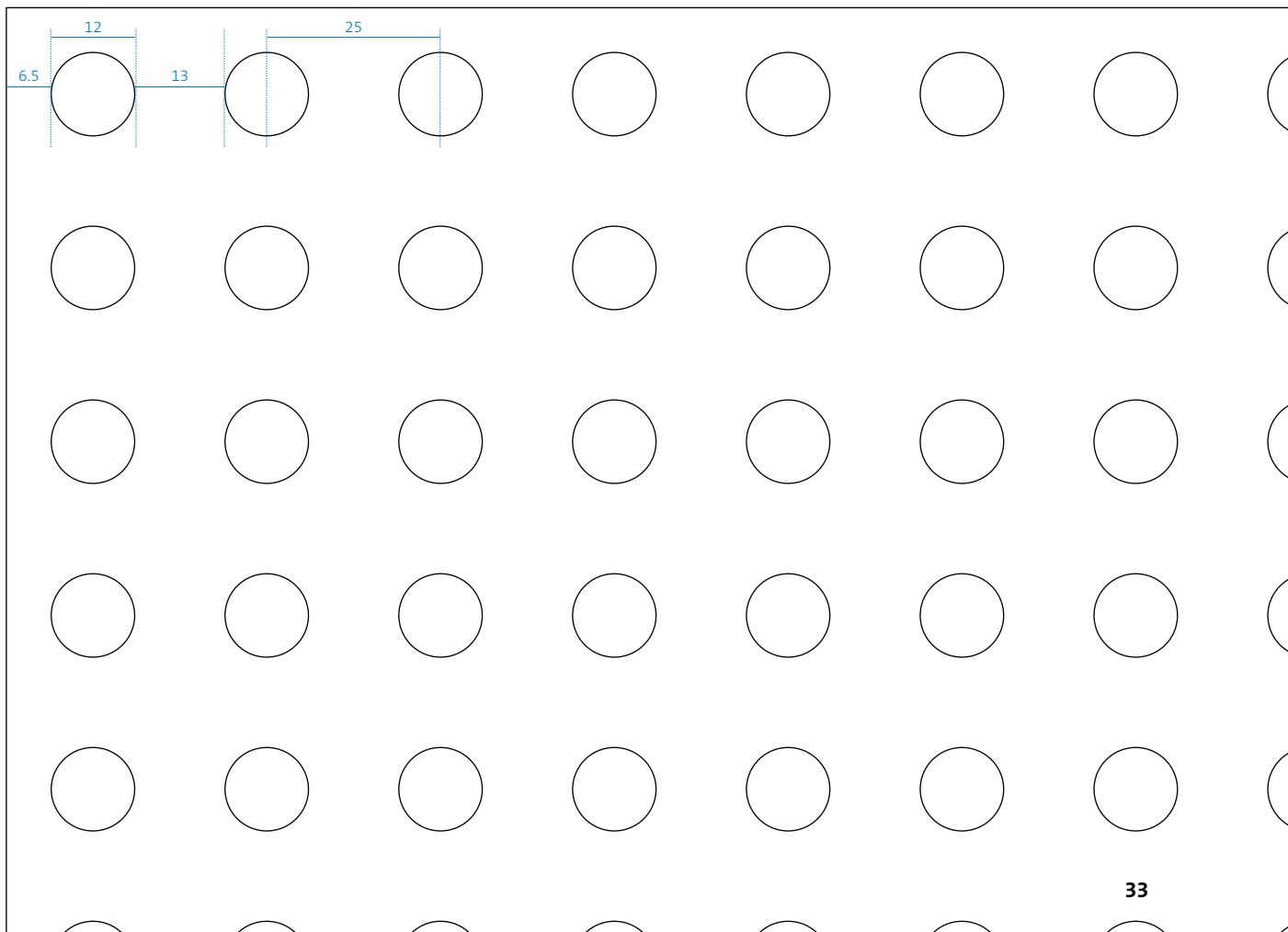
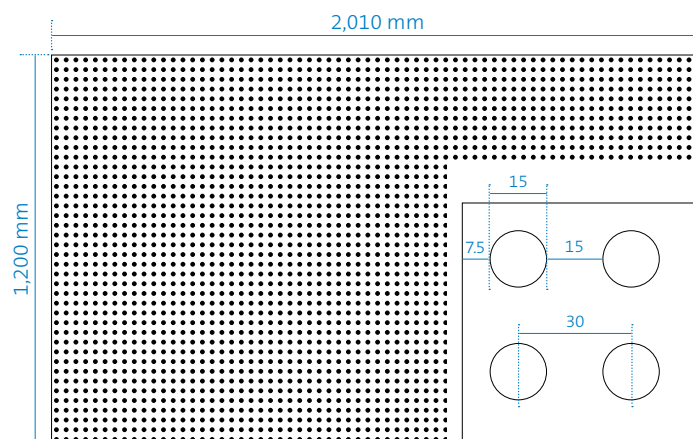


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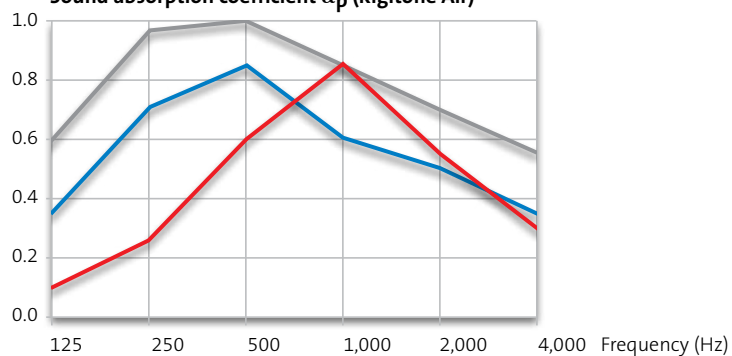


Rigitone Air · Climafit · Clima Top Air 15 / 30



	Rigitone Air	Rigitone Climafit	Rigitone Clima Top Air
 System number	4.07.21	—	—
 Board thickness in mm	12.5	10	10
 Weight in kg/m²	approx. 9.0	approx. 7.5	approx. 7.5
 Perforated area in %	19.6	19.6	19.6
 Centre-to-centre distance between support profiles in mm	335	335	335
 Air cleaning power	✓	—	✓
 Reaction to fire in accordance with DIN EN 13501	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)

Sound absorption coefficient α_p (Rigitone Air)



	125	250	500	1,000	2,000	4,000	Frequency (Hz)	Absorber class
							α_w	
—	Plenum depth 50 mm							
	0.10	0.25	0.60	0.85	0.55	0.30	0.45 (M)	D
—	Plenum depth 200 mm							
	0.35	0.70	0.85	0.60	0.50	0.35	0.50 (LM)	D
—	Plenum depth 200 mm, mineral wool layer 50 mm							
	0.60	0.95	1.00	0.85	0.70	0.55	0.70 (LM)	C

15 / 30

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Regular round perforation

Width x length: 1,200 x 2,010 mm

Perforated area: 19.6 %

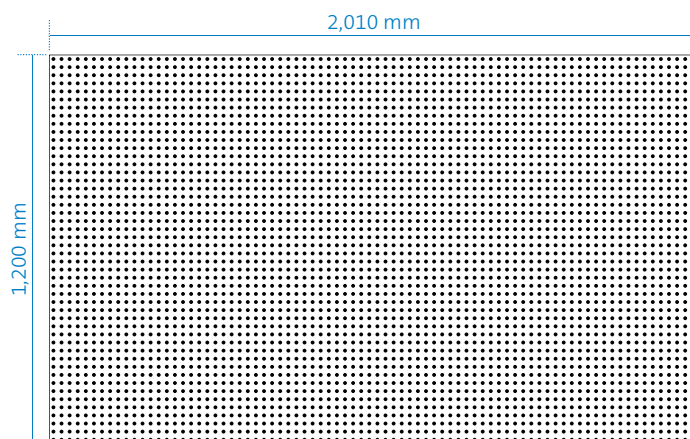
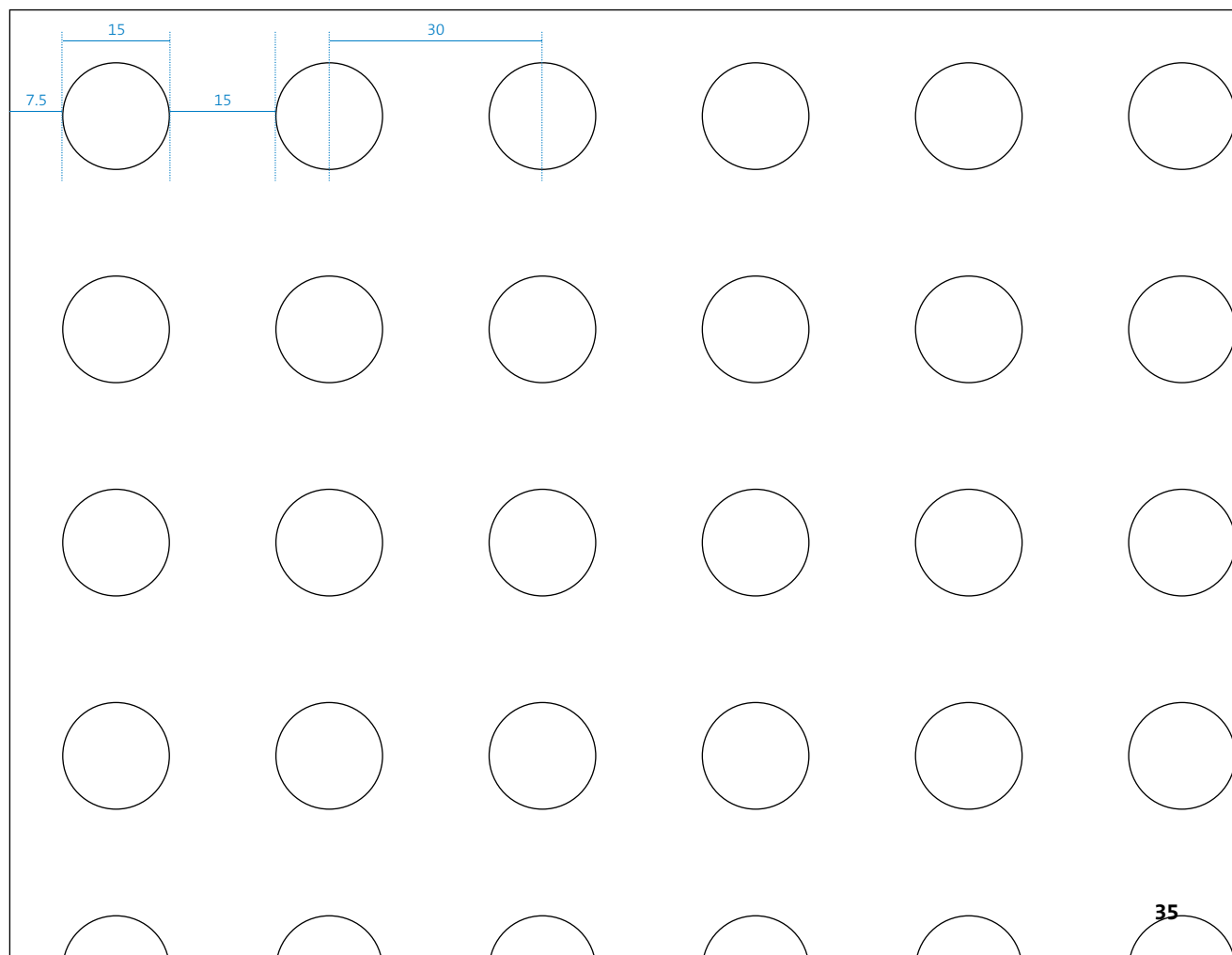
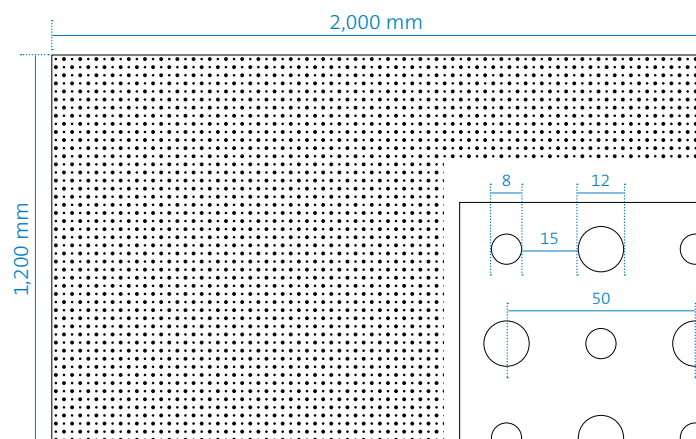


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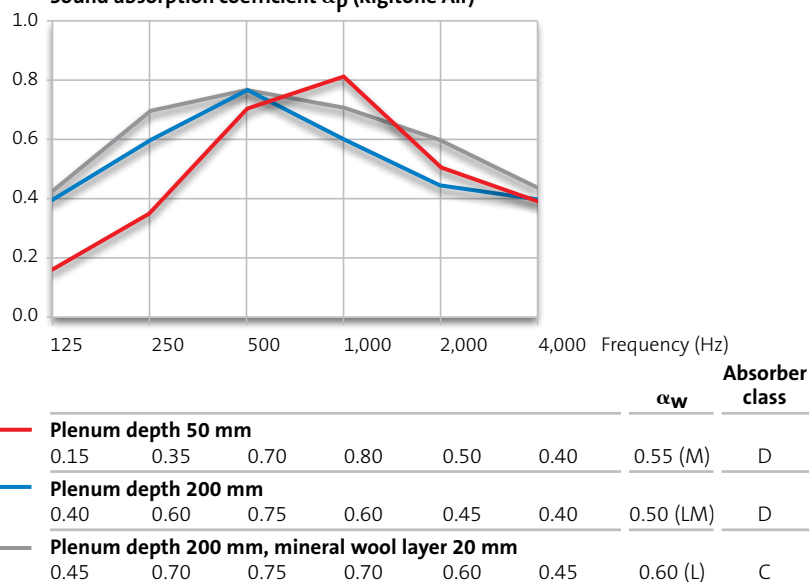


Rigitone Air 8-12 / 50



	Rigitone Air
 System number	4.07.21
 Board thickness in mm	12.5
 Weight in kg/m²	approx. 9.5
 Perforated area in %	13.1
 Centre-to-centre distance between support profiles in mm	333
 Air cleaning power	✓
 Reaction to fire in accordance with DIN EN 13501	A2-s1, d0 (C.4)

Sound absorption coefficient α_p (Rigitone Air)



8-12 / 50

Rigiton Air

Regularly staggered round perforation

Width x length: 1,200 x 2,000 mm

Perforated area: 13.1 %

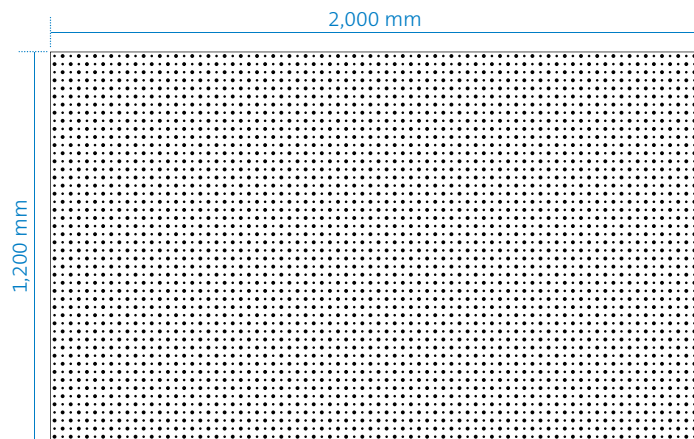
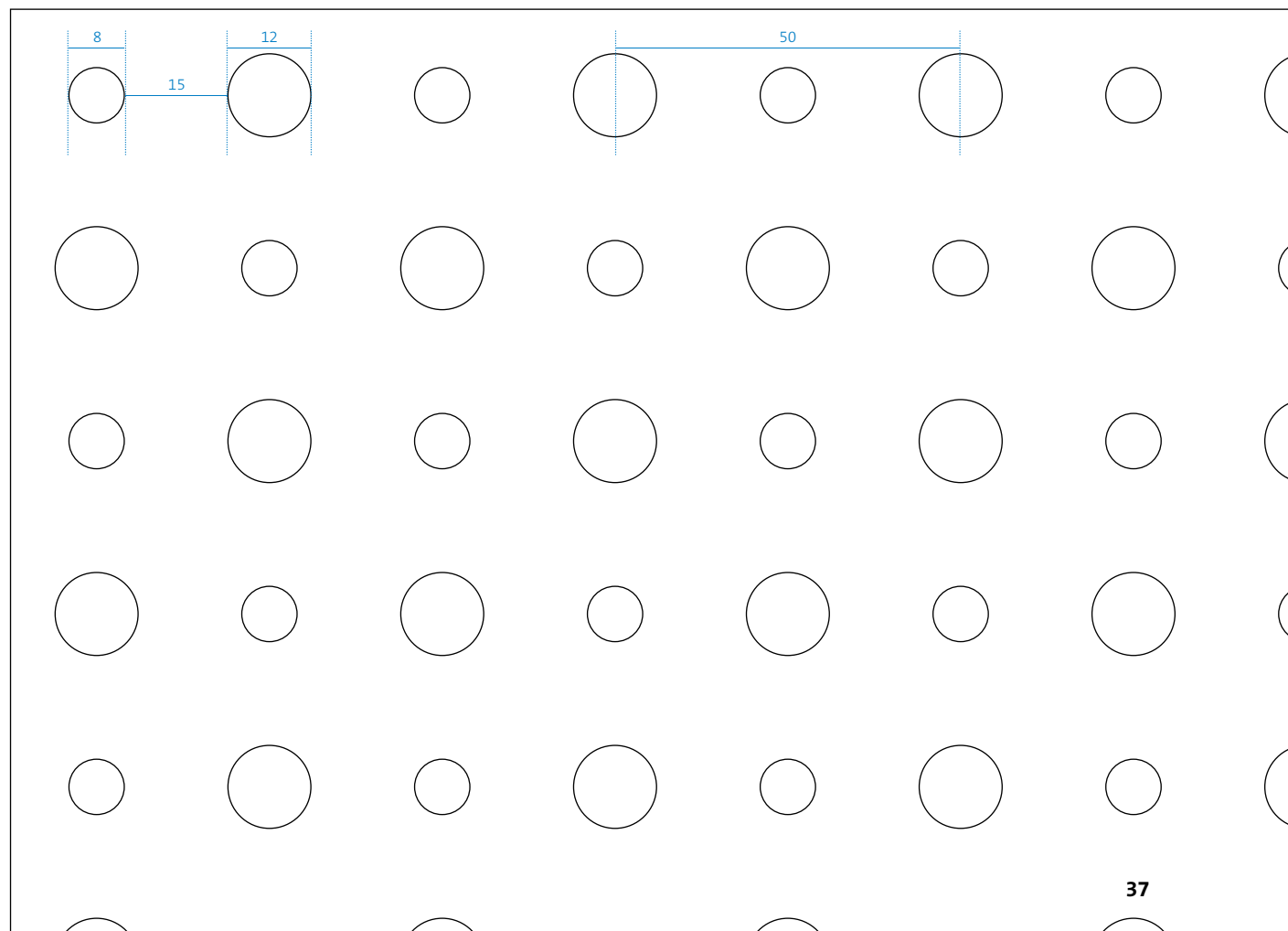
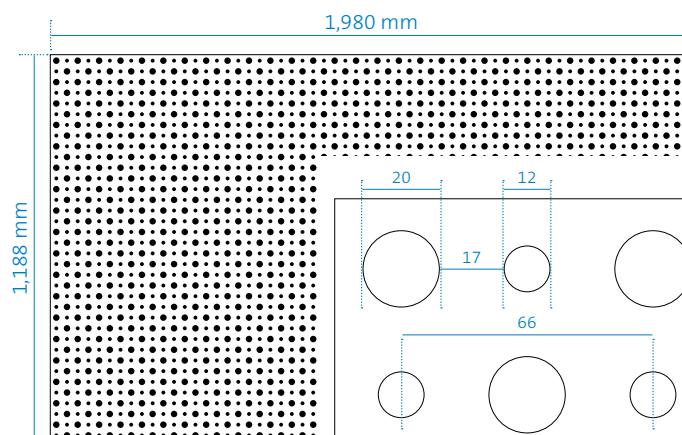


Diagram scale 1:1

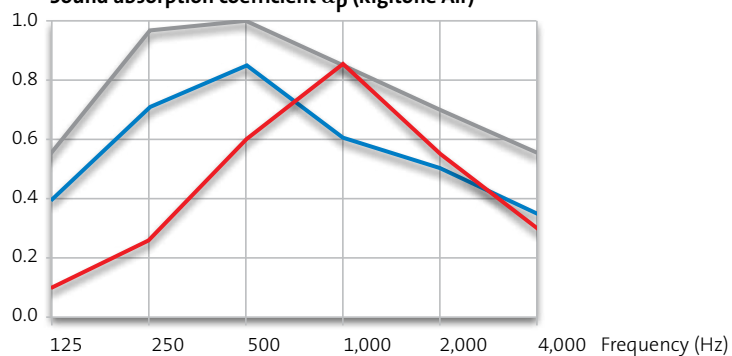


Rigitone Air · Climafit · Clima Top Air 12-20/66



	Rigitone Air	Rigitone Climafit	Rigitone Clima Top Air
 System number	4.07.21	—	—
 Board thickness in mm	12.5	10	10
 Weight in kg/m²	approx. 9.0	approx. 7.5	approx. 7.5
 Perforated area in %	19.6	19.6	19.6
 Centre-to-centre distance between support profiles in mm	330	330	330
 Air cleaning power	✓	—	✓
 Reaction to fire in accordance with DIN EN 13501	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)

Sound absorption coefficient α_p (Rigitone Air)



						α_w	Absorber class
— Plenum depth 50 mm	0.10	0.25	0.60	0.85	0.55	0.30	0.45 (M) D
— Plenum depth 200 mm	0.40	0.70	0.85	0.60	0.50	0.35	0.50 (LM) D
— Plenum depth 200 mm, mineral wool layer 50 mm	0.55	0.95	1.00	0.85	0.70	0.55	0.70 (LM) C



12-20 / 66

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Regularly staggered round perforation

Width x length: 1,188 x 1,980 mm

Perforated area: 19.6 %

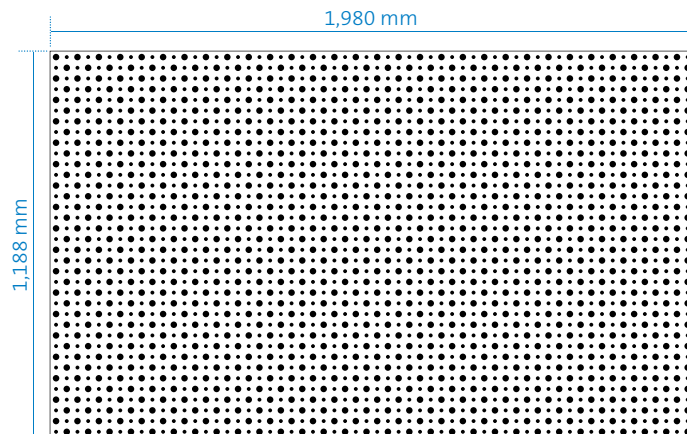
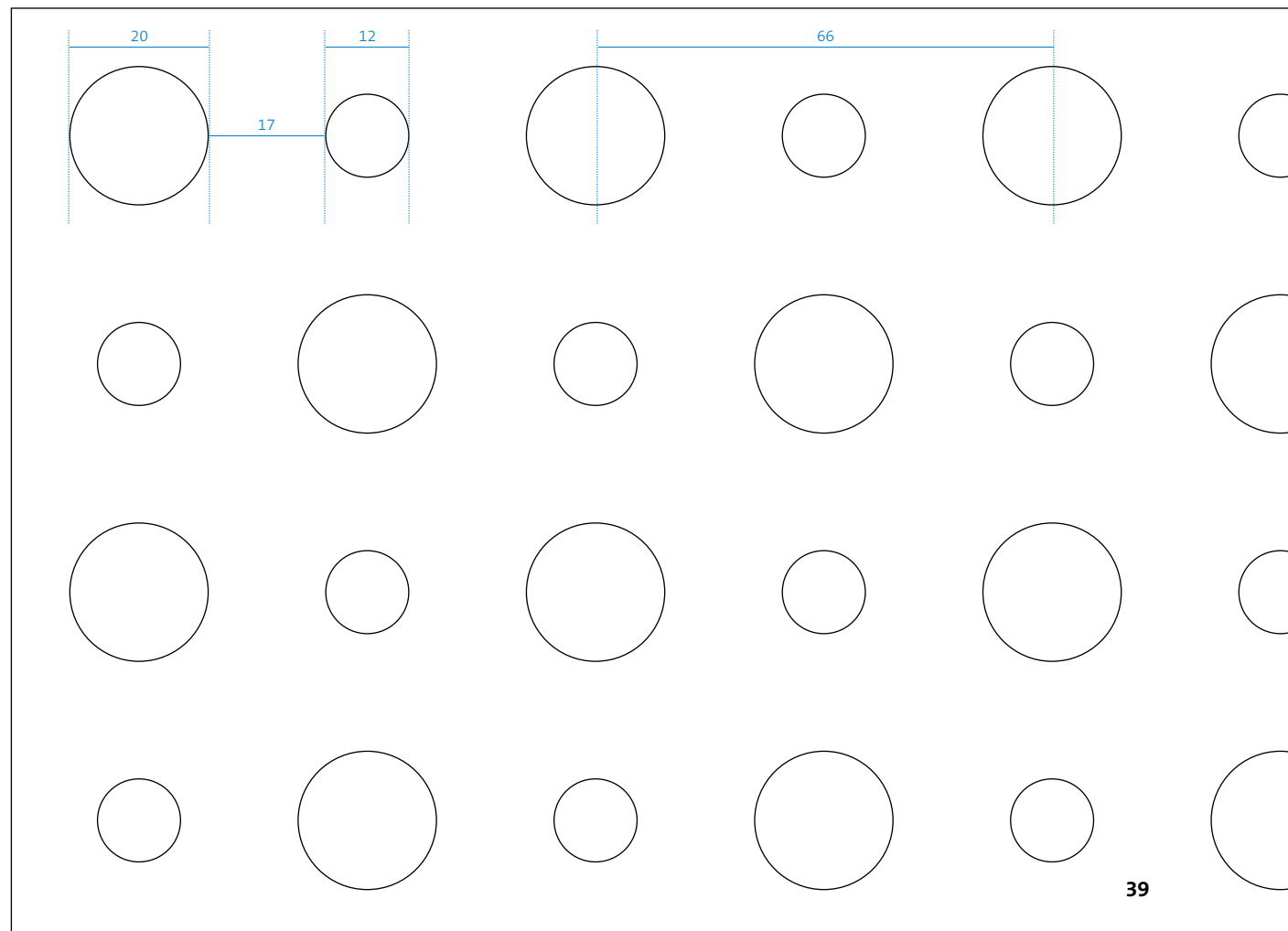
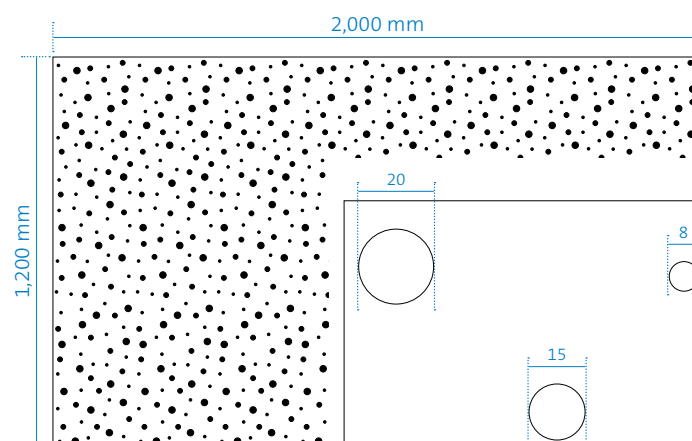


Diagram scale 1:1

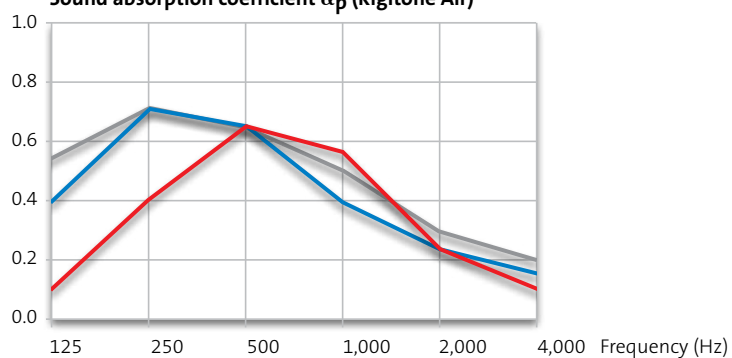


Rigitone Air · Climafit · Clima Top Air 8-15-20



	Rigitone Air	Rigitone Climafit	Rigitone Clima Top Air
 System number	4.07.21	—	—
 Board thickness in mm	12.5	10	10
 Weight in kg/m²	approx. 10	approx. 8.5	approx. 8.5
 Perforated area in %	6	6	6
 Centre-to-centre distance between support profiles in mm	333	333	333
 Air cleaning power	✓	—	✓
 Reaction to fire in accordance with DIN EN 13501	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)

Sound absorption coefficient α_p (Rigitone Air)



	125	250	500	1,000	2,000	4,000	Frequency (Hz)	Absorber class
							α_w	
	Plenum depth 50 mm							
	0.10	0.40	0.65	0.55	0.25	0.10	0.25 (LM)	E
	Plenum depth 200 mm							
	0.40	0.70	0.65	0.40	0.25	0.15	0.30 (LM)	D
	Plenum depth 200 mm, mineral wool layer 50 mm							
	0.55	0.70	0.65	0.50	0.30	0.20	0.35 (LM)	D



8-15-20

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Irregular scattered perforation

Width x length: 1,200 x 2,000 mm

Perforated area: 6.0 %

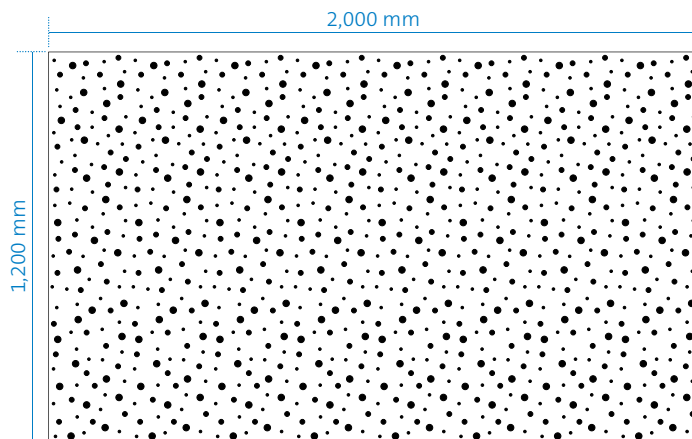
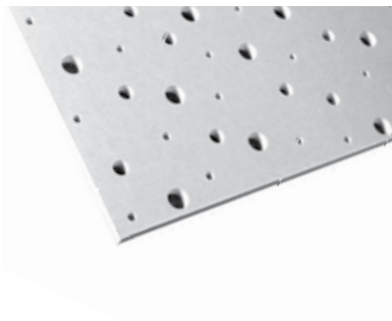
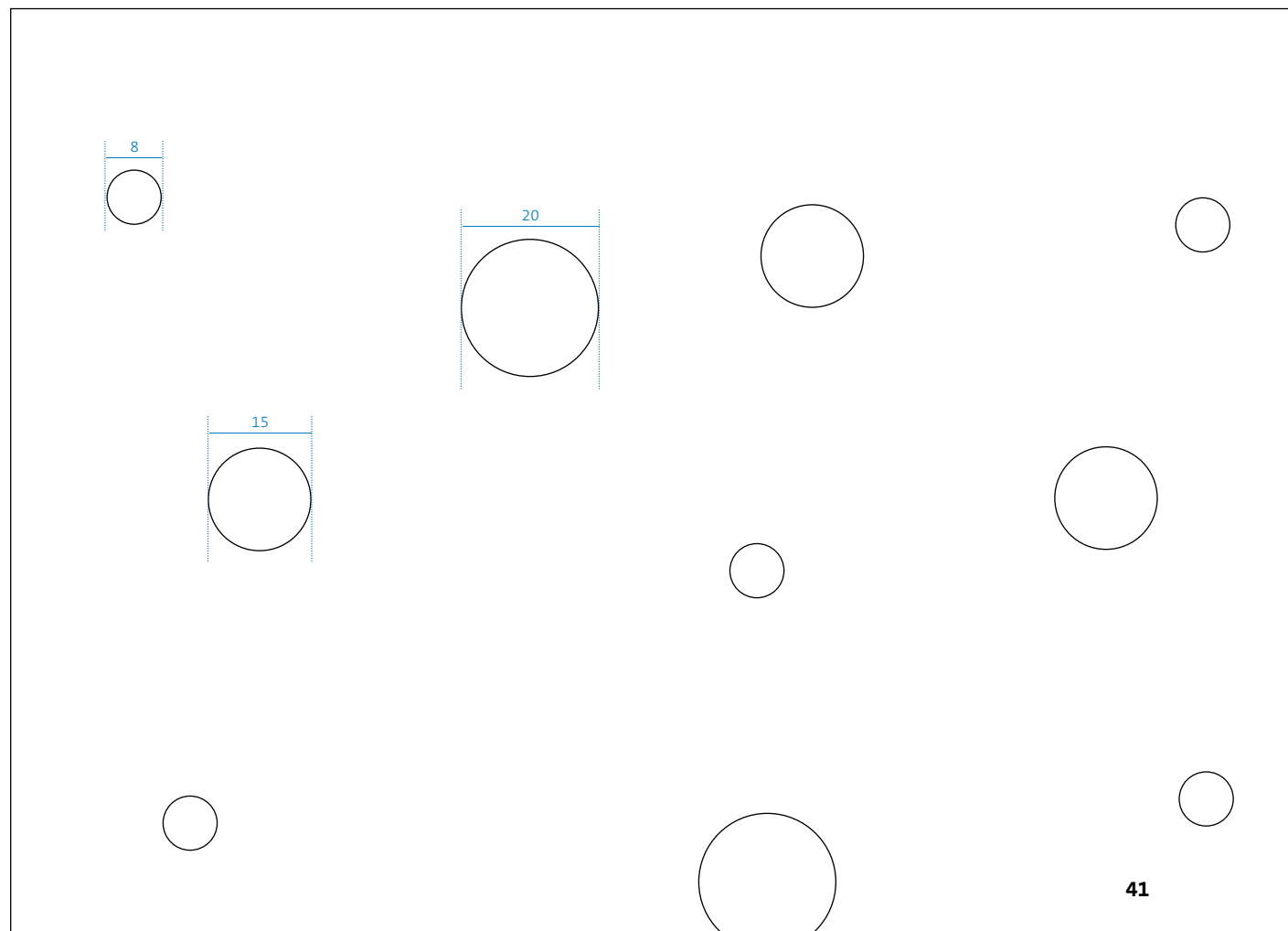
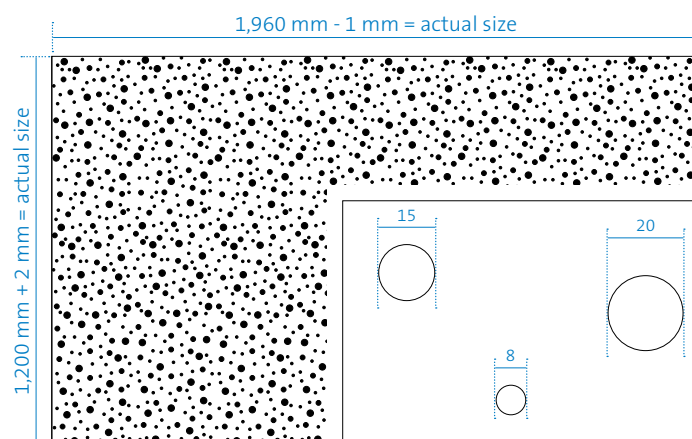


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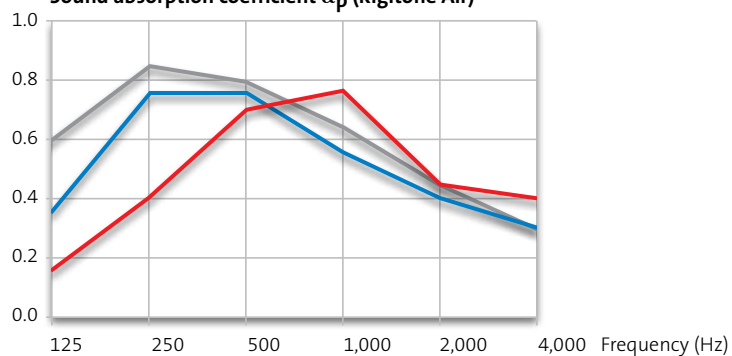


Rigitone Air · Climafit · Clima Top Air 8-15-20 super



	Rigitone Air	Rigitone Climafit	Rigitone Clima Top Air
 System number	4.07.21	—	—
 Board thickness in mm	12.5	10	10
 Weight in kg/m²	approx. 10	approx. 8.5	approx. 8.5
 Perforated area in %	10	10	10
 Centre-to-centre distance between support profiles in mm	327	327	327
 Air cleaning power	✓	—	✓
 Reaction to fire in accordance with DIN EN 13501	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)

Sound absorption coefficient α_p (Rigitone Air)



	125	250	500	1,000	2,000	4,000	Frequency (Hz)	Absorber class
							α_w	
—	Plenum depth 50 mm							
	0.15	0.40	0.70	0.75	0.45	0.40	0.50 (M)	D
—	Plenum depth 200 mm							
	0.35	0.75	0.75	0.55	0.40	0.30	0.45 (LM)	D
—	Plenum depth 200 mm, mineral wool layer 50 mm							
	0.60	0.85	0.80	0.65	0.45	0.30	0.45 (LM)	D



8-15-20 super

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Irregular scattered perforation

Width x length: 1,200 x 1,960 mm

Perforated area: 10.0 %

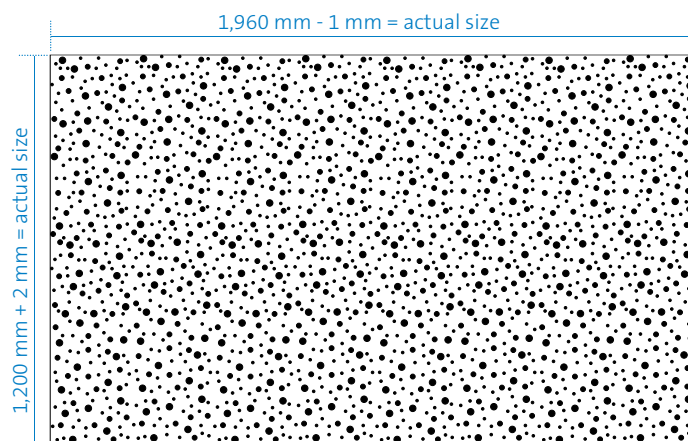
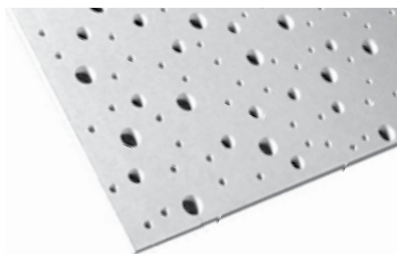
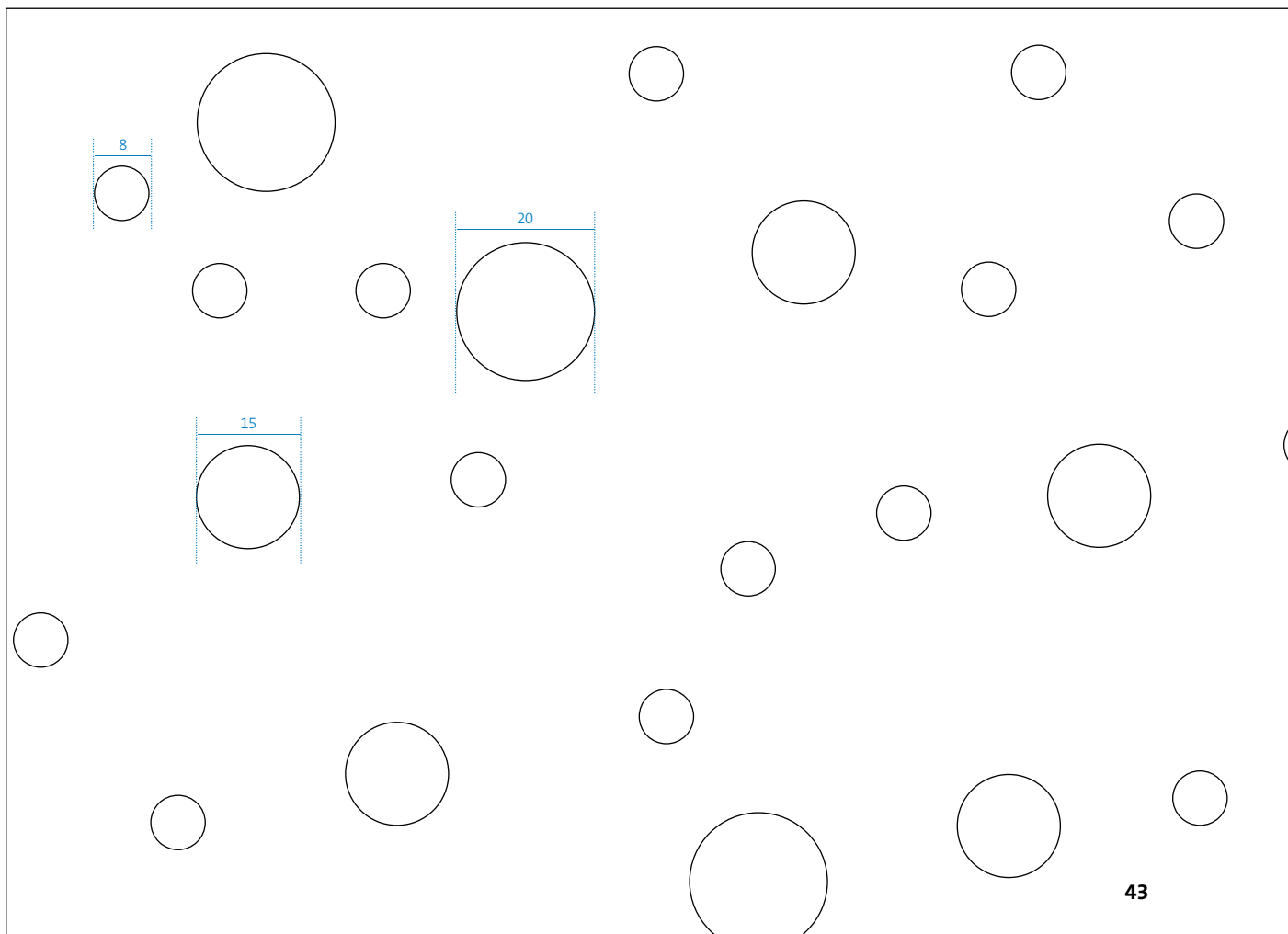
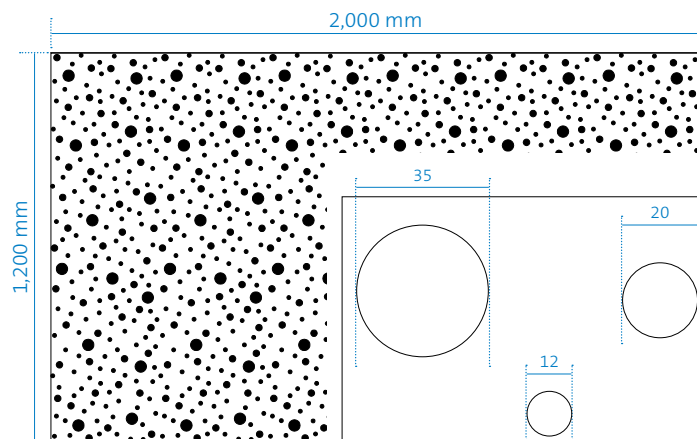


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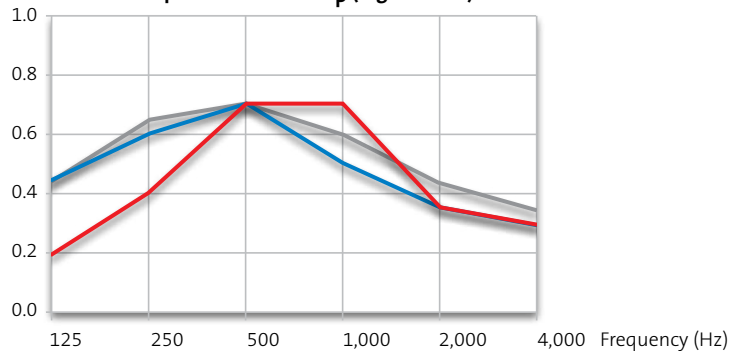


Rigitone Air 12-20-35



	Rigitone Air
 System number	4.07.21
 Board thickness in mm	12.5
 Weight in kg/m²	approx. 10
 Perforated area in %	11
 Centre-to-centre distance between support profiles in mm	333
 Air cleaning power	✓
 Reaction to fire in accordance with DIN EN 13501	A2-s1, d0 (C.4)

Sound absorption coefficient α_p (Rigitone Air)



								α_w	Absorber class
—	Plenum depth 50 mm								
	0.20	0.40	0.70	0.70	0.35	0.30	0.40 (M)	D	
—	Plenum depth 200 mm								
	0.45	0.60	0.70	0.50	0.35	0.30	0.40 (LM)	D	
—	Plenum depth 200 mm, mineral wool layer 20 mm								
	0.45	0.65	0.70	0.60	0.45	0.35	0.50 (L)	D	



12-20-35

Rigiton Air

Irregular scattered perforation

Width x length: 1,200 x 2,000 mm

Perforated area: 11.0 %

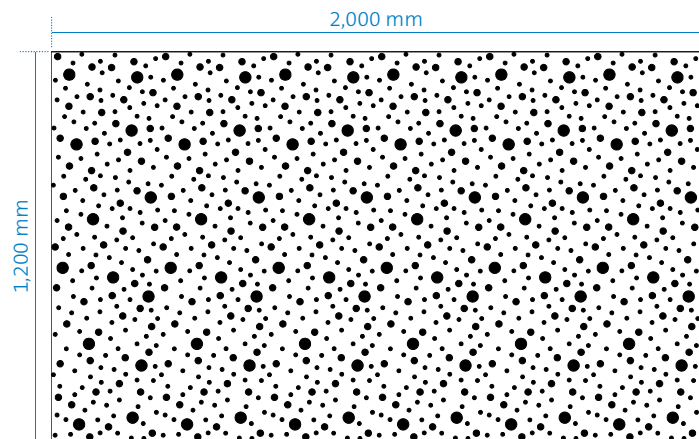
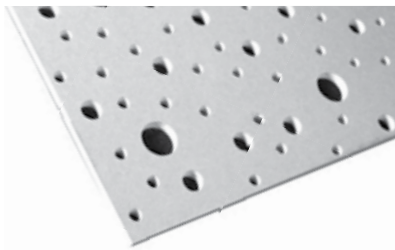
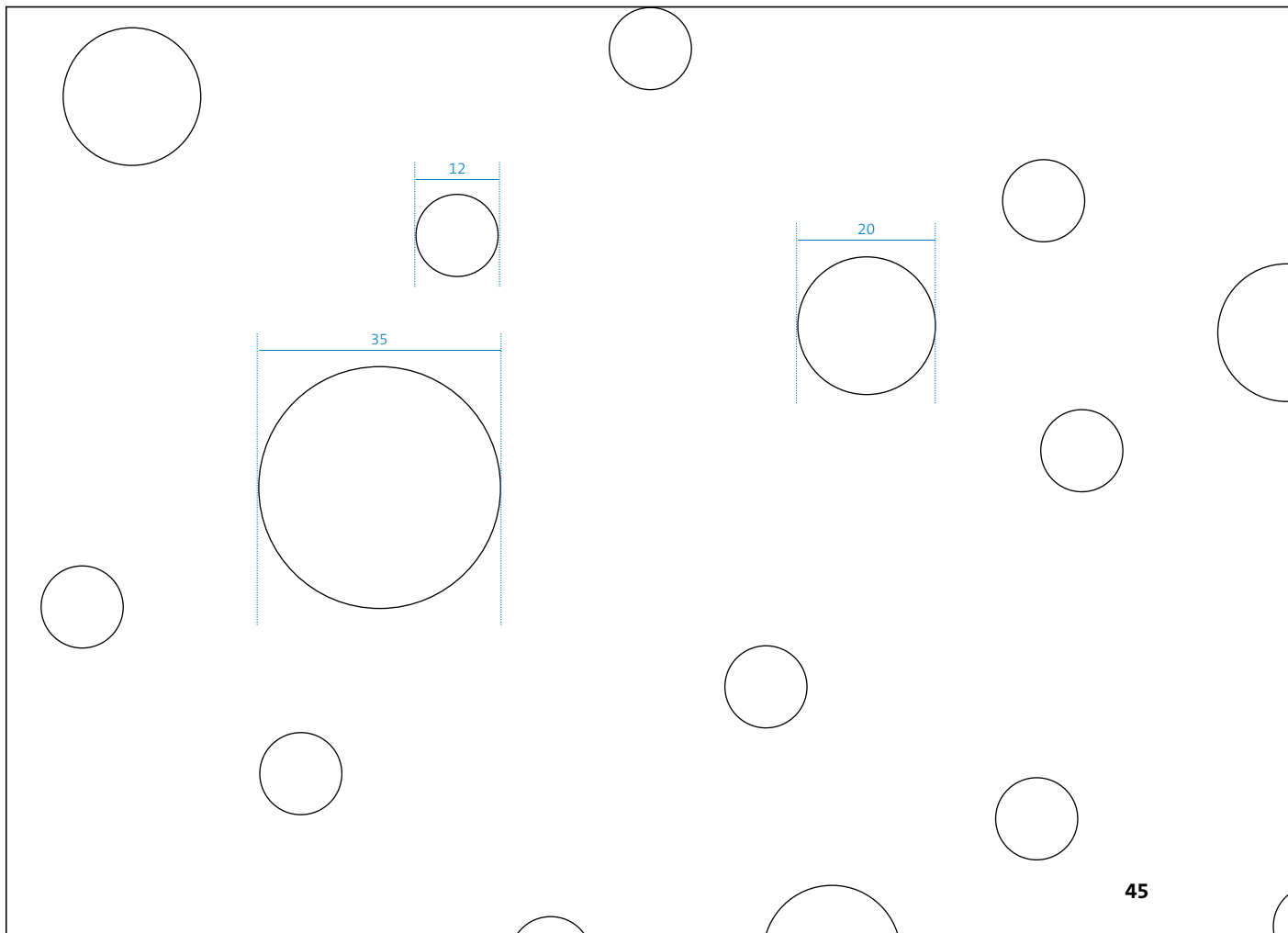
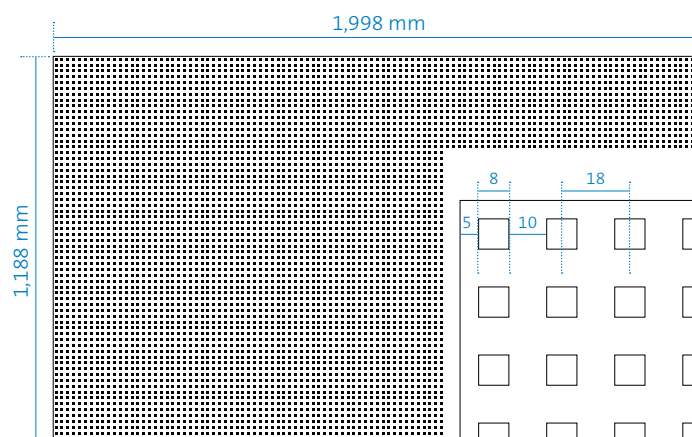


Diagram scale 1:1

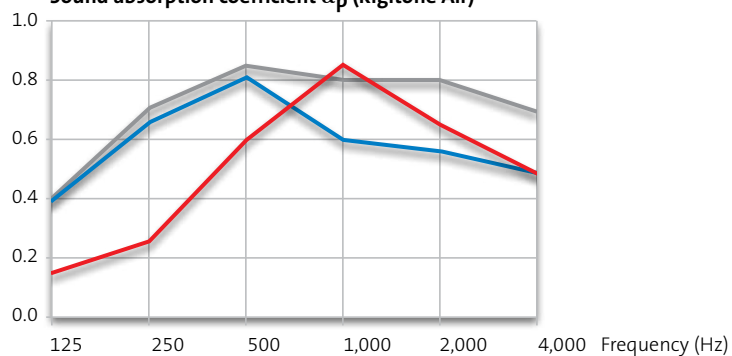


Rigitone Air · Climafit · Clima Top Air 8/18 Q



	Rigitone Air	Rigitone Climafit	Rigitone Clima Top Air
 System number	4.07.25	—	—
 Board thickness in mm	12.5	10	10
 Weight in kg/m²	approx. 9.0	approx. 7.5	approx. 7.5
 Perforated area in %	19.8	19.8	19.8
 Centre-to-centre distance between support profiles in mm	333	333	333
 Air cleaning power	✓	—	✓
 Reaction to fire in accordance with DIN EN 13501	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)

Sound absorption coefficient α_p (Rigitone Air)



								α_W	Absorber class
—	Plenum depth 50 mm								
	0.15	0.25	0.60	0.85	0.65	0.50	0.55 (M)	D	
—	Plenum depth 200 mm								
	0.40	0.65	0.80	0.60	0.55	0.50	0.60	C	
—	Plenum depth 200 mm, mineral wool layer 20 mm								
	0.40	0.70	0.85	0.80	0.80	0.70	0.80	B	

8 / 18 Q

**Rigitone Air, Rigitone Climafit,
Rigitone Clima Top Air**

Regular squared perforation

Width x length: 1,188 x 1,998 mm

Perforated area: 19.8 %

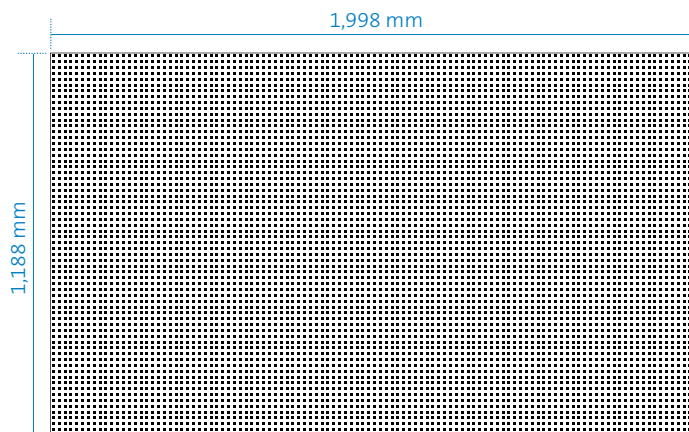
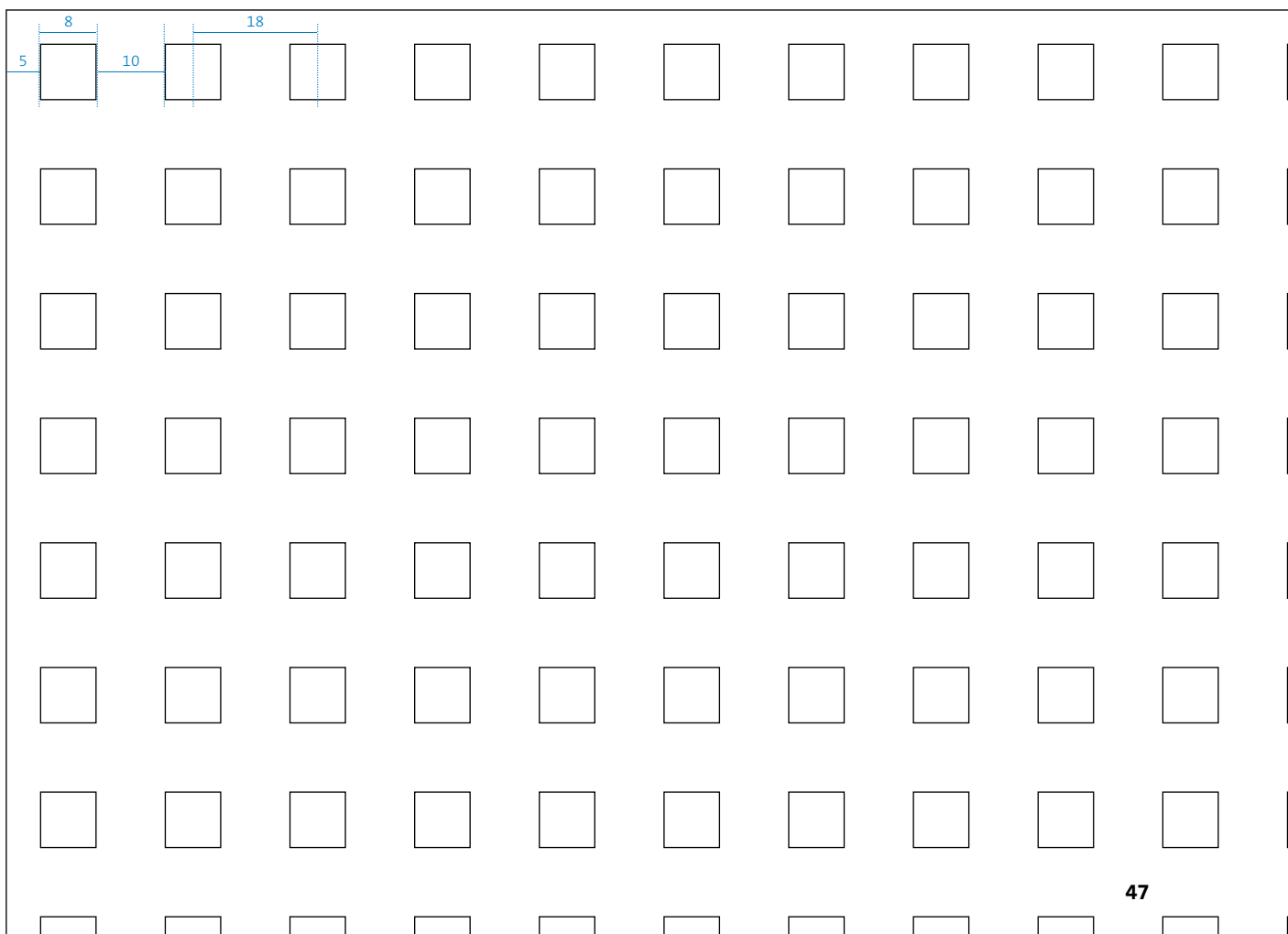
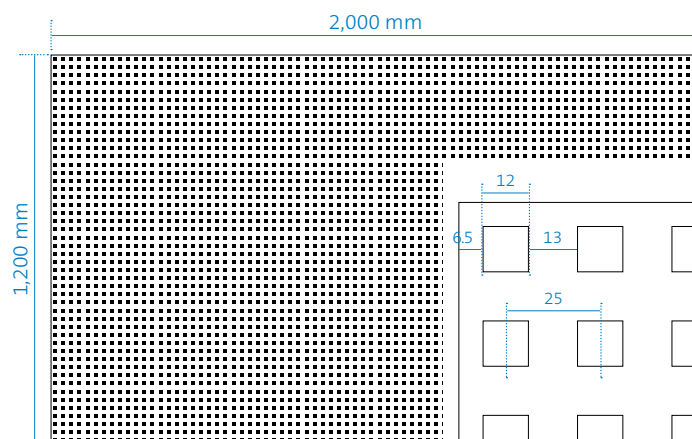


Diagram scale 1:1

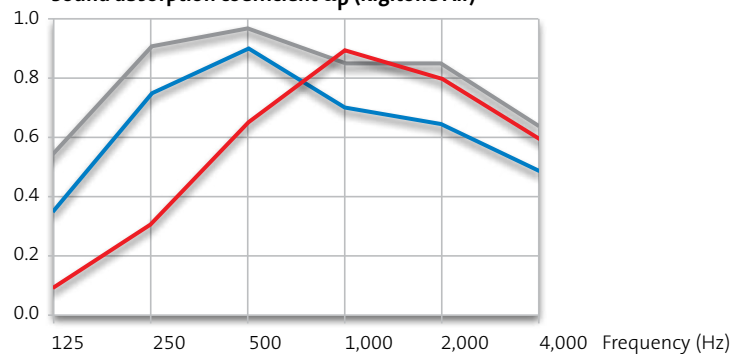


Rigitone Air · Climafit · Clima Top Air 12 / 25 Q



	Rigitone Air	Rigitone Climafit	Rigitone Clima Top Air
 System number	4.07.25	—	—
 Board thickness in mm	12.5	10	10
 Weight in kg/m²	approx. 8.5	approx. 7.0	approx. 7.0
 Perforated area in %	23	23	23
 Centre-to-centre distance between support profiles in mm	333	333	333
 Air cleaning power	✓	—	✓
 Reaction to fire in accordance with DIN EN 13501	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)	A2-s1, d0 (C.4)

Sound absorption coefficient α_p (Rigitone Air)



							α_W	Absorber class
—	Plenum depth 50 mm							
	0.10	0.30	0.65	0.90	0.80	0.60	0.60 (M)	C
—	Plenum depth 200 mm							
	0.35	0.75	0.90	0.70	0.65	0.50	0.65 (LM)	C
—	Plenum depth 200 mm, mineral wool layer 50 mm							
	0.55	0.90	0.95	0.85	0.85	0.65	0.85 (L)	B



12 / 25 Q

Rigitone Air, Rigitone Climafit, Rigitone Clima Top Air

Regularly squared perforation
Width x length: 1,200 x 2,000 mm
Perforated area: 23.0 %

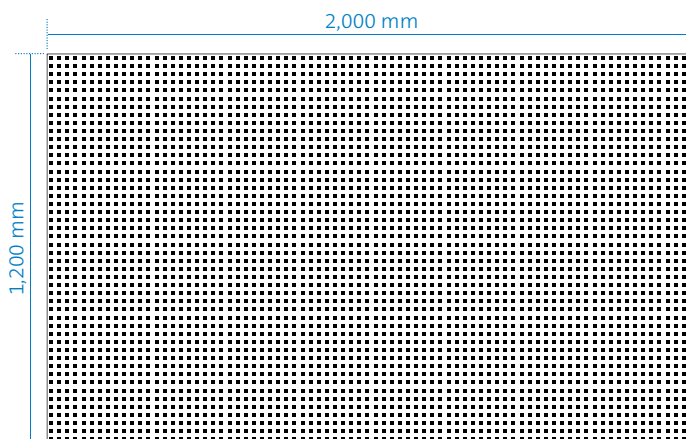


Diagram scale 1:1



Installation information Rigitone perforated ceilings

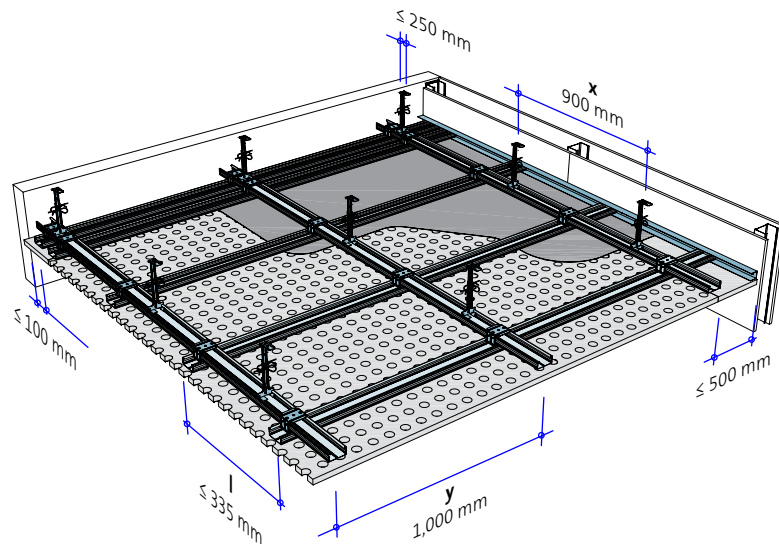
Rigitone perforated ceiling with border

Substructure

The substructure - comprising base and support profiles (CD profiles) - should be mounted and aligned in such a way that the Rigitone boards can be fastened at right angles to the support profiles. A support profile must always be located at the transverse joints of the boards.

Fastening

Rigitone 3.5 x 30 mm perforated panel screws should be attached at intervals ≤ 170 mm; the Rigitone boards should be fastened along the short side first, then the long side.



Installation techniques for Rigitone perforated boards:

Two proven techniques, which both ensure a flawless appearance and long-lasting results, can be used to install Rigitone perforated boards:

• Rigitone Fix Joint Filling Technique

The specially developed Rigitone Fix Joint Filling Set enables quick and secure installation.

• Rigitone Fix Adhesive Joint Technique

The main advantages of the Adhesive Joint Technique are the very high joint strength and resistance to cracking. With our newly developed Rigitone Fix Adhesive Set, installation is now even quicker and thus more cost-effective.

Rigips information



Detailed information about the Rigitone Fix Joint Filling and Adhesive Joint Techniques can be found in the "Rigitone Fix Joint Filling Set" and "Rigitone Fix Adhesive Set" brochures or on the internet at www.rigips.de (German only).

Centre-to-centre distance between support profiles as per the perforation pattern

Product	Centre-to-centre distance between support profiles mm
Rigitone 6/18	333
Rigitone 8/18	333
Rigitone 10/23	333
Rigitone 12/25	333
Rigitone 15/30	335
Rigitone 8-12/50	333
Rigitone 12-20/66	330
Rigitone 8-15-20	333
Rigitone 8-15-20 super	327
Rigitone 12-20-35	333
Rigitone 8/18 Q	333
Rigitone 12/25 Q	333

Substructure spacing

Base profile CD 60/27-06		Hanger spacing ¹⁾ Load class kN/m ² up 0.15		Support profile CD 60/27-06
y mm	x mm	x mm	l mm	
500	1,200	950	max. 335	
600	1,150	900	max. 335	
700	1,100	850	max. 335	
800	1,050	800	max. 335	
900	1,000	800	max. 335	
1,000	900	750	max. 335	
1,100	900	700	max. 335	
1,200	900	650	max. 335	
1,300	850		max. 335	
1,400	850		max. 335	
1,500	850		max. 335	

Note: Board weight + substructure + 20 mm mineral wool < 15 kg/m² (0.15 kN/m²). Additional layers will increase the total surface weight of the ceiling and may result in classification in the load class up to 0.30 kN/m².

¹⁾ Load capacity class of hanger: 0.40 kN/m²



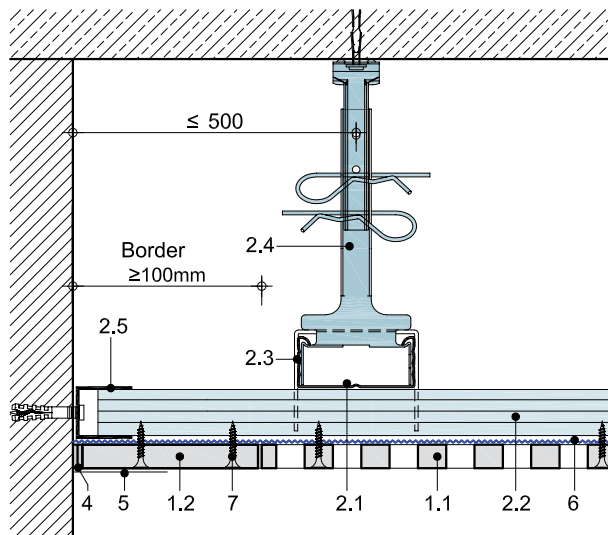
Wall joints

To allow for structural tolerances, a non-perforated plasterboard strip should be installed around the edges. Rigitone perforated boards can also be supplied with non-perforated edges.

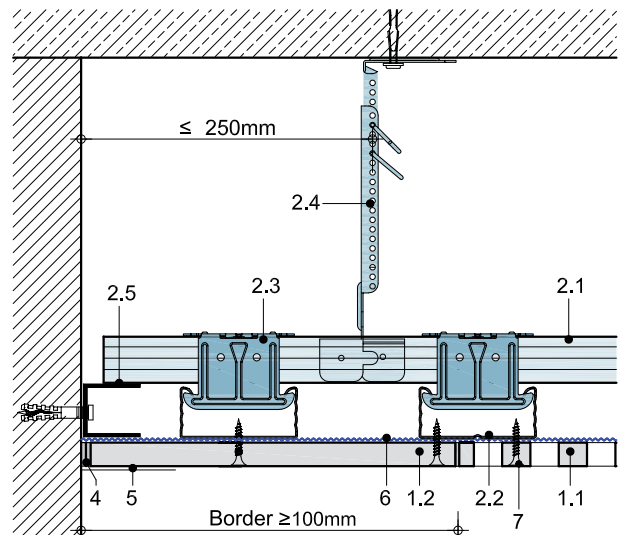
Filled joints using Rigips UD 28 joint profiles with border

Where a Rigitone perforated board ceiling meets a building wall which is to be plastered, Rigips Trennfix should be inserted before filling. This ensures neat separation of the different materials.

Short side



Long side

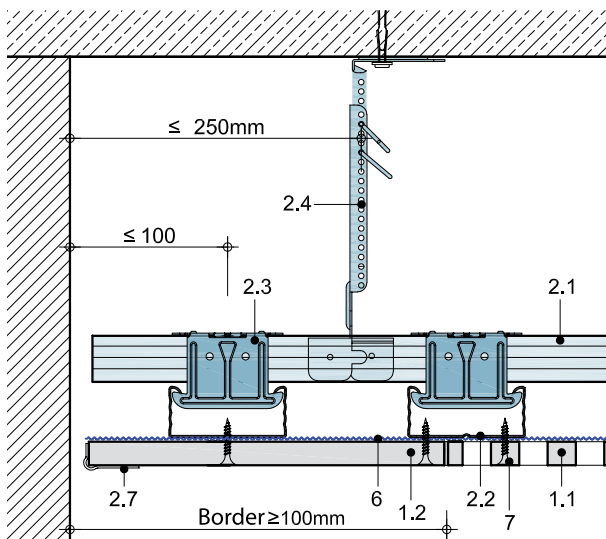


- 1.1 Rigitone perforated board
- 1.2 Border
- 2.1 Base profile – Rigips CD 60/27
- 2.2 Support profile – Rigips CD 60/27
- 2.3 Profile connector crossover fast connector
- 2.4 Rigips 400 N nonius hanger
- 2.5 UD 28 U-joint profile
- 4 Separator strips + VARIO joint filler
- 5 Reinforcement strips (embedded in filler where necessary)
- 6 Acoustic tissue (fitted as standard)
- 7 Rigitone perforated panel screw

Installation information Rigitone perforated ceilings

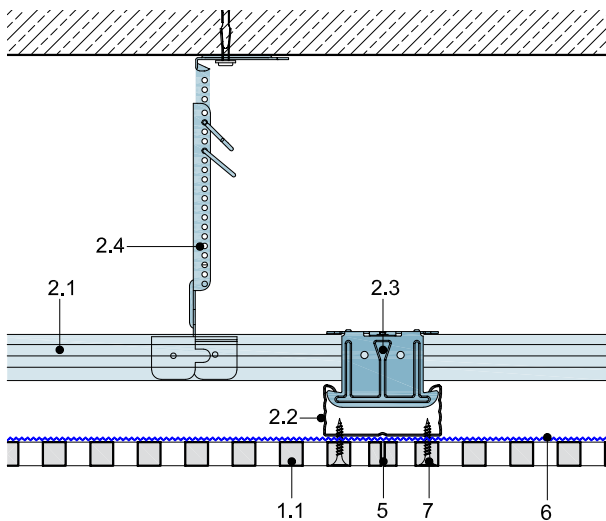
Joints with a shadow gap

In the case of separated ceiling to wall joints, the gap between the support profiles and the wall should be max. 150 mm. A Rigips 3/25-045 end profile ("Goeppinger profile") may also be embedded in the filler flush to the surface along the free board edges.

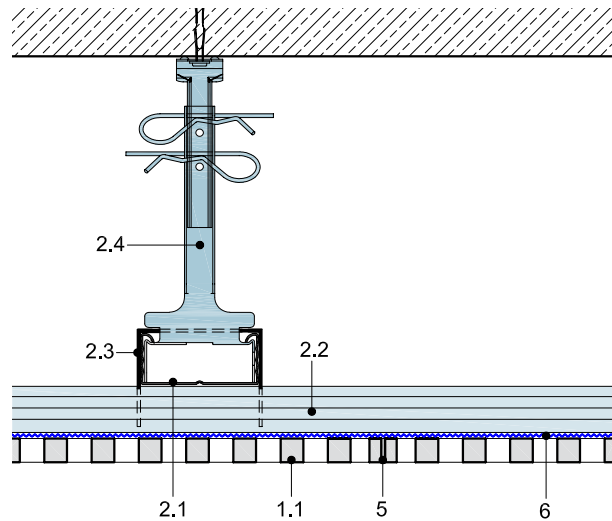


- 1.1 Rigitone perforated board
- 1.2 Border
- 2.1 Base profile – Rigips CD 60/27
- 2.2 Support profile – Rigips CD 60/27
- 2.3 Rigitone crossover fast connector
- 2.4 Rigips 400 N nonius hanger
- 2.5 Rigips UD 28 joint profile
- 2.7 Rigips 13/25-045 end profile ("Goeppinger profile")
- 3 Plasto-elastic joint filler
- 5 Butt joint (adhesive or filled joint)
- 6 Acoustic tissue (fitted as standard)
- 7 Rigitone perforated panel screw

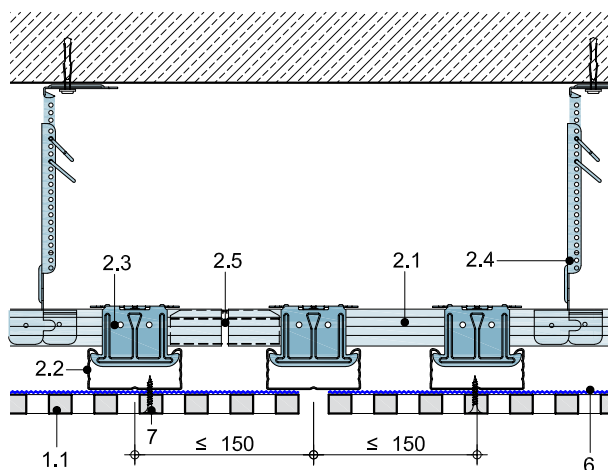
Rigitone short edge joint



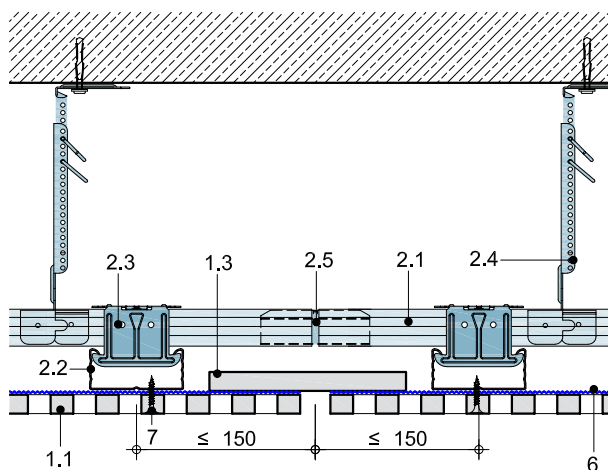
Rigitone long edge joint



Variant 1: Settlement joint with profile cover for Rigips acoustic ceilings



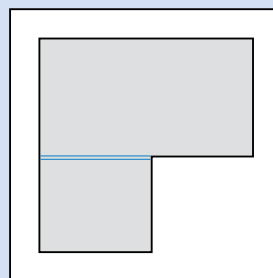
Variant 2: Settlement joint with profile cover for Rigips acoustic ceilings



- 1.1 Rigitone perforated board
- 1.3 Board strip fixed on one side using VARIO Joint Filler
- 2.1 Base profile – Rigips CD 60/27
- 2.2 Support profile – Rigips CD 60/27
- 2.3 Profile connector Rigips crossover fast connector
- 2.4 Rigips nonius hanger 400 N
- 2.5 Rigips ceiling profile connector
- 6 Acoustic tissue (fitted as standard)
- 7 Rigitone perforated panel screw

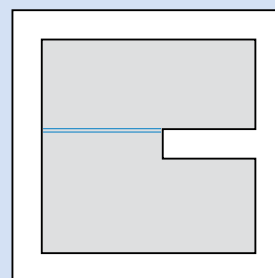
! Rigips note

Settlement joints in the building shell must be continued into the structure of the suspended ceiling. In general, expansion joints should also be spaced longitudinally and transversely at intervals of approx. 10 m. It is necessary to reduce the given side lengths where the free movement of the ceiling area is prevented and where long ceilings with relatively large integrated lighting systems (e.g. corridor ceilings) are installed. Layouts where the free movement of the ceiling area is prevented should be as follows:



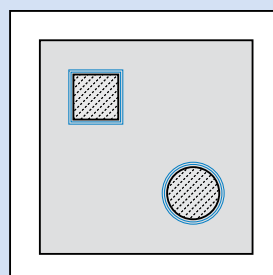
Re-entrant structural components

- Open expansion joint
- Sliding expansion joint (settlement joint) necessary



Re-entrant shear walls

- Open expansion joint or
- sliding expansion joint (settlement joint) necessary



Suspended ceilings with cavities for supports

- Sliding joint necessary



Rigitone sports hall ceilings – capable of taking everything thrown at them

When planning modern sports facilities, both functional and aesthetic requirements must be taken into account. "Impact resistance" is also a criterion here. Rigitone perforated ceilings can be supplied in "impact-resistant" versions in accordance with DIN 18032 Part 3 – this corresponds to test class A1 in DIN EN 13964 Annex D. Depending on the perforation pattern, the centre-to-centre distances between support profiles given in the table must be observed.

Substructure

Reducing the centre-to-centre distance between the support profiles ensures impact resistance.

Fastening

Rigitone SN 3.5 x 30 mm perforated panel screws should be attached at intervals of 170 mm. Both the Joint Filling and Adhesive Joint Techniques can be used for Rigitone perforated ceilings.

Centre-to-centre distance between support profiles as per the perforation pattern

Product	Profile spacing		
	200 mm	250 mm	320 mm
Rigitone Air 6/18		X	
Rigitone Air 8/18		X	
Rigitone Air 10/23		X	
Rigitone Air 12/25		X	
Rigitone Air 15/30		X	
Rigitone Air 8-12/50		X	
Rigitone Air 12-20/66		X	
Rigitone Air 12-20-35			X
Rigitone Air 8-15-20			X
Rigitone Air 8-15-20 super			X
Rigitone Air 8/18 Q	X		
Rigitone Air 12/25 Q	X		

Rigits information



Detailed information about the Rigitone Fix Joint Filling and Adhesive Joint Techniques can be found in the "Rigitone Fix Joint Filling Set" and "Rigitone Fix Adhesive Set" brochures or on the internet at www.rigits.de (German only).





Rigitone F30 ceiling: Fire protection and acoustics

The tried and tested Rigitone F 30 ceiling offers a fire resistance of up to 30 minutes in the event of a fire, regardless of whether it comes from the area above the suspended ceiling or the room. This is a requirement for escape routes, e.g. in public buildings, hospitals, schools and administrative buildings. The need for accessibility for inspection purposes was also taken into account in the development of this Rigitone F 30 ceiling. The inspection flaps from Riegelhof & Gärtner (RUG) are fire-certified and allow access to installations in the ceiling cavity at all times.

Substructure

- Rigips direct fasteners for C ceiling profiles (running rails) are used to fasten the support profile to the base profile through the fireproof board.
- Alternatively, U direct hangers, adjustable direct hangers or Rigips "Klick Fix" direct fasteners may be used.
- Where there is a risk of exposure to fire from below, the base profile should be attached to the slab using the CD 250 nonius hanger system. Where there is a risk of exposure to fire from above, the CD 400 nonius hanger system should be used. In the event of fire exposure from the area above the suspended ceiling, the slab must have a fire resistance class of at least F 30.



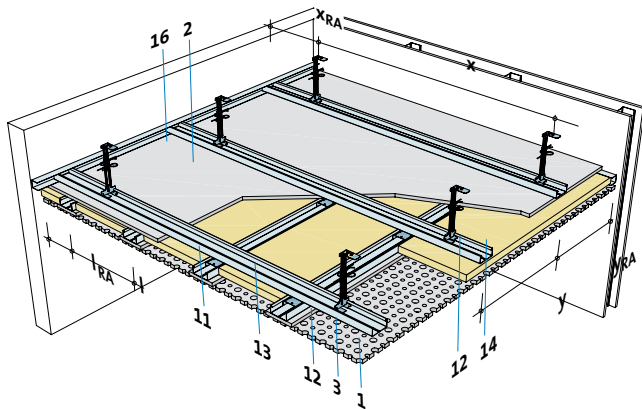
General building code inspection certificate P-3260/9580-MPA BS confirms the required fire protection certification. The fireproof ceiling cannot absorb any additional loads from the ceiling cavity in the event of a fire.

Rigits information

The acoustic properties of the Rigitone F 30 ceiling depend on the perforation design. The absorption values for the corresponding perforations with a 50 mm plenum depth and acoustic tissue may be taken as approximate values here.



Rigitone F30 ceiling: Fire protection and acoustics

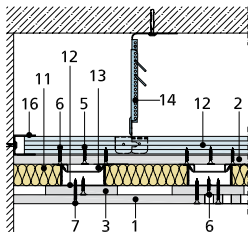


Substructure spacing

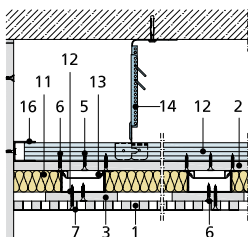
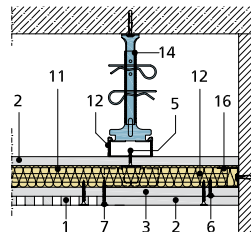
Where the suspended ceiling is at risk of exposure to fire

	from below	*from above
Hanger system	Nonius CD 250	Nonius CD 400
l Centre-to-centre distance between support profiles	≤ 320 mm	≤ 320 mm
x Hanger spacing	≤ 1,000 mm	≤ 850 mm
y Centre-to-centre distance between base profiles	≤ 500 mm	≤ 500 mm

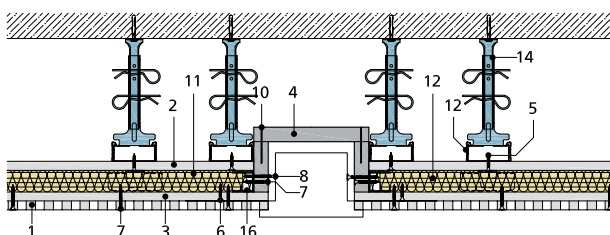
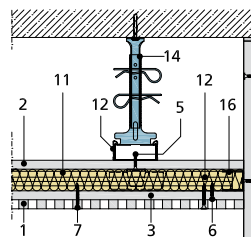
*from the area above the suspended ceiling



Joint to building wall with a border using a Rigips DU 28 joint profile



Joint to a Rigips panelled wall > F 30 without border



Integration of lighting elements

- 1 Rigitone perforated board, d = 12.5 mm
- 2 Rigips RF fireproof board, d = 12.5 mm
- 3 Rigips RF fireproof board strip, d = 12.5 mm b = 100 mm
- 4 Glasroc F (Ridurit) 20 mm
- 5 Rigips drywall screw TN 3.5 x 25 mm, a = 170 mm
- 6 Rigips drywall screw TN 3.5 x 25 mm, a = 750 mm
- 7 Rigips drywall screw TN 3.5 x 35 mm, a = 170 mm
- 8 Rigips drywall screw TN 3.5 x 45 mm
- 9 Rigips drywall screw TN 3.5 x 55 mm, a = 500 mm
- 10 Steel wire clips - dimensions: 50/11.25/1.53 mm
- 11 Mineral wool, d ≥ 25 mm in accordance with DIN 18165 building material classification A, melting point ≥ 1,000°C, density 90 ± 10 kg/m³ (e.g. ISOVER EP3) or mineral wool in accordance with DIN 18165, d = 40 mm, building material classification A in accordance with DIN 4102-1, melting point ≥ 1,000 °C, density 60 ± 10 kg/m³
- 12 Rigips CD 60/27 ceiling profile
- 13 Rigips direct fasteners (e.g. running rails)
- 14 Rigips nonius hanger system:
load capacity class: 0.25 kN
(risk of exposure to fire from the room)
and load capacity class: 0.40 kN
(risk of exposure to fire from the area above the suspended ceiling)
- 15 Rigips 30/30-0.7 mm angle profile
- 16 Rigips UD 28 joint profile
- 17 CD safety transverse connector
- 18 Angles made from Rigips CD 60/27 ceiling profiles (l = 150 mm)
- 19 Rigips 3.8 x 11 mm drywall screws

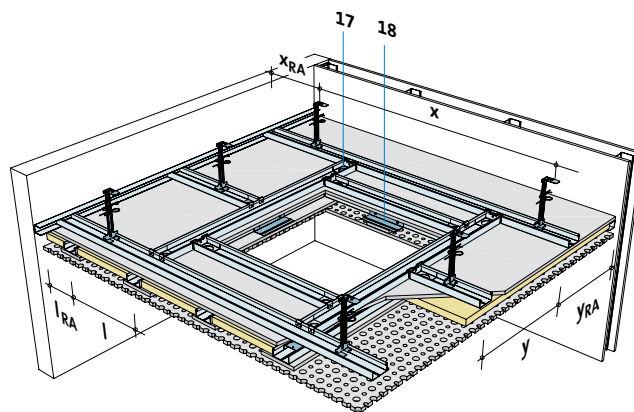
Wall joints

The joint between the wall and the Rigitone F 30 ceiling can be realised with or without a Rigips UD 28 joint profile. The edge spacing for the substructure set out in the table (see right-hand side) must be observed.



Substructure edge gaps

Edge gaps	With joint profile	Without joint profile
I_{RA} Support profile (centre axis) <—> wall spacing	≤ 130 mm	≤ 130 mm
x_{RA} Hanger (centre axis) <—> wall spacing	≤ 1,000 mm (Fire from below) ≤ 850 mm (Fire from above)	≤ 250 mm
y_{RA} Base profile (centre axis) <—> wall spacing	≤ 500 mm	≤ 250 mm



Inspection flap fastenings

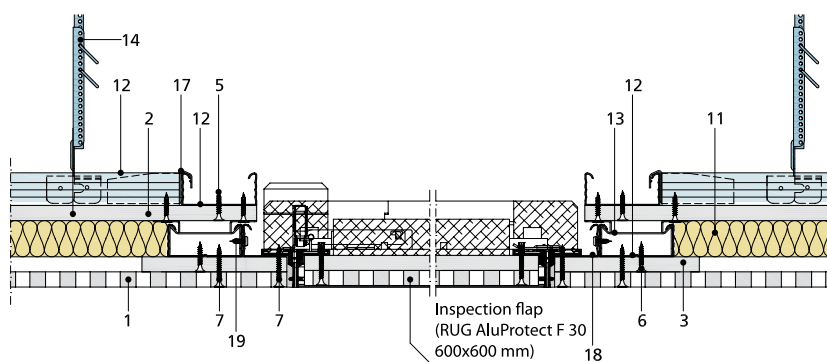
Inspection flaps from Riegelhof & Gärtner (RUG) with inside dimensions of up to 600 x 600 mm may be integrated into a Rigitone F 30 ceiling. The entire surrounding metal substructure should be replaced with CD 60-06 ceiling profiles at the level of the base and support profiles. The replaced profiles should be fastened together and to the substructure using safety transverse connectors. The surrounding fireproof board strips and Rigitone boards should be joined to the fra-

me at intervals of approx. 170 mm using Rigips TN 3.5 x 25 mm and TN 3.5 x 35 mm drywall screws.

! Rigips note

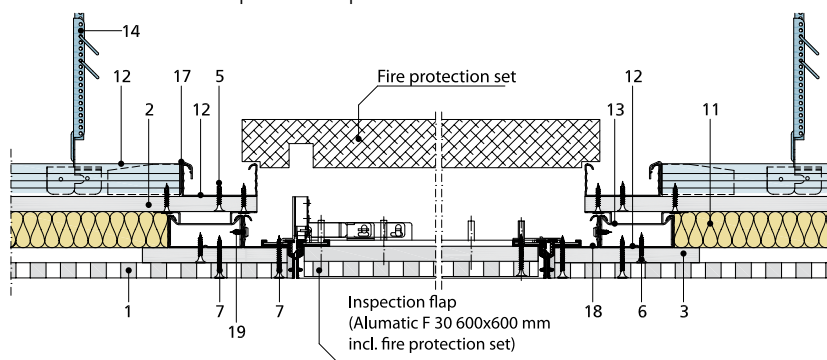
To ensure a flawless perforation pattern, it is recommended that the perforated board section for the inspection flap cover is cut on site.

RUG AluProtect® F 30 inspection flap

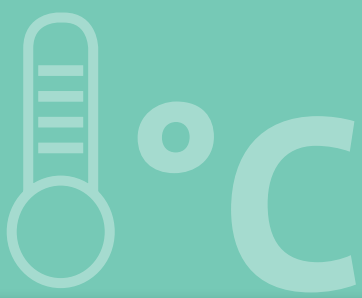


The inspection flaps should be fastened to the suspended ceiling using Rigips TN 3.5 x 35 mm drywall screws at intervals of approx. 170 mm. The weight of the inspection flap is transferred to the substructure via four 150 mm long angles, one positioned at the centre of each side. These angles should be cut from a CD profile and screwed into the frame using with two 3.8 x 11 mm drywall screws for each one.

RUG Alumatic F 30 inspection flap



In order to protect the ceiling from exposure to fire from the area above the suspended ceiling (from above) the fire protection set supplied with the inspection flap must be installed. The Alumatic F 30 fire protection set made of mineral wool is only necessary in the event of fire exposure from above.



Temperature control ceilings: Cooling and heating systems





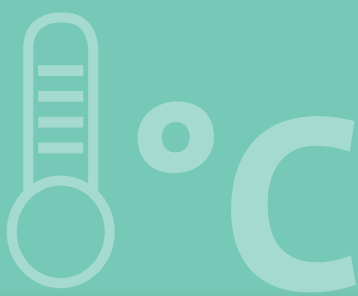
Optimum room temperature

Radiant cooling and heating systems offer the ideal combination of comfort and cost-effectiveness. They ensure a constant room temperature throughout the year. As they operate on the radiant principle, they heat and cool rooms gently. They are extremely efficient, save space and have many other advantages such as:

- No disruptive operating noises
- No air disturbance
- No unpleasant draughts
- No spreading of dust particles and bacteria

They offer the benefit of low flow temperatures, e.g. if a temperature-control ceiling is used for heating, flow temperatures of approx. 30 °C are sufficient and if it is used as a cooling ceiling, the desired effect can already be achieved at temperatures of approx. 16 °C. These low flow temperatures enable the use of alternative, eco-friendly energy sources such as heat pumps, solar systems, etc.

The effectiveness of temperature-control ceilings is strongly dependent on their panelling. The more efficiently the generated heat or coldness is transmitted, the less energy and material needs to be used to achieve a specific temperature effect.



Temperature control ceilings: Cooling and heating systems

Rigips offers two high-performance product ranges for the panelling of cooling and heating systems.

Rigips Clima Top Air and Rigitone Clima Top Air

Clima Top Air boards are highly thermally conductive and include air cleaning power as standard. Their greater thermal conductivity makes them well-suited for the panelling of cooling and heating systems, enabling room temperature to be regulated as desired without significant primary energy consumption. This greater thermal conductivity supports the air conditioning system to optimum effect. Rigips Clima Top Air boards give heating and cooling ceilings a smooth, joint-free appearance without visible substructures. The same guidelines apply for the installation of Clima Top Air boards as for standard boards.

Rigips Climafit and Rigitone Climafit

Climafit boards are the premium products for state-of-the-art cooling and heating systems - they are special plasterboards with a gypsum core containing graphite. Climafit combines the outstanding residential construction qualities of a plasterboard ceiling with the temperature control performance of a metal ceiling, offering natural comfort while realising highly efficient temperature control.

Rigitone Climafit boards have a unique thermal conductivity level of $0.52 \text{ W}/(\text{m} \cdot \text{K})$ in accordance with DIN EN 12664. This increases the efficiency of the temperature control effect in the magnitude of 15 - 35% (in watts). Climafit ceiling boards also offer the familiar advantages of Rigips boards: they are easy to install, highly flexible, tested for building biology aspects, clean and environmentally friendly.

i Rigips Climafit information

The secret of the extraordinary thermal conductivity of Rigips Climafit boards lies in their gypsum core: it contains a graphite granulate - a construction material made of flaked natural graphite. This is a naturally occurring mineral and - like diamond - is an inorganic modification of carbon. It is completely safe to use, non-combustible, highly chemically and thermally resistant, and extraordinarily conductive. The graphite volume is enlarged/expanded up to

400 times in the manufacturing process, resulting in a significant weight reduction while its inherent excellent level of thermal conductivity is retained. The graphite granulate produced in this way, with a thermal conductivity coefficient similar to that of aluminium, is then integrated into the highly thermally conductive Climafit plasterboards.



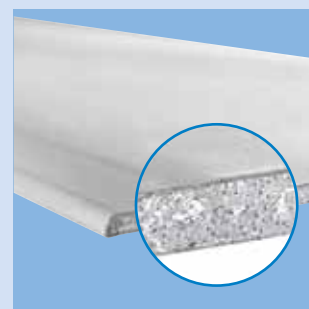
Gypsum crystal

- Natural raw material
- Recommended in terms of building biology
- Regulates indoor climate
- Versatile
- Non-combustible



Graphite crystal

- Natural product
- Thermally conductive
- Light
- Non-combustible
- Flexible



Rigips Climafit

with a gypsum-graphite core:
 λ value $> 0.5 \text{ W}/(\text{m} \cdot \text{K})$

In addition to the outstanding climate regulation effect of the Climafit boards, the visual aspects of the Rigitone Climafit boards are a further advantage. In addition to the broad range of different perforation patterns available, they also possess special acoustic properties - the perfect symbiosis of aesthetic room ambience and optimum indoor climate.

Installation information

- Please note that the acoustics may vary depending on the cooling ceiling system used.
- For non-perforated Climafit boards, the substructure span must be ≤ 400 mm.
- The substructure is always a component of the climate control technology.
- The structure of the panel temperature control system varies depending on the manufacturer. The manufacturer specifications must therefore be observed during installation.
- Settlement joints in the building shell must be continued into the structure of the suspended ceiling. In general, expansion joints should also be spaced longitudinally and transversely at intervals of approx. 7.5 m. It is necessary to reduce the given side lengths where the free movement of the ceiling area is prevented or where long ceilings with relatively large integrated lighting systems (e.g. corridor ceilings) are installed. gebaut werden.



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