UP MAGAZINE

OFFICE 02

METAL ACOUSTIC
SOFT ACOUSTIC

FURAL

METALIT

DIPLING

BRÜNSCH

Soft Acoustics | Float Product

Acoustics that put people at the center

At Fural Soft Acoustics, we develop acoustic solutions that combine comfort, functionality, and design. Our metal acoustic and soft acoustic ceilings noticeably improve room quality—for workspaces, living environments, and public areas where people are at the center.

Fural Systeme in Metall acquired the acoustic production machinery from the insolvent Pinta Systems and took on many of its employees. Products such as Float Polar, Balance Polar, Balance, Balance Art, Absorber Plano S Polar, Absorber Plano, Absorber Rondo, Pyramid, and Waffle Polar are now marketed under the name "Soft Acoustics.

Why metal ceilings?

- The components already have a **finished surface** at the time of delivery.
- Delivery and assembly are **dust-free**.
- Both the ceilings and the substructures stand out due to their **durability**.
- Thanks to their continuous paint surface, metal ceilings are **especially hygienic**.
- The paint surfaces can be **easily cleaned, dry or wet**.
- For school rooms and sports venues, our ceilings can be designed to be **ball-proof**.
- Our metal ceiling systems can be easily **serviced**.
- There is a possibility of **simple dismantling**.
- Our products are winners owing to their **reusability**.
- All our components allow mono-material recycling.
- We have a **large portfolio** of possible perforations.
- The **integration** of technical elements can be done **easily and precisely**.
- Our metal ceiling systems offer **optimal conditions for the combination** with heating and cooling elements.
- We manufacture precise and **aesthetic** products.
- Modular pre-production **allows for a short construction time.**

Acoustics

Heating and cooling

Fire protection

Hygiene

Design

Sustainability

Parzifal®

Baffle

Why Soft Acoustics?

-**General:** Soft Acoustics acoustic elements are based on two innovative core materials: PET and Basotect®.
- The materials are free from mineral fibers and adhesives.
- PET is recyclable and supports a closed material cycle.
- They are highly sound-absorbing, extremely lightweight, and offer great design flexibility.
- The lightweight construction is further enhanced through lighting design.
- A high degree of prefabrication enables fast and efficient installation.

- **PET:** Fural POLAR is a 100% pure-material sandwich element made from PET, produced without the use of binders or adhesives.
  This allows the material to be easily separated by type after its service life and returned to the raw material cycle.
  The material is formaldehyde-free, manufactured without chemical additives, and already consists of up to 70% recycled fibers, for example from PET bottles.
  It meets the criteria for a healthy indoor environment and is certified with Class 1 of the Oeko-Tex Standard 100.
  Fural POLAR is allergy-friendly, low in odor, and completely safe from a toxicological perspective.
  The material is breathable, diffusion-open, and free from fiber dust.
  The sandwich elements are UV-resistant and flame-retardant (according to DIN EN 13501-1: up to 20 mm thickness: B-s1, d0; 20–40 mm: B-s2, d0).
  The surfaces can be coated.

- **Basotect®:** Basotect® is an open-cell melamine resin foam consisting of 99% air.
  Due to its material structure, Basotect® is highly sound-absorbing while remaining extremely lightweight.
  The material is soft and flexible, yet dimensionally stable and highly durable.
  Basotect® can be shaped freely and offers flexible color design options.
  The following fire classifications apply: flame-retardant (according to DIN EN 13501-1: up to 15 mm thickness: B-s1, d0; up to 80 mm: C-s2, d0 / C-s1, d0; up to 200 mm: C-s3, d0).

Acoustics

Indoor air quality

Lighting

Design

Hygiene

Comfort Criteria

Human-centered architecture
Buildings must do more than just function. They should promote well-being, health, and productive work..

Climate
- Room temperature
- Humidity
- Air movement

Indoor air quality
- Materials
- Ecological criteria
- VOC-free building product

Acoustic comfort
- Noise reduction
- Audibility
- Speech intelligibility

Lighting
- Influence on circadian rhythm
- Concentration

Visual comfort
- Design
- Surfaces
- Objects

Hygienic comfort
- Dust-free environment
- Disinfectability
- Indoor air quality

Did you know that...
...the speed of sound in air does not depend on pressure, but on temperature?
As the temperature increases, the speed of sound also increases.

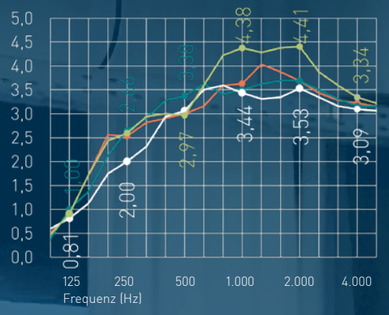
We design future-oriented work environments

UP

Metal Acoustics | Floating ceiling

Ceiling and lighting as an integral part of architecture

Floating ceiling Soft Aoustics
Float Polar, Thickness 40 mm



Sound absorption

Deckenhohlraum 100 mm
α_s

Deckenhohlraum 200 mm
α_s

Deckenhohlraum 300 mm
α_s

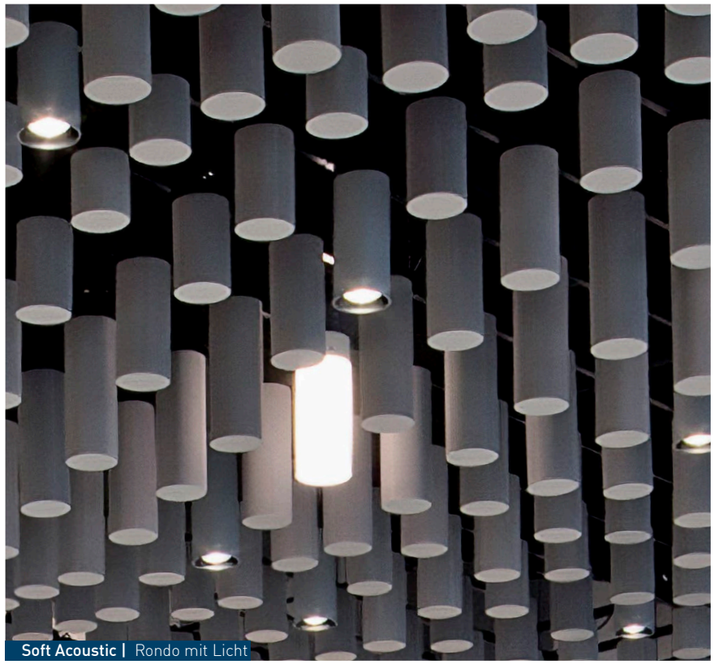
Deckenhohlraum 500 mm
α_s

Did you know that...

...the word "noise" originates from "à l'arme"? This French expression is borrowed from the Italian "all'arme," literally meaning "to arms".

UP

Soft Acoustics | Float Polar

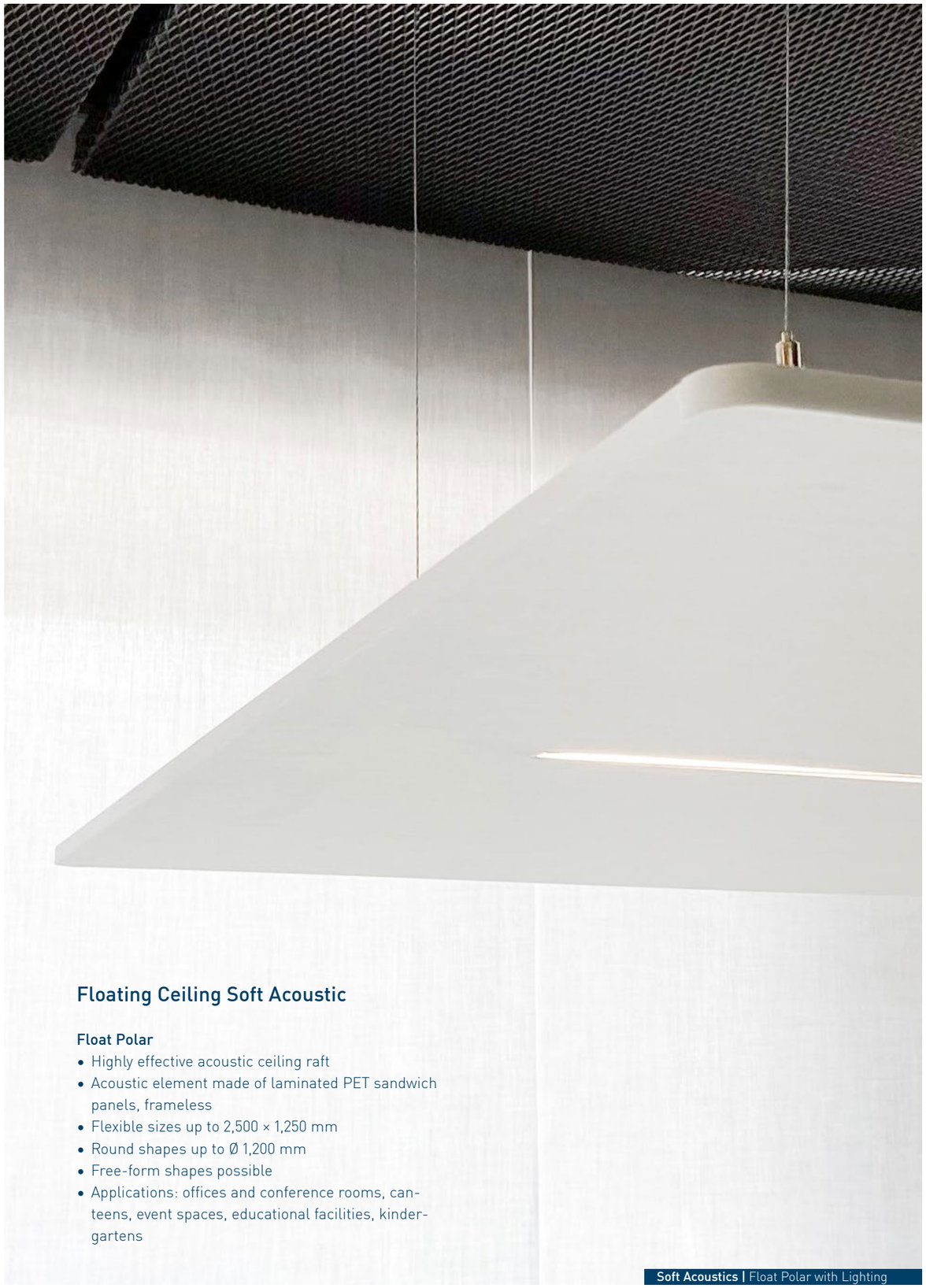


Soft Acoustic | Rondo mit Licht

Metal Acoustics and Soft Acoustics with Lighting

Our ceilings with integrated lighting combine modern design with maximum functionality. Available with LED spotlights, light strips, or indirect lighting, they create uniform, glare-free illumination while adding stylish accents to the space. Lightweight, durable, and easy to install, they are ideal for offices, conference rooms, reception areas, and public facilities. Thanks to their modular design, these ceiling solutions can be flexibly adapted to any room size and lighting concept.

Metal Acoustics | Expanded metal

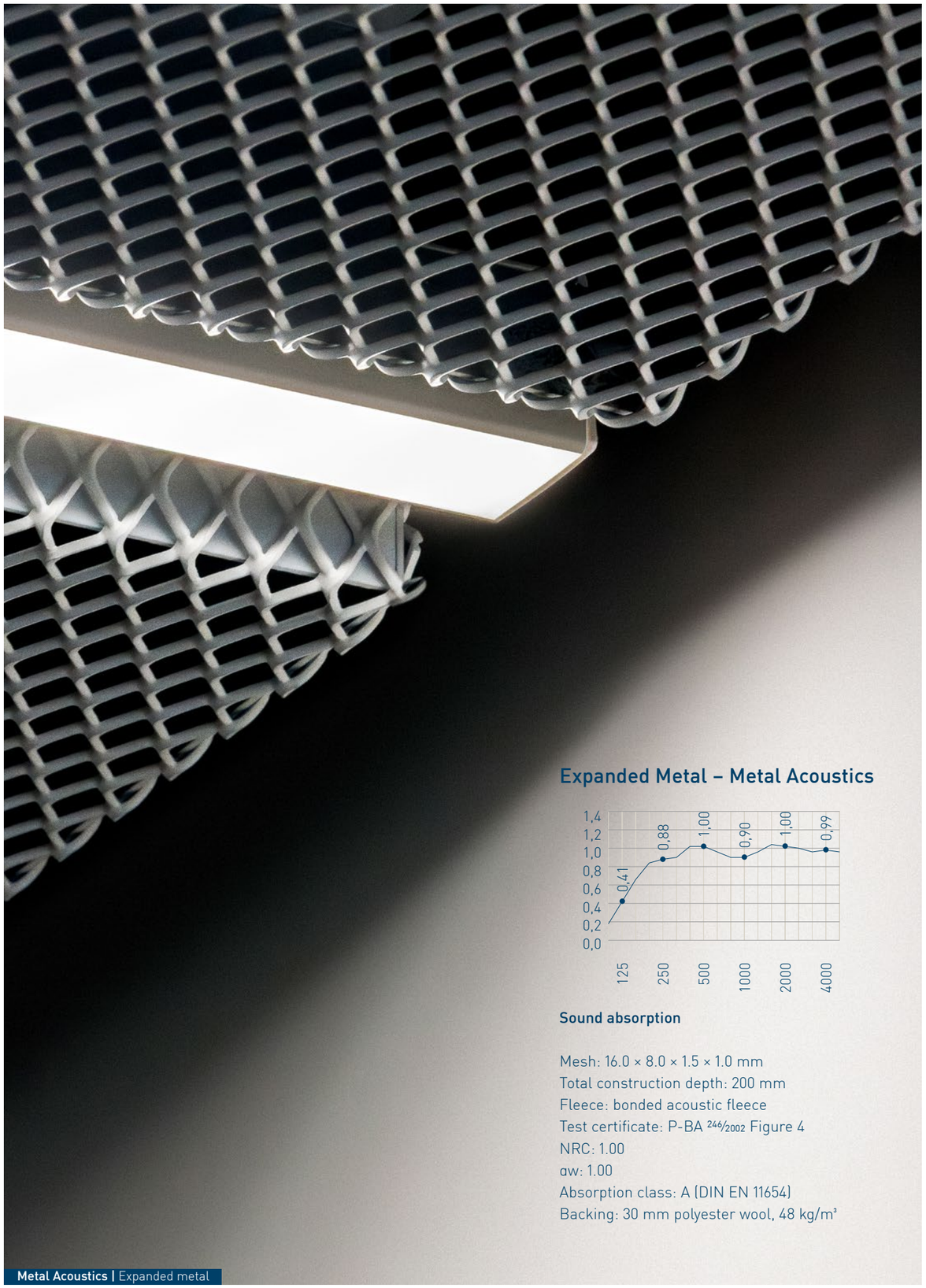


Floating Ceiling Soft Acoustic

Float Polar

- Highly effective acoustic ceiling raft
- Acoustic element made of laminated PET sandwich panels, frameless
- Flexible sizes up to 2,500 × 1,250 mm
- Round shapes up to Ø 1,200 mm
- Free-form shapes possible
- Applications: offices and conference rooms, canteens, event spaces, educational facilities, kindergartens

Soft Acoustics | Float Polar with Lighting

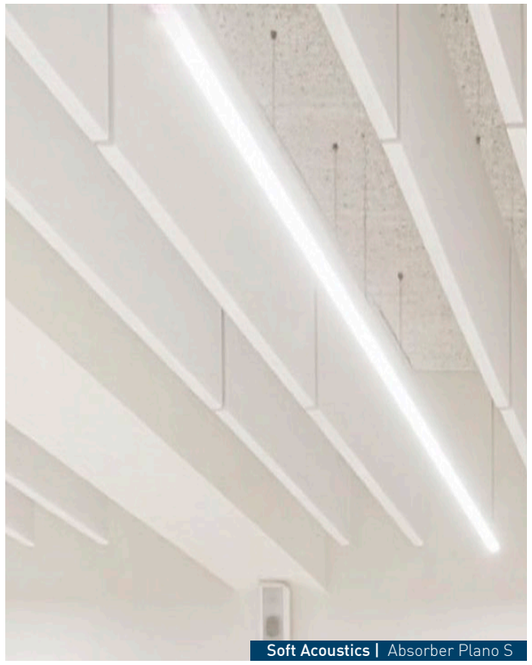


Expanded Metal – Metal Acoustics

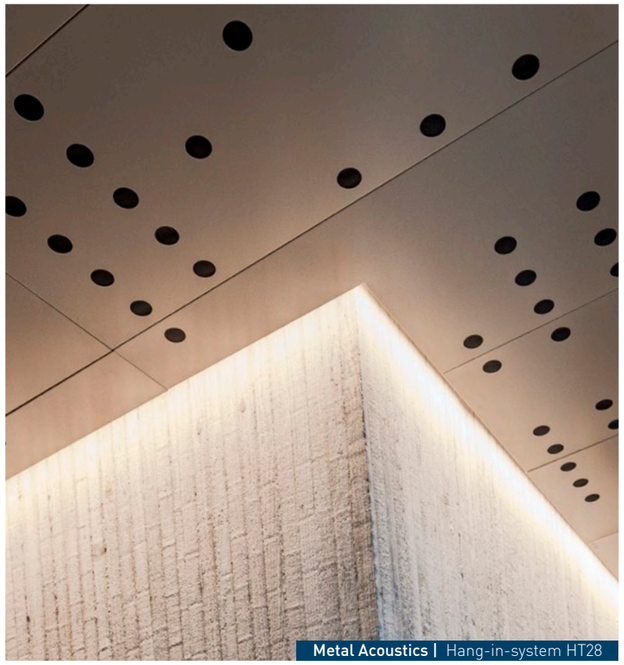
Sound absorption

Mesh: 16.0 × 8.0 × 1.5 × 1.0 mm
Total construction depth: 200 mm
Fleece: bonded acoustic fleece
Test certificate: P-BA $^{246}/_{2002}$ Figure 4
NRC: 1.00
αw: 1.00
Absorption class: A (DIN EN 11654)
Backing: 30 mm polyester wool, 48 kg/m³

Metal Acoustics | Expanded metal



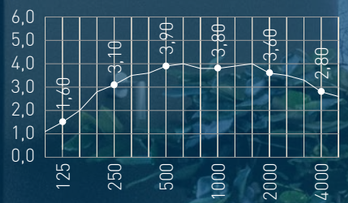
Soft Acoustics | Absorber Plano S



Metal Acoustics | Hang-in-system HT28

Soft Acoustics | Plano Polar Strips

Floating Ceiling Metal Acoustics



Sound absorption

Perforation: Rg 2.5–16%
Total construction depth: 200 mm
Fleece: bonded acoustic fleece
Test certificate: 07.12.2010 M $^{61840}/_{17}$
Equivalent sound absorption: (500 Hz) 3.90 m²
Tested surface area: 2.88 m²
Backing: 50 mm mineral wool, 150 kg/m³, in PE foil

Did you know that...
...it was already known in ancient times that sound is generated by the vibrations of objects? Even today, the design of the Theatre of Dionysus on the Athenian Acropolis shows that the Greeks had a fundamental understanding of natural acoustics.

UP

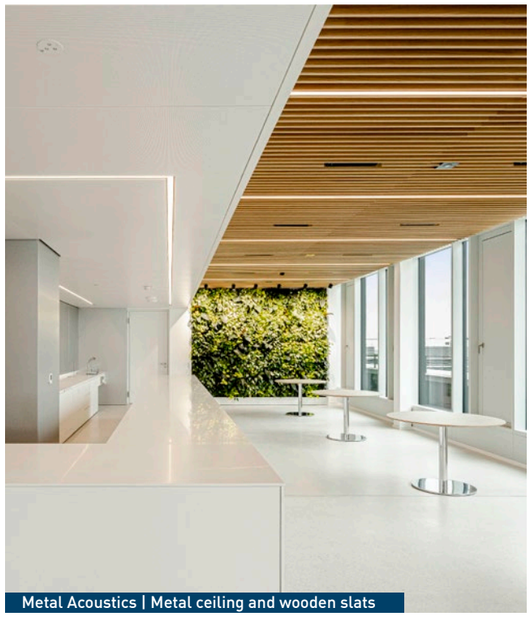
The elegance of wood, the strength of metal – calmness as a spatial quality

Metal Acoustics | Floating ceiling 90 Grad

Metal Meets Wood

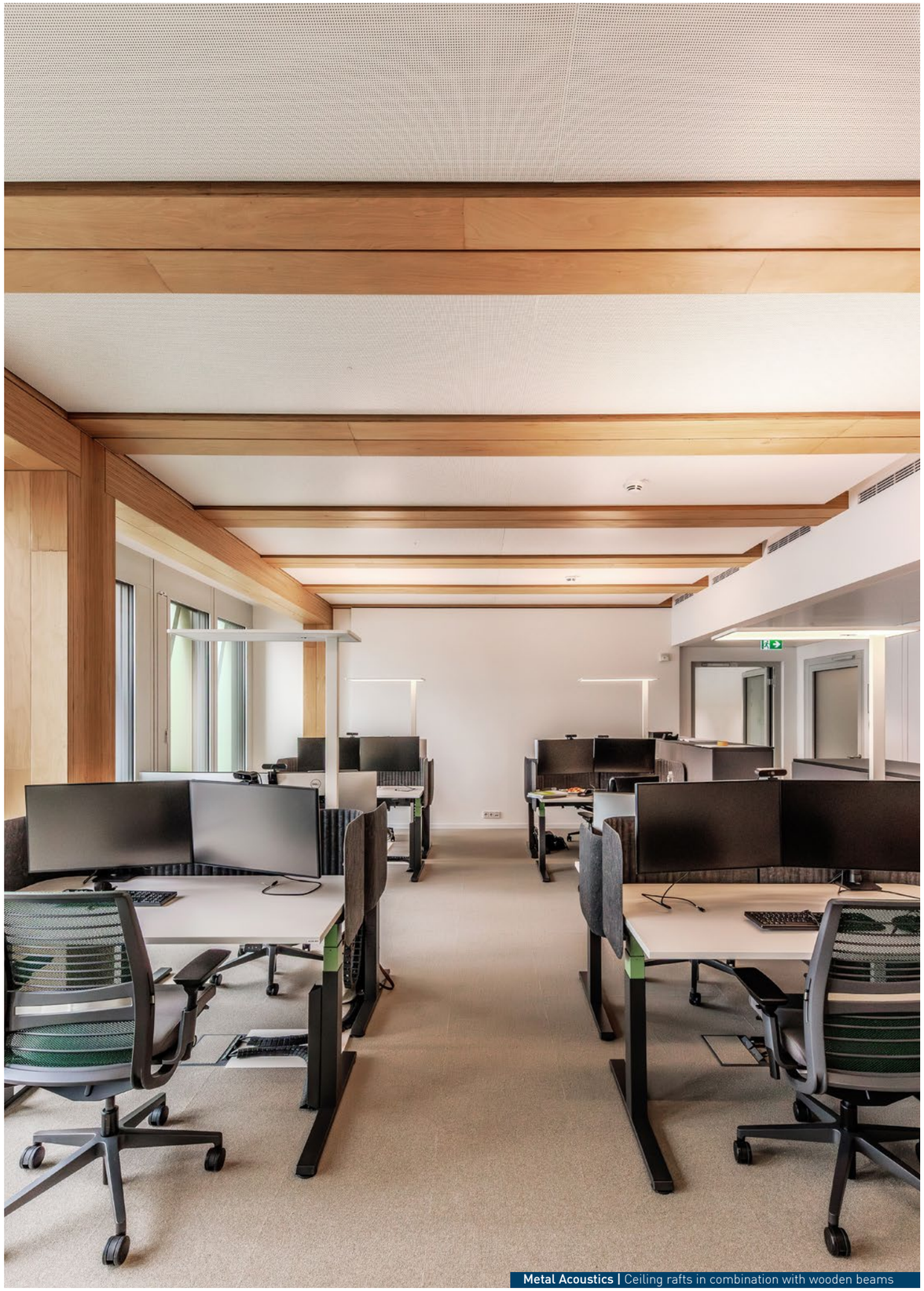
Wood conveys warmth, naturalness, and tradition—while metal stands for precision, durability, and modern design. When these two materials come together, they create a compelling architectural dialogue: the lightness and flexibility of metal ceilings complement the structural clarity of timber construction.

Whether in foyers, meeting rooms, or large halls, this combination creates spaces that are both functional and aesthetically convincing. Wood adds a sense of comfort, while metal ensures acoustic performance, fire protection, and durability. Together, they form a harmonious overall concept that unites architecture, technology, and atmosphere.



Metal Acoustics | Metal ceiling and wooden slats

Metal Acoustics | Floating ceiling with acoustic guide profile



Metal Acoustics | Ceiling rafts in combination with wooden beams

Soft Acoustics Adhesive Systems

Plano Polar

- Highly effective acoustic ceiling or wall element for direct bonding
- Acoustic element made of 100% polyester
- Smooth acoustic element with or without chamfer
- Standard formats: 1,250 × 625 mm and 626 × 625 mm
- Free-form shapes possible
- Cost-effective acoustic solution
- Applications: production facilities, kindergartens and schools, offices and conference rooms

Did you know that...
...sound waves travel four times faster in water than in air? In water, sound propagates at a speed of about 5,340 km/h—more than twice the top speed of the Concorde.

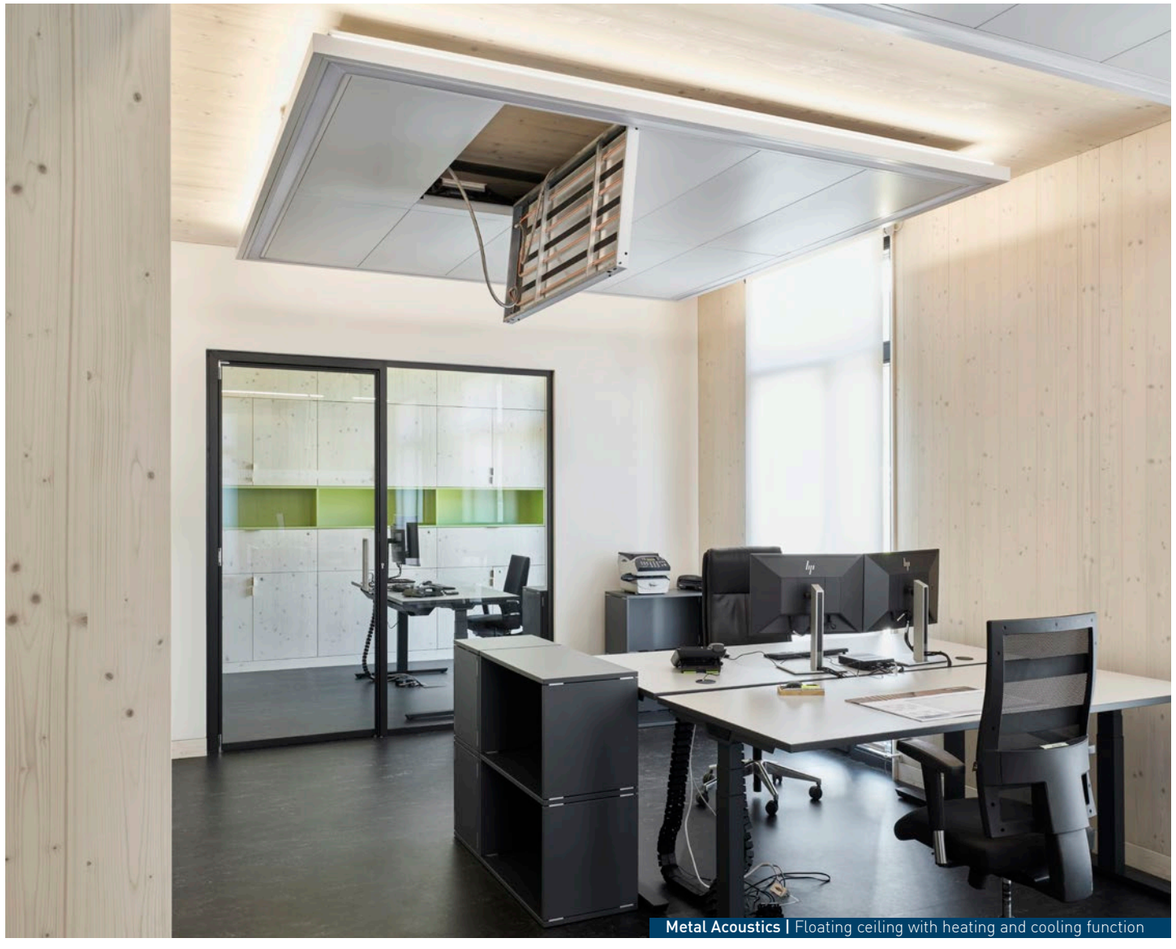
Design forms that characterize interior spaces

Metal Acoustics | Ceiling rafts and long panel cassettes

Lightweight Structures as an Advantage in Timber Construction

In timber construction, every additional weight matters. Moreover, it lacks the thermal storage mass typical of concrete construction. Lightweight metal ceiling systems place minimal load on the supporting structure and, thanks to their high level of prefabrication, are ideally suited to the often modular nature of timber construction. As responsive heating and cooling ceilings, they ensure comfortable, energy-efficient indoor environments.

Metal Acoustics | Floating ceiling with heating and cooling function



Metal Acoustics | Floating ceiling with heating and cooling function

Office buildings at the highest standard - smart, comfortable, inspiring

Did you know that...
...sound cannot exist without a medium? In space, there is almost a vacuum—so it is completely silent, even when massive explosions occur.

Metal Acoustics | Floating ceiling

Holistic Room Solutions

Through the seamless integration of lighting, acoustic elements, and construction, we create holistic room solutions from a single source. Whether in offices, public areas, or high-quality interiors—our systems adapt flexibly to different usage scenarios, supporting both focused work and relaxed interaction.

Precise craftsmanship, well-thought-out details, and a clear design language turn every ceiling and wall solution into a design feature with functional added value. The result is spaces that not only look good but also feel noticeably better.

Metal Acoustics | Baffle

Metal Acoustics | Floating ceiling 90 degree

Metal Acoustics | Hang-in system HT28 TPR Chrom

Spacious and functional ceilings for meeting rooms

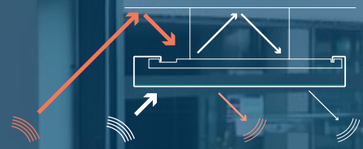
UP

Acoustic Considerations for Floating ceilings

Acoustic planning for individual absorbers follows different principles than for continuous ceiling surfaces.

According to ISO 354, sound absorption coefficients cannot be determined for ceiling rafts.

Due to the additional absorbing rear side of ceiling rafts, excellent acoustic results can be achieved on paper, but these cannot be meaningfully calculated.



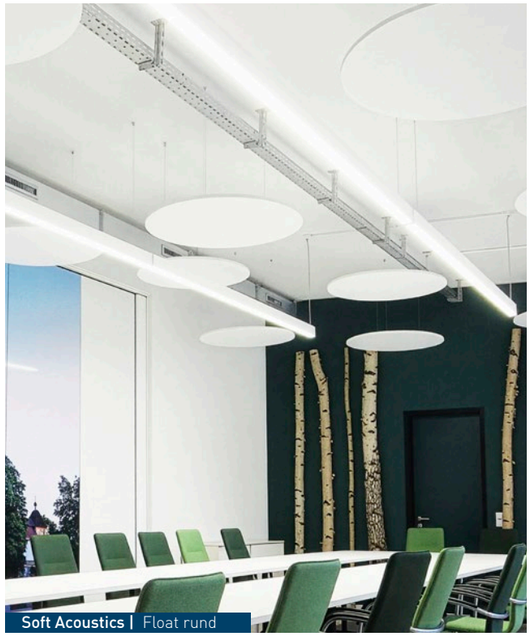
Floating ceiling absorb sound on both the front and back, significantly improving room acoustics.

Did you know that...
...low frequencies are much more difficult to absorb than high frequencies? That's why bass absorbers require significantly greater material depth than typical high-frequency absorbers.

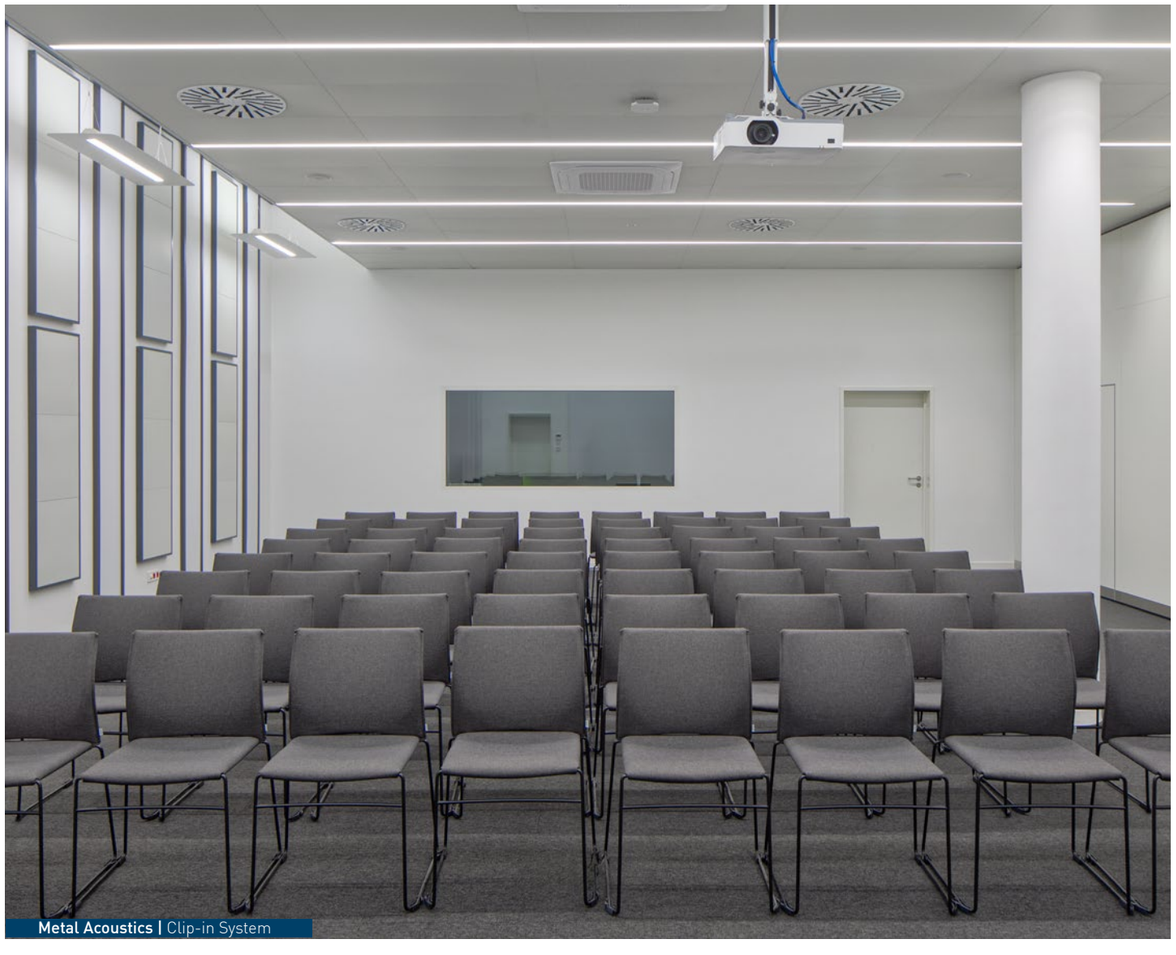
Soft Acoustics | Balance Polar

Acoustics in Meeting Rooms

Good acoustics are essential for effective meetings. In poorly designed acoustic environments, issues such as reverberation, disturbing reflections, or difficulties in understanding speech can occur. Acoustic elements such as sound-absorbing ceiling panels, wall panels, or carpets help to dampen sound and improve speech intelligibility. Proper room design and the placement of furniture also contribute to ensuring that conversations remain clear and free from disturbance. Well-planned acoustics not only increase efficiency but also enhance the well-being of participants.



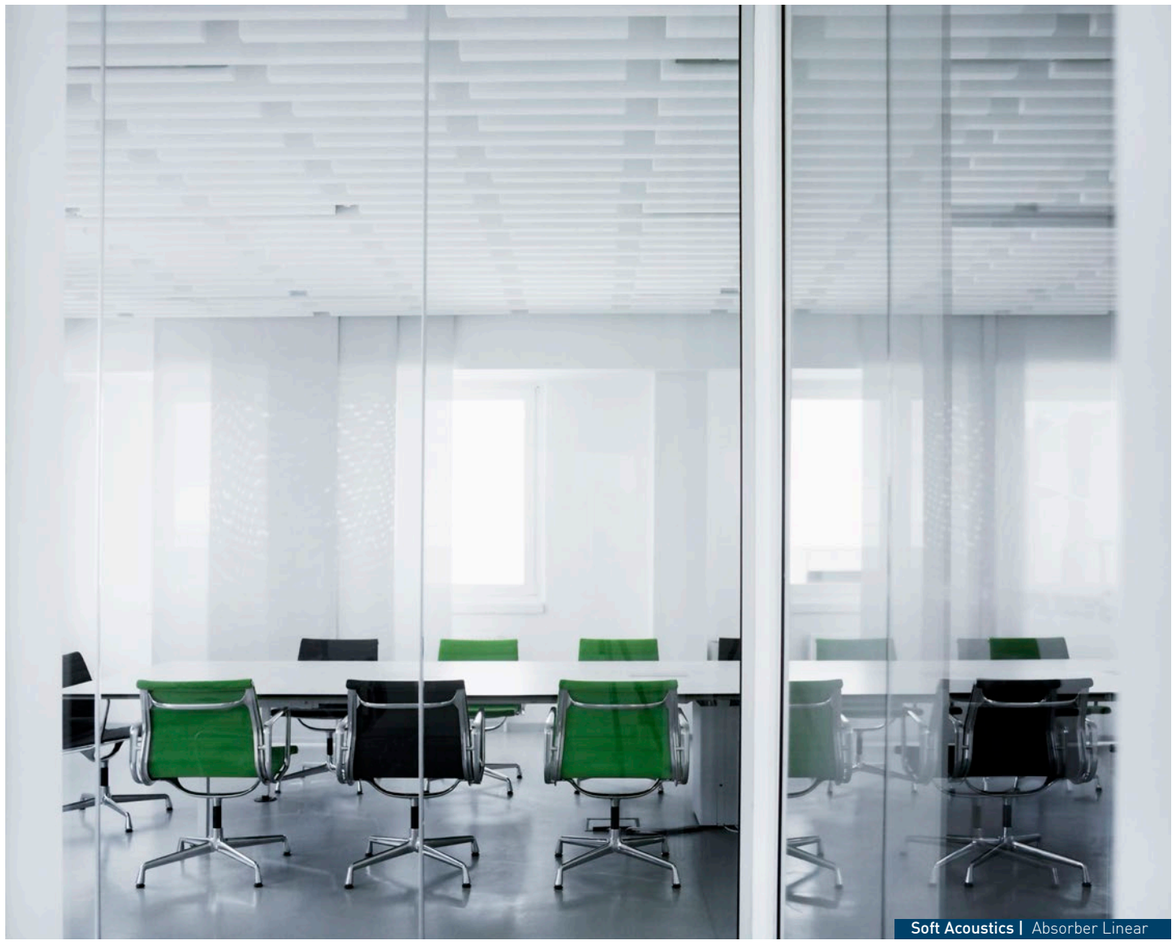
Soft Acoustics | Float rund



Metal Acoustics | Clip-in System

Metal Acoustics | Clip-in System

Metal Acoustics | Hang-in system with Z-profile

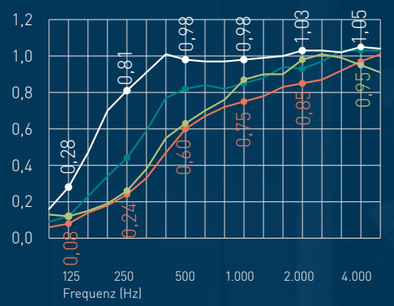


Soft Acoustics | Absorber Linear

Metal Acoustics | Floating Ceiling

Walls that do more than just divide

Pyramid Soft Acoustics



Sound absorption

Pyramide 50/50 — α_p

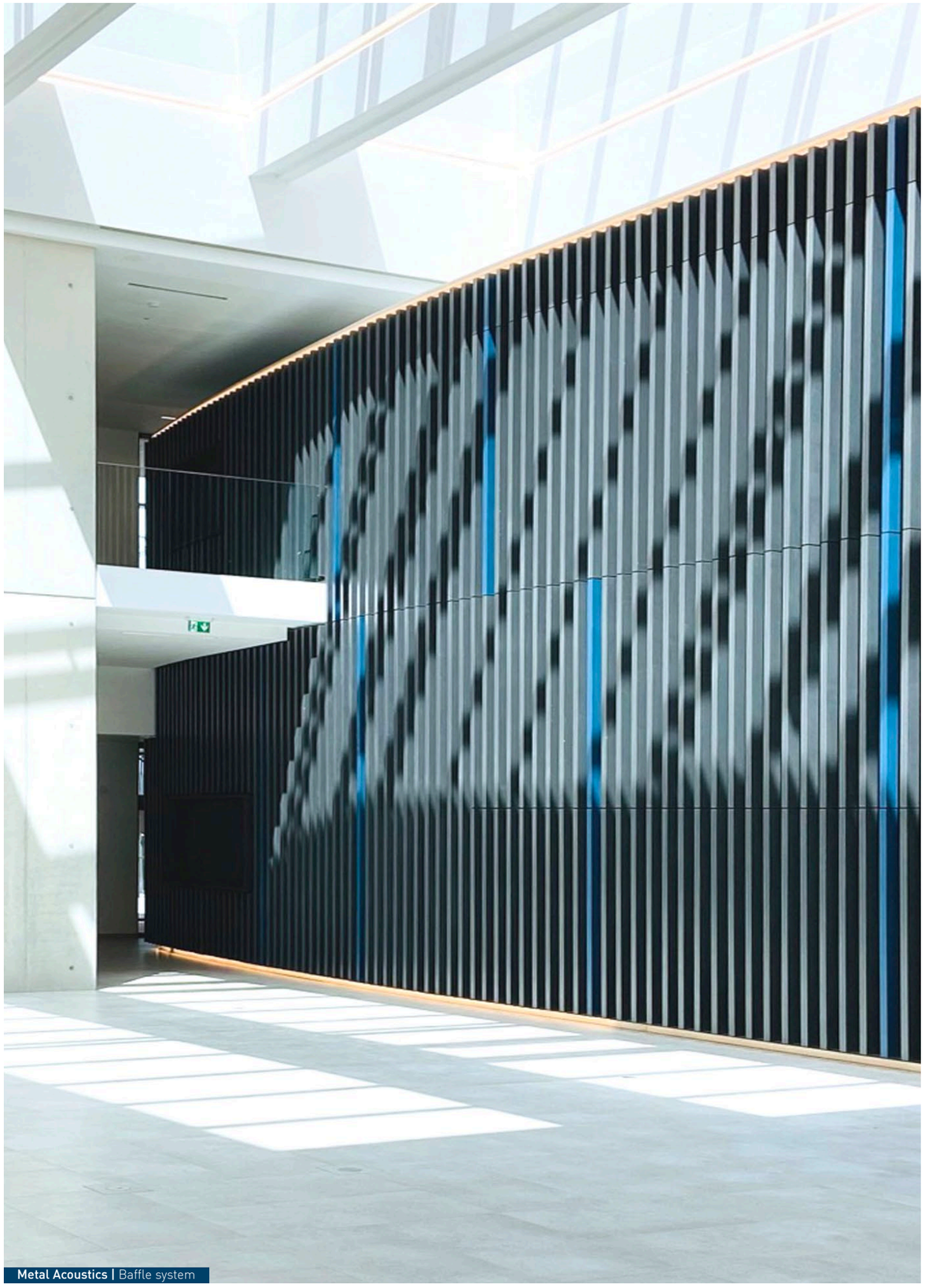
Pyramide 70/50 — α_p

Pyramide 100/50 — α_p

Pyramide 70/100 (PUR) — α_p

Did you know that...

...wood has been used in instrument making for centuries because it has excellent vibrational acoustic properties? Its elasticity and internal damping play a crucial role in shaping sound.


Metal Acoustics | Baffle system

Acoustic Walls in Metal and Soft Acoustics

The wall claddings combine high-quality design with functional acoustics. Natural materials, precise craftsmanship, and modern constructions create stylish surfaces with tangible added value. While metal acoustics impress with clean lines and robust solutions, soft acoustics ensure a pleasant room acoustic environment and greater calm. Together, they offer flexible design possibilities for modern and sophisticated interiors.


Soft Acoustics | Pyramid


Soft Acoustic | Balance Art

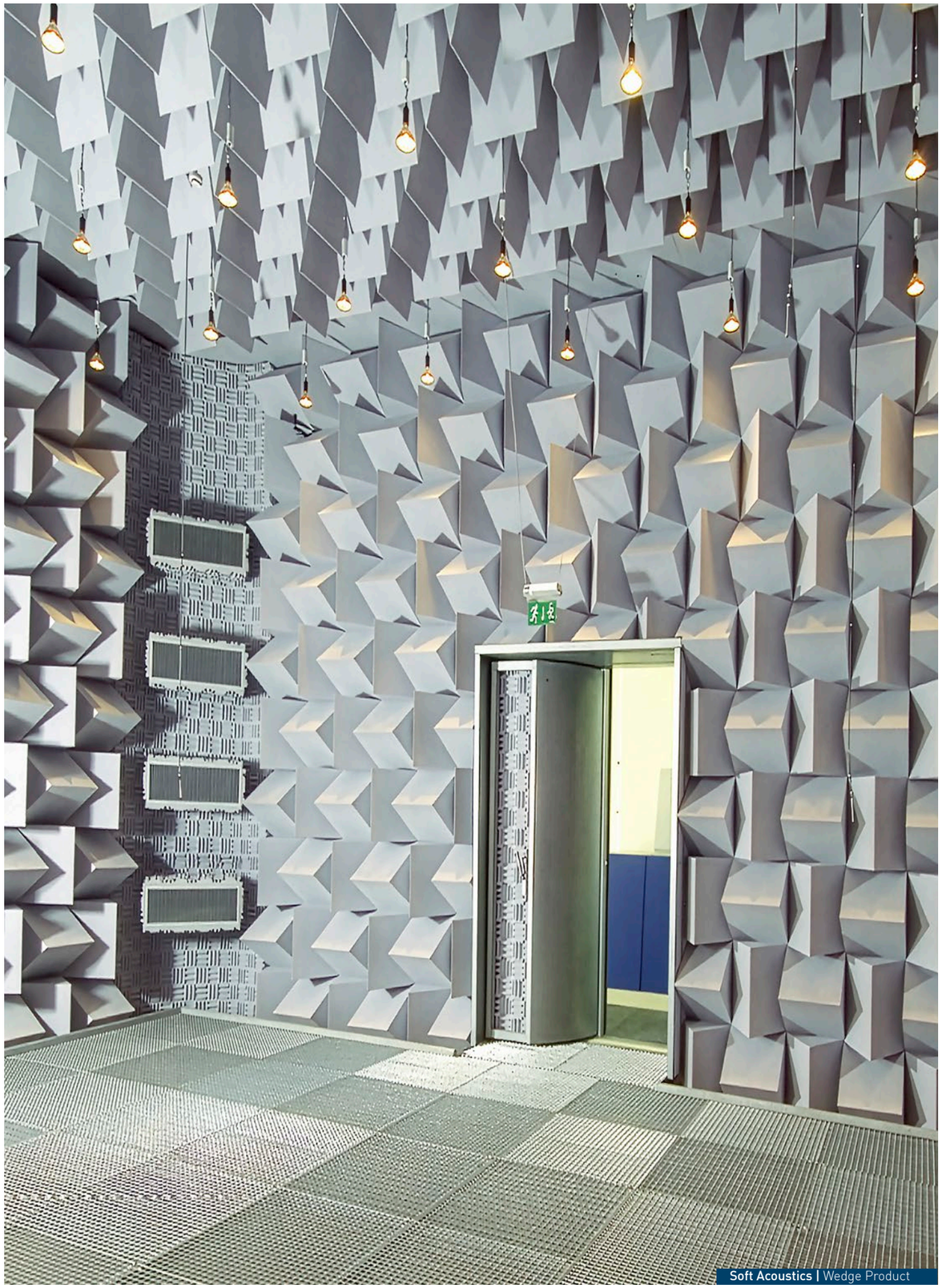
Soft Acoustics | Absorber Linear Wave

Versatile Design Possibilities

Soft Acoustics ceilings and walls offer almost unlimited design possibilities for modern architecture. Thanks to the flexible material structure, a wide variety of forms can be realized—from clear, geometric elements to organic, free-flowing designs. This enables the creation of individual ceiling concepts that adapt perfectly to both architecture and usage requirements.

Whether individual acoustic panels, large-scale ceiling rafts, or three-dimensional structures—products made from PET or Basotect® combine effective sound absorption with creative freedom. Different material thicknesses, surface textures, and colors allow for tailor-made solutions for offices.

Soft Acoustics | Absorber Linear



Soft Acoustics | Wedge Product

Modern staff restaurants begin with good acoustics

Did you know that...
...the reverberation time of a room is crucial for its use?
While a concert hall for symphonic music can have up to two seconds of reverberation, in classrooms it should ideally be below one second.

Metal Acoustics | Expanded metal


Metal Acoustics | Clip-in system

Acoustics in Staff Canteens

Staff canteens are places of interaction and communication—making balanced room acoustics all the more important. High noise levels caused by conversations, dishes, and movement can quickly become a strain. Acoustically effective wall and ceiling elements reduce sound, improve speech intelligibility, and create a pleasant atmosphere. This results in canteens that invite people to stay and offer true spaces for relaxation in everyday work life.

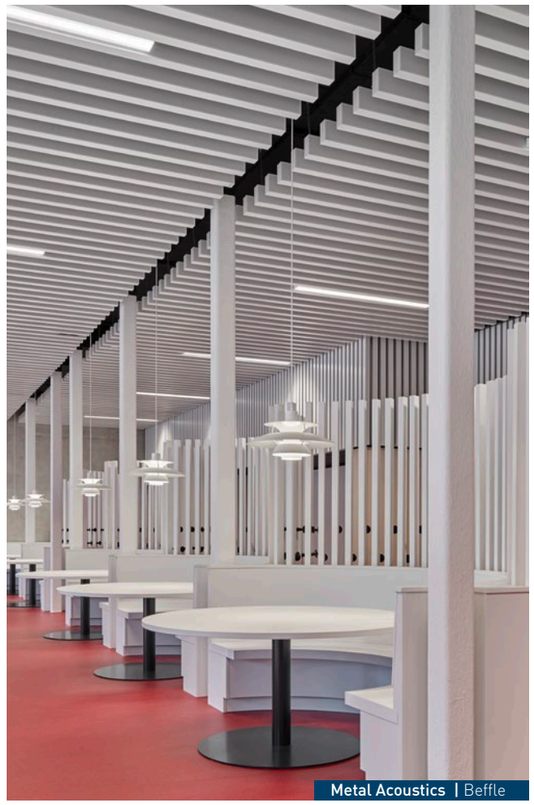

Soft Acoustics | Plano T


Metal Acoustics | Floating ceiling 90 degree


Metal Acoustics | Baffle system

Soft Acoustics | Float rund

Soft Acoustics | Rondo



Metal Acoustics | Beffle

Soft Acoustics | Rondo

Acoustic comfort in corridors

UP

Did you know that...
...glass may seem hard, but it can be acoustically problematic? Large glass surfaces strongly reflect sound and can lead to unpleasant echo effects.

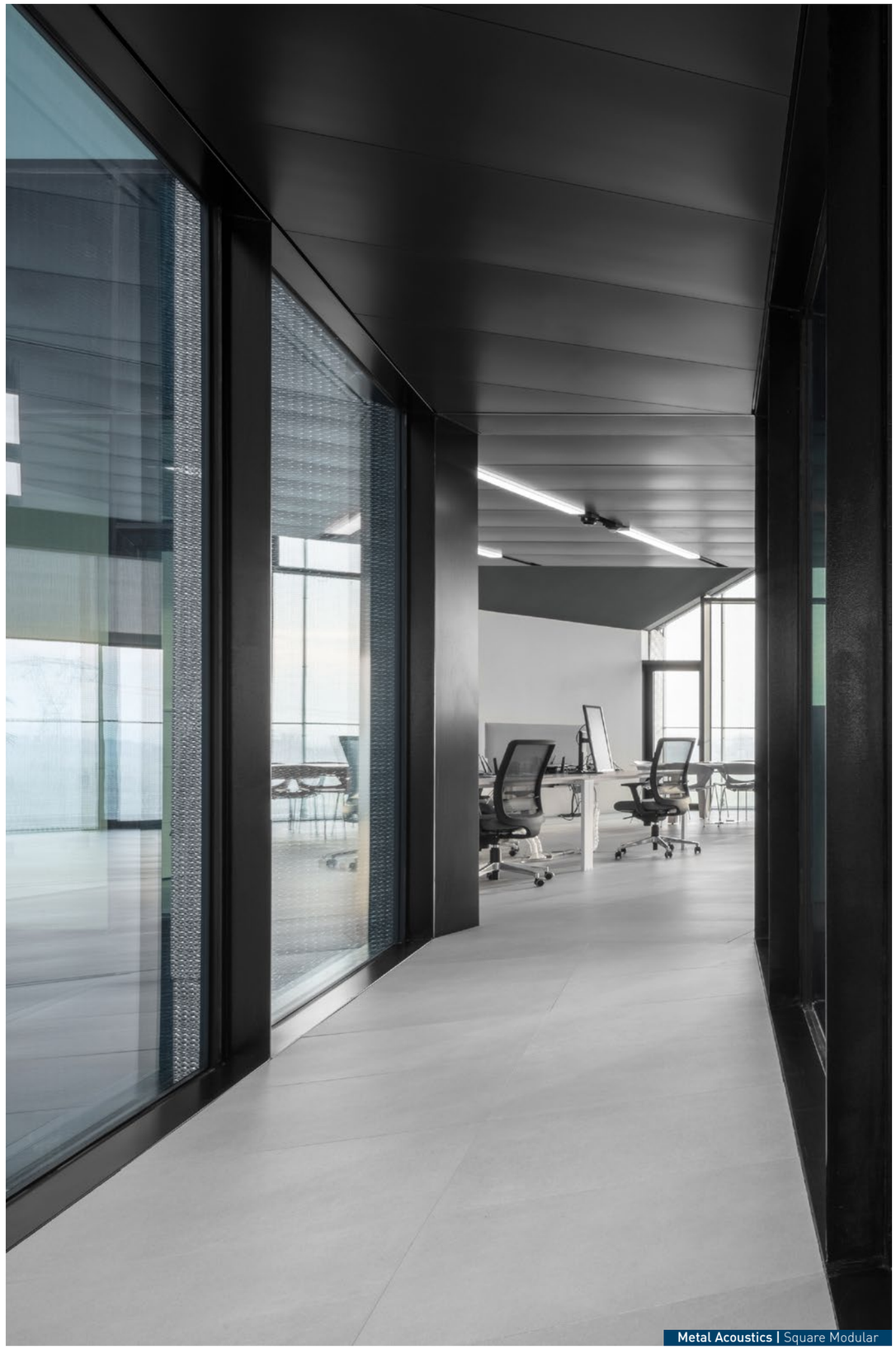
Metal Acoustics | Long panel cassettes, deep matte grey

Soft Acoustics | Plano

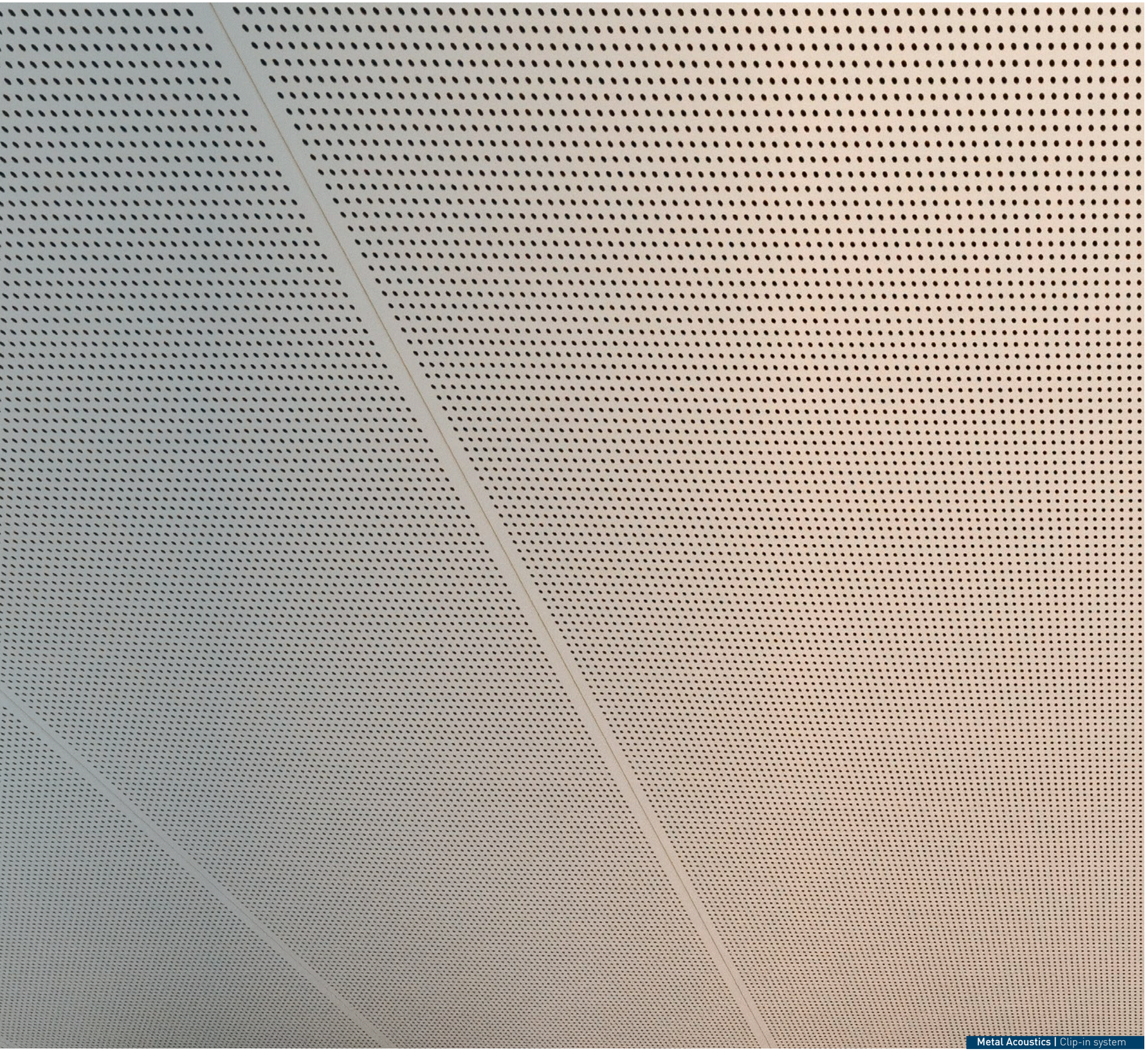
Acoustic Comfort in Corridors

Acoustic comfort in corridors plays an important role in users' well-being. Corridors are often high-traffic areas where noise is generated by footsteps, conversations, or closing doors. Targeted acoustic design—such as using sound-absorbing materials on walls, ceilings, or floors—can significantly reduce noise levels. This shortens reverberation time and creates a more pleasant, quieter atmosphere. Good acoustic comfort in corridors not only reduces noise but also improves orientation and overall spatial quality.

Metal Acoustics | Expanded Metal



Metal Acoustics | Square Modular



Metal Acoustics | Clip-in system

We are acoustic ceilings. We are acoustic walls.

Acoustic comfort

School demands both concentration and communication from pupils. Both can be significantly impaired by acoustic disturbance factors within the classroom, in circulation areas and corridors and in open spaces. This can lead to physical and psychological damage.

From the ceiling to the wall

Acoustic walls from Fural Metalit Dipling not only control the room acoustics, they also optimize the design of the entire classroom.

Thanks to their specific structure, the wall elements act as broadband absorbers and are therefore ideal for regulating reverberation time and speech intelligibility.

The benefits of metal ceilings as acoustic ceilings

Our systems combine outstanding acoustic properties and a high-quality appearance with functionality and durability. This combination creates a pleasant room atmosphere that impresses developers and users alike. Architects and installers hold us in high regard for our easily installed, perfected acoustic metal ceiling systems and our service-oriented project handling.

Our acoustic ceilings can also be fitted with additional functions, such as air conditioning (cooling, heating, ventilation) or lighting. Likewise, the product properties can be enhanced in terms of fire protection, hygiene (hospitals and laboratories) or resistance to ball impact (kindergartens, schools and sports halls). Ceiling components are manufactured on state-of-the-art production systems, which can produce everything from individual pieces to high volumes with maximum precision.
The metal ceilings are delivered with finished surfaces to the construction site, thereby ensuring quick and simple processing and short construction processes.

Our products are sustainable, because they consist of easily processed materials that can either be reused or straightforwardly recycled.

Acoustics terminology

Sound and sound level

The term "sound" refers to localised vibration and the propagating waves. These can occur in air (**airborne sound**) or in solid materials (**structure-borne sound**). If floors, ceilings and stairs are stimulated to vibrate by footfall, this is referred to as **impact sound**.

The sound intensity is designated with sound level L and specified in the decibel (dB) unit.

Acoustic quality

The term "acoustic quality" describes the interaction of the acoustic factors of a room for such sound events as music or speech with reference to the individual location of the person listening.

Rather than any physical properties of the room, the acoustic quality describes audio-physiological and audio-psychological effects on the listeners.

Acoustic quality is therefore not a clearly ascertainable quantity. It also depends on individual and subjective factors, for example on hearing capacity and listening experience.

However, the aim of a good acoustic plan should also be to include people with poorer hearing and therefore to achieve generally good average audibility.

Sound absorption area

The so-called **equivalent sound absorption area**, A, of a component is calculated by multiplying its area with the sound absorption coefficient, α.

All boundary surfaces, S_i, of a room have individual sound absorption coefficients, α_i, which allows the equivalent sound absorption area, A_i, to be determined for each partial area:

$$A_i = \alpha_i \times S_i (m^2)$$

The total equivalent sound absorption area, A, is calculated by adding up the individual amounts:

$$A_{total} = \alpha_1 \times S_1 (m^2) + \alpha_2 \times S_2 (m^2) + \dots$$

Reverberation time

The reverberation time, T_{60}, is a measure of the time required for the sound pressure to reduce to 1/1000 of its initial value after the sound source becomes silent.

This value is usually determined for a centre frequency (500 Hz or 1000 Hz) and specified accordingly.

The reverberation time increases in proportion to the volume of the room and in inverse proportion to the equivalent sound absorption area, A.

Sabine formula

In the field of technical acoustics, reverberation time T is calculated with the "Sabine formula":

$$T = V \div A \times 0.163$$

"V" describes the room volume and "A" the equivalent sound absorption area in m^2.

What do abbreviations α_s, α_p, α_w and NRC A stand for?

α_s ($alpha_s$) describes the so-called **one-third-octave** value. In a close spacing of thirds, 18 different sound absorption values are measured between 100 and 5000 Hz (100 Hz, 125 Hz, 160 Hz, 200 Hz, 250 Hz, 315 Hz, 400 Hz, 500 Hz, 630 Hz, 800 Hz, 1000 Hz, 1250 Hz, 1600 Hz, 2000 Hz, 2500 Hz, 3150 Hz, 4000 Hz and 5000 Hz). A value of 1.0 means complete absorption, while a value of 0.0 means complete reflection.

α_p ($alpha_p$) describes the so-called **practical sound absorption coefficient**. Three on-third-octave values α_s are used to calculate an **octave value** α_p. In addition 6 frequencies are represented (125 Hz, 250 Hz, 500 Hz, 1000 Hz, 2000 Hz and 4000 Hz).

α_w ($alpha_w$) describes the so-called **weighted sound absorption coefficient**. This is frequency-dependent and specified as a single-number value rounded to the nearest 0.05. The α_w value can be supplemented with so-called "shape indicators". These state that the measured values in the low (L), mid (M) or high (H) frequency range are better than those identified by the α_w value (see index word "shape indicators").

NRC A specifies the average of the sound absorption at octave values 250 Hz, 500 Hz, 1000 Hz and 2000 Hz, rounded to the nearest 0.05. A noise reduction coefficient of 0.80 stands for an average sound absorption of 80%.

Shape indicators (L/M/H)

The weighted sound absorption coefficient, α_w, can be supplemented with so-called "shape indicators", expressed by the letters L, M and H (low, mid, high), in which frequency ranges the sound absorption level is particularly high.

- L Particularly good absorption up to 250 Hz
- M Particularly good absorption at 500 Hz to 1000 Hz
- H Particularly good absorption at 2000 Hz to 4000 Hz

Absorber classes

According to DIN EN 11654, acoustic elements are assigned to absorber class A, B, C, D or E based on their sound absorption coefficient.

- A Extremely absorbent α_w 0.90–1.00
- B Highly absorbent α_w 0.80-0.85
- C Very absorbent α_w 0.60-0.75
- D Absorbent α_w 0.30-0.55
- E Slightly absorbent α_w 0.15-0.25

Longitudinal sound insulation $D_{n,f,w}$

In buildings with a skeleton construction – typically nearly all new office buildings today – the individual rooms are separated by lightweight partition walls. The ceilings are suspended.

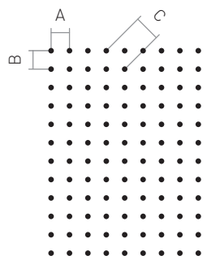
The cavity that this creates between raw ceiling and suspended ceiling acts as a sound transmission path which must be compensated for with longitudinal sound insulation.

The longitudinal sound insulation can be implemented with vertical or horizontal compartmentalisation.

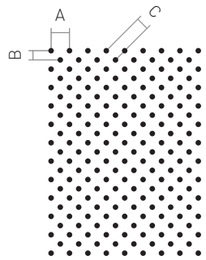
The longitudinal sound insulation is determined according to EN ISO 717-1 and specified as a weighted normalised flanking sound level difference **$D_{n,f,w}$** in **dB** units.

Here "$D_{n,f}$" describes the normalised flanking level difference for flanking components (e.g. suspended ceilings). "$_w$" means that the measured values have been weighted in accordance with normative specifications. The specified numerical value is the value read from the reference curve at 500 Hz.

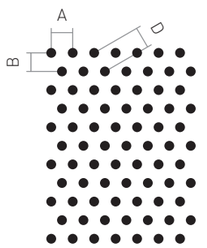
The reference curve is not shown in the test report diagrams.



Rg



Rd



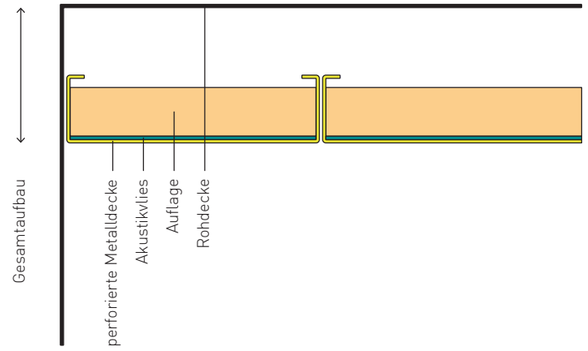
Rv

Perforation sizing

- A Horizontal spacing
- B Vertical spacing
- C Diagonal spacing 45°
- D Offset spacing 60°

Effect of acoustic infills

Pädagogische Hochschule, Thurgau (CH)



Influence of Different Types of Backings (Absorber Types)

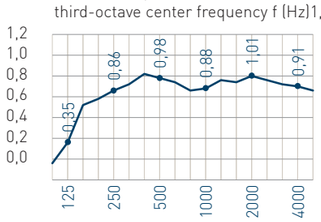
The sound absorption coefficient is strongly influenced by the type of backing used, which can consist of mineral wool, mineral wool sealed in PE foil, foam, or polyester wool.
These backings are also available in different densities (kg/m³).

Fural

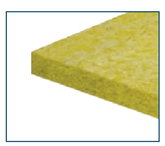
	Rg 2,5 - 16 %
Perforation Ø	2,5 mm
Hole content	16 %
Max. perforation width	1.460 mm
Des. acc. to DIN 24041	Rg 2,50 - 5,50
Horizontal spacing	5,50 mm →
Vertical spacing	5,50 mm ↓
Offset spacing 60°	7,78 mm ↘
Perforation direction	→

Schallabsorption

Sound absorption coefficient as at third-octave center frequency f (Hz)1,4



Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	P-BA 279/2006 photo 14
NRC	0,95
aw	0,95
Absorber class	A (DIN EN 11654)
Acoustic infill	**30 mm Mineral wool 45 kg/m³**

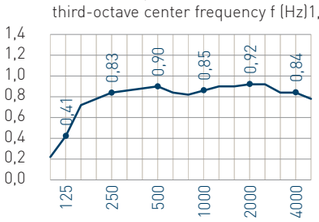


Fural

	Rg 2,5 - 16 %
Perforation Ø	2,5 mm
Hole content	16 %
Max. perforation width	1.460 mm
Des. acc. to DIN 24041	Rg 2,50 - 5,50
Horizontal spacing	5,50 mm →
Vertical spacing	5,50 mm ↓
Offset spacing 60°	7,78 mm ↘
Perforation direction	→

Schallabsorption

Sound absorption coefficient as at third-octave center frequency f (Hz)1,4



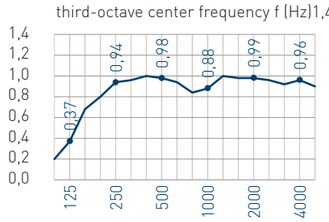
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	P-BA 279/2006 photo 17
NRC	0,85
aw	0,90
Absorber class	A (DIN EN 11654)
Acoustic infill	**30 mm MMineral wool 45 kg/m³ in PE-Foil**

Fural

	Rg 2,5 - 16 %
Perforation Ø	2,5 mm
Hole content	16 %
Max. perforation width	1.460 mm
Des. acc. to DIN 24041	Rg 2,50 - 5,50
Horizontal spacing	5,50 mm →
Vertical spacing	5,50 mm ↓
Offset spacing 60°	7,78 mm ↘
Perforation direction	→

Schallabsorption

Sound absorption coefficient as at third-octave center frequency f (Hz)1,4



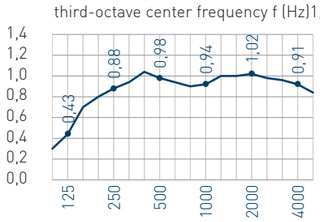
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	P-BA 279/2006 photo 18
NRC	0,95
aw	0,95
Absorber class	A (DIN EN 11654)
Acoustic infill	**30 mm Foam 9 kg/m³**

Fural

	Rg 2,5 - 16 %
Perforation Ø	2,5 mm
Hole content	16 %
Max. perforation width	1.460 mm
Des. acc. to DIN 24041	Rg 2,50 - 5,50
Horizontal spacing	5,50 mm →
Vertical spacing	5,50 mm ↓
Offset spacing 60°	7,78 mm ↘
Perforation direction	→

Schallabsorption

Sound absorption coefficient as at third-octave center frequency f (Hz)1,4

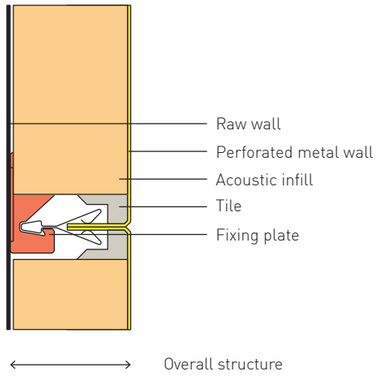


Overall structure	200 mm
Fleece	Bonded acoustic fleecet
Test certificate	P-BA 279/2006 photo 19
NRC	0,95
aw	0,95
Absorber class	A (DIN EN 11654)
Acoustic infill	**30 mm Polyester wool48 kg/m³**

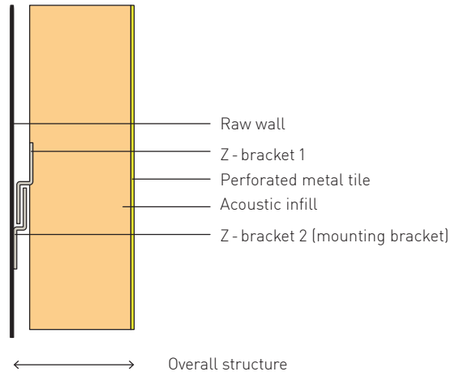
Acoustic walls

EMBL, Heidelberg (DE)

Clip-in system



Hang-in system

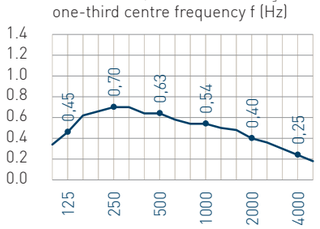


Fural
Rg 0.7 - 1 %

Perforation Ø	0.7 mm
Hole content	1 %
Max. perforation width	1,140 mm
Des. acc. to DIN 24041	Rg 0.70 - 6.00
Horizontal spacing	6.00 mm →
Vertical spacing	6.00 mm ↓
Diagonal spacing	8.48 mm ↘
Perforation direction	→

Sound absorption

Sound absorption coefficient α_s at one-third centre frequency f (Hz)



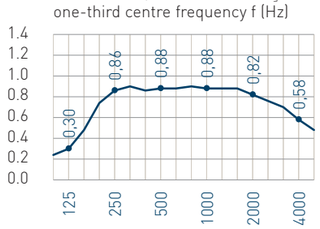
Overall structure	50 mm
Fleece	Bonded acoustic fleece
Test certificate	07.12.2010 M 61840/27
NRC	0.55
α_w	0.40 (L)
Absorber class	D (DIN EN 11654)
Acoustic infill	**50 mm mineral wool 100 kg/m³ in PE film**

Fural
Rg 0.7 - 4 %

Perforation Ø	0.7 mm
Hole content	4 %
Max. perforation width	1,140 mm
Des. acc. to DIN 24041	Rg 0.70 - 3.00
Horizontal spacing	3.00 mm →
Vertical spacing	3.00 mm ↓
Diagonal spacing	4.24 mm ↘
Perforation direction	→

Sound absorption

Sound absorption coefficient α_s at one-third centre frequency f (Hz)



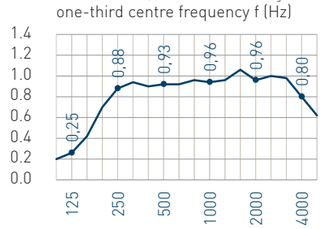
Overall structure	50 mm
Fleece	Bonded acoustic fleece
Test certificate	07.12.2010 M 61840/26
NRC	0.85
α_w	0.80 (L)
Absorber class	B (DIN EN 11654)
Acoustic infill	**50 mm mineral wool 100 kg/m³ in PE film**

Fural
Rv 1.6 - 20 %

Perforation Ø	1.6 mm
Hole content	20 %
Max. perforation width	1,450 mm
Des. acc. to DIN 24041	Rv 1.60 - 3.50
Horizontal spacing	3.50 mm →
Vertical spacing	3.03 mm ↓
Offset spacing 60°	3.50 mm ↘
Perforation direction	→

Sound absorption

Sound absorption coefficient α_s at one-third centre frequency f (Hz)



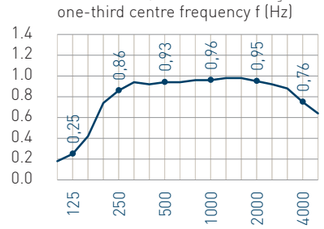
Overall structure	50 mm
Fleece	Bonded acoustic fleece
Test certificate	07.12.2010 M 61840/22
NRC	0.95
α_w	0.95
Absorber class	A (DIN EN 11654)
Acoustic infill	**50 mm mineral wool 100 kg/m³ in PE film**

Fural
Rd 1.8 - 21 %

Perforation Ø	1.8 mm
Hole content	21 %
Max. perforation width	1,400 mm
Des. acc. to DIN 24041	Rd 1.80 - 3.50
Horizontal spacing	4.96 mm →
Vertical spacing	2.48 mm ↓
Diagonal spacing	3.50 mm ↘
Perforation direction	→

Sound absorption

Sound absorption coefficient α_s at one-third centre frequency f (Hz)



Overall structure	50 mm
Fleece	Bonded acoustic fleece
Test certificate	07.12.2010 M 61840/25
NRC	0.95
α_w	0.95
Absorber class	A (DIN EN 11654)
Acoustic infill	**50 mm mineral wool 100 kg/m³ in PE film**

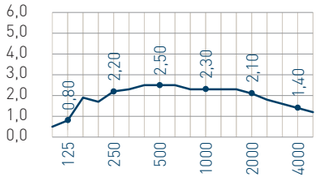
Cooling ceilings

MED Campus, Graz (AT)

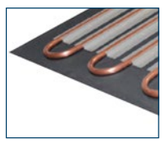
	Fural
	Rg 2,5 - 16 %
Perforation Ø	2,5 mm
Hole content	16 %
Max. perforation width	1.460 mm
Des. acc. to DIN 24041	Rg 2,50 - 5,50
Horizontal spacing	5,50 mm →
Vertical spacing	5,50 mm ↓
Offset spacing 60°	7,78 mm ↘
Perforation direction	→

Sound absorption

Absorptionsfläche A_{Obj}/m² zu Terzmittenfrequenz f (Hz)



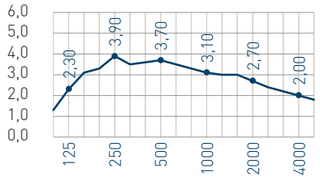
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	28.06.2019 M 105629/37
Equiv. sound absorp.	(500 Hz) 2,50 m²
Visible surface area	3,45 m²
Acoustic infill	
Acoustic occ. level	Cooling coil 73% (cooling coil with 12 thermal conduction profiles)



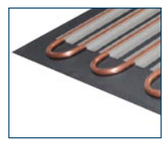
	Fural
	Rg 2,5 - 16 %
Perforation Ø	2,5 mm
Hole content	16 %
Max. perforation width	1.460 mm
Des. acc. to DIN 24041	Rg 2,50 - 5,50
Horizontal spacing	5,50 mm →
Vertical spacing	5,50 mm ↓
Diagonal spacing	7,78 mm ↘
Perforation direction	→

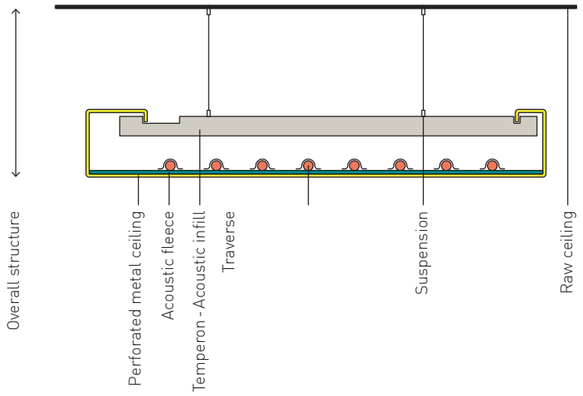
Sound absorption

Absorptionsfläche A_{Obj}/m² zu Terzmittenfrequenz f (Hz)



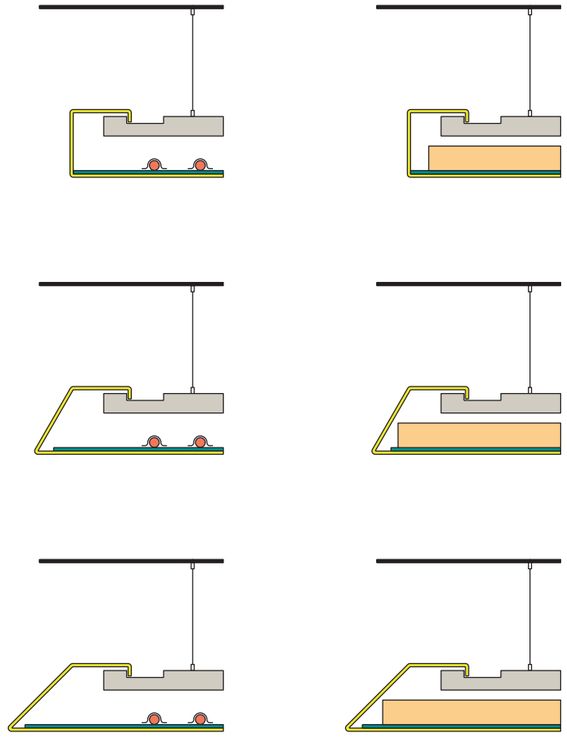
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	28.06.2019 M 105629/38
Equiv. sound absorp.	(500 Hz) 3,70 m²
Visible surface area	3,45 m²
Acoustic infill	**50 mm Mineral wool 100 kg/m³, in PE-Foil, +cooling coil**
Acoustic occ. level	**73% (cooling coil with 12 thermal conduction profiles)**





Room temperature control by floating ceiling

Floating ceilings are particularly suitable for combination with water-bearing heat exchangers for room temperature control. Fitting with cooling systems changes the acoustic properties of the floating ceilings, because the previously continuous holes of profiles are covered. Therefore the "acoustic occupancy level" is specified in the tables. This means the proportion of the area covered by the heat conducting profile.



Edge formation of floating ceilings

The edge formation of floating ceilings can be implemented with internal angles of 90°, 60° or 45°. While internal angles of 90° create a voluminous impression, the versions with internal angles of 60° and 45° have a more two-dimensional effect.

Acoustic properties of Soft Acoustics

Soft Acoustics integrates highly effective room acoustic systems with defined absorption coefficients as a design element within architecture. Through broadband sound absorption across the relevant frequency spectrum, reverberation time is specifically reduced, while speech intelligibility and acoustic comfort are measurably improved.

This allows acoustic planning to be incorporated early into the design process and used as both a technical and aesthetic component of the overall spatial concept.

Distribution of absorbers in the room

When distributing sound absorbers in a room, care should be taken to preserve useful reflective surfaces.

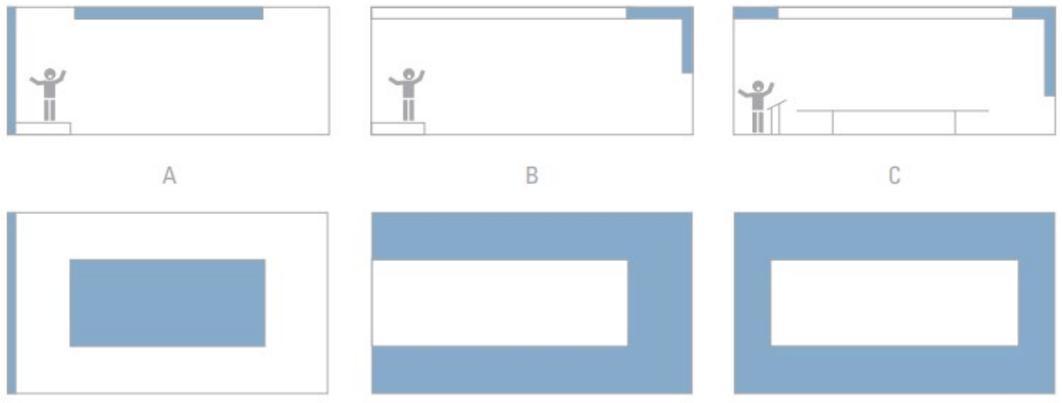


Illustration based on DIN 18041

A: Inefficient absorber distribution, as useful reflective surfaces become ineffective.
B, C: Effective absorber distribution, as useful reflective surfaces remain effective.

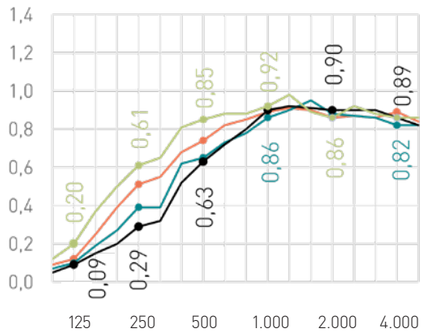
Plano Polar

Product Properties

Base material: 100% polyester
Material density: 50 kg/m³ ±15%
Material color*: white
Fire behavior DIN EN 13501-1:** B-s1, d0 (50 mm)
Long-term temperature stability: 70 °C
Material thicknesses: 30, 40, 50, and 60 mm

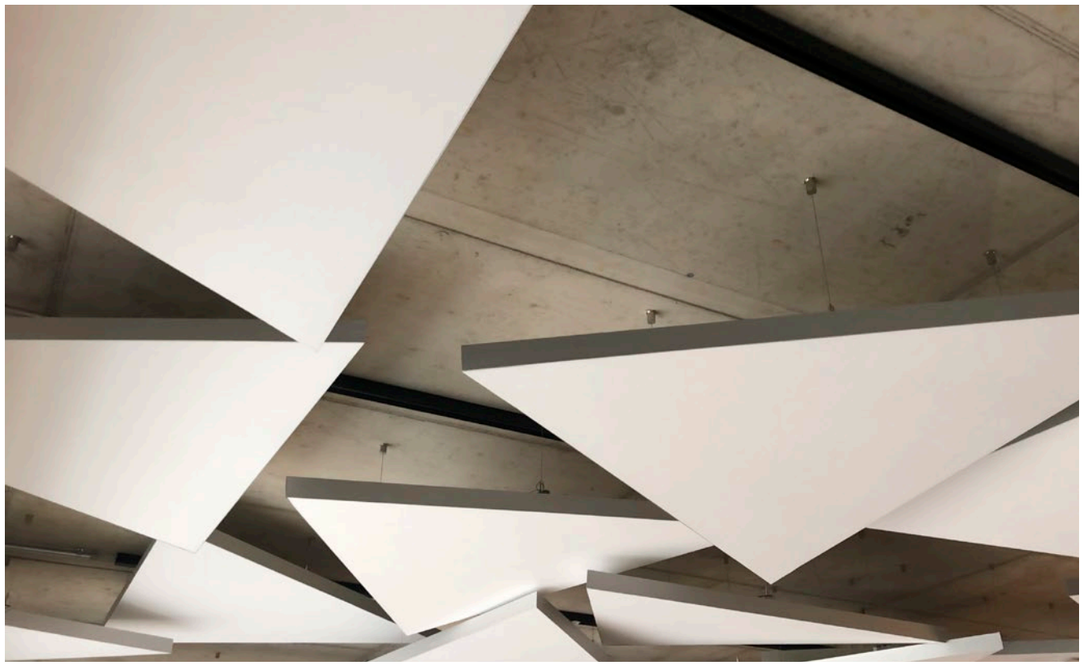
Acoustic properties

Schallabsorptionsgrad α_s, PLANO POLAR, nach DIN EN ISO 11654



Plano Polar 30 mm						
α_p	0,10	0,25	0,60	0,85	0,90	0,85
Format: 2,50 x 1,25 m, thk.: 40 mm, ceiling cavity: 200 mm						
α_p	0,10	0,35	0,65	0,85	0,90	0,85
Format: 2,50 x 1,25 m, thk.: 40 mm, ceiling cavity: 300 mm						
α_p	0,15	0,50	0,75	0,90	0,90	0,85
Format: 2,50 x 1,25 m, thk.: 40 mm, ceiling cavity: 500 mm						
α_p	0,25	0,60	0,85	0,90	0,90	0,85

* Color variations may occur.
** Fire classification tested for white, uncoated material up to 50 mm thickness.



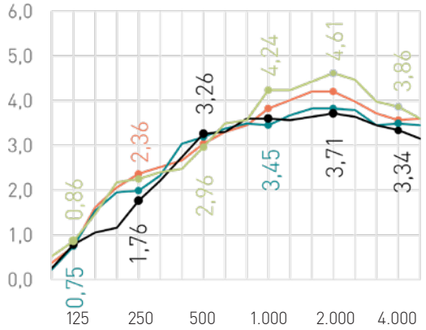
Balance Polar

Product Properties

Base material: 100% polyester
Material density: 40 kg/m³ ±15%
Material color: white
Fire behavior DIN EN 13501-1:** B-s1, d0 (20 mm), B-s2, d0 (40 mm)
Long-term temperature stability: 70 °C
Material thicknesses: 20 and 40 mm

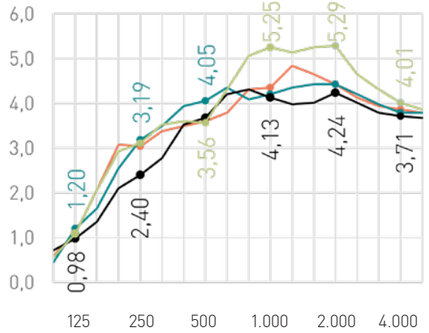
Acoustic properties

Equivalent sound absorption area $A_o$bj, considered as a single absorber at a thickness of 20 mm



Format: 3,00 x 1,25 m, thk.: 20 mm, ceiling cavity: 100 mm						
A_{obj}	0,70	1,71	3,10	3,59	3,66	3,31
Format: 3,00 x 1,25 m, thk.e: 20 mm, ceiling cavity: 200 mm						
A_{obj}	0,84	2,09	3,20	3,54	3,81	3,46
Format: 3,00 x 1,25 m, thk.: 20 mm, ceiling cavity: 300 mm						
A_{obj}	0,91	2,31	3,00	3,76	4,13	3,63
Format: 3,00 x 1,25 m, thk.e: 20 mm, ceiling cavity: 500 mm						
A_{obj}	0,95	2,28	2,98	4,01	4,50	3,81

Equivalent sound absorption area $A_o$bj, considered as a single absorber at a thickness of 40 mm



Format: 3,00 x 1,25 m, thk.: 40 mm, ceiling cavity: 100 mm						
A_{obj}	1,01	2,43	3,80	4,14	4,09	3,73
Format: 3,00 x 1,25 m, thk.e: 40 mm, ceiling cavity: 200 mm						
A_{obj}	1,10	3,08	4,11	4,21	4,35	3,85
Format: 3,00 x 1,25 m, thk.: 40 mm, ceiling cavity: 300 mm						
A_{obj}	1,25	3,16	3,63	4,50	4,40	3,86
Format: 3,00 x 1,25 m, thk.: 40 mm, ceiling cavity: 500 mm						
A_{obj}	1,24	3,19	3,83	5,15	5,06	4,06

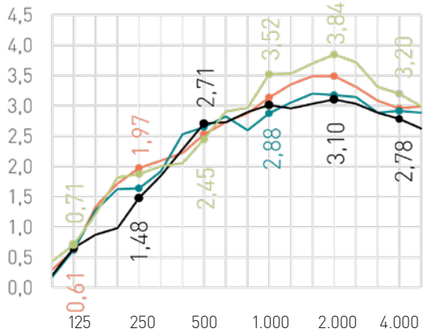
Float Polar

Product Properties

Base material: 100% polyester
Material density: 40 kg/m³ ±15%
Material color: white
Fire behavior DIN EN 13501-1: B-s1, d0 (20 mm), B-s2, d0 (40 mm)
Long-term temperature stability: 70 °C
Material thicknesses: 20 and 40 mm

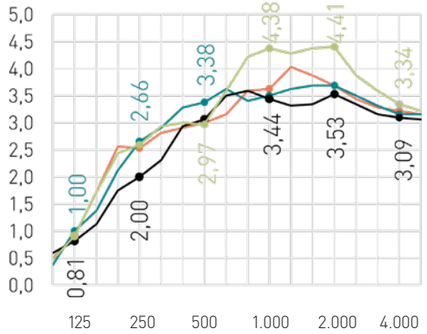
Acoustic properties

Equivalent sound absorption area $A_o$bj, considered as a single absorber at a thickness of 20 mm



Format: 2,50 x 1,25 m, thk.: 20 mm, ceiling cavity: 100 mm						
A_{obj}	0,63	1,41	2,66	2,97	3,13	2,81
Format: 2,50 x 1,25 m, thk.: 20 mm, ceiling cavity: 200 mm						
A_{obj}	0,63	1,72	2,66	2,97	3,13	2,81
Format: 2,50 x 1,25 m, thk.: 20 mm, ceiling cavity: 300 mm						
A_{obj}	0,78	1,88	2,50	3,13	3,13	2,97
Format: 2,50 x 1,25 m, thk.: 20 mm, ceiling cavity: 500 mm						
A_{obj}	0,78	1,88	2,50	3,13	3,13	3,13

Equivalent sound absorption area $A_o$bj, considered as a single absorber at a thickness of 40 mm



Format: 2,50 x 1,25 m, thk.e: 40 mm, ceiling cavity: 100 mm						
A_{obj}	0,78	2,03	3,13	3,13	3,13	3,13
Format: 2,50 x 1,25 m, thk.: 40 mm, ceiling cavity: 200 mm						
A_{obj}	0,94	2,50	3,13	3,13	3,13	3,13
Format: 2,50 x 1,25 m, thk.: 40 mm, ceiling cavity: 300 mm						
A_{obj}	1,09	2,66	2,97	3,13	3,13	3,13
Format: 2,50 x 1,25 m, thk.: 40 mm, ceiling cavity: 500 mm						
A_{obj}	1,09	2,66	3,13	3,13	3,13	3,13

Spaces that rethink work and shape modern workplaces

UP

Metal Acoustic | Bandrastersystem

Reduce, reuse, recycle
100% circular economy

Sustainable building with sustainable metal ceilings

Sustainability - a topic that is increasingly becoming the focus of social discussions – and justifiably so!

In the fight against climate change, the conscientious use of resources and measures to promote the ecosystem are urgently needed to protect the environment. The idea of sustainability should also find its way into the construction industry: Thus, at Fural Metalit Dipling we focus on this and process our steel and aluminum sheets directly in the factory and to measure, which avoids unnecessary work on the construction site. In addition, metal ceilings allow repairs and revisions at any time without much effort and can be reused. Last, but not least, our metal ceiling systems are long-lasting and easy to recycle, thus gentle on the environment.

Building materials

The use of building materials and constructions with substances that cause environmental damage has long been avoided or greatly reduced in sustainable construction.

In addition, we always keep an eye on the reusability of individual components in the event of modernization or reconstruction. Since around 79% of mineral waste in Germany comes from the building industry and a total of around 53% of the entire waste volume can be attributed to the building industry, possible deconstruction or conversion is increasingly being taken into account as early as the planning phase.

In addition, building components and products that require less energy to manufacture are now preferred - assessing the energy flows involved in manufacturing, transporting, and processing building materials involves calculating their primary share of non-renewable energy, their share of global warming, and their share of acidification.

Metal ceilings for more comfort in the room

Metal ceilings are ideal for cooling and heating rooms, because the temperature control is based on the radiation principle: The heat or cold radiates gently through the metal ceiling directly into the room. In addition, cooling ceilings work completely without air circulation and thus cause neither dust turbulence nor drafts.

»Nothing fits the building life cycle like a Fural metal ceiling«
(Dirk Freytag, CTO)

The best architecture features functional ceilings by Fural

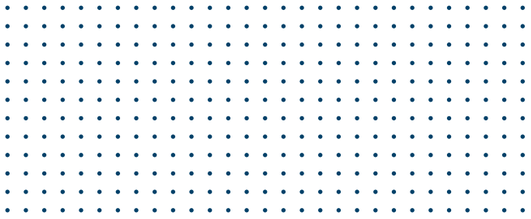
Did you know that...
...the so-called "sound level" is measured in decibels, but 0 dB does not mean "no sound"? It simply represents the lower threshold of human hearing.

Architecture | Bonfiglioli Bologna

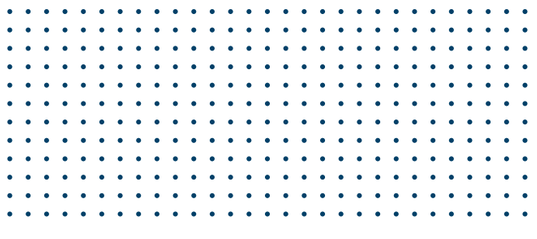
Tested perforations 1

	Fural
	Rg 0.7 - 1 %
Perforation Ø	0.7 mm
Hole content	1 %
Max. perforation width	1,197 mm
Des. acc. to DIN 24041	Rg 0.70 - 6.00
Horizontal spacing	6.00 mm →
Vertical spacing	6.00 mm ↓
Diagonal spacing	8.48 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	31/08/2007 P-BA 231/2007
NRC	0.65
α_w	0.50 (LM)
Absorber class	D (DIN EN 11654)
Acoustic infill	w/o

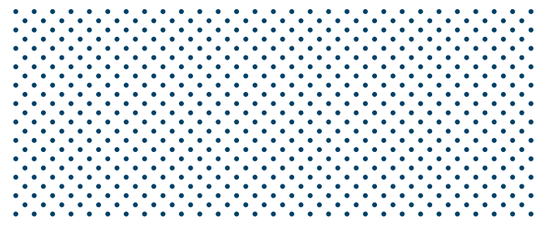
	Fural
	Rg 0.7 - 1.5 %
Perforation Ø	0.7 mm
Hole content	1.5 %
Max. perforation width	1,400 mm
Des. acc. to DIN 24041	Rg 0.70 - 5.00
Horizontal spacing	5.00 mm →
Vertical spacing	5.00 mm ↓
Diagonal spacing	7.07 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	04/12/2019 M 105629
NRC	0.60
α_w	0.50 (L)
Absorber class	D (DIN EN 11654)
Acoustic infill	w/o



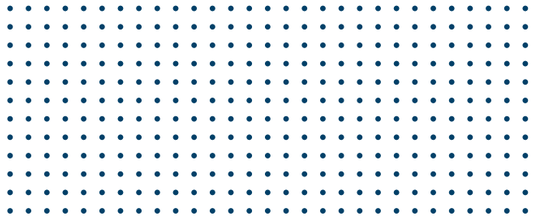
	Fural
	Rg 0.7 - 4 %
Perforation Ø	0.7 mm
Hole content	4 %
Max. perforation width	1,197 mm
Des. acc. to DIN 24041	Rg 0.70 - 3.00
Horizontal spacing	3.00 mm →
Vertical spacing	3.00 mm ↓
Diagonal spacing	4.24 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	31/08/2007 P-BA 219/2007
NRC	0.80
α_w	0.75 (LM)
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o



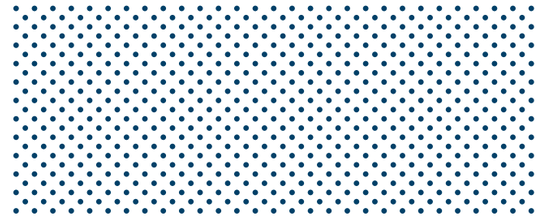
	Fural
	Rg 0.8 - 6 %
Perforation Ø	0.8 mm
Hole content	6 %
Max. perforation width	1,400 mm
Des. acc. to DIN 24041	Rg 0.80 - 3.00
Horizontal spacing	3.00 mm →
Vertical spacing	3.00 mm ↓
Diagonal spacing	4.24 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	09/06/2017 M 105629/17
NRC	0.75
α_w	0.75
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o



	Fural
	Rd 0.8 - 11 %
Perforation Ø	0.8 mm
Hole content	11 %
Max. perforation width	1,400 mm
Des. acc. to DIN 24041	Rd 0.80 - 2.12
Horizontal spacing	3.00 mm →
Vertical spacing	1.50 mm ↓
Diagonal spacing	2.12 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	09/06/2017 M 105629/18
NRC	0.75
α_w	0.70
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o

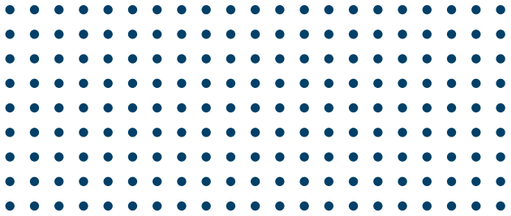


	Fural
	Rg 0.9 - 7 %
Perforation Ø	0.9 mm
Hole content	7 %
Max. perforation width	1,022 mm
Des. acc. to DIN 24041	Rg 0.90 - 3.00
Horizontal spacing	3.00 mm →
Vertical spacing	3.00 mm ↓
Diagonal spacing	4.24 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	30/09/2019 M 105629/44
NRC	0.75
α_w	0.70
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o

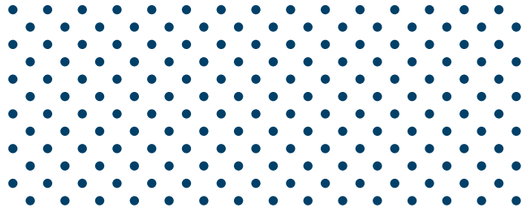


	Fural
	Rd 0.9 - 14 %
Perforation Ø	0.9 mm
Hole content	14 %
Max. perforation width	1,022 mm
Des. acc. to DIN 24041	Rd 0.90 - 2.12
Horizontal spacing	3.00 mm →
Vertical spacing	1.50 mm ↓
Diagonal spacing	2.12 mm ↘
Perforation direction	→
Overall structure	400 mm
Fleece	Bonded acoustic fleece
Test certificate	17/11/2012 7178-12-2
NRC	0.55
α_w	0.55 (LH)
Absorber class	D (DIN EN 11654)
Acoustic infill	w/o

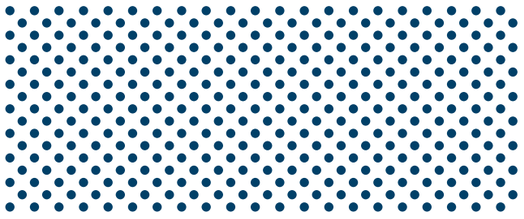
Tested perforations 2



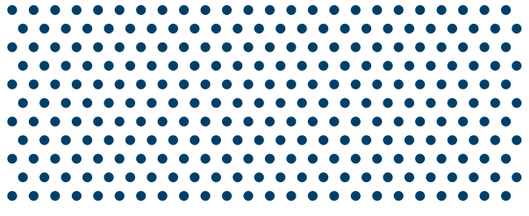
	Fural
	Rg 1.5 - 11 %
Perforation Ø	1.5 mm
Hole content	11 %
Max. perforation width	1,488 mm
Des. acc. to DIN 24041	Rg 1.50 - 4.00
Horizontal spacing	4.00 mm →
Vertical spacing	4.00 mm ↓
Diagonal spacing	5.65 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	07/12/2010 M 61840/6
NRC	0.80
α_w	0.75
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o



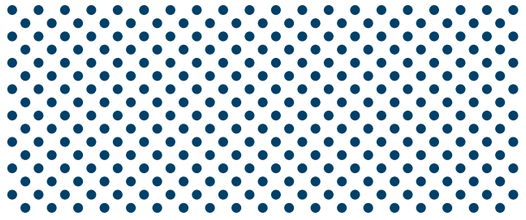
	Fural
	Rd 1.5 - 11 %
Perforation Ø	1.5 mm
Hole content	11 %
Max. perforation width	1,470 mm
Des. acc. to DIN 24041	Rd 1.50 - 4.00
Horizontal spacing	5.66 mm →
Vertical spacing	2.83 mm ↓
Diagonal spacing	4.00 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	07/12/2010 M 61 840/6
NRC	0.80
α_w	0.75
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o



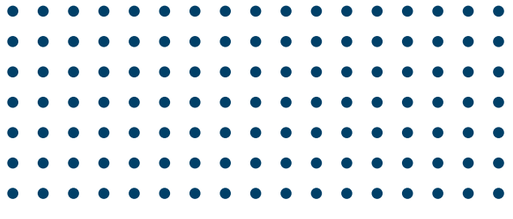
	Fural
	Rd 1.5 - 22 %
Perforation Ø	1.5 mm
Hole content	22 %
Max. perforation width	1,488 mm
Des. acc. to DIN 24041	Rd 1.50 - 2.83
Horizontal spacing	4.00 mm →
Vertical spacing	2.00 mm ↓
Diagonal spacing	2.83 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	07/12/2010 M 61840/5
NRC	0.70
α_w	0.70
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o



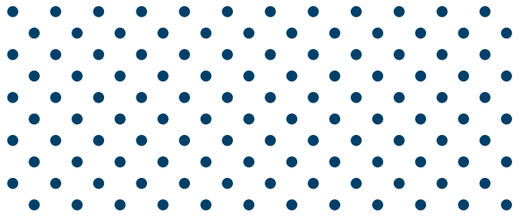
	Fural
	Rv 1.6 - 20 %
Perforation Ø	1.6 mm
Hole content	20 %
Max. perforation width	1,450 mm
Des. acc. to DIN 24041	Rv 1.60 - 3.50
Horizontal spacing	3.50 mm →
Vertical spacing	3.03 mm ↓
Offset spacing 60°	3.50 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	14/12/2006 P-BA 279/2006
NRC	0.74
α_w	0.80
Absorber class	B (DIN EN 11654)
Acoustic infill	w/o



	Fural
	Rd 1.6 - 22 %
Perforation Ø	1.6 mm
Hole content	22 %
Max. perforation width	636.4 mm
Des. acc. to DIN 24041	Rd 1.60 - 3.00
Horizontal spacing	4.30 mm →
Vertical spacing	2.15 mm ↓
Diagonal spacing	3.00 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	09/06/2017 M 105629/19
NRC	0.70
α_w	0.70
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o

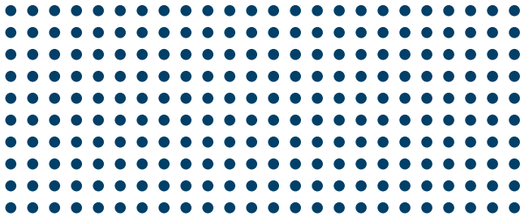


	Fural
	Rg 1.8 - 10 %
Perforation Ø	1.8 mm
Hole content	10 %
Max. perforation width	1,400 mm
Des. acc. to DIN 24041	Rg 1.80 - 4.95
Horizontal spacing	4.95 mm →
Vertical spacing	4.95 mm ↓
Diagonal spacing	7.00 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	07/12/2010 M 61840/4
NRC	0.80
α_w	0.75
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o

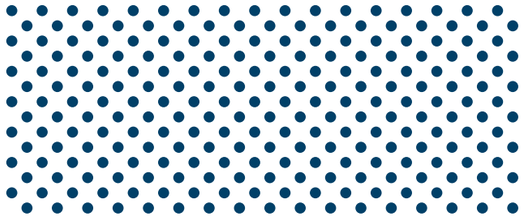


	Fural
	Rd 1.8 - 10 %
Perforation Ø	1.8 mm
Hole content	10 %
Max. perforation width	1.460 mm
Des. acc. to DIN 24041	Rd 1.80 - 4.95
Horizontal spacing	7.00 mm →
Vertical spacing	3.50 mm ↓
Diagonal spacing	4.95 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	07/12/2010 M 61840/4
NRC	0.80
α_w	0.75
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o

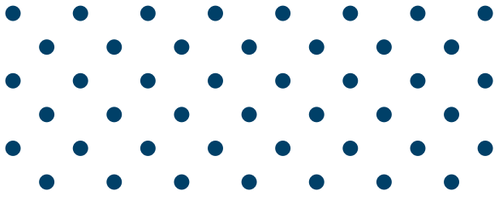
Tested perforations 3



	Fural
	Rg 1.8 - 20 %
Perforation Ø	1.8 mm
Hole content	20 %
Max. perforation width	1.460 mm
Des. acc. to DIN 24041	Rg 1.80 - 3.50
Horizontal spacing	3.50 mm →
Vertical spacing	3.50 mm ↓
Diagonal spacing	4.95 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	P-BA 220/2007 Figure 2
NRC	0.75
α_w	0.75
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o

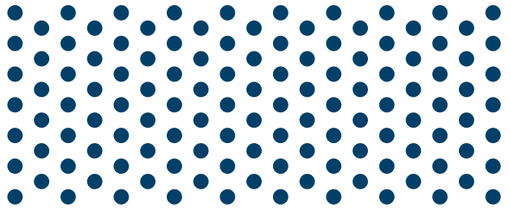


	Fural
	Rd 1.8 - 21 %
Perforation Ø	1.8 mm
Hole content	21 %
Max. perforation width	1,400 mm
Des. acc. to DIN 24041	Rd 1.80 - 3.50
Horizontal spacing	4.96 mm →
Vertical spacing	2.48 mm ↓
Diagonal spacing	3.50 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	31/08/2007 P-BA 220/2007 Figure 2
NRC	0.75
α_w	0.75
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o

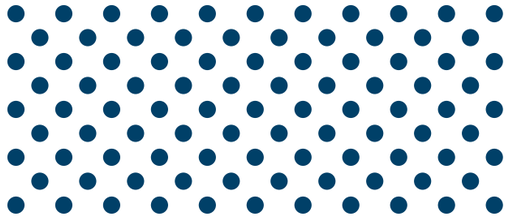


	Fural
	Rd 2.5 - 8 %
Perforation Ø	2.5 mm
Hole content	8 %
Max. perforation width	1,460 mm
Des. acc. to DIN 24041	Rd 2.50 - 7.80
Horizontal spacing	11.0 mm →
Vertical spacing	5.50 mm ↓
Diagonal spacing	7.78 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	14/12/2006 P-BA 279/2006 Figure 5
NRC	0.80
α_w	0.75
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o

	Fural
	Rg 2.5 - 16 %
Perforation Ø	2.5 mm
Hole content	16 %
Max. perforation width	1,460 mm
Des. acc. to DIN 24041	Rg 2.50 - 5.50
Horizontal spacing	5.50 mm →
Vertical spacing	5.50 mm ↓
Diagonal spacing	7.78 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	14/12/2006 P-BA 279/2006 Figure 1
NRC	0.80
α_w	0.80
Absorber class	B (DIN EN 11654)
Acoustic infill	w/o

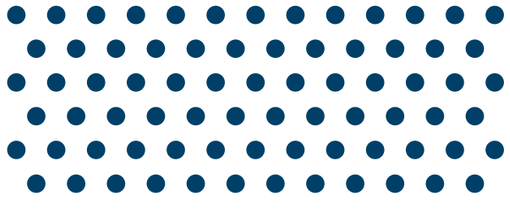


	Fural
	Rv 2.5 - 23 %
Perforation Ø	2.5 mm
Hole content	23 %
Max. perforation width	1,467 mm
Des. acc. to DIN 24041	Rv 2.50 - 5.00
Horizontal spacing	8.66 mm →
Vertical spacing	2.50 mm ↓
Offset spacing 60°	5.00 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	07/12/2010 M 61 840/7
NRC	0.75
α_w	0.75 (L)
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o



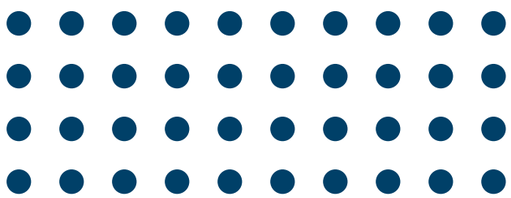
	Fural
	Rd 2.8 - 20 %
Perforation Ø	2.8 mm
Hole content	20 %
Max. perforation width	627.9 mm
Des. acc. to DIN 24041	Rd 2.80 - 5.50
Horizontal spacing	7.80 mm →
Vertical spacing	3.90 mm ↓
Diagonal spacing	5.50 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	09/06/2017 M 105629/20
NRC	0.75
α_w	0.75
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o

	Fural
	Rg 3.0 - 20 %
Perforation Ø	3.0 mm
Hole content	20 %
Max. perforation width	1,434 mm
Des. acc. to DIN 24041	Rg 3.00 - 6.00
Horizontal spacing	6.0 mm →
Vertical spacing	6.0 mm ↓
Diagonal spacing	8.48 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	P-BA 221/2007 Figure 2
NRC	0.80
α_w	0.75 (L)
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o

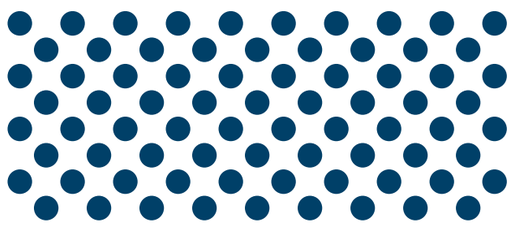


	Fural
	Rv 3.0 - 20 %
Perforation Ø	3.0 mm
Hole content	20 %
Max. perforation width	1,402 mm
Des. acc. to DIN 24041	Rv 3.00 – 6.35
Horizontal spacing	6.50 mm →
Vertical spacing	5.50 mm ↓
Offset spacing 60°	6.39 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	P-BA 221/2007 Figure 2
NRC	0.80
α_w	0.75 (L)
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o

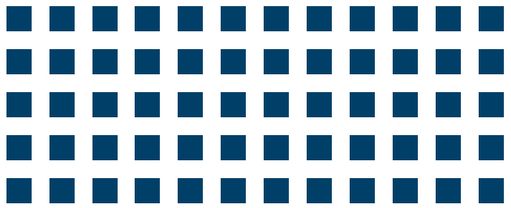
Tested perforations 4



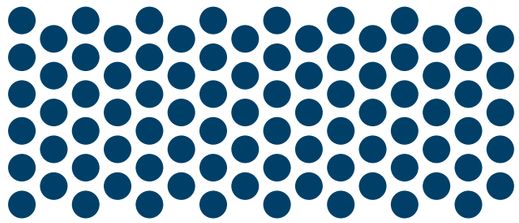
	Fural
	Rg 4.0 - 17 %
Perforation Ø	4.0 mm
Hole content	17 %
Max. perforation width	1,453 mm
Des. acc. to DIN 24041	Rg 4.00 - 8.60
Horizontal spacing	8.60 mm →
Vertical spacing	8.60 mm ↓
Diagonal spacing	12.1 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	P-BA 279/2006 Figure 7
NRC	0.80
α_w	0.80
Absorber class	B (DIN EN 11654)
Acoustic infill	w/o



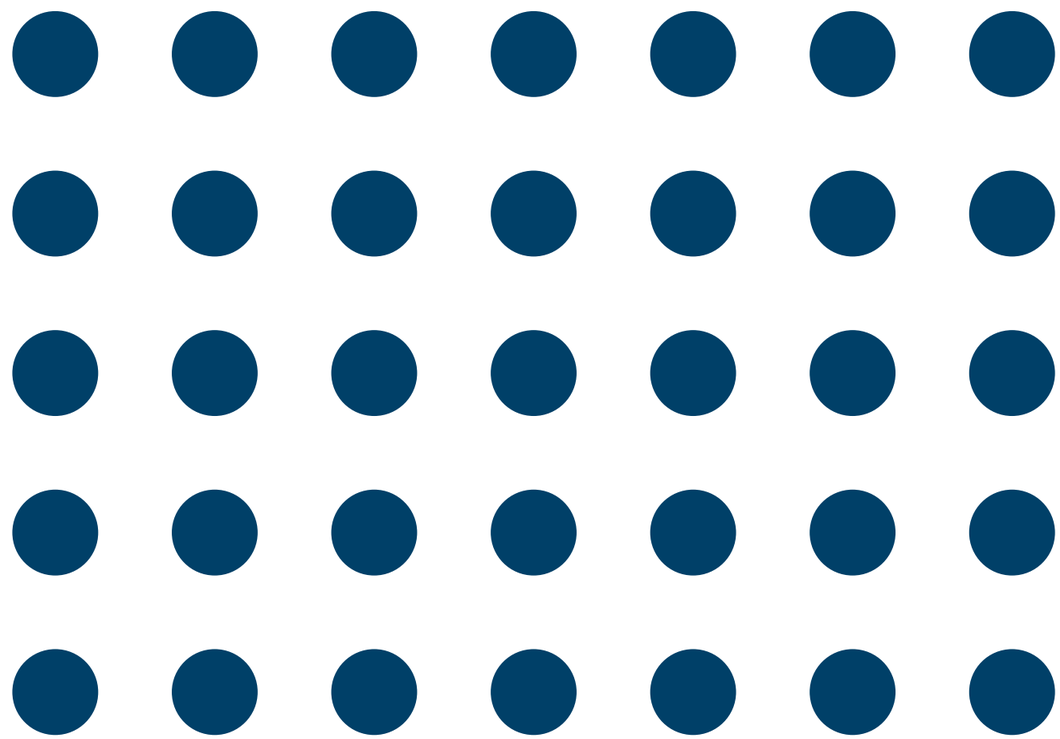
	Fural
	Rd 4.0 - 33 %
Perforation Ø	4.0 mm
Hole content	33 %
Max. perforation width	1,450 mm
Des. acc. to DIN 24041	Rd 4.00 - 6.10
Horizontal spacing	8.60 mm →
Vertical spacing	4.30 mm ↓
Diagonal spacing	6.10 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	P-BA 279/2006 Figure 3
NRC	0.80
α_w	0.80
Absorber class	B (DIN EN 11654)
Acoustic infill	w/o



	Fural
	Qg 4.0 - 33 %
Perforation	4.0 mm
Hole content	33 %
Max. perforation width	630 mm
Des. acc. to DIN 24041	Qg 4.00 - 7.00
Horizontal spacing	7.00 mm →
Vertical spacing	7.00 mm ↓
Diagonal spacing	9.89 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	P-BA 279/2006 Figure 4
NRC	0.80
α_w	0.80
Absorber class	B (DIN EN 11654)
Acoustic infill	w/o



	Fural
	Rv 4.5 - 51 %
Perforation Ø	4.5 mm
Hole content	51 %
Max. perforation width	627 mm
Des. acc. to DIN 24041	Rv 4.50 - 6.00
Horizontal spacing	10.4 mm →
Vertical spacing	3.00 mm ↓
Offset spacing 60°	6.00 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	09/06/2017 M 105629/21
NRC	0.65
α_w	0.65 (L)
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o



	Fural
	Rg 14.0 - 23 %
Perforation Ø	14.0 mm
Hole content	23 %
Max. perforation width	598 mm
Des. acc. to DIN 24041	Rg 14.00 - 26.00
Horizontal spacing	26.00 mm →
Vertical spacing	26.00 mm ↓
Diagonal spacing	36.76 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	P-BA 279/2006 Figure 8
NRC	0.75
α_w	0.75 (L)
Absorber class	C (DIN EN 11654)
Acoustic infill	w/o

Did you know that...
...a doubling of perceived loudness physically corresponds to a tenfold increase in sound intensity? This is because our hearing perceives loudness logarithmically rather than linearly.

Metal Acoustics | Floating ceiling

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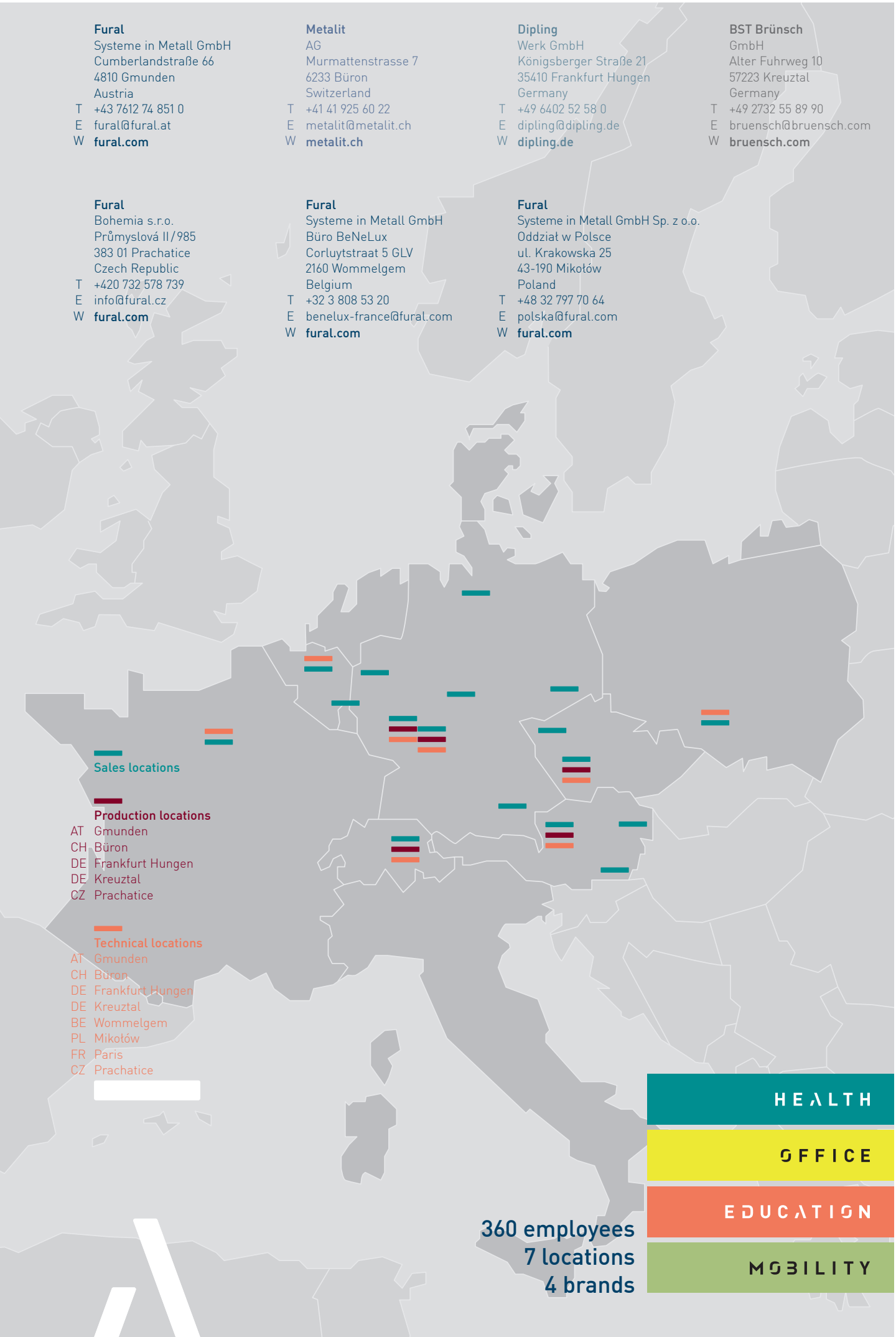

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