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UP

OFFICE 01

MAGAZINE

FURAL

METALIT

DIPLING



R2 Tower, Wallisellen (CH)

Sustainability is the new standard

» What is preventing building professionals from making sustainability the new standard?
It is remarkable how creatively they continue to look for reasons
why once again something is not possible... «

(Dr. Christine Lemaitre from Schulbau 02-2019)

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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 **served**.
- 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

We think in terms of
healthy working environment

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Impressive interiors with 8.000 m² of metal ceilings: Karlstraße Munich (DE)

Room air quality

30,000 square meters of floor space, designed by British architect David Chipperfield. The new company building is very understated on the outside - not a Silicon Valley building, but deliberately discreet architecture in which new talents can find their field of activity. Simple on the outside and powerful on the inside, in the style of the company and product brand.

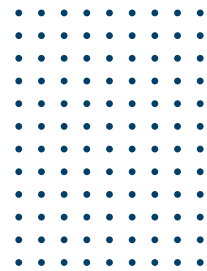
The interior of the building is diverse and technologically special, which is particularly evident in the three metal ceiling systems used: expanded metal, strip grid and floating ceiling.

Karl-Straße Munich (DE)

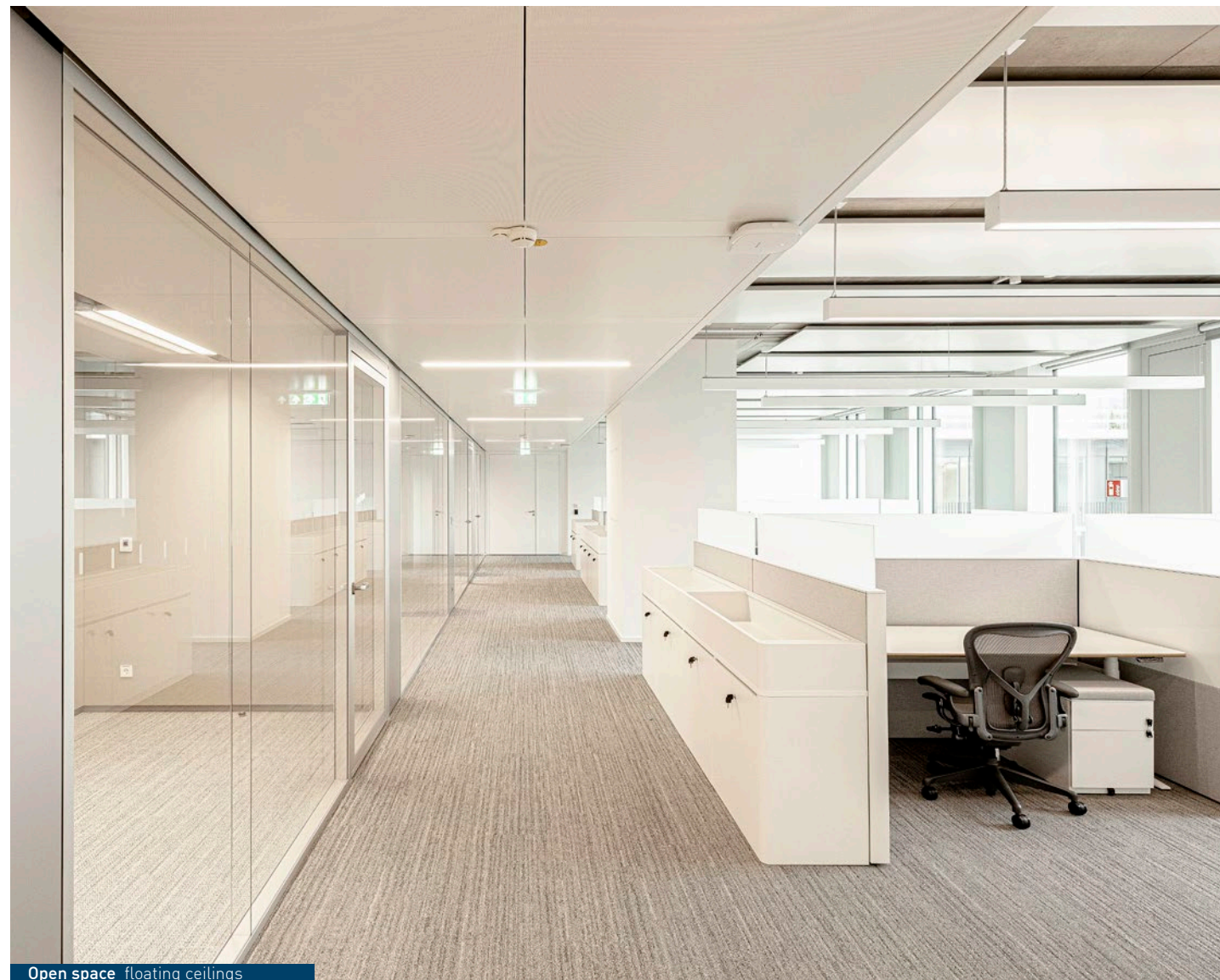
Architecture David Chipperfield Architects
Metal ceiling area 8.200 m²
Ceiling system expanded metal, floating ceiling, strip grid
Material galvanized sheet steel
Mesh 16×8×1,5×1 mm
Surface color RAL 9016 Parzifal®
Function acoustic, design, heating-cooling

Perforation

Perforation Ø 0,9 mm
Percentage of holes 7%
Perforation width max 1.022 mm
Ref. according to DIN 24041 Rg 0,90 - 3,00
Distance horizontal 3,00 mm →
Distance vertical 3,00 mm ↓
Distance diagonal 4,24 mm ↘
Perforation direction →



Corridors expanded metal



Open space floating ceilings



Lounge area acoustic ceiling



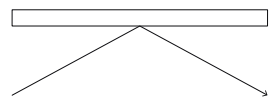
Parzifal® – super matt surfaces for metal ceilings

Parzifal® – the result of a long quest

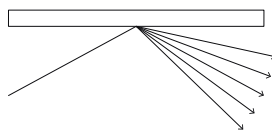
The quest for a naturally matt surface without sidelight effects for metal ceilings has previously not amounted to an auspicious one for many architects and planners. Now the search has come to an end: Fural Metalit Dipling designed a naturally matt surface with an elegant look that is not affected by changing lighting conditions, thus being the sole metal ceiling manufacturer to offer a coating of hydro stove enamel in addition to the classic powder coating.

Although the path to the goal was a long one – it was worth it! Because realising a matt surface coating for metal ceilings with the powder procedure is technically complex and does not look very natural.

With the new surface with hydro stove enamel finish, the light is not directly reflected but is diffusely refracted. The wide light scattering lends an elegant, harmonic and homogeneous appearance, especially in the case of large ceilings.



Light reflection on standard surfaces



Parzifal®-effect: diffuse light refraction without reflection

No or few reflections on the ceiling surface thanks to Parzifal® supermatt

Quality at the highest level

At the same time, the Parzifal® metal ceilings offer the high quality that Fural as one of the market leaders promises: Excellent fire behaviour (A1 classified, non-combustible according to EN 13501-1), optimal acoustics, high level of hygiene, and ease of maintain and clean. What's more, the coated tiles meet the limit values for the emission of volatile organic substances (VOCs) according to the AgBB (Committee for Health Evaluation of Building Products) evaluation scheme and are free of production dust and hazardous fibres.

Matt or textured

Architects and builder-owners are faced with a true agony of choice because Parzifal® is now available in two versions. Both have degrees of glossiness below 10 according to Gardner.

The »matt« variant is available in the special shade of »light white« and in numerous RAL colours. The smooth surface coating reveals the natural character of the basic material and is quite easy to clean.

The »texture« variant is visually impressive with a unique, finely textured surface and can be currently designed in the shade of »white natural matt«. No matter how your decision turns out, the room design is supplemented as you like.



For more information,
please go to brochure
»Parzifal® supermatt«.

Parzifal® – Lighting Tests

In a simulated, dramatic backlighting situation, samples of coated metal ceiling sheets were placed next to each other. The sheets are unperforated, lightly, moderately and heavily perforated as well as partially textured.

The samples coated with Parzifal® show significantly better scattering of the incident light and considerably fewer reflections.

The Parzifal® coating is based on a hydro stove enameling process. The colour pigments contained in the coating effectively scatter the incident light. The gloss level is less than 10 units according to Gardner.

Gloss level measurements according to DIN 67530

For paints, the gloss levels of the surfaces are measured at the following angles: 20 ° for predominantly high-gloss test specimens, 60 ° for predominantly medium-gloss test specimens and 85 ° for predominantly matt test specimens. Polished, black glass is defined with 100 GU (gloss units), a completely matt surface has the value 0 GU. The value of less than 10 GU achieved by Parzifal® surfaces is remarkable. Matt powder coatings, on the other hand, have a gloss level of 20 – 30 GU.

Indirect

Like landing spaceships, the lights are suspended below the metal ceiling tiles, projecting indirect light on surfaces powder-coated in matt white. It is exciting how different reflections blend into a new form. On the top, the reflection of the ring is visible, while broad and diffuse reflections are shown in the lower area. With the uniformity of the reflections and the lessening of brightness, the precision of our products and their installation becomes apparent.

Ideal working environment –
acoustics, design, room temperature control
Trusted Advisors, Zurich



Meeting room round cut metal ceiling

Trusted Advisors,
Zurich (CH)

Architecture	Auf der Mauer Gruppe AG, Zurich
Metal ceiling area	400 m²
Ceiling system	hang-in HT28-profile, floating ceiling
Material	galvanized sheet steel
Perforation	Rg 0,9 - 7%
Surface	color RAL 9016 matt
Function	acoustic and cooling

Perforation	Fural	
Perforation Ø	Rg 0,9 - 7%	
Percentage of holes	0,9 mm	
Perforation width max	7%	
Ref. according to DIN 24041	1.022 mm	
Distance horizontal	Rg 0,90 - 3,00	
Distance vertical	3,00 mm →	
Distance diagonal	3,00 mm ↓	
Perforation direction	4,24 mm ↘	
	→	



Precision soft reflections



Corridors round cut metal ceiling



UP

We think from the perspective
the employees.



PwC, Luxembourg (LU)

Optimizing the indoor climate by improving the acoustics

Metal ceilings from Fural Metalit Dipling provide an exceptional acoustic environment and are adaptable to different requirements in terms of reverberation time. Our ceilings are the ideal solution for areas where a high level of concentration is required, while at the same time ensuring a pleasant indoor climate, meeting the needs of users and reducing stress.

Our wide range of acoustic ceiling solutions are ideal for rooms that need to be free from disturbing noises, for rooms that are designed to create acoustic delights; or even rooms that need to be isolated from the outside world so that people can relax and recover. The aim of acoustics is the good health and well-being of the people who spend time in the building.

On the one hand, the problem of increasing noise pollution is due to the higher density and frequency of use. This applies equally to cities, transportation systems, buildings and used areas such as offices and other forms of workplaces.

Acoustic and noise protection measures are therefore highly relevant everywhere and are becoming a necessary standard in interior design.

Increased room activity requires actions

More room activity means more sound activity, which is why we are now seeing a much greater need for acoustic solutions that can meet the needs of users and create a comfortable indoor environment.

Metal ceiling systems from Fural Metalit Dipling offer unsurpassed acoustic performance and can be customized to meet specific requirements in terms of sound insulation results and acoustic quality.

By using the acoustic fleece from Fural Metalit Dipling, we achieve sound absorption class A and thus meet the requirements of EN ISO 11654.

Only with optimum room acoustics can employees in an office concentrate and focus on their work.

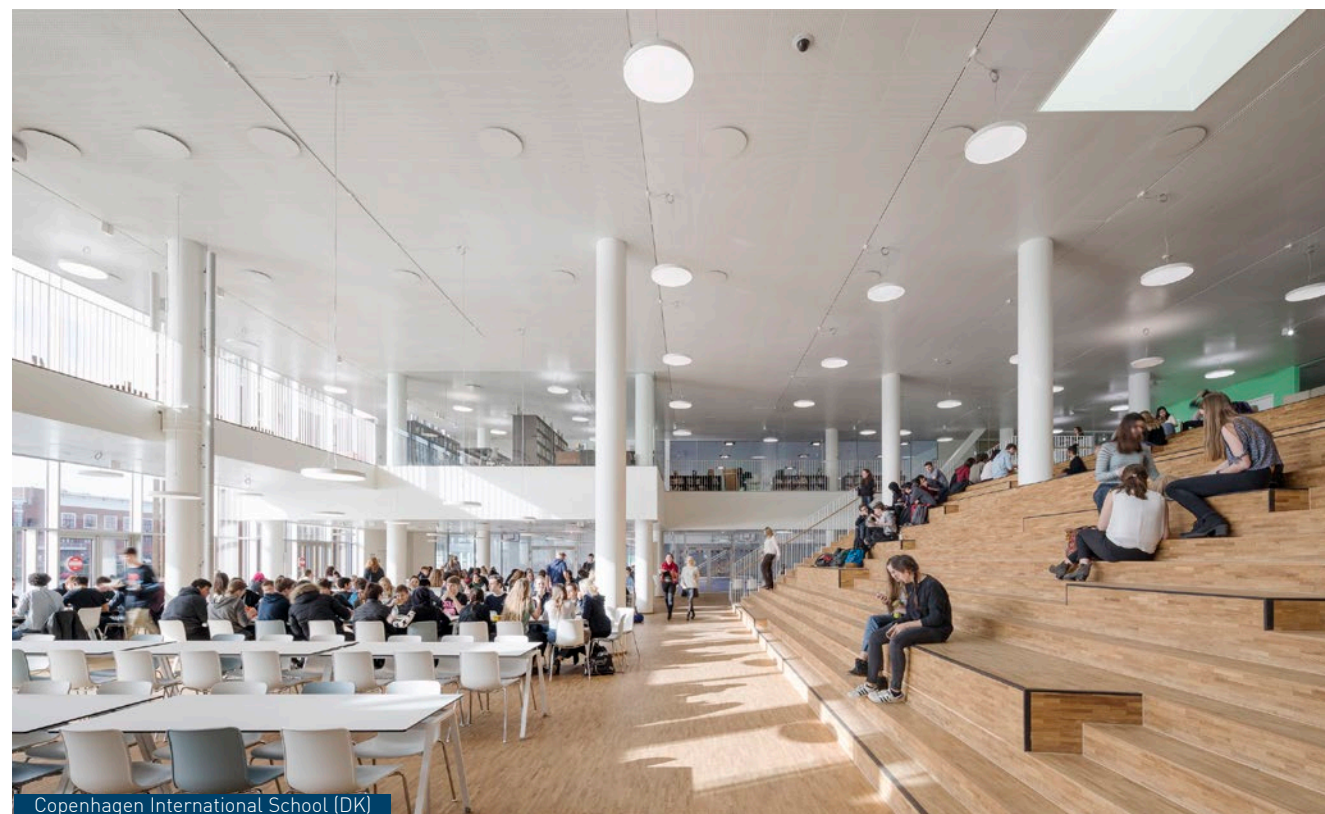


Built-in acoustics, allergy-friendly and long service life

Metal ceiling systems from Fural Metalit Dipling provide integrated acoustic improvements. Perforation and acoustic fleece achieve sound absorption in the relevant frequencies, creating a great indoor climate and making the use of the room a much better experience.

It is also possible to integrate additional functionalities such as lighting and air conditioning into the ceiling products.

Interiors with a high frequency of use in particular often have hard floors due to better cleanability and abrasion resistance, which is detrimental to good acoustics. Metal ceiling systems from Fural Metalit Dipling offer an excellent acoustic optimization option on the ceiling in such rooms of educational and office buildings such as canteens and restaurants.





Corda Campus, Hasselt (BE)

Secure great benefits with cooling and heating ceilings

Climate ceilings from Fural Metalit Dipling form the basis for a healthy, clean and comfortable indoor climate without draughts. Our solutions are suitable for private homes as well as offices, educational buildings, workplaces and other environments where good indoor air quality is the most important factor for well-being and health.

Perfect room temperature control with minimal sound reflection creates optimum feel-good conditions. Reducing air circulation minimizes the proliferation of bacteria and the risk of disease transmission.

The fixtures in climate-controlled ceilings are concealed above the ceiling elements, ensuring a quiet and minimalist ceiling design.

The advantages of cooling and heating ceilings:

- energy-saving operation
- reduction and optimization of operating costs
- pleasant indoor climate
- minimal maintenance effort
- no compromises in design compared to function
- healthy indoor climate



PostFinance, Bern (CH)

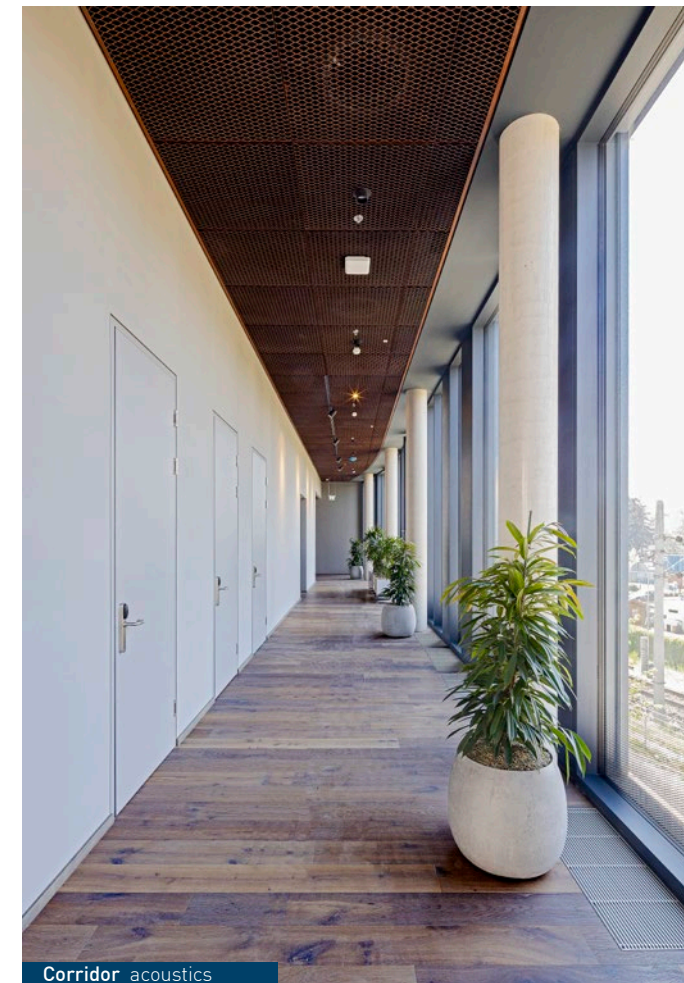
The future-oriented building: Merkur Campus, Graz

Stages

The architecture provides interior and exterior theatre-like stages, where people take the stage and meet. Open spaces, staircases and ramps, bars and restaurants become the podium of lifestyle. The architects of Zechner & Zechner have designed the connecting communal areas of the three high-rise towers of the new "Merkur Campus" in Graz with a varied sequence of spaces and an exciting mix of materials. Our expanded metal tiles painted in rust colour effect make for a lively iridescent and airy-looking ceiling.



Foyer round end to the facade



Corridor acoustics



Integration cut-outs



Function technology in front of and behind the expanded metal ceiling

Merkur Campus, Graz (AT)

Architecture	Zechner & Zechner ZT GmbH, Vienna
Metal ceiling area	1.500 m ²
Ceiling system	expanded metal H35-hang-in
Material	galvanized sheet steel
Mesh	75×31×7×2 mm
Surface	Parzifal® RAL 8016
Function	acoustics and design

The smartest building in the world: The Edge, Amsterdam (NL)

Exemplarity

The Edge, a globally recognized smart building that stands out for its performance, environmental friendliness and beauty. This building uses a system of technological innovations to maximize comfort and energy efficiency. It improves the health, comfort and productivity of Deloitte employees and other building occupants while reducing energy consumption and environmental impact. The Edge is a net-zero energy building, producing 102% of the energy it consumes.



Acoustics coffee bar



Acoustics lounge areas

The Edge,
Amsterdam (NL)

Architecture	Bank & Sämman Architekten
Metal ceiling area	28.000 m²
Ceiling system	strip grid with French Hook
Material	galvanized sheet steel
Perforation	Rg 2,5 - 16%
Surface	color RAL 9010
Function	acoustics and design

Perforation	Fural	● ● ● ● ●
	Rg 2,5 - 16%	
Perforation Ø	2,5 mm	● ● ● ● ●
Percentage of holes	16%	● ● ● ● ●
Perforation width max	1.460 mm	● ● ● ● ●
Ref. according to DIN 24041	Rg 2,50 - 5,50	● ● ● ● ●
Distance horizontal	5,50 mm →	● ● ● ● ●
Distance vertical	5,50 mm ↓	● ● ● ● ●
Distance diagonal	7,78 mm ↘	● ● ● ● ●
Perforation direction	→	



Acoustics lounge areas



The Edge, Amsterdam (NL)



ACOUSTICS

Acoustics as a decisive factor

One of the most important human senses is the sense of hearing. Especially in buildings such as schools, office complexes or hospitals, acoustics are a decisive factor in being able to work effectively and feel comfortable. Acoustic concepts are therefore essential and should already be included in the planning phase of a project.

Why metal acoustic ceilings?

Although metal ceilings are hard, they work perfectly as absorbers due to the materials and processing steps used.

The starting point is steel and aluminum sheets with a low material thickness. In combination with various perforations, the acoustic fleece and the ceiling void above, this results in very good sound absorption values.

All-in

Our systems combine excellent acoustic characteristics and a high-quality appearance with functionality and durability, ensuring a holistic sense of well-being.

Acoustic ceilings can also be equipped with additional functions such as heating, cooling, ventilation or suitable lighting. It is also possible to customize and expand the product characteristics. For example, solutions can be designed that also incorporate fire protection or hygiene aspects.

Variety

All metal ceiling systems from Fural Metalit Dipling can also be used as acoustic ceilings. A variety of perforations in combination with an acoustic fleece or an overlay, which can consist of mineral wool, mineral wool welded into PE foil, foam, sheep's wool or polyester wool, offer perfect acoustics for your project.

Handbook »Certified Acoustics«

page	
4–12	Introduction
14–42	Acoustic metal ceilings
	– Metal ceilings Best Practice
	– Effect of acoustic infills
	– Effect of the thickness
	– Effect of the acoustic fleece
	– Effect of heavy-duty infills
48–50	Acoustic expanded metal ceilings
54–58	Acoustic cooling and heating ceilings
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84–92	Tested perforation overview
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**For more information
see our Handbook**



**»Certified Acoustics« and our
homepage: [www.fural.com/de/metaldecken/
akustik/10](http://www.fural.com/de/metaldecken/akustik/10)**

We are acoustic ceilings. We are acoustic walls.

Acoustic comfort

Daily work in the office requires employees to work in isolation and concentrate as well as form groups and communicate. Work processes can be significantly impaired by acoustic disturbance factors both inside and outside the office (corridors, circulation areas, waiting areas, surroundings). Noise can trigger both physical and psychological impairments.

From the ceiling to the wall

Acoustic walls from Fural not only control the room acoustics, they also optimize the design of the entire room. Thanks to their specific structure, the wall elements act as broadband absorbers and are thus ideally suited for regulating reverberation time and speech intelligibility. The wall cladding is suitable for both targeted and subsequent optimization of the room acoustics.

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.

Med Campus Modul 2, Graz (AT)



Graphics

Our metal ceilings and walls can also be printed in color using the Colorprint process. There are virtually no limits to the imagination. Materials such as stone or wood can be simulated on the surface, and logos and lettering can be applied. The implementation of complex, large-format graphics is also possible. In the foyer of the Eckenberg secondary school, yellow on gray motifs delight students and teachers. The soft contrast of the implementation is reminiscent of high-quality tapestries.



Eckenberg Secondary School, Adelsheim (DE)

Architecture	Ecker Architekten, Buchen
Metal ceiling area	80 m²
Ceiling system	lay-in, swing, KQK Door, KQK
Material	galvanized sheet steel
Perforation	Rg 0,7 - 4%
Surface	RAL 9006, RAL 9016, RAL 5015, Colorprint
Function	acoustics and design



Office building with distinctiveness and character: Legero United Campus

Circulation

You might think that with metal ceiling systems you are bound to orthogonal floor plans and ceiling mirrors. However, Fural Metalit Dimpling proves the opposite and works with you to find the optimum solution for your project. To do this, we are happy to work with your plans and develop a tailor-made design for even the most eccentric idea.

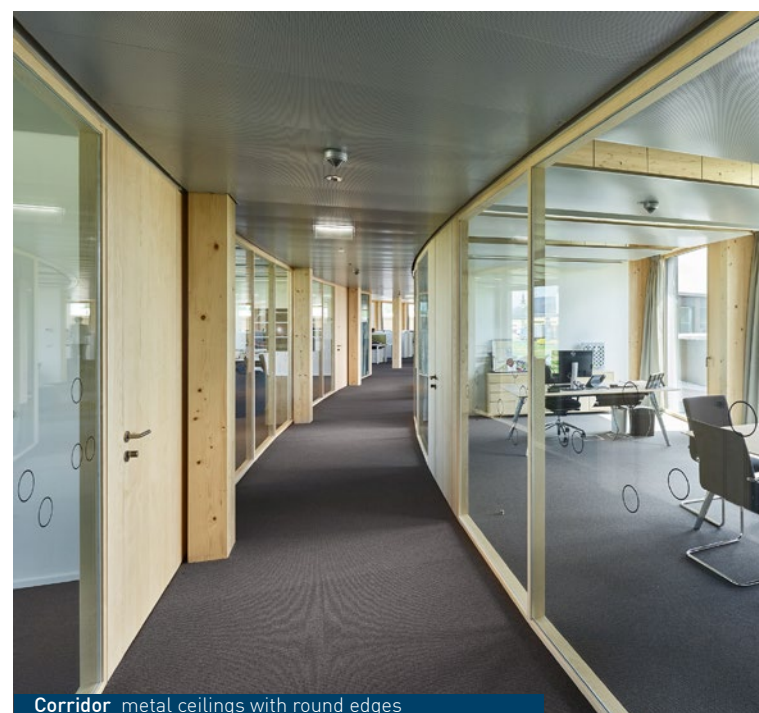


Night image floating ceiling look outwards

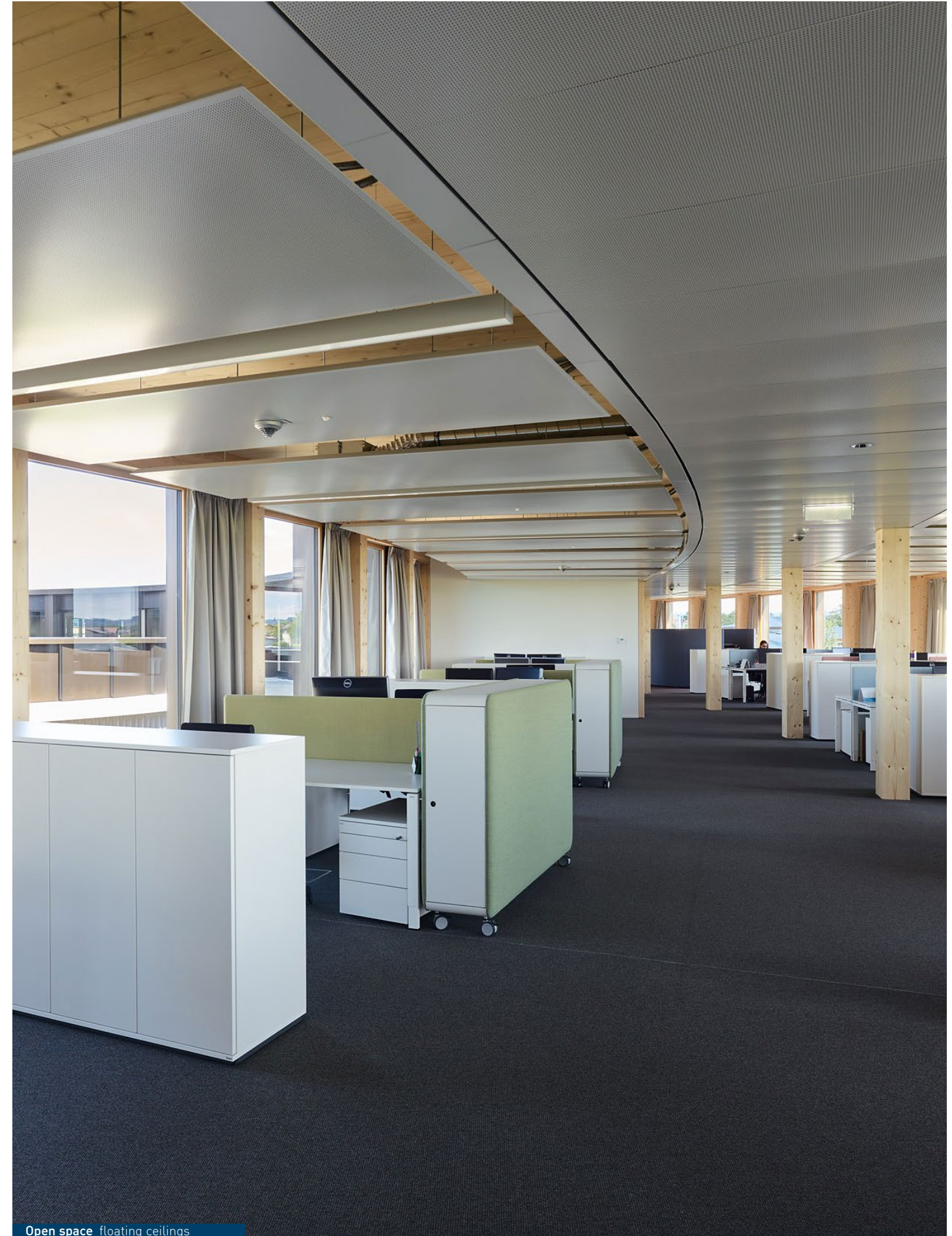
**Legero United Campus,
Feldkirchen near Graz (AT)**

Architecture	Dietrich Untertrifaller Architekten, Graz
Metal ceiling area	1.500 m²
Ceiling system	floating ceiling, hang-in Z profile
Material	galvanized sheet steel
Perforation	Rg 3,0 - 20 %
Surface	color RAL 9006
Function	acoustics and cooling

Perforation	Fural	● ● ● ●
Perforation Ø	Rg 3,0 - 20 %	● ● ● ●
Percentage of holes	3,0 mm	● ● ● ●
Perforation width max	20 %	● ● ● ●
Ref. according to DIN 24041	1.434 mm	● ● ● ●
Distance horizontal	Rg 3,00 - 6,00	● ● ● ●
Distance vertical	6,0 mm →	● ● ● ●
Distance diagonal	6,0 mm ↓	● ● ● ●
Perforation direction	8,48 mm ↘	● ● ● ●
	→	● ● ● ●



Corridor metal ceilings with round edges



Open space floating ceilings

Sentimentality

The company focuses on innovation, technology, design, sustainability and future orientation for its products. These aspects have also inspired the architects

An open floor plan encourages dialog, brainstorming and the development of ideas, while closed spaces promote concentration on work. The office spaces are modular so that they can be adapted to new requirements that arise in the future.

Scott Sports' values are also reflected in the materials used for the building, such as wood, concrete, glass and metal, with sentimental references to the company's pioneering products. The choice of aluminum for the façade is a tribute to the first product manufactured by the company: the aluminum ski pole. The space of the large atrium is entirely clad in vertical wooden slats, alluding to the close connection with skiing. In fact, the word »Ski«literally means »a long, thin piece of cut wood«in Norwegian.

The project with a gold award
at the Arc Award BIM:
Headquarter Scott Sports, Givisiez

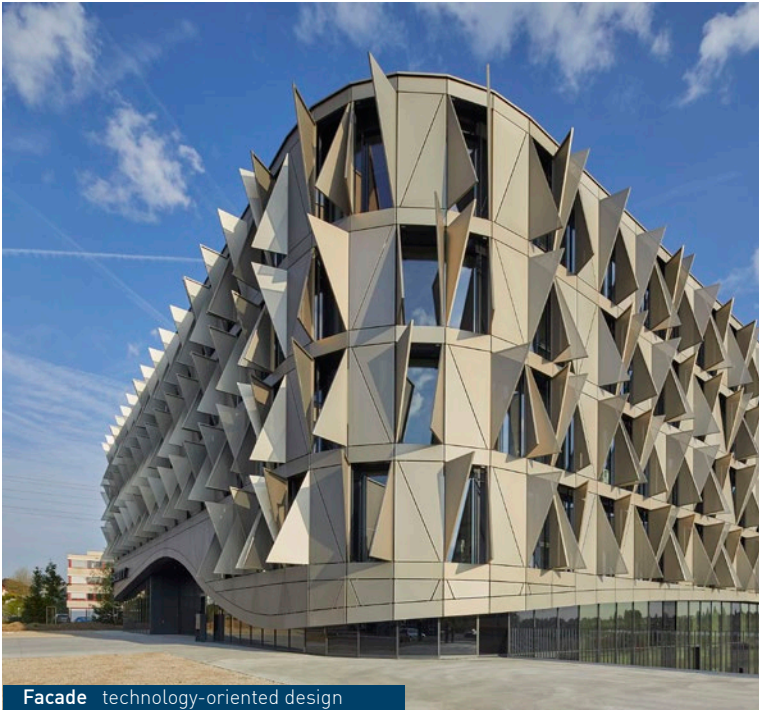
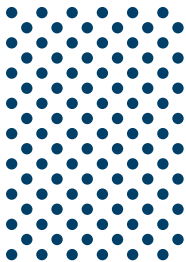


Corridor ceiling with installations

Headquarter Scott Sports,
Givisiez (CH)

Architecture Itten + Brechbühl AG, Bern
Metal ceiling area 2.000 m²
Ceiling system hang-in Z-profile,
suspension for floating ceilings
Material galvanized sheet steel
Perforation Rd 1,5 - 22% over edge
Surface color NCS S-2502-Y matt
Function acoustics, cooling and design

Perforation Fural
Rd 1,5 - 22%
Perforation Ø 1,5 mm
Percentage of holes 22%
Perforation width max 1.488 mm
Ref. according to DIN 24041 Rd 1,50 - 2,83
Distance horizontal 4,00 mm →
Distance vertical 2,00 mm ↓
Distance diagonal 2,83 mm ↘
Perforation direction →



Facade technology-oriented design



Meeting rooms acoustic and cooling ceilings

Hide or expose?

You can hide technology behind ceilings and pretend it is not there. Or you can expose it so that it proudly displays its potential. Ingenhoven architects clearly favor the second approach. They created two ducts that bundle ventilation, heating, cooling, sprinkler system, electricity and lighting. The spatial design of the common spaces are similar to the interior of a passenger plane.

Spectacular new building with
sophisticated climate concept:
European Investment Bank



Canteen curved cooling floating ceiling

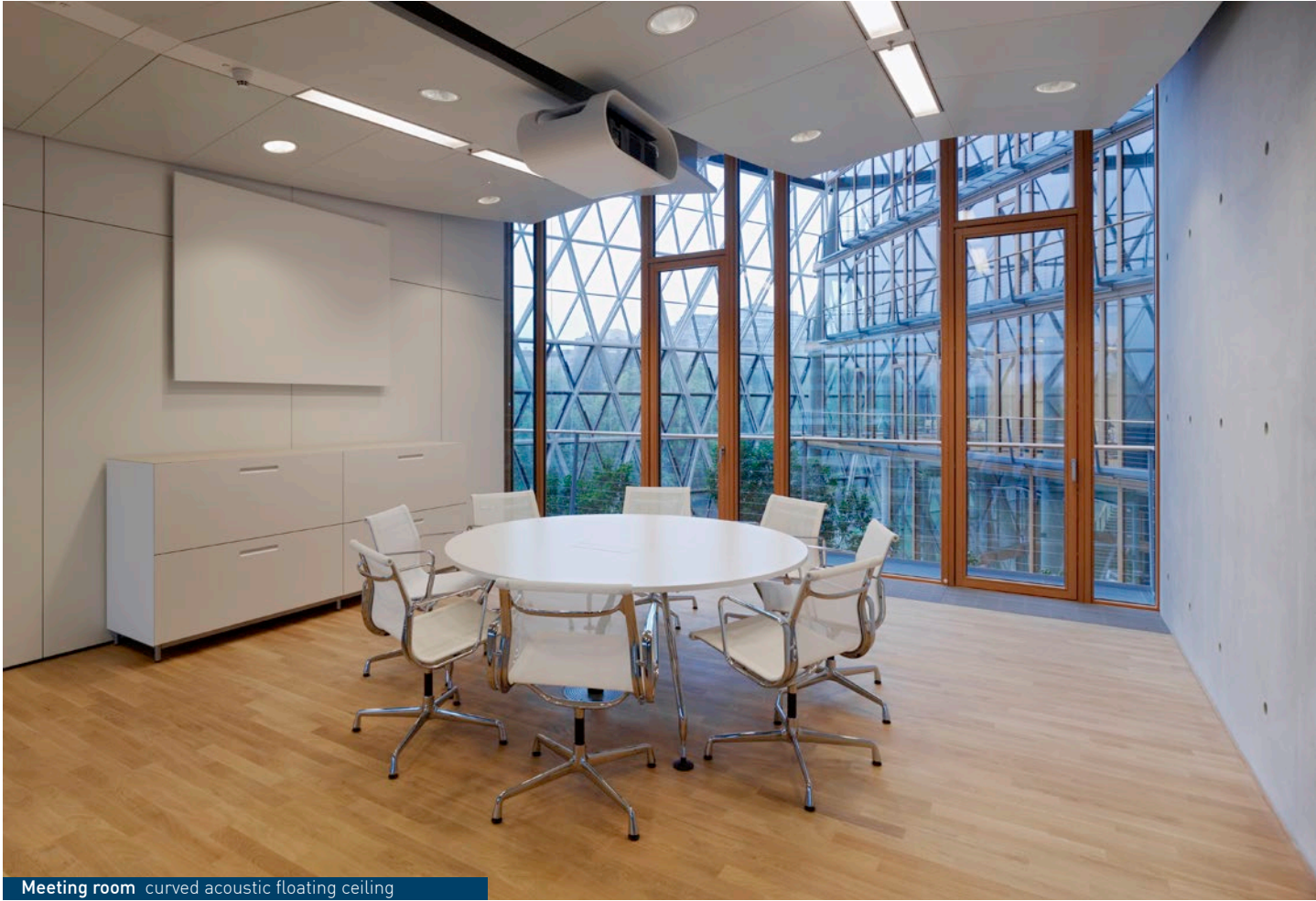
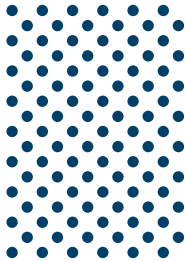


Atrium floating ceiling and overall appearance

European Investment Bank,
Luxemburg (LUX)

Architecture	ingenhoven architects GmbH, Düsseldorf
Metal ceiling area	12.000 m²
Ceiling system	floating ceiling
Material	galvanized sheet steel
Perforation	Rd 1,8 - 21 %
Surface	color RAL 9010
Function	acoustics and cooling ceiling

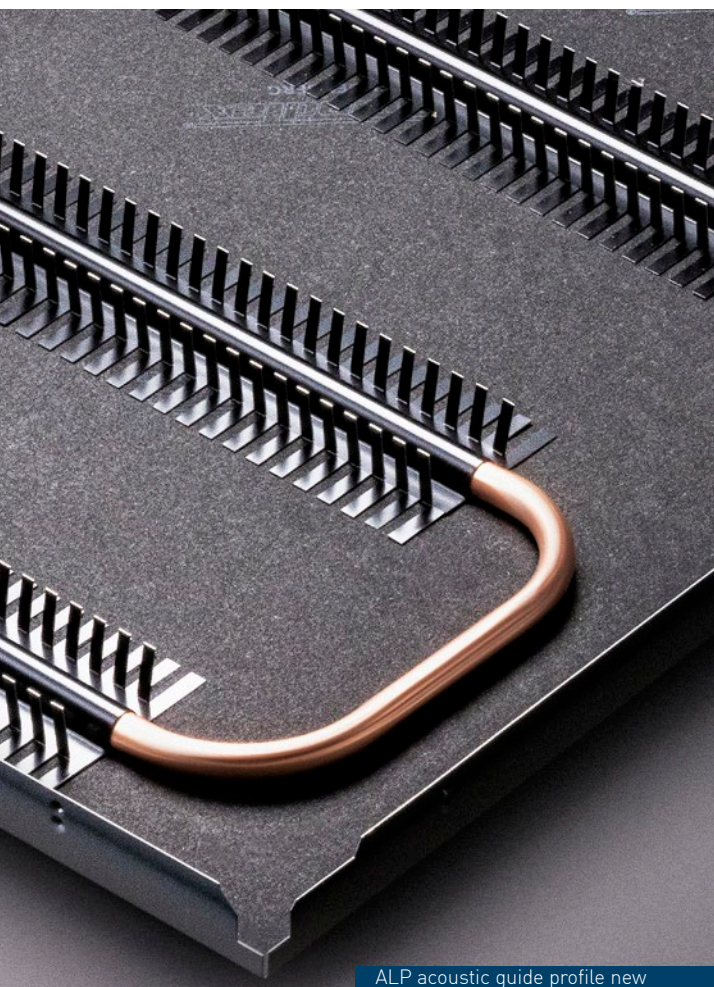
Perforation	Fural
Perforation Ø	Rd 1,8 - 21 %
Percentage of holes	1,8 mm
Perforation width max	21 %
Ref. according to DIN 24041	1.400 mm
Distance horizontal	Rd 1,80 - 3,50
Distance vertical	4,96 mm →
Distance diagonal	2,48 mm ↓
Perforation direction	3,50 mm ↘



Meeting room curved acoustic floating ceiling



Energy saving fair with innovation ALP, Wels



ALP acoustic guide profile new



heat guide plate old

ACOUSTIC GUIDE PROFILE

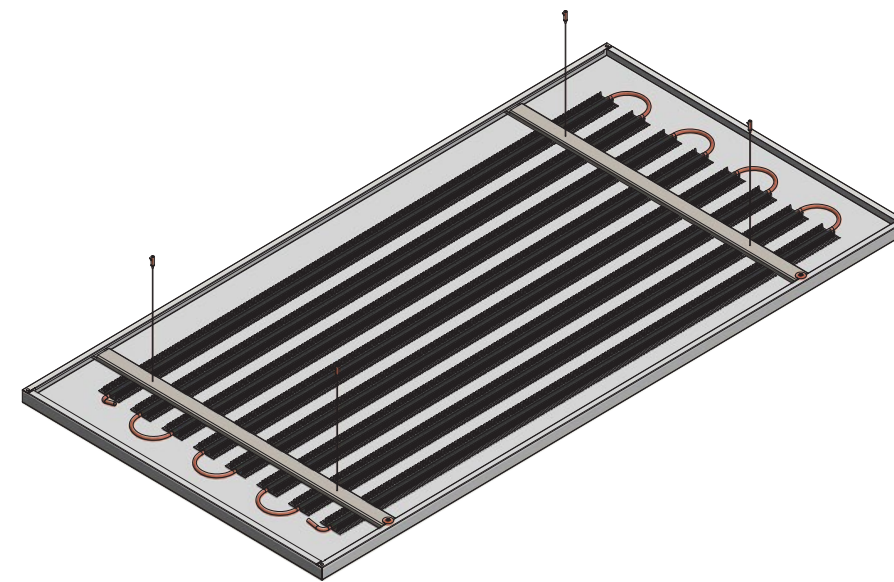
Heat guide plate (WLB) vs. Acoustic guide profile (ALP)

When using the ALP, much less acoustically effective area is covered than when using thermal baffles. The incident sound energy can be absorbed, but the thermal energy is still transferred to the water-bearing pipes. No material is wasted due to the partial bending up of the lamellas.

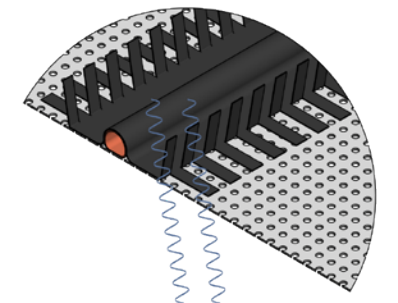
Advantages of ALP over WLB

- 20 % more acoustics, 20 % more cooling
- better sound absorption
- er heating and cooling performance with floating ceilings and closed ceilings

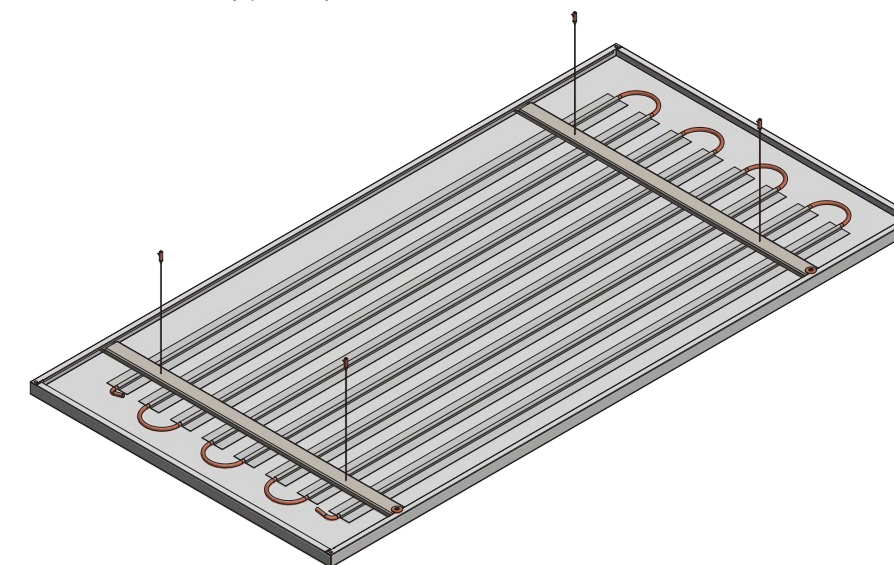
Download Handbook
»ALP – Acoustic guide profile«



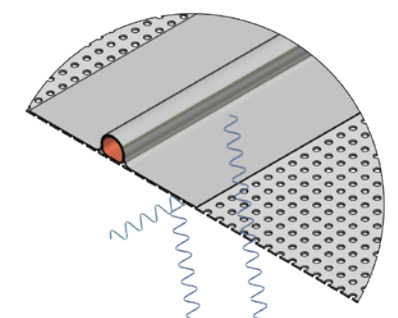
Innovative acoustic guide profile - ALP
Sound waves are only partially reflected



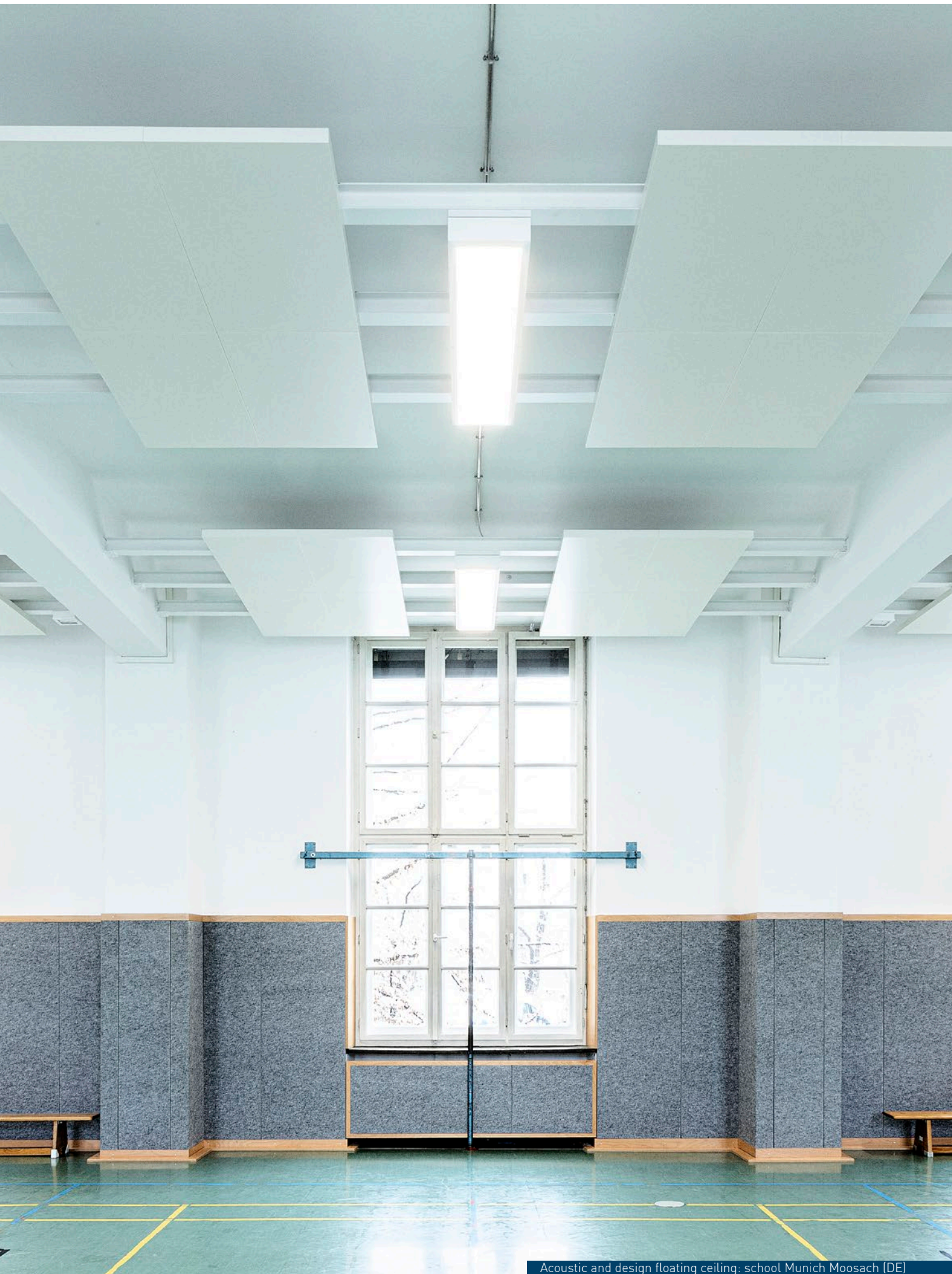
Note: Acoustic fleece not shown



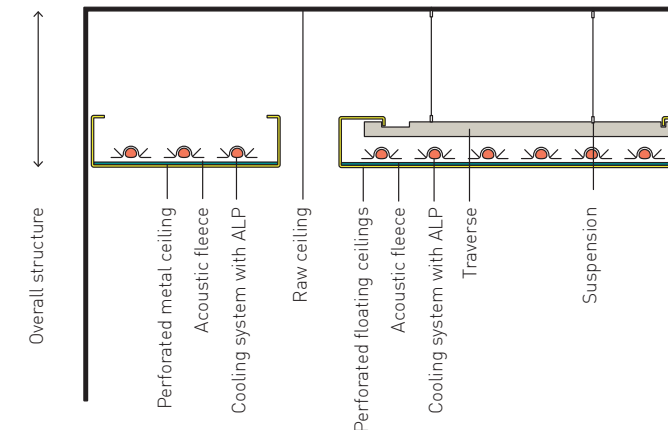
Conventional heat guiding plate
Sound waves are completely reflected by the heat guiding plate



Note: Acoustic fleece not shown



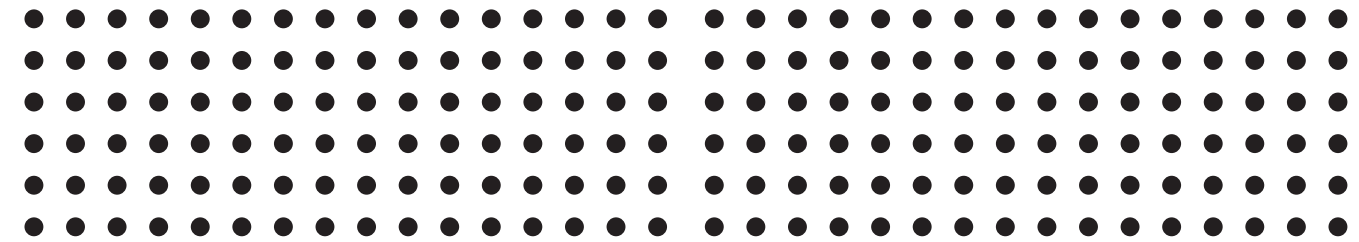
Acoustic and design floating ceiling: school Munich Moosach (DE)



Comparison of floating ceilings and closed ceiling – first sound transmission

Metal floating ceilings with ALP offer the ideal combination to achieve very good sound absorption values and cooling/heating performance. Even without additional overlays, both closed ceilings and floating ceilings perform very well (see left column).

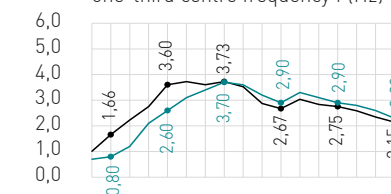
If overlays such as mineral wool strips are used, the physical properties of the floating ceilings (e.g. edge diffraction effect) have a stronger effect (right column).



	Fural Metalit Dipling
	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

Absorption area A_{obj}/m^2 at one-third centre frequency f (Hz)

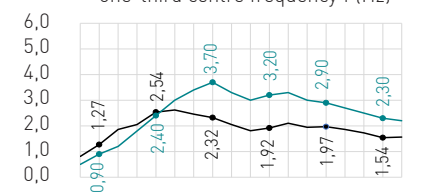


Overall Structure	200 mm
Fleece	bonded acoustic fleece
Type	closed ceiling*; floating ceiling
Test certificate	B105629_64; B105629_77
equiv. sound absorp.	(500 Hz) 3,73 m²; 3,70 m²
Visible surface area	4,05 m²
Acoustic infill	without
Acoustic occ. level	62% cooling register with ALP

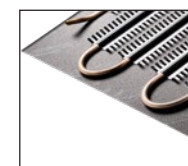
	Fural Metalit Dipling
	Rg 2,5 - 16 %
Perforation Ø	2,5 mm
Hole content	16 %
Max. perforation width	1.460 mm
Des. acc. to DIN 24041	Rg 2,50 - 5,50
Horizontal spacing	5,50 mm →
Vertical spacing	5,50 mm ↓
Diagonal spacing	7,78 mm ↘
Perforation direction	→

Sound absorption

Absorption area A_{obj}/m^2 at one-third centre frequency f (Hz)

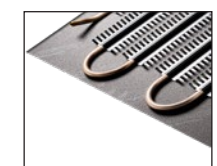


Overall Structure	200 mm
Fleece	bonded acoustic fleece
Type	closed ceiling*; floating ceiling
Test certificate	B105629_73; B105629_80
equiv. sound absorp.	(500 Hz) 2,32 m²; 3,70 m²
Visible surface area	2,70 m²
Acoustic infill	33 % with 50 x 50 mm mineralwool
	57 kg/m³ in PE-film between ALP
Acoustic occ. level	62% cooling register with ALP



* The sound absorption coefficient α_s of the closed ceiling was converted to the visible surface area (4,05 m²) of the floating ceiling A_{ob}

** The sound absorption coefficient α_s of the closed ceiling was converted to the visible surface area (2,70 m²) of the floating ceiling A_{ob}



Thermal and architectural renovation at the highest level: Post Finance, Bern

Coolness

Color psychology plays a major role in interior design. It is known, for example, that certain tones have a calming effect and slow down the pulse, but also promote concentration and strengthen the sense of responsibility. In the renovated Post Finance in Bern, a light azure blue supports the cooling function integrated into our floating ceiling.



Single office acoustic and cooling floating ceiling

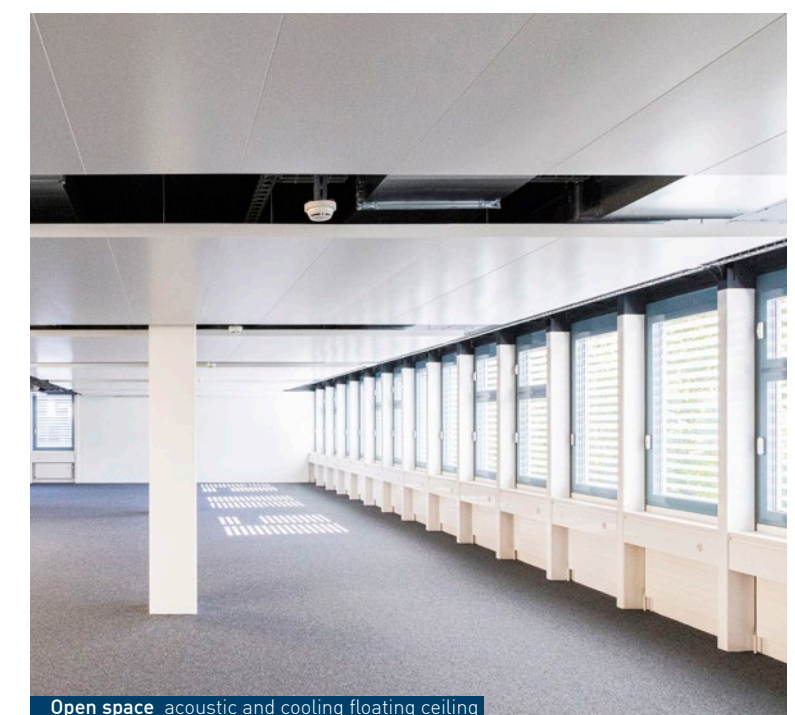
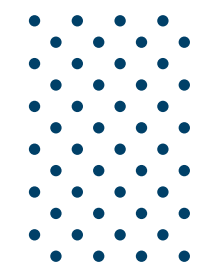


Pipeline systems acoustic and cooling floating ceilings

PostFinance, Bern (CH)

Architecture	PUR.BE Gesamtleistungen AG, Liebefeld
Metal ceiling area	1.600 m ²
Ceiling system	floating ceiling
Material	Galvanized sheet steel
Perforation	Rd 1,5 - 11%
Surface	color RAL 9016
Function	acoustic and cooling ceiling

Perforation	Fural
Perforation Ø	Rd 1,5 - 11%
Percentage of holes	1,5 mm
Perforation width max	11%
Ref. according to DIN 24041	1.470 mm
Distance horizontal	Rd 1,50 - 4,00
Distance vertical	5,66 mm →
Distance diagonal	2,83 mm ↓
Perforation direction	4,00 mm ↘



Open space acoustic and cooling floating ceiling



Salzkammergut Clinic, Vöcklabruck (AT)



HYGIENE

Fural – the hygienic metal ceiling

It is scientifically proven:
Fural metal ceilings are an ideal solution in the medical field:

- Dust-free and hygienic
- Optimal cleaning and disinfection
- Agreeable, quiet acoustics
- Easy to install and durable

In terms of hygiene, Fural metal ceilings are the perfect solution for use in hospitals. A recent scientific opinion by the German Advisory Centre for Hygiene (Deutsches Beratungszentrum für Hygiene, BZH) shows that metal ceilings for indoor areas have decisive advantages compared with conventional ceiling elements such as plaster boards: Metal ceilings prevent dust formation, are perfect for cleaning and disinfecting and feature agreeable acoustics to boot. These outstanding properties make Fural metal ceilings suitable for the operation theatre and clean rooms as well.

The plain facts for metal ceiling in medical establishments – the expert opinion of the Advisory Centre for Hygiene.

Following extensive in-depth analyses, the German Advisory Centre for Hygiene in Freiburg i. Br. has found in its expert opinion that the examined Fural metal ceiling elements meet the highest requirements of hospitals with all key parameters.

Thanks to their high-quality coatings, the clean, smooth surfaces ensure top-notch hygienic efficiency in the area of wiping disinfection – from disinfectants all the way to peroxide compounds with sporicidal effect. By using metal tiles, dust and particles are prevented from drifting downwards. In the area of efficient noise absorption, the metal ceiling elements with integrated acoustic fleece also prove their suitability for the medical field.

Fural Metalit Dipling – more than perfect metal ceilings: Your partner for your personal solution.

Fural metal ceilings have been providing valuable services in the medical area for many years now. Numerous hospitals throughout Europe rely on the combination of high-quality appearance and excellent hygienic and acoustic properties. In addition, the metal ceilings guarantee maximum functionality and durability.

Architects and processors appreciate Fural's installation-friendly and sophisticated metal ceiling systems as well as the high level of flexibility and the personal care on the part of Fural for each individual project. Reliably predictable delivery times and modular pre-manufacture allow for short construction times. At Fural, the wishes and requirements of the customers are in the focus of our work. The company develops individual customer solutions instead of pre-fabricated standard systems. Adherence to deadlines and service oriented project are a matter of course.

With the experience of more than 70 years and a capacity of over 1 million m2 per year, Fural stands for leading edge know-how, best product quality in high precision and project reliability.



Download report » Hygienic Suitability of metal ceilings «.



Further information can be found in our »Hygiene« brochure.

METAL CEILINGS WITH HYGIENE

Cleanliness is also a top priority in office buildings. To guarantee this, the metal ceiling systems from Fural Metalit Dipling provide the necessary conditions. Thanks to their high-quality coating, they have a perfectly smooth surface and can be cleaned effortlessly with standard cleaning agents or even dry. The antibacterial coating offers even more safety in terms of hygiene.



Dust-free

Dust is a so-called »dry« carrier of infections, in which viruses and bacteria spread. Dust can also be deposited in mucous membranes and the respiratory tract. This is why it is vital to avoid dust.



Fibre-free

Fibres are also "dry" carriers of infection. Since fibres can enter the body through the respiratory tract and skin, it is essential to avoid fibres – and not only those of a risky type.



Mould-free

Mould fungi evolve in a humid and warm environment. They secrete substances that can be harmful to humans, either indirectly through the air or by direct contact. Mould must be avoided.



Disinfection

In sensitive environments such as hospitals, doctor's offices, schools and public institutions, hazardous environments can be created through use and operation. It must be possible to disinfect surfaces in such buildings.



No moisture absorption

Components that can absorb moisture often turn into a breeding ground for microorganisms when heated. Subsequently, the surfaces are hard to disinfect and dry. Metal ceilings by contrast are especially easy to clean and do not absorb moisture.



Hygienic heating and cooling

Thanks to the high level of thermal conductivity of metal, our ceilings are excellently suited for heating and cooling. Since our systems work via radiation instead of air transport, they are also especially hygienic.



Serviceability

Our ceilings can be quickly and easily opened nearly everywhere. This guarantees easy and thorough servicing not only of the ceiling itself but of the ceiling cavity and the built-in components in it as well.



Wet cleaning

With water as a solvent and surfactants, dirt can be removed far easier than by dry cleaning. Important here is that the surfaces can be rinsed with clean water – metal ceiling systems allow for this, too.



Interior air quality

Our metal ceiling systems do not release any relevant quantities of VOCs, even taking into account the paints and adhesives (LCI values, evaluation according to AgBB evaluation scheme). Independent testing institutes have certified this.



UP

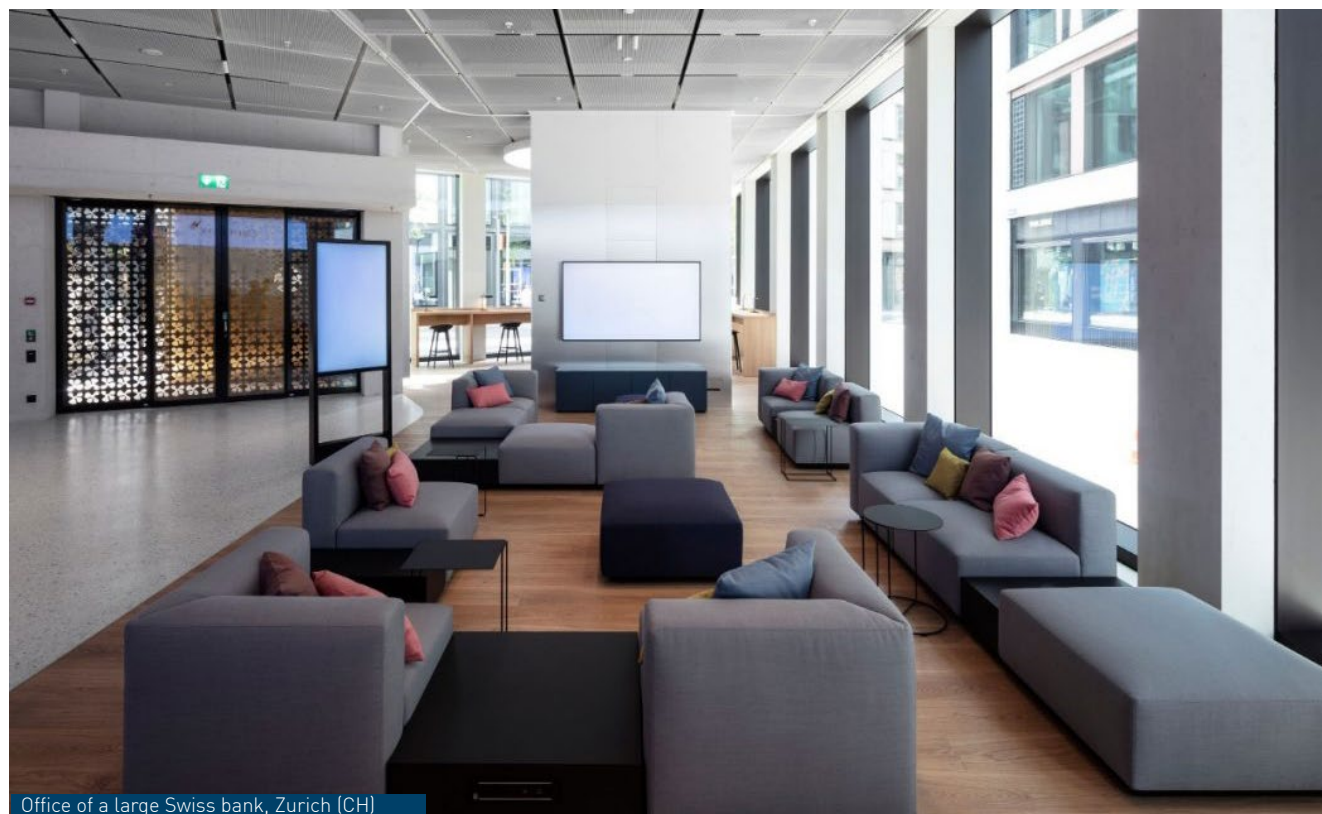
We thinkin terms of
comfortable common rooms.



Stay in a feel-good atmosphere

In addition to excellent, all-inclusive care, the environment and atmosphere in hospitals is an important factor in feeling comfortable.

The metal ceilings from Fural Metalit Dipling create an area with one hundred percent feel-good character in the lounge, eating and drinking areas. Whether for eating, drinking, chatting or relaxing and switching off - for patients and all employees.

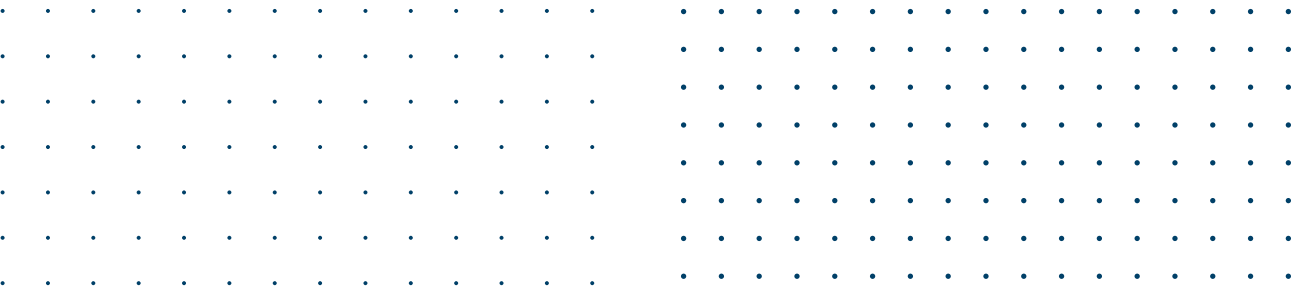


Office of a large Swiss bank, Zurich (CH)

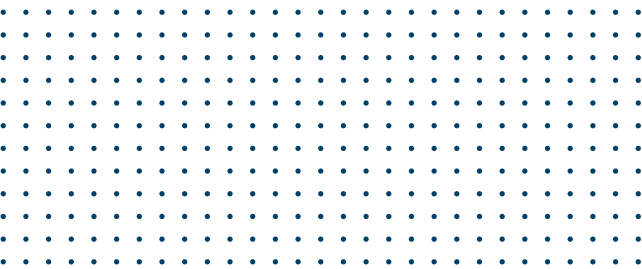


PwC, Luxembourg (LU)

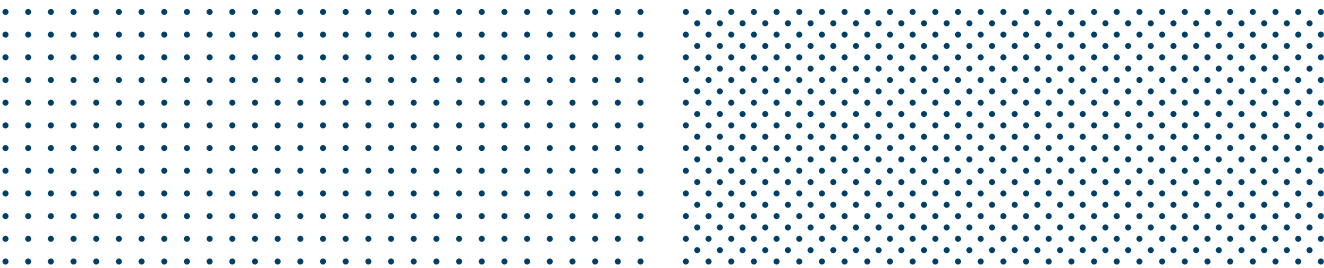
Tested perforations 1



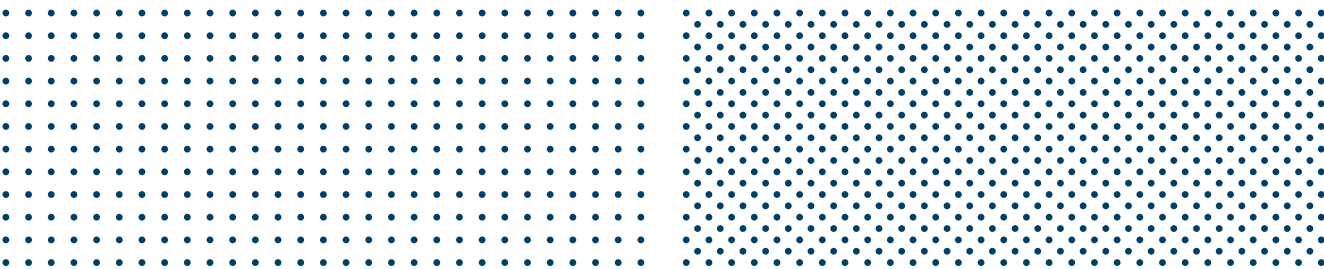
	Fural		Fural
	Rg 0.7 -1 %		Rg 0.7 -1.5 %
Perforation Ø	0.7 mm	Perforation Ø	0.7 mm
Hole content	1 %	Hole content	1.5 %
Max. perforation width	1,197 mm	Max. perforation width	1,400 mm
Des. acc. to DIN 24041	Rg 0.70 - 6.00	Des. acc. to DIN 24041	Rg 0.70 - 5.00
Horizontal spacing	6.00 mm →	Horizontal spacing	5.00 mm →
Vertical spacing	6.00 mm ↓	Vertical spacing	5.00 mm ↓
Diagonal spacing	8.48 mm ↘	Diagonal spacing	7.07 mm ↘
Perforation direction	→	Perforation direction	→
Overall structure	200 mm	Overall structure	200 mm
Fleece	Bonded acoustic fleece	Fleece	Bonded acoustic fleece
Test certificate	31/08/2007 P-BA 231/2007	Test certificate	04/12/2019 M105629
NRC	0.65	NRC	0.60
α _w	0.50 (LM)	α _w	0.50 (L)
Absorber class	D (DIN EN 11654)	Absorber class	D (DIN EN 11654)
Acoustic infill	w/o	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

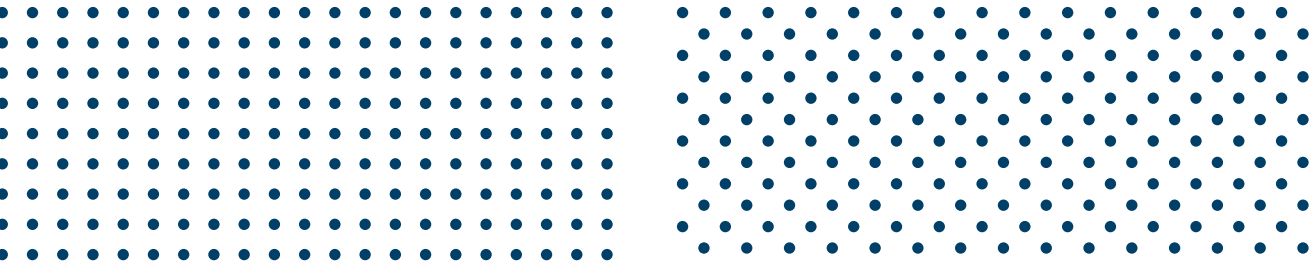


	Fural		Fural
	Rg 0.8 - 6 %		Rd 0.8 - 11 %
Perforation Ø	0.8 mm	Perforation Ø	0.8 mm
Hole content	6 %	Hole content	11 %
Max. perforation width	1,400 mm	Max. perforation width	1,400 mm
Des. acc. to DIN 24041	Rg 0.80 - 3.00	Des. acc. to DIN 24041	Rd 0.80 - 2.12
Horizontal spacing	3.00 mm →	Horizontal spacing	3.00 mm →
Vertical spacing	3.00 mm ↓	Vertical spacing	1.50 mm ↓
Diagonal spacing	4.24 mm ↘	Diagonal spacing	2.12 mm ↘
Perforation direction	→	Perforation direction	→
Overall structure	200 mm	Overall structure	200 mm
Fleece	Bonded acoustic fleece	Fleece	Bonded acoustic fleece
Test certificate	09/06/2017 M105629/17	Test certificate	09/06/2017 M105629/18
NRC	0.75	NRC	0.75
α _w	0.75	α _w	0.70
Absorber class	C (DIN EN 11654)	Absorber class	C (DIN EN 11654)
Acoustic infill	w/o	Acoustic infill	w/o

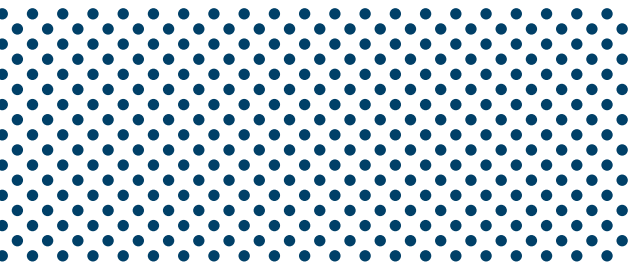


	Fural		Fural
	Rg 0.9 - 7 %		Rd 0.9 - 14 %
Perforation Ø	0.9 mm	Perforation Ø	0.9 mm
Hole content	7 %	Hole content	14 %
Max. perforation width	1,022 mm	Max. perforation width	1,022 mm
Des. acc. to DIN 24041	Rg 0.90 - 3.00	Des. acc. to DIN 24041	Rd 0.90 - 2.12
Horizontal spacing	3.00 mm →	Horizontal spacing	3.00 mm →
Vertical spacing	3.00 mm ↓	Vertical spacing	1.50 mm ↓
Diagonal spacing	4.24 mm ↘	Diagonal spacing	2.12 mm ↘
Perforation direction	→	Perforation direction	→
Overall structure	200 mm	Overall structure	400 mm
Fleece	Bonded acoustic fleece	Fleece	Bonded acoustic fleece
Test certificate	30/09/2019 M105629/44	Test certificate	17/11/2012 7178-12-2
NRC	0.75	NRC	0.55
α _w	0.70	α _w	0.55 (LH)
Absorber class	C (DIN EN 11654)	Absorber class	D (DIN EN 11654)
Acoustic infill	w/o	Acoustic infill	w/o

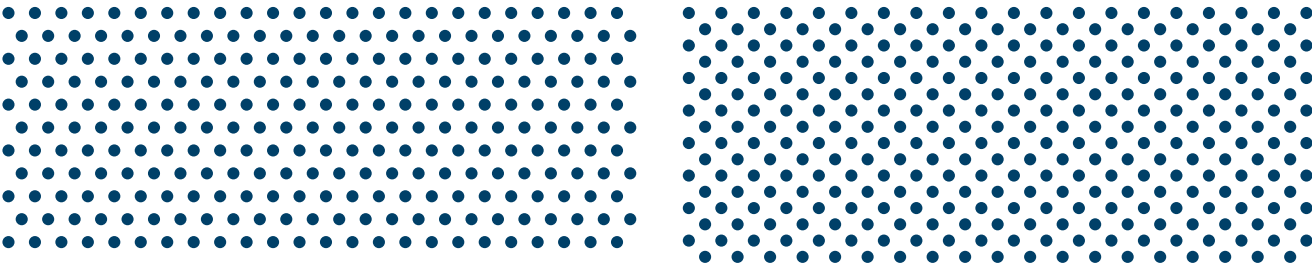
Tested perforations 2



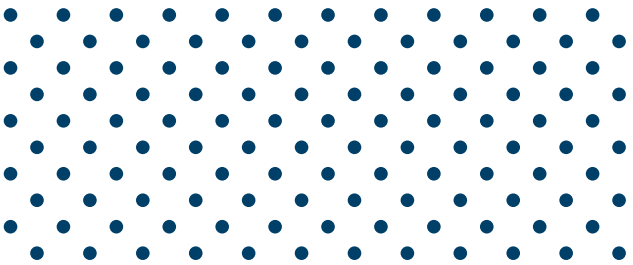
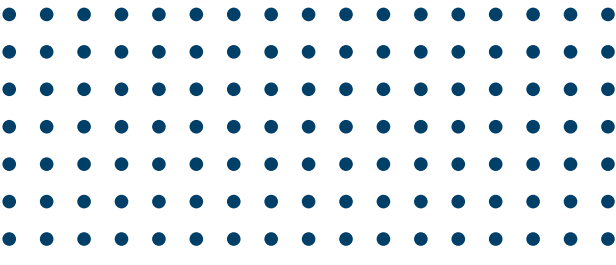
	Fural		Fural
	Rg 1.5 - 11%		Rd 1.5 - 11%
Perforation Ø	1.5 mm	Perforation Ø	1.5 mm
Hole content	11%	Hole content	11%
Max. perforation width	1,488 mm	Max. perforation width	1,470 mm
Des. acc. to DIN 24041	Rg 1.50 - 4.00	Des. acc. to DIN 24041	Rd 1.50 - 4.00
Horizontal spacing	4.00 mm →	Horizontal spacing	5.66 mm →
Vertical spacing	4.00 mm ↓	Vertical spacing	2.83 mm ↓
Diagonal spacing	5.65 mm ↘	Diagonal spacing	4.00 mm ↘
Perforation direction	→	Perforation direction	→
Overall structure	200 mm	Overall structure	200 mm
Fleece	Bonded acoustic fleece	Fleece	Bonded acoustic fleece
Test certificate	07/12/2010 M 61840/6	Test certificate	07/12/2010 M 61840/6
NRC	0.80	NRC	0.80
α _w	0.75	α _w	0.75
Absorber class	C (DIN EN 11654)	Absorber class	C (DIN EN 11654)
Acoustic infill	w/o	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

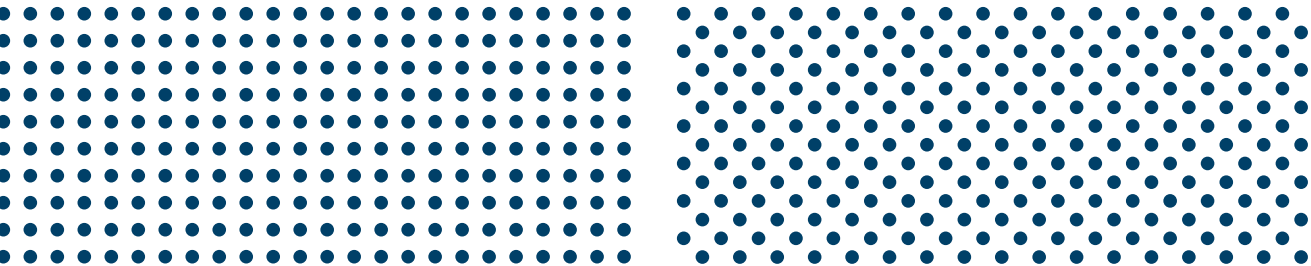


	Fural		Fural
	Rv 1.6 - 20 %		Rd 1.6 - 22 %
Perforation Ø	1.6 mm	Perforation Ø	1.6 mm
Hole content	20 %	Hole content	22 %
Max. perforation width	1,450 mm	Max. perforation width	636.4 mm
Des. acc. to DIN 24041	Rv 1.60 - 3.50	Des. acc. to DIN 24041	Rd 1.60 - 3.00
Horizontal spacing	3.50 mm →	Horizontal spacing	4.30 mm →
Vertical spacing	3.03 mm ↓	Vertical spacing	2.15 mm ↓
Offset spacing 60°	3.50 mm ↘	Diagonal spacing	3.00 mm ↘
Perforation direction	→	Perforation direction	→
Overall structure	200 mm	Overall structure	200 mm
Fleece	Bonded acoustic fleece	Fleece	Bonded acoustic fleece
Test certificate	14/12/2006 P-BA 279/2006	Test certificate	09/06/2017 M 105629/19
NRC	0.74	NRC	0.70
α _w	0.80	α _w	0.70
Absorber class	B (DIN EN 11654)	Absorber class	C (DIN EN 11654)
Acoustic infill	w/o	Acoustic infill	w/o

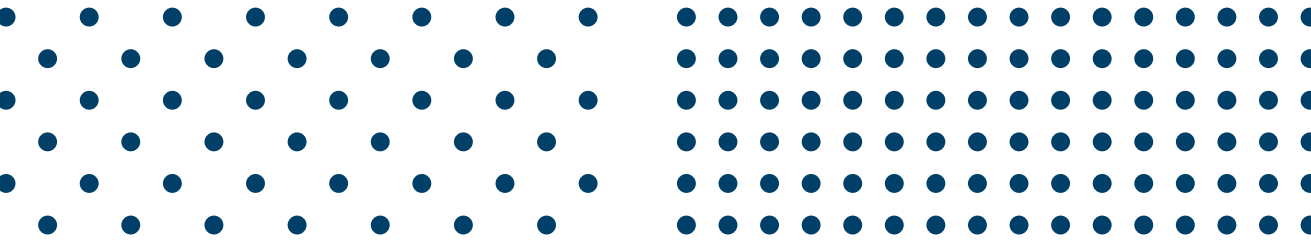


	Fural		Fural
	Rg 1.8 - 10 %		Rd 1.8 - 10 %
Perforation Ø	1.8 mm	Perforation Ø	1.8 mm
Hole content	10 %	Hole content	10 %
Max. perforation width	1,400 mm	Max. perforation width	1,460 mm
Des. acc. to DIN 24041	Rg 1.80 - 4.95	Des. acc. to DIN 24041	Rd 1.80 - 4.95
Horizontal spacing	4.95 mm →	Horizontal spacing	7.00 mm →
Vertical spacing	4.95 mm ↓	Vertical spacing	3.50 mm ↓
Diagonal spacing	7.00 mm ↘	Diagonal spacing	4.95 mm ↘
Perforation direction	→	Perforation direction	→
Overall structure	200 mm	Overall structure	200 mm
Fleece	Bonded acoustic fleece	Fleece	Bonded acoustic fleece
Test certificate	07/12/2010 M 61840/4	Test certificate	07/12/2010 M 61840/4
NRC	0.80	NRC	0.80
α _w	0.75	α _w	0.75
Absorber class	C (DIN EN 11654)	Absorber class	C (DIN EN 11654)
Acoustic infill	w/o	Acoustic infill	w/o

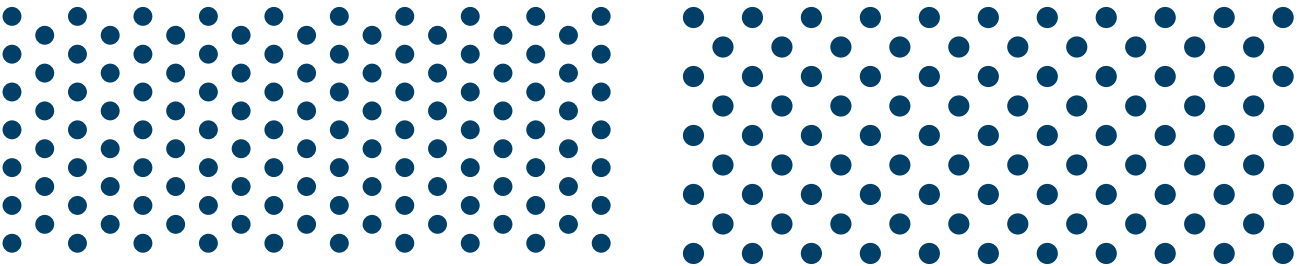
Tested perforations 3



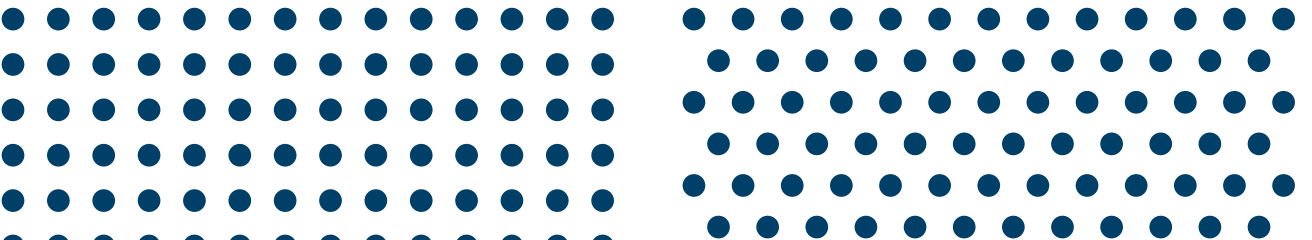
	Fural		Fural
	Rg 1.8 - 20%		Rd 1.8 - 21%
Perforation Ø	1.8 mm	Perforation Ø	1.8 mm
Hole content	20%	Hole content	21%
Max. perforation width	1.460 mm	Max. perforation width	1.400 mm
Des. acc. to DIN 24041	Rg 1.80 - 3.50	Des. acc. to DIN 24041	Rd 1.80 - 3.50
Horizontal spacing	3.50 mm →	Horizontal spacing	4.96 mm →
Vertical spacing	3.50 mm ↓	Vertical spacing	2.48 mm ↓
Diagonal spacing	4.95 mm ↘	Diagonal spacing	3.50 mm ↘
Perforation direction	→	Perforation direction	→
Overall structure	200 mm	Overall structure	200 mm
Fleece	Bonded acoustic fleece	Fleece	Bonded acoustic fleece
Test certificate	P-BA 220/2007 Figure 2	Test certificate	31/08/2007 P-BA 220/2007 Figure 2
NRC	0.75	NRC	0.75
α _w	0.75	α _w	0.75
Absorber class	C (DIN EN 11654)	Absorber class	C (DIN EN 11654)
Acoustic infill	w/o	Acoustic infill	w/o



	Fural		Fural
	Rd 2.5 - 8%		Rg 2.5 - 16%
Perforation Ø	2.5 mm	Perforation Ø	2.5 mm
Hole content	8%	Hole content	16%
Max. perforation width	1.460 mm	Max. perforation width	1.460 mm
Des. acc. to DIN 24041	Rd 2.50 - 7.80	Des. acc. to DIN 24041	Rg 2.50 - 5.50
Horizontal spacing	11.0 mm →	Horizontal spacing	5.50 mm →
Vertical spacing	5.50 mm ↓	Vertical spacing	5.50 mm ↓
Diagonal spacing	7.78 mm ↘	Diagonal spacing	7.78 mm ↘
Perforation direction	→	Perforation direction	→
Overall structure	200 mm	Overall structure	200 mm
Fleece	Bonded acoustic fleece	Fleece	Bonded acoustic fleece
Test certificate	14/12/2006 P-BA 279/2006 Figure 5	Test certificate	14/12/2006 P-BA 279/2006 Figure 1
NRC	0.80	NRC	0.80
α _w	0.75	α _w	0.80
Absorber class	C (DIN EN 11654)	Absorber class	B (DIN EN 11654)
Acoustic infill	w/o	Acoustic infill	w/o

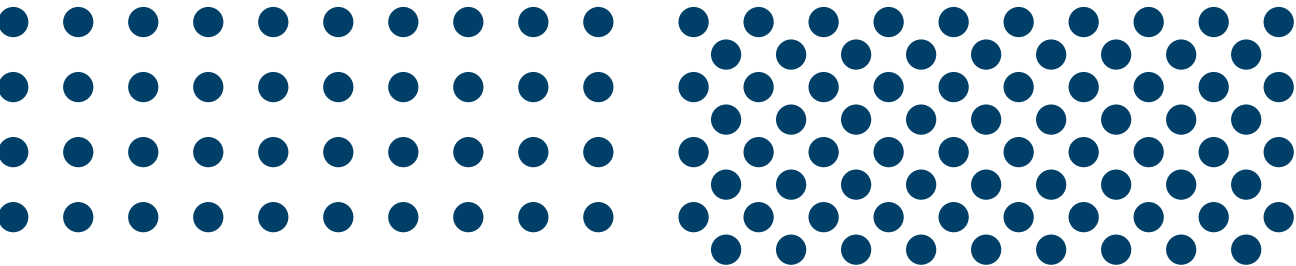


	Fural		Fural
	Rv 2.5 - 23%		Rd 2.8 - 20%
Perforation Ø	2.5 mm	Perforation Ø	2.8 mm
Hole content	23%	Hole content	20%
Max. perforation width	1.467 mm	Max. perforation width	627.9 mm
Des. acc. to DIN 24041	Rv 2.50 - 5.00	Des. acc. to DIN 24041	Rd 2.80 - 5.50
Horizontal spacing	8.66 mm →	Horizontal spacing	7.80 mm →
Vertical spacing	2.50 mm ↓	Vertical spacing	3.90 mm ↓
Offset spacing 60°	5.00 mm ↘	Diagonal spacing	5.50 mm ↘
Perforation direction	→	Perforation direction	→
Overall structure	200 mm	Overall structure	200 mm
Fleece	Bonded acoustic fleece	Fleece	Bonded acoustic fleece
Test certificate	07/12/2010 M 61840/7	Test certificate	09/06/2017 M 105629/20
NRC	0.75	NRC	0.75
α _w	0.75 (L)	α _w	0.75
Absorber class	C (DIN EN 11654)	Absorber class	C (DIN EN 11654)
Acoustic infill	w/o	Acoustic infill	w/o

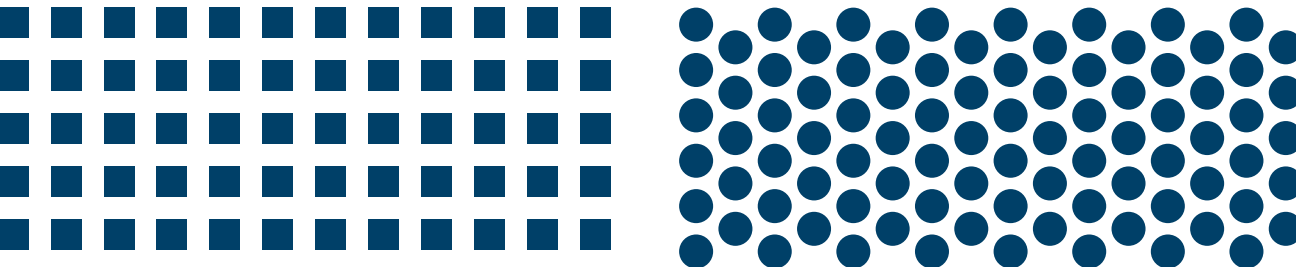


	Fural		Fural
	Rg 3.0 - 20%		Rv 3.0 - 20%
Perforation Ø	3.0 mm	Perforation Ø	3.0 mm
Hole content	20%	Hole content	20%
Max. perforation width	1.434 mm	Max. perforation width	1.402 mm
Des. acc. to DIN 24041	Rg 3.00 - 6.00	Des. acc. to DIN 24041	Rv 3.00 - 6.35
Horizontal spacing	6.0 mm →	Horizontal spacing	6.50 mm →
Vertical spacing	6.0 mm ↓	Vertical spacing	5.50 mm ↓
Diagonal spacing	8.48 mm ↘	Offset spacing 60°	6.39 mm ↘
Perforation direction	→	Perforation direction	→
Overall structure	200 mm	Overall structure	200 mm
Fleece	Bonded acoustic fleece	Fleece	Bonded acoustic fleece
Test certificate	P-BA 221/2007 Figure 2	Test certificate	P-BA 221/2007 Figure 2
NRC	0.80	NRC	0.80
α _w	0.75 (L)	α _w	0.75 (L)
Absorber class	C (DIN EN 11654)	Absorber class	C (DIN EN 11654)
Acoustic infill	w/o	Acoustic infill	w/o

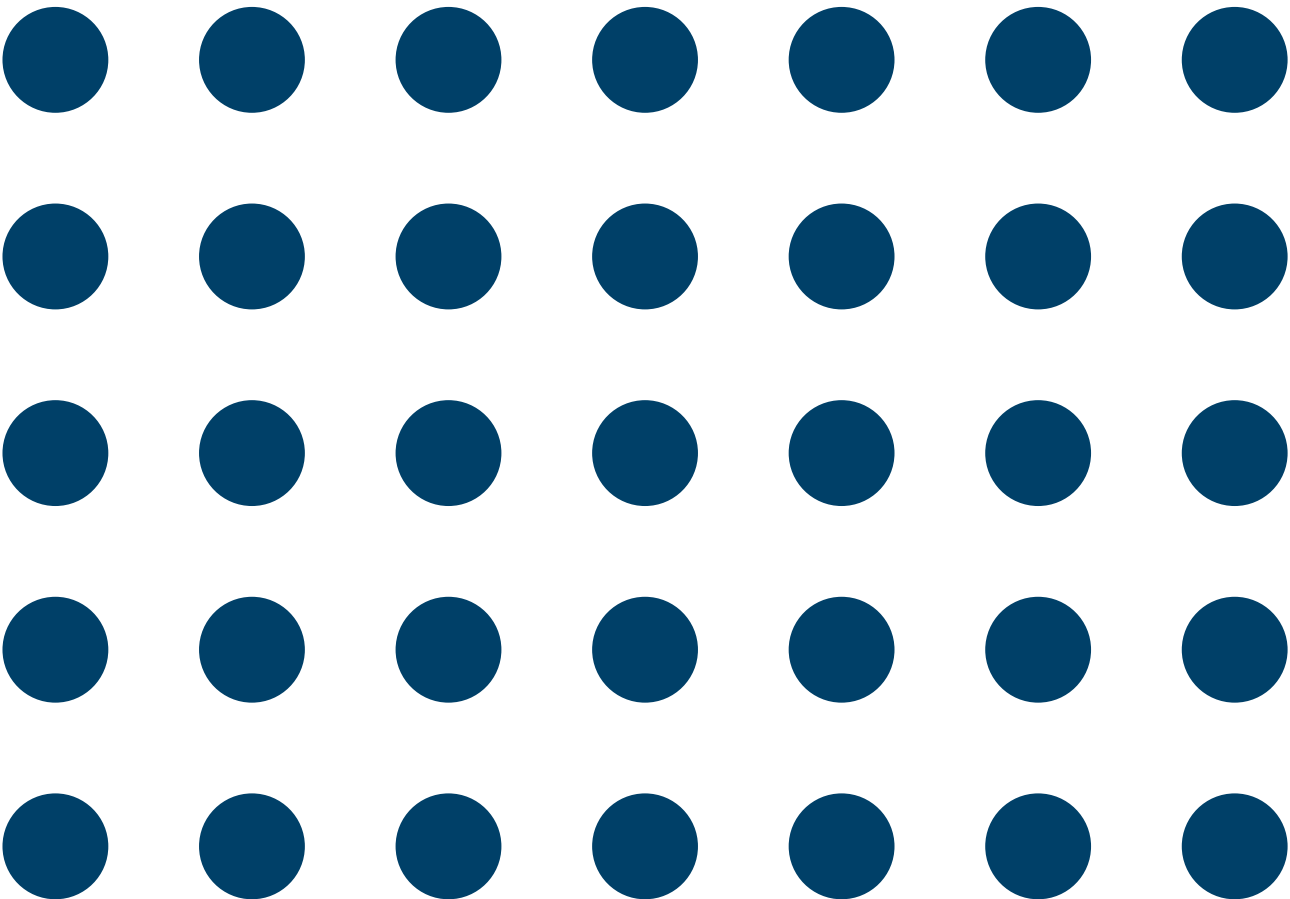
Tested perforations 4



	Fural		Fural
	Rg 4.0 - 17 %		Rd 4.0 - 33 %
Perforation Ø	4.0 mm	Perforation Ø	4.0 mm
Hole content	17 %	Hole content	33 %
Max. perforation width	1,453 mm	Max. perforation width	1,450 mm
Des. acc. to DIN 24041	Rg 4.00 - 8.60	Des. acc. to DIN 24041	Rd 4.00 - 6.10
Horizontal spacing	8.60 mm →	Horizontal spacing	8.60 mm →
Vertical spacing	8.60 mm ↓	Vertical spacing	4.30 mm ↓
Diagonal spacing	12.1 mm ↘	Diagonal spacing	6.10 mm ↘
Perforation direction	→	Perforation direction	→
Overall structure	200 mm	Overall structure	200 mm
Fleece	Bonded acoustic fleece	Fleece	Bonded acoustic fleece
Test certificate	P-BA 279/2006 Figure 7	Test certificate	P-BA 279/2006 Figure 3
NRC	0.80	NRC	0.80
α _w	0.80	α _w	0.80
Absorber class	B (DIN EN 11654)	Absorber class	B (DIN EN 11654)
Acoustic infill	w/o	Acoustic infill	w/o



	Fural		Fural
	Qg 4.0 - 33 %		Rv 4.5 - 51 %
Perforation	4.0 mm	Perforation Ø	4.5 mm
Hole content	33 %	Hole content	51 %
Max. perforation width	630 mm	Max. perforation width	627 mm
Des. acc. to DIN 24041	Qg 4.00 - 7.00	Des. acc. to DIN 24041	Rv 4.50 - 6.00
Horizontal spacing	7.00 mm →	Horizontal spacing	10.4 mm →
Vertical spacing	7.00 mm ↓	Vertical spacing	3.00 mm ↓
Diagonal spacing	9.89 mm ↘	Offset spacing 60°	6.00 mm ↘
Perforation direction	→	Perforation direction	→
Overall structure	200 mm	Overall structure	200 mm
Fleece	Bonded acoustic fleece	Fleece	Bonded acoustic fleece
Test certificate	P-BA 279/2006 Figure 4	Test certificate	09/06/2017 M105629/21
NRC	0.80	NRC	0.65
α _w	0.80	α _w	0.65 (L)
Absorber class	B (DIN EN 11654)	Absorber class	C (DIN EN 11654)
Acoustic infill	w/o	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

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