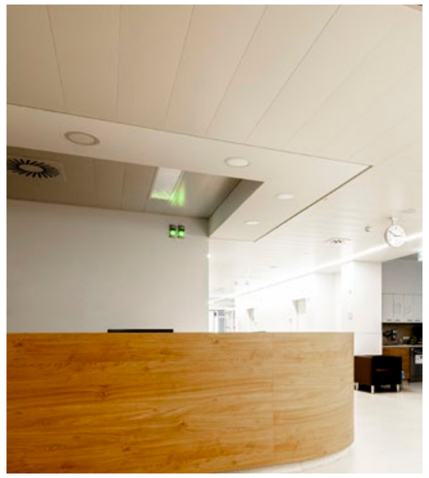
UP MAGAZINE

HEALTH 03

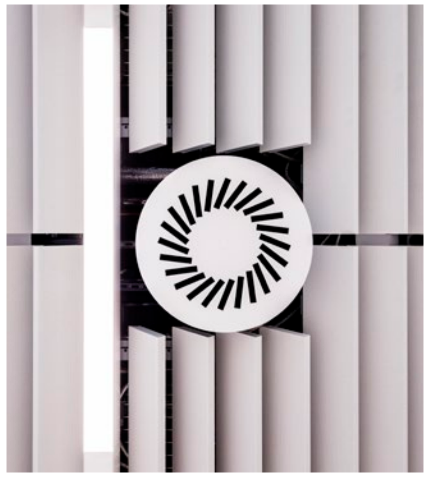
FURAL

METALIT

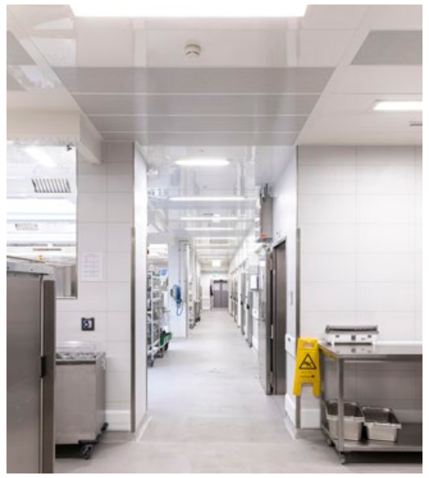
DIPLING









UP! at lofty heights.

»

What is the aim of what we do at Fural Metalit Dipling? To develop, produce and supply the metal ceiling systems that you need as a specialist in hospital buildings.

We think in terms of solutions rather than products and we are so successful because we know the problems in your project field inside out.

Let me give you a few examples:

Even before the coronavirus pandemic, we knew that we had to improve the hygiene of buildings. We think in terms of holistic hygiene, which includes production, delivery, installation, use, maintenance, dismantling and, at some point, disposal.

Not only since the current energy crisis have we known that buildings need to be tempered more efficiently and that cooling will become almost more important than heating in the future. Our heating and cooling ceiling systems make an important contribution here.

Work and patient protection is important in the operation of hospital buildings. With our metal ceiling systems, the acoustics in your construction projects can be significantly improved, for example particularly effectively with our floating ceiling.

And - last but not least - we need to act and build much more sustainably. This applies to material and substance cycles as well as usage cycles. With our highly recyclable steel and aluminum base materials, we score points here as well as with the optimal revision, conversion and dismantling capability of our metal ceiling systems.

We work in the lofty heights of your rooms. Where we are, is above. Together with you, we would like to develop and construct contemporary hospital buildings.

Let us inspire and excite you, rediscover materials and get to know us better! We hope you enjoy reading the new UP↑ 03 HEALTH

Christian Demmelhuber
CEO Fural Metalit Dipling
Perfect metal ceilings

«

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

UP

We think in terms of feeling good and getting well faster.

Highest quality of care at Salzkammergut Clinic Vöcklabruck

The Salzkammergut Klinikum Vöcklabruck has received a three-storey extension. This offers plenty of space for the important areas of dialysis, child and adolescent psychiatry and psychosomatics. The new dialysis center was opened in March 2021. Due to the increased capacity, it represents a significant relief for patients and hospital staff. Patients who previously had to travel regularly to Linz or Wels now receive treatment close to home with the best quality of treatment at Salzkammergut Klinikum Vöcklabruck.

Fural Metalit Dipling EI 30 fire protection ceilings were installed in some areas of the hospital corridors. However, the majority of the corridors are fitted with the Fural clip-in system. This has a special hospital wall connection, which is ideal for corridors in healthcare facilities.

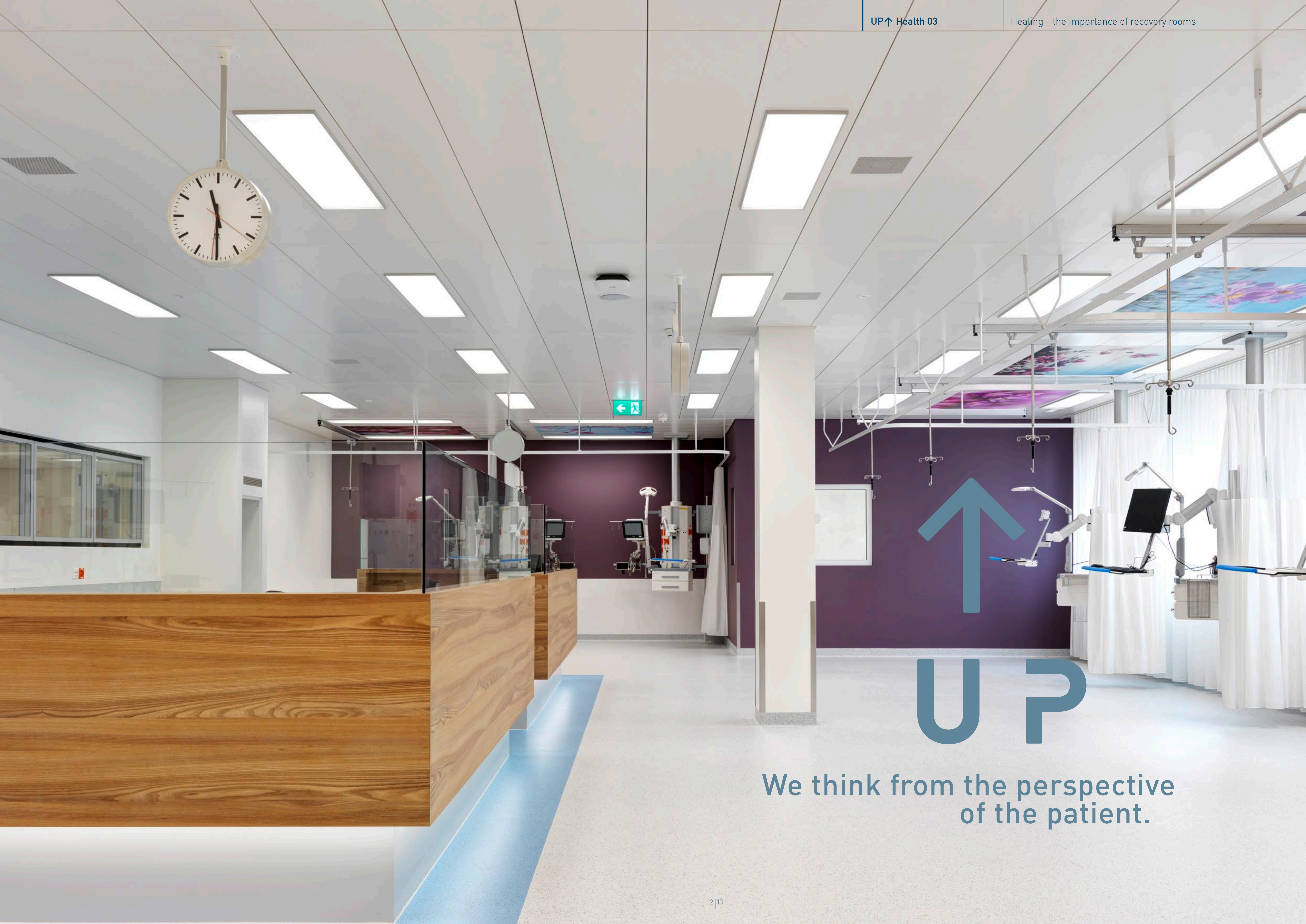
With the help of the Aluline clip-in system, a long, continuous strip light has also been created in the corridors. Both ceiling systems are acoustically effective thanks to their perforation and offer easy access to the ceiling void in the event of an inspection.

The Fural Metalit Dipling clip-in system was also installed in selected rooms - but here with a cooling function. This creates a pleasant environment for patients and hospital staff..

Salzkammergut Clinic Vöcklabruck

Architecture	Urban Zesch Architekten
Gross floor area	1.400 m²
Ceiling system	Fold-down slideF30, Clip-in
Material	Galvanized sheet steel
Surface	RAL 9010

Perforation	Fural
	Rg 0,7 - 4 %
Perforation Ø	0,7 mm
Percentage of holes	4 %
Perforation width max	1.197 mm
Ref. according to DIN 24041	Rg 0,70 - 3,00
Distance horizontal	3,00 mm →
Distance vertical	3,00 mm ↓
Distance diagonal	4,24 mm ↘
Perforation direction	→



↑ UP

We think from the perspective of the patient.

Comfort criteria for patient and staff.

The well-being of patients in their hospital environment and their ability to recover are influenced by various factors. In addition to medical and social factors, these include the comfort factors of indoor climate, indoor air quality, visual and acoustic comfort, accessibility and the area of electromagnetic fields.

When planning patient rooms, the needs of the patients should be taken into account first and only after that the technical and constructional desired requirements as well as possible problem areas of the hospital staff should be considered.

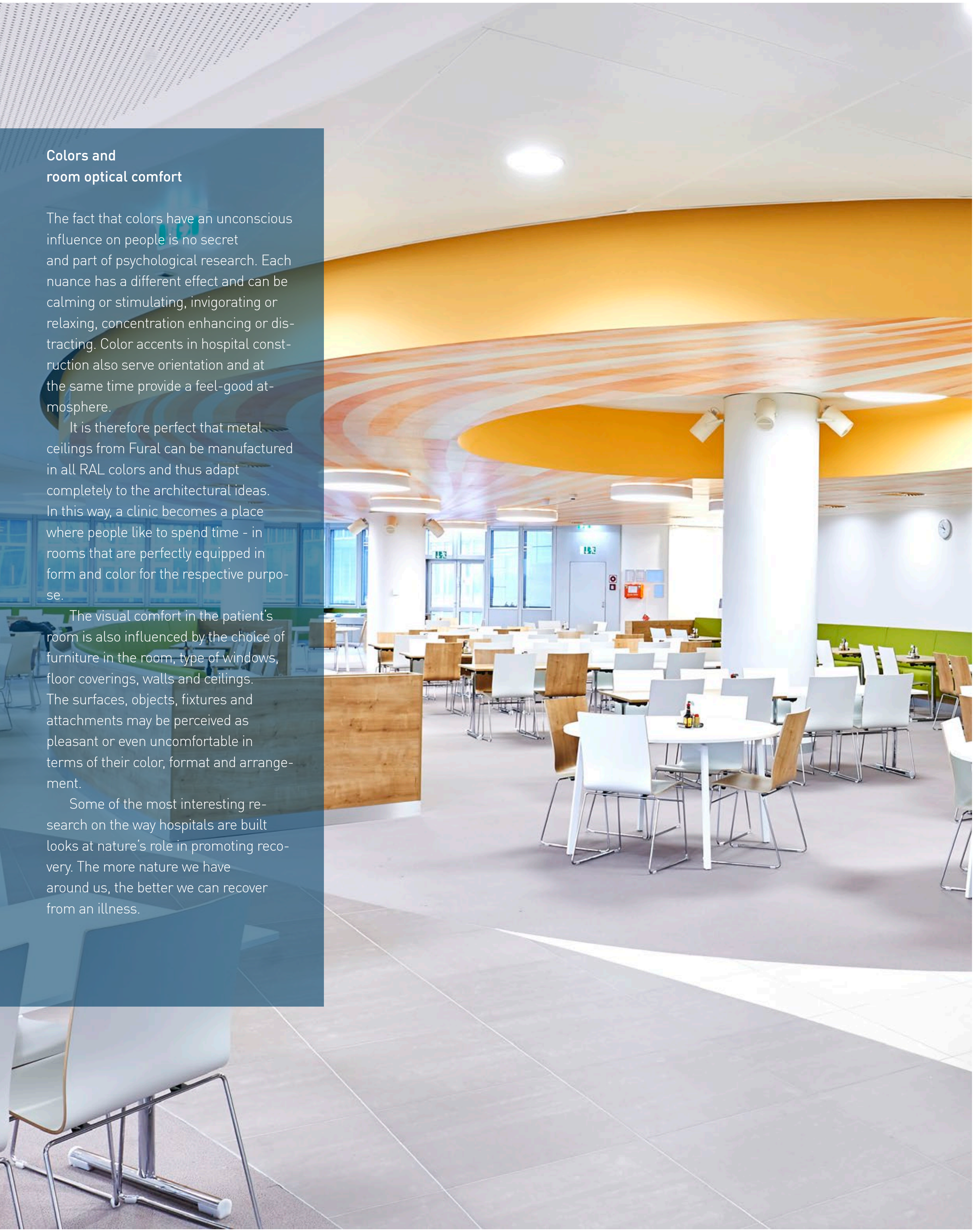
State Hospital Salzburg (AT)

Room air quality

Room air quality is significantly influenced by the building products used. Construction projects are monitored from a construction ecology perspective during the planning and construction phase in order to select the construction materials and construction chemicals used according to ecological criteria and to avoid the introduction of materials that are hazardous to health. Particular attention is paid to solvents and allergenic building materials. Building products as possible sources of pollutants are fibers, radon (granite), and VOCs (solvents in paints, glue, and varnishes, biocides in wood preservatives and carpets, PAHs in parquet adhesives, and formaldehyde-containing adhesives in wood-based materials).

Our metal ceilings and walls take the hygiene aspect into account. Our fire protection ceilings additionally ensure safety, because they achieve the required fire resistance - and without inserts made of artificial mineral fibers.

Ventilation diffusers



Colors and room optical comfort

The fact that colors have an unconscious influence on people is no secret and part of psychological research. Each nuance has a different effect and can be calming or stimulating, invigorating or relaxing, concentration enhancing or distracting. Color accents in hospital construction also serve orientation and at the same time provide a feel-good atmosphere.

It is therefore perfect that metal ceilings from Fural can be manufactured in all RAL colors and thus adapt completely to the architectural ideas. In this way, a clinic becomes a place where people like to spend time - in rooms that are perfectly equipped in form and color for the respective purpose.

The visual comfort in the patient's room is also influenced by the choice of furniture in the room, type of windows, floor coverings, walls and ceilings. The surfaces, objects, fixtures and attachments may be perceived as pleasant or even uncomfortable in terms of their color, format and arrangement.

Some of the most interesting research on the way hospitals are built looks at nature's role in promoting recovery. The more nature we have around us, the better we can recover from an illness.

Insurance Institute Vienna (AT)

We are acoustic ceilings. We are acoustic walls.

Acoustic comfort

Hospitalization requires both mental concentration and communication from patients.

The recovery process can be significantly affected by acoustic annoyance. These impairments can be: noise penetrating from outside and generated by work equipment, personal or telephone conversations of fellow patients, noise and sounds of any kind penetrating from the corridor, technical background noise, which is mainly generated by EDP and air-conditioning devices or room air-conditioning systems.

Sound triggers physiological and psychological reactions: some sounds are perceived as pleasant, others cause tension or feelings of annoyance.

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.

See from page 48 Special Acoustics.

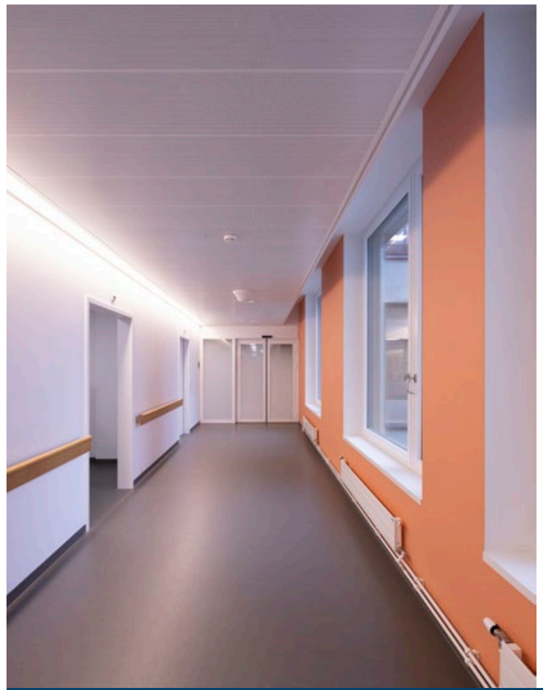
Felix-Platter Hospital Basel (CH)

Holistic approach to care for patients and the building

The renowned hospital in Basel specializes in university geriatric medicine and aims to provide integrated care for patients. This includes diagnostics and therapy as well as nursing care. The hospital meets high quality standards, but also takes economic efficiency into account.

Appreciation, attentiveness and discretion towards all those affected and those involved are actively practiced. The hospital also makes sustainable and careful use of resources.


» North Entrance « Felix-Platter Hospital Basel (CH)


»Fire protection ceiling« Felix-Platter Hospital Basel (CH)


»Treatment room« Felix-Platter Hospital Basel (CH)

pRED Hoffmann-La Roche Basel (CH)


»Special lab« pRED Hoffmann-La Roche Basel (CH)

Metalldecken voll im Trend

A modern research and development center was built at the Basel site. The center consists of four new laboratory and office buildings with around 1,800 workstations, which are connected by an underground car park. The new building offers a comprehensive infrastructure for new research tasks.

The complex meets the highest requirements for a working environment that promotes innovation. The first floor of the building has a public function that facilitates communication. In addition to innovative office space and state-of-the-art laboratories, the building has a congress center for 200 people with an auditorium.

Modern spaces need unique solutions. Fural met the company's expectations and equipped the center with 150,000 specially developed aluminum baffles. The 45° inclined elements significantly improve the acoustics of the rooms and also provide active cooling. Ventilation and lighting were also elegantly integrated.

Multifunctional metal ceilings

Hospital buildings and their technical equipment are complex. Construction and operation must always be considered holistically. Ultimately, the aim is to meet the various requirements such as hygiene, functionality, reliability, auditability and aesthetics in equal measure.

The various metal ceiling systems from Fural Metalit Dipling are used according to individual requirements. For example, the Swing F0 systems, a lay-in system and clip-in systems were used in the Salzburg State Hospital over an area of 5,000 m². In addition to the various advantages of the individual systems, additional functions promise better acoustics and impress with their linear and clear appearance. Our metal ceilings are also completely free of dust, fibers and mold and are easy to disinfect, making them exceptionally hygienic.

»Patient bathroom ceiling« Salzburg State Hospital (AT)

»Ward room« Salzburg State Hospital (AT)

»Intensive care unit« Salzburg State Hospital (AT)

St.-Clara-Hospital, Basel (CH)

Hospital in the park

»The decision to use a metal ceiling was based on several factors. The main issues were fire protection due to the installation density and therefore the fire loads, as well as good accessibility to the installations during operation. Logically, the architectural and design aspects as well as the acoustics also played a role. In our view, the collaboration with Fural Metalit Dipling was very good and always solution-oriented. Good and clean solutions were found for all spatial and design challenges.«

Roger Wagner
BFB Architekten AG

UP

We think in terms of maintenance and service.


Detail F30 tile

Fire protection and hygiene

In hygiene-sensitive buildings in particular, hospitals for example, cleanliness and sterility take top priority. The fire protection ceilings from Fural offer the necessary conditions for it.

Thanks to their special design, metal ceilings from Fural Metalit Dipling not only prevent the accumulation of the dust particles but also ensure easy cleaning of the surfaces. The plaster board of our fire protection tiles behind the ceiling remains completely closed, so dust has no possibility to accumulate. The metal ceiling also enables ideal disinfection.

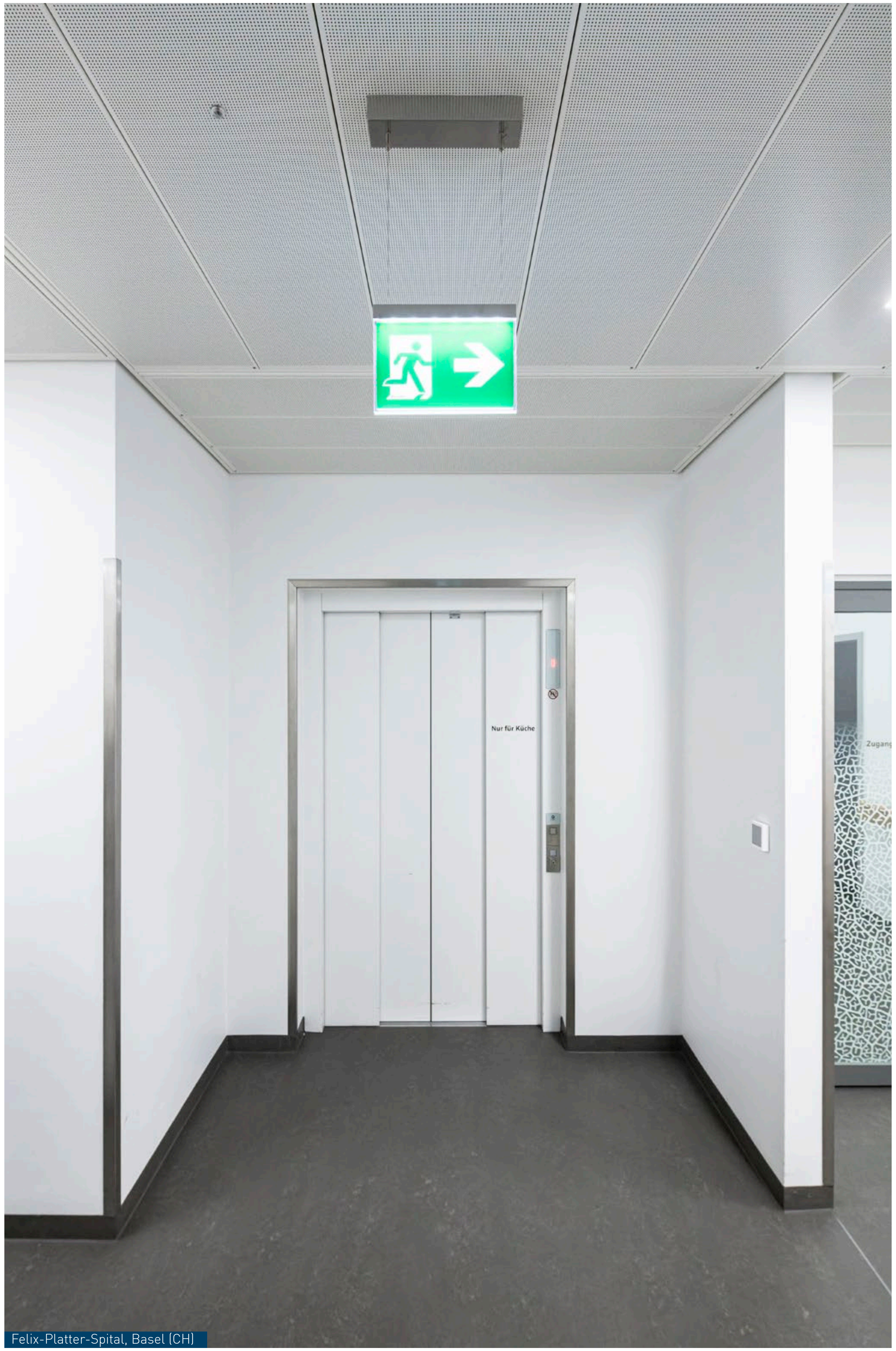
Fural metal fire protection ceilings combine practicality and safety with today's building requirements and boast of numerous advantages:
In addition to being 100% free of dust, ceilings from Fural Metalit Dipling are easy to clean and fibre-free. The panels do not contain any rock wool; as false ceilings, they guarantee fire protection for up to 90 minutes.

Thanks to the minimum height, light or emergency and warning lights can be easily integrated into the ceiling panels.

In addition to the fire protection function, a cooling system can be integrated as well.

For more information, see our "Fire Protection Ceilings" Manuals, available for Germany, Austria and Switzerland, as well as on our website at: https://www.fural.com/de/metalldecken/brandschutz/11

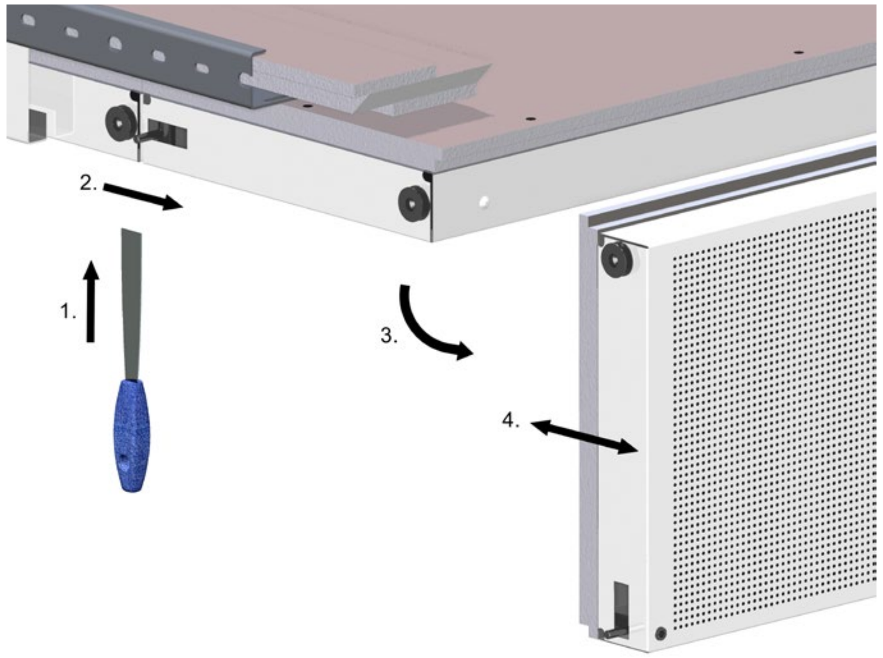

»Registration« Regional Hospital Hall (AT)



Felix-Platter-Spital, Basel (CH)

Open and close

Hinge-down process of the Fural-Fire protection wall
- The ceiling is easy and to open without special tools.
- With a spatula or Hex key the F30/EI 30, EI 60 and F90/EI 90 or F90/EI 90 ceilings can be easily opened.
- The twist lock is galvanized and prevents signs of wear due to the opening.
- The swivel castors guarantee through their perfect shape an auto-centering of the tiles between



1 Insert ceiling opener or Hex key
2 Open twist lock
3 Fold down tile
4 Move tile

Technical fixtures

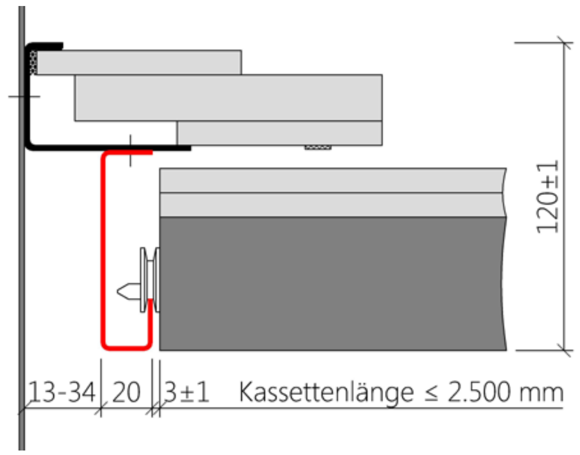
Generally tested are the installation or connection of:
- Lights, e.g. LED-light 410 and more types, LED Luminaire series 481
- Speaker
- Escape route pictograms
- Disc valves
- Fire dampers/Swirl diffusers

Various fixtures can be supplied as system parts integrated at the factory. These include a selection of LED lights, escape route pictograms and speakers.
Further information on this as well as photometric data can be found on our website www.fural.com or on request. Cut-outs for built-in fixtures are manufactured at the factory.

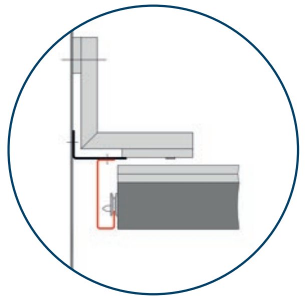
Security

A particularly successful example of how the diverse requirements of a hospital ceiling can be met is the Heart Center of the Ludwigshafen City Hospital, which opened in 2016.

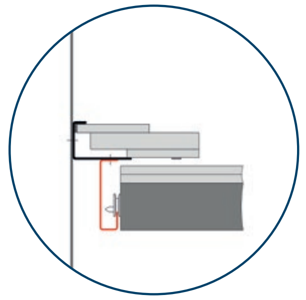
Several ceiling systems from Fural Metalit Dipling were used, which were optimally matched to the respective area of application. Fire protection ceilings F30 and swing ceilings F0 were used in the corridors. KQK clip-in tiles with perforation Rg 2.5 - 16 % were used in the care support points. This provides both patients and staff with the room acoustic comfort required for optimum healing and a high-quality workplace. In areas with increased hygiene requirements, e.g. operating theatres, smooth cassettes type KQR or KLR with an additional sealed bead were used.



A.W.50
Longitudinal corridor connection



Connection old



Connection new

»Heart Center« Ludwigshafen City Hospital (DE)


Staet Hospital Villach (AT)

Multifunctionality

Metal ceilings from Fural can be equipped with functions in many ways. Our products combine the following features:

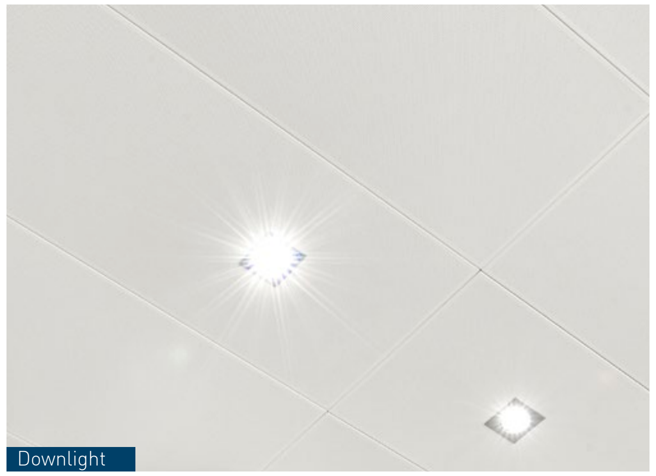
- Fire protection
- Acoustics
- Heating, cooling and ventilation
- Integration possibility of fixtures
- Each tile can be hinged-down
- Simple maintenance
- easy replacement of ceiling components
- easy revision of the ceiling void
- 100 % separable by type
- Recyclability

»Elevator lobby« St. - Clara - Hospital, Basel (CH)

Integration of technology

It is important to control not only the technical aspects of the building, but also the comfort of patients and staff. For example, the control of temperature and humidity, thermal regulation and lighting appropriate to health conditions, and combine all this with the intended use of the structure (clinical paths and relative coherence of the rooms, flexibility of the parameters of each room).

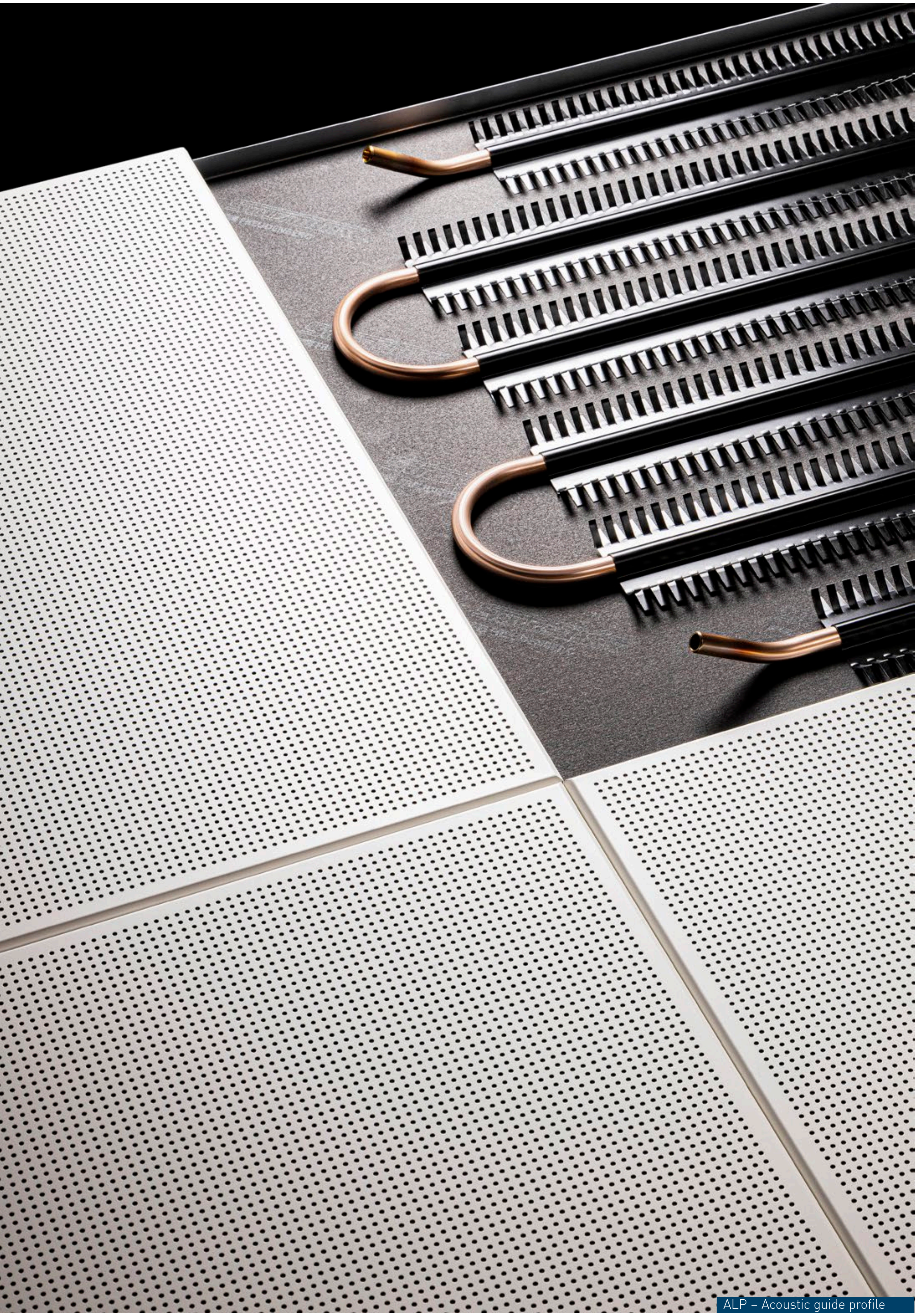

Linear luminaire


Downlight

Time display


Speaker


Escape route signs


ALP – Acoustic guide profile

Heating and cooling

We are a cool company!

One thing in particular is cool for us: our metal ceilings. Because they make it possible to heat and cool rooms in a very simple way. Climate functions can be added and integrated into our metal ceilings according to the modular principle and be combined with other ceiling variants, e.g. acoustic ceilings.

Why use metal for a cooling ceiling?

Metal is ideally suited as a conductive medium for heat and cold. Optimal temperature control is achieved on the basis of the radiation principle.

Since our cooling ceilings work completely without air circulation, dust swirling is prevented and the draft is avoided. During the pollen season, it is particularly important to ensure an agreeable cooling of the room – without being exposed to pollen.
This is particularly relevant to school buildings, since more and more children suffer from allergies due to pollen in the air.

Cooling and heating ceilings with copper/ aluminium or plastic systems can be implemented in various designs. Sustainability is also taken into account: Energy is saved, and costs are reduced.

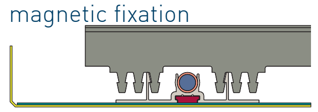
We test cooling ceilings

The efficiency of our cooling ceilings and walls is no accident. We test your individual projects in our own test laboratory and guarantee custom-tailored solutions for your projects in topmost quality.

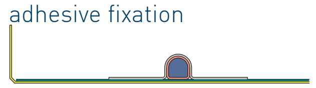
Climate elements

In Austria, the following climate elements are manufactured by long-term and well-experienced partner companies and integrated into our products.

– Copper/aluminium systems with magnetic fixation

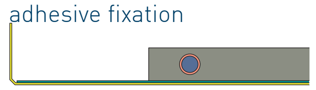


– Copper/aluminium systems with adhesive fixation



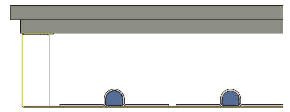
– Plastic/aluminium systems with magnetic fixation

– Copper/graphite systems with adhesive fixation

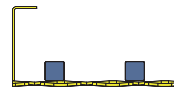


Fire protection ceiling and cooling

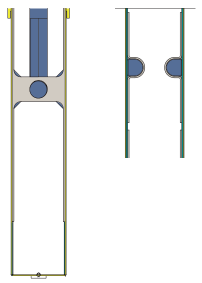
Cooling ceiling systems in the case of fire protection ceilings always require an expert opinion.



Expanded metal ceiling and cooling

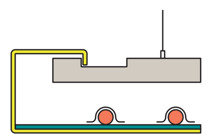


Baffle ceiling and cooling

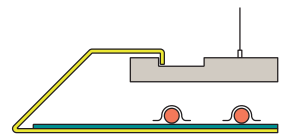


Deckensegel und Kühlung

90° angle



45° angle



(60° angle also available)

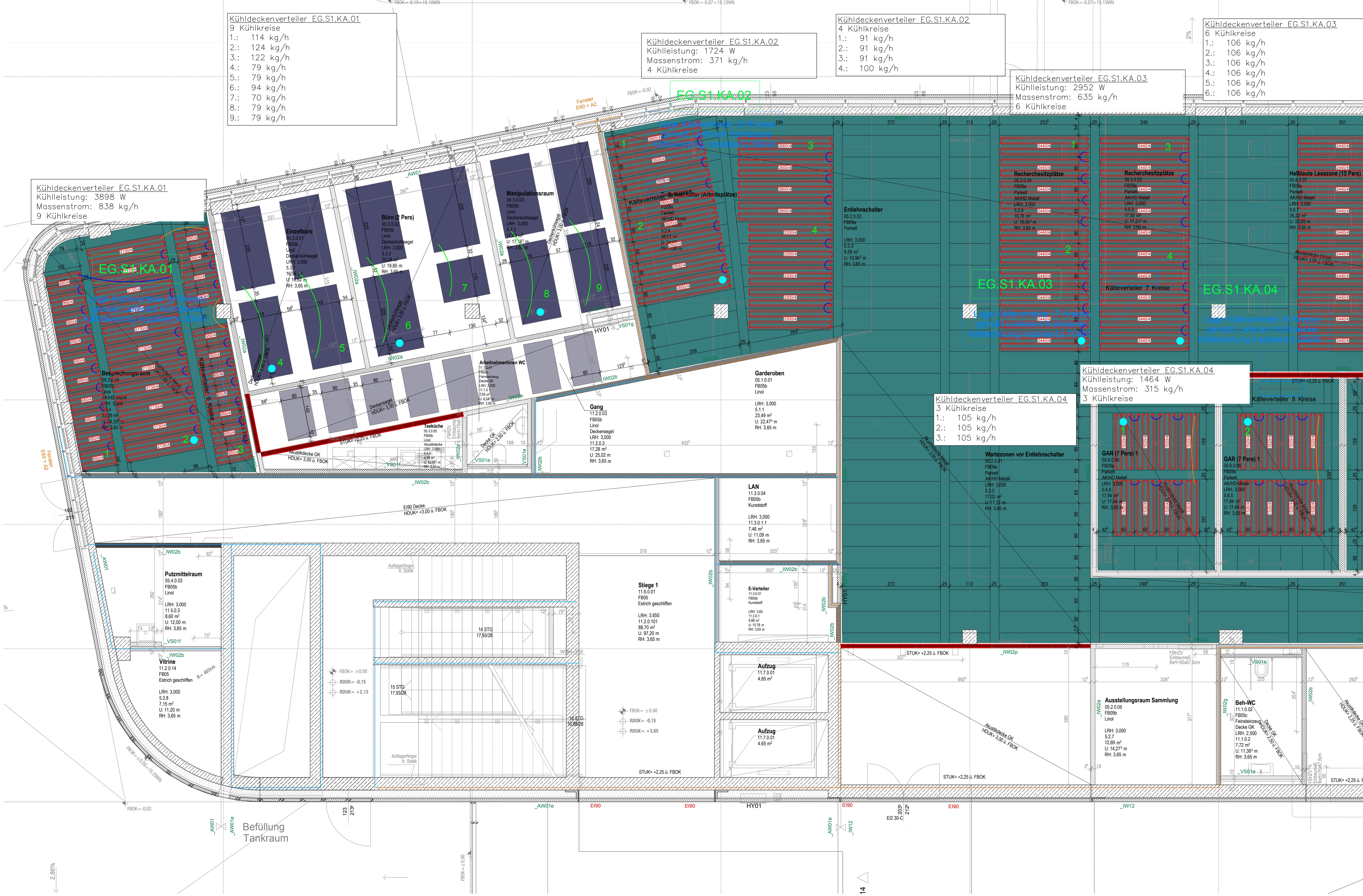
»Cooling architecture will be more important than heating in the future.« (Christian Demmelhuber, CEO Fural Metalit Dipling)

We plan cooling ceilings

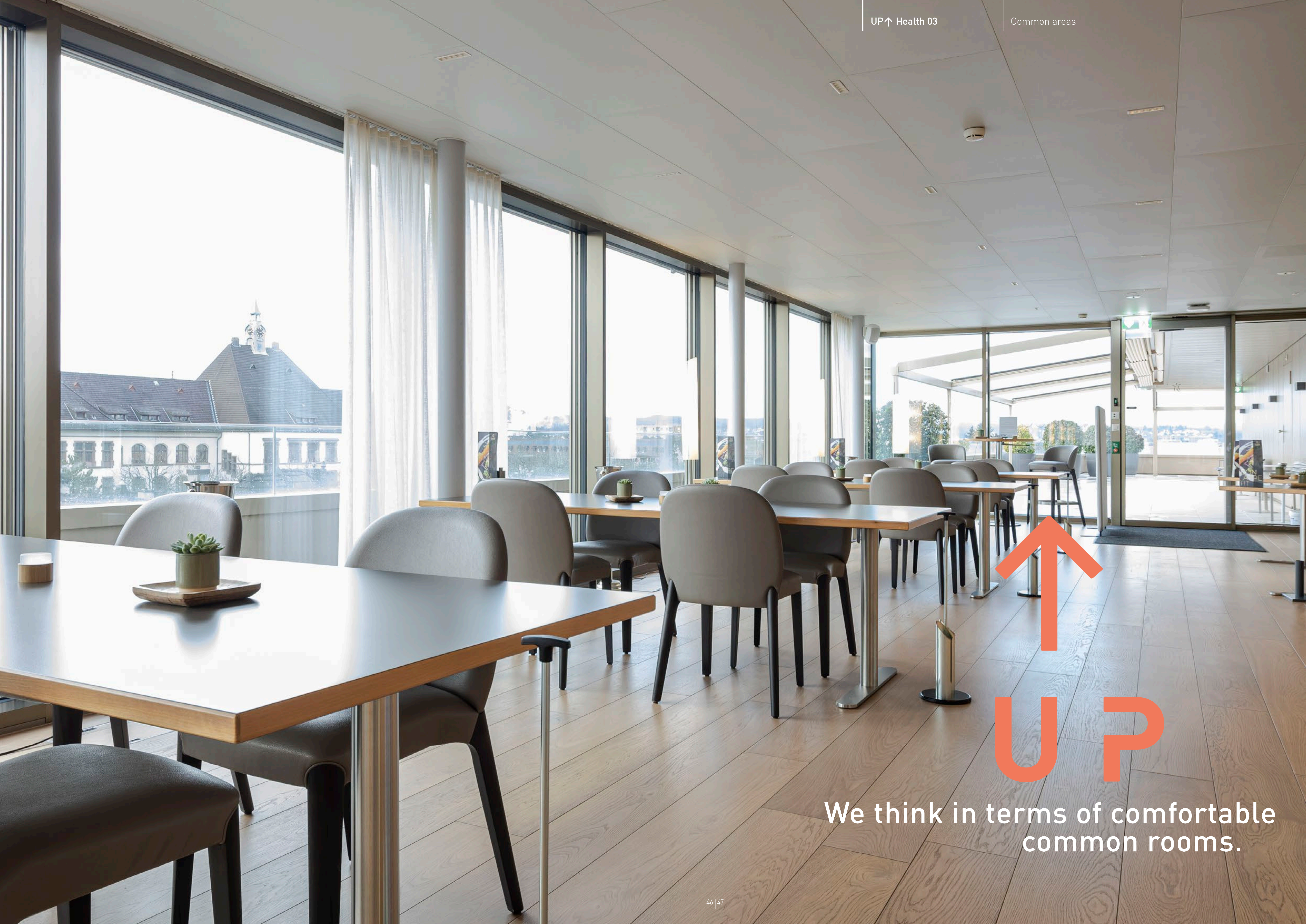
We see ourselves not only as a manufacturer and supplier of high-quality metal ceilings, but also as a planning partner for your project.

You can rely on our expertise because we know the properties of the cooling systems we install inside out. We advise you on the selection of the right cooling system for your project, select the metal ceiling system together with you and also help you to improve room acoustics and comply with fire protection regulations with our metal ceiling systems.

You will find that our metal ceiling systems contribute in many ways to the success of your project and ensure many years of trouble-free operation.

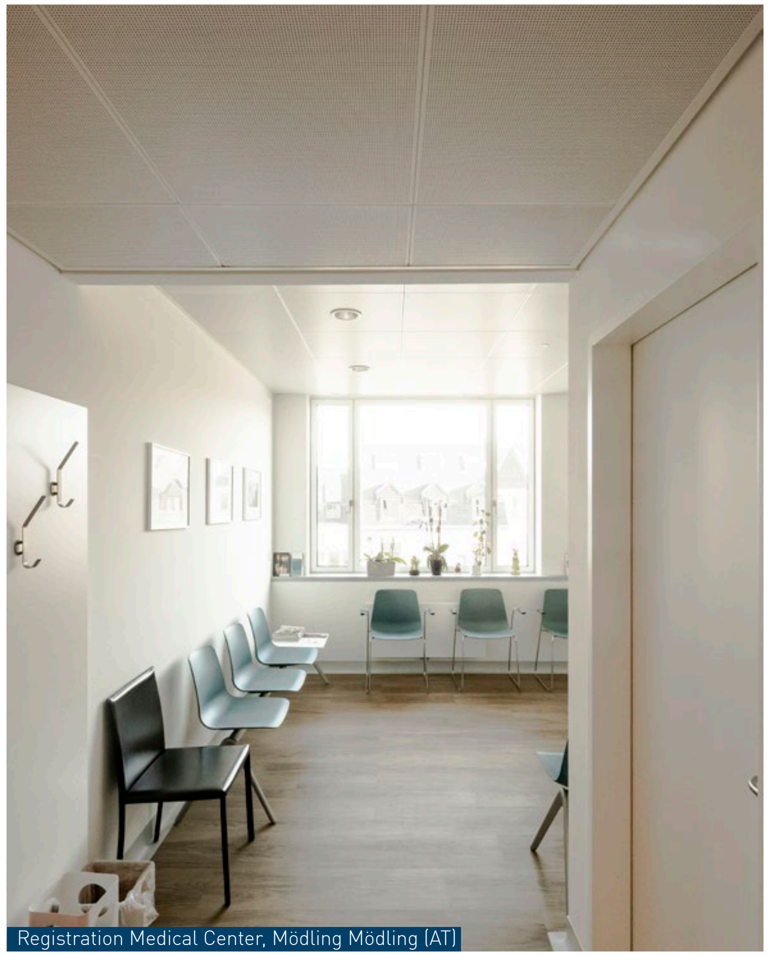


University of Vienna
Biology Building
- Consortium Biology Center/ Marcel Backhaus and Karsten Liebner/ Vasko+Partner
- Perforation Rg 0,7-4% and Rg 2,5-16%
- Color RAL 9010
- Strip grid system, floating ceiling
- Cooling system Krantz-Fural



UP

We think in terms of comfortable common rooms.


Registration Medical Center, Mödling Mödling (AT)

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.

Registration Villach Regional Hospital (AT)


Canteen Insurance Institute, Vienna(AT)

↑ UP

Silence

»Action takes place in a certain amount of noise.
Work takes place in silence.«
(Peter Bamm, 1897–1975)

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:

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

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.

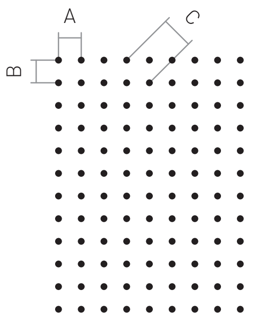
The cavity that this creates between raw ceiling and suspended ceiling acts as a sound transmission path which must be compensated for with longitudinal sound insulation.

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

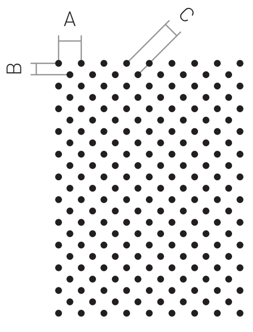
The longitudinal sound insulation is determined according to EN ISO 717-1 and specified as a weighted normalised flanking sound level difference **$D_{n,f,w}$** in **dB** units.

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.

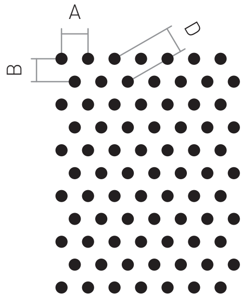
The reference curve is not shown in the test report diagrams.



Rg



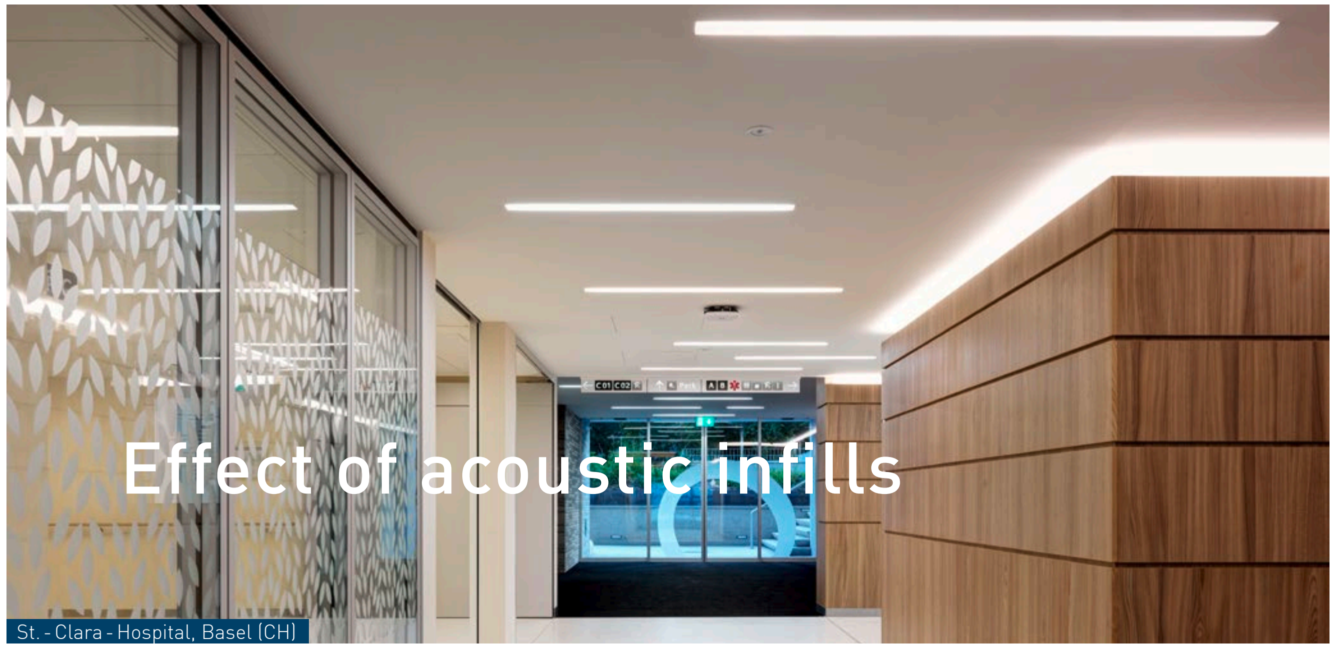
Rd



Rv

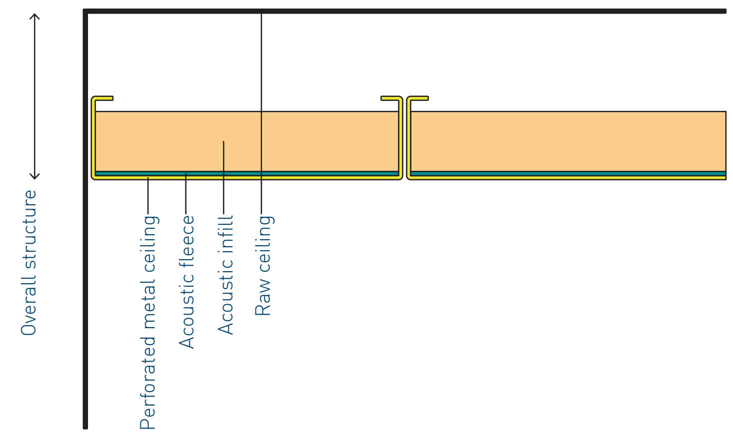
Perforation sizing

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



Effect of acoustic infills

St. - Clara - Hospital, Basel (CH)



Different acoustic infills (absorber types)

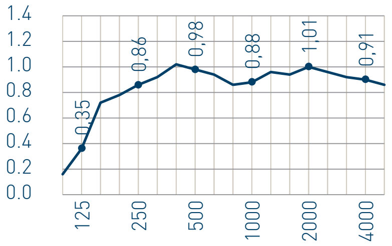
The sound absorption coefficient is greatly affected by the acoustic infills used, which can consist of mineral wool, mineral wool sealed in PE film, foam or polyester wool.

These acoustic infills are also available in different volumetric weights (kg/m³).

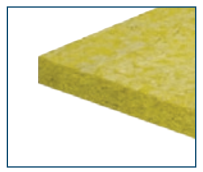
	Fural
	Rg 2.5 - 16 %
Perforation Ø	2.5 mm
Hole content	16 %
Max. perforation width	1,460 mm
Des. acc. to DIN 24041	Rg 2.50 - 5.50
Horizontal spacing	5.50 mm →
Vertical spacing	5.50 mm ↓
Diagonal spacing	7.78 mm ↘
Perforation direction	→

Sound absorption

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



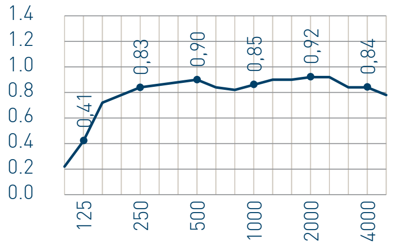
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	P-BA 279/2006 Figure 14
NRC	0.95
α_w	0.95
Absorber class	A (DIN EN 11654)
Acoustic infill	**30 mm mineral wool 45 kg/m³**



	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 2.5 - 5.50
Horizontal spacing	5.50 mm →
Vertical spacing	5.50 mm ↓
Diagonal spacing	7.78 mm ↘
Perforation direction	→

Sound absorption

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

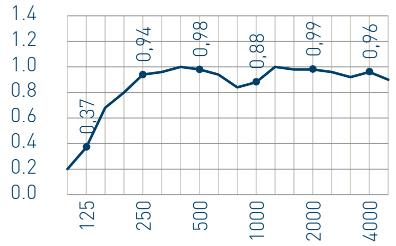


Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	P-BA 279/2006 Figure 17
NRC	0.85
α_w	0.90
Absorber class	A (DIN EN 11654)
Acoustic infill	**30 mm mineral wool 45 kg/m³ in PE film**

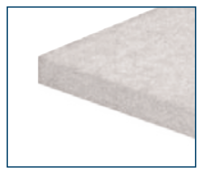
	Fural
	Rg 2.5 - 16 %
Perforation Ø	2.5 mm
Hole content	16 %
Max. perforation width	1,460 mm
Des. acc. to DIN 24041	Rg 2.50 - 5.50
Horizontal spacing	5.50 mm →
Vertical spacing	5.50 mm ↓
Diagonal spacing	7.78 mm ↘
Perforation direction	→

Sound absorption

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



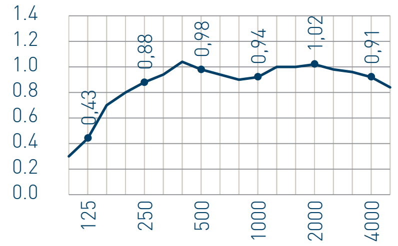
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	P-BA 279/2006 Figure 18
NRC	0.95
α_w	0.95
Absorber class	A (DIN EN 11654)
Acoustic infill	**30 mm foam 9 kg/m³**



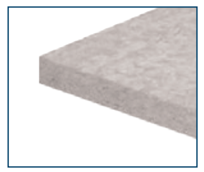
	Fural
	Rg 2.5 – 16 %
Perforation Ø	2.5 mm
Hole content	16 %
Max. perforation width	1,460 mm
Des. acc. to DIN 24041	Rg 2.50 – 5.50
Horizontal spacing	5.50 mm →
Vertical spacing	5.50 mm ↓
Diagonal spacing	7.78 mm ↘
Perforation direction	→

Sound absorption

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



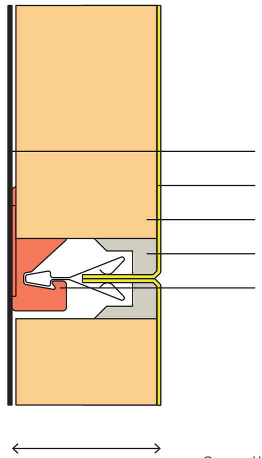
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	P-BA 279/2006 Figure 19
NRC	0.95
α_w	0.95
Absorber class	A (DIN EN 11654)
Acoustic infill	**30 mm polyester wool 48 g/m³**



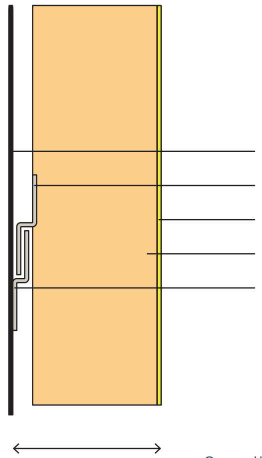
Acoustic walls

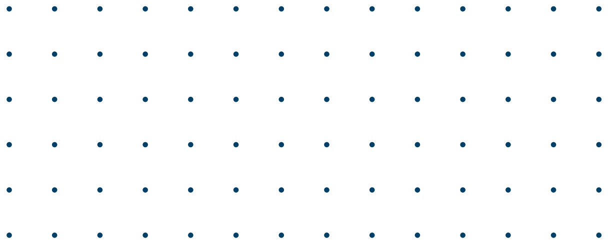
School, Munich (DE)

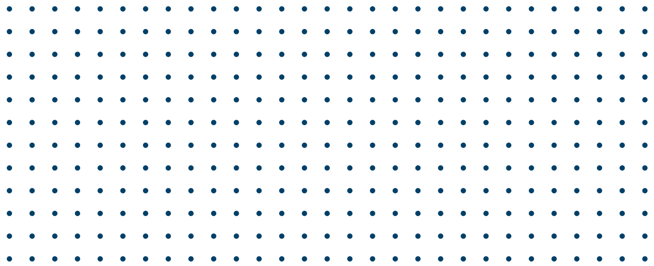
Clip-in system

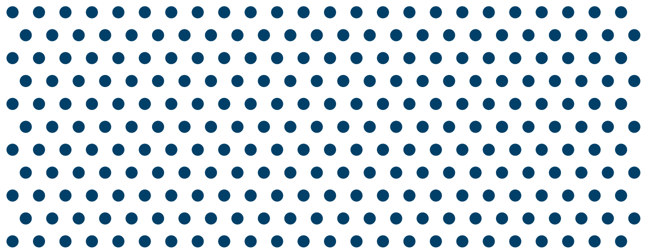


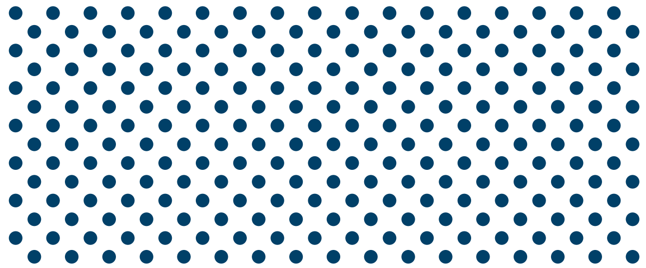
Hang-in system







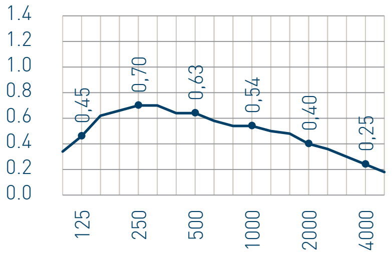




Fural Rg 0.7 - 1 %

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

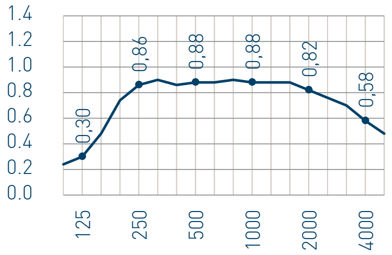


Overall structure	50 mm
Fleece	Bonded acoustic fleece
Test certificate	07.12.2010 M 61840/27
NRC	0.55
α_w	0.40 (L)
Absorber class	D (DIN EN 11654)
Acoustic infill	**50 mm mineral wool 100 kg/m³ in PE film**

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

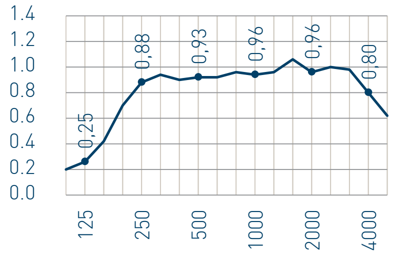


Overall structure	50 mm
Fleece	Bonded acoustic fleece
Test certificate	07.12.2010 M 61840/26
NRC	0.85
α_w	0.80 (L)
Absorber class	B (DIN EN 11654)
Acoustic infill	**50 mm mineral wool 100 kg/m³ in PE film**

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

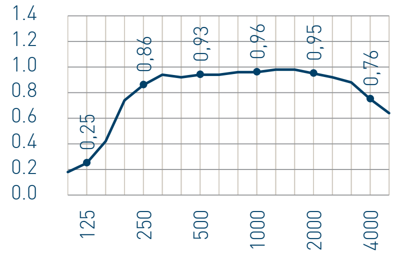


Overall structure	50 mm
Fleece	Bonded acoustic fleece
Test certificate	07.12.2010 M 61840/22
NRC	0.95
α_w	0.95
Absorber class	A (DIN EN 11654)
Acoustic infill	**50 mm mineral wool 100 kg/m³ in PE film**

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	→

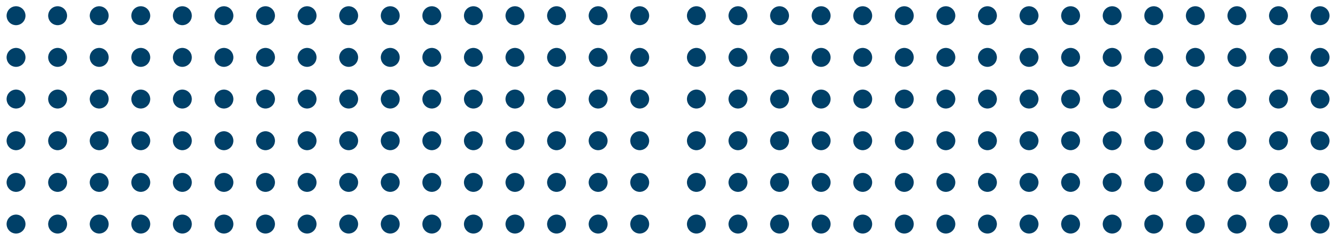
Sound absorption



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 floating ceiling

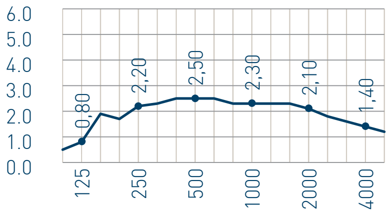
Post Finance, Bern (CH)



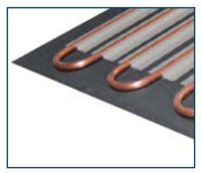
	Fural
	Rg 2.5 - 16 %
Perforation Ø	2.5 mm
Hole content	16 %
Max. perforation width	1,460 mm
Des. acc. to DIN 24041	Rg 2.50 - 5.50
Horizontal spacing	5.50 mm →
Vertical spacing	5.50 mm ↓
Diagonal spacing	7.78 mm ↘
Perforation direction	→

Sound absorption

Absorption area A_{Obj}/m² at one-third centre frequency f (Hz)



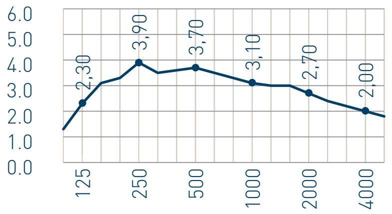
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	28.06.2019 M 105629/37
Equiv. sound absorp.	(500 Hz) 2.50 m²
Visible surface area	3.45 m²
Acoustic infill	**Cooling system**
Acoustic occ. level	73 % (cooling system with 12 heat conducting profiles)



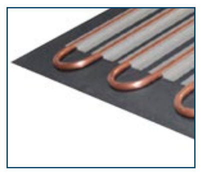
	Fural
	Rg 2.5 - 16 %
Perforation Ø	2.5 mm
Hole content	16 %
Max. perforation width	1,460 mm
Des. acc. to DIN 24041	Rg 2.50 - 5.50
Horizontal spacing	5.50 mm →
Vertical spacing	5.50 mm ↓
Diagonal spacing	7.78 mm ↘
Perforation direction	→

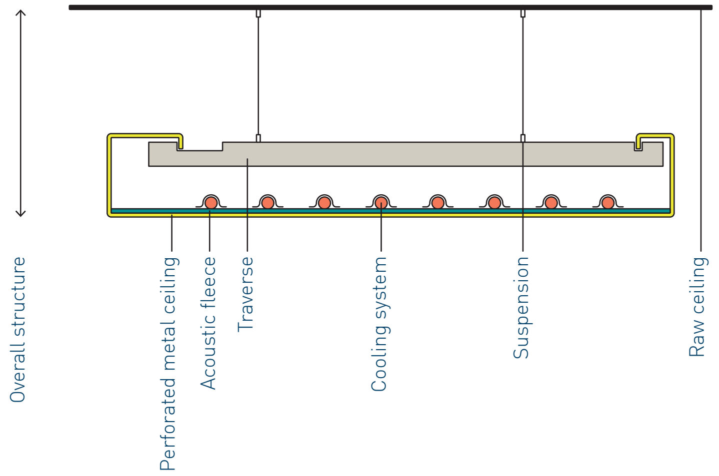
Sound absorption

Absorption area A_{Obj}/m² at one-third centre frequency f (Hz)



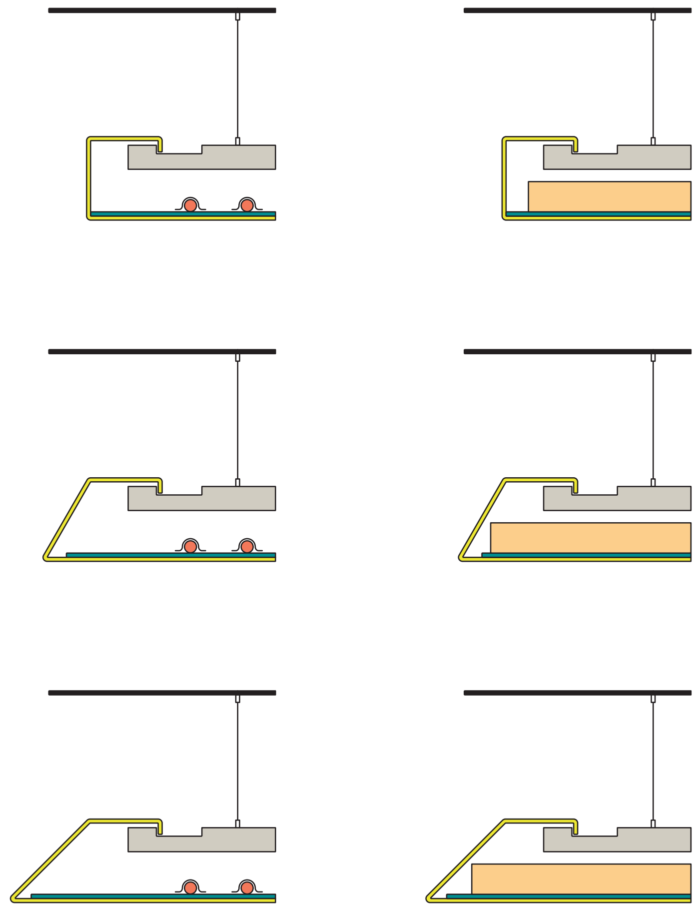
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	28.06.2019 M 105629/38
Equiv. sound absorp.	(500 Hz) 3.70 m²
Visible surface area	3.45 m²
Acoustic infill	**50 mm mineral wool 100 kg/m³ in PE film + cooling system**
Acoustic occ. level	73 % (cooling system with 12 heat conducting 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.

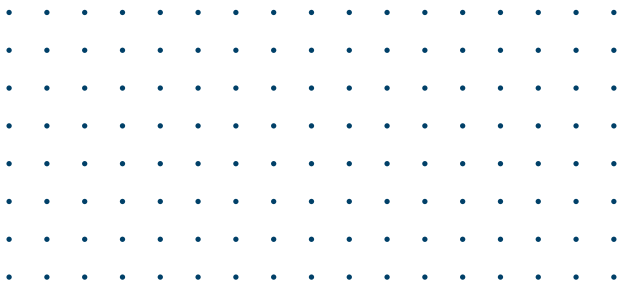
↑ UP

Acoustics, fire protection and aesthetics.
We think in terms of patient rooms.

Tested perforations 1

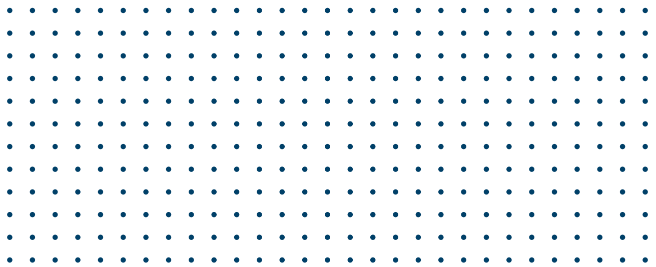
Fural
Rg 0.7 - 1 %

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



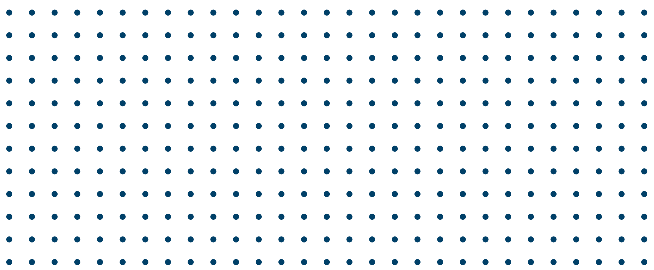
Fural
Rg 0.7 - 1.5 %

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



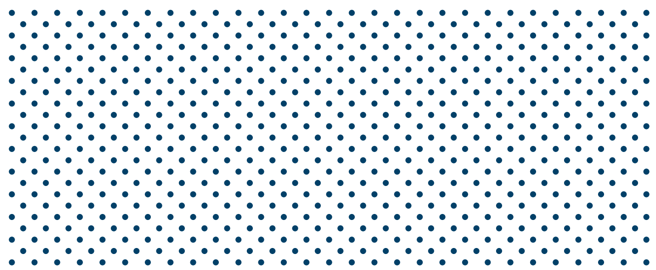
Fural
Rg 0.7 - 4 %

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



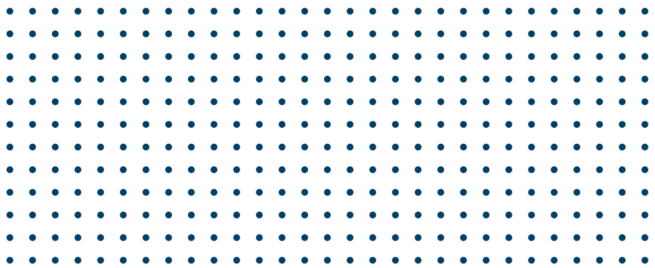
Fural
Rg 0.8 - 6 %

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



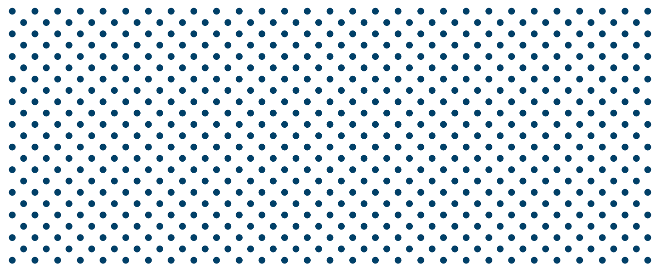
Fural
Rd 0.8 - 11 %

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 %

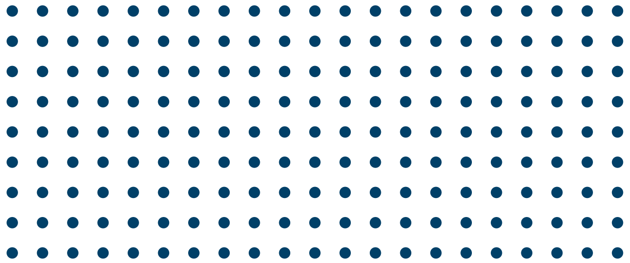
Perforation Ø	0.9 mm
Hole content	7 %
Max. perforation width	1,022 mm
Des. acc. to DIN 24041	Rg 0.90 - 3.00
Horizontal spacing	3.00 mm →
Vertical spacing	3.00 mm ↓
Diagonal spacing	4.24 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	30/09/2019 M 105629/44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

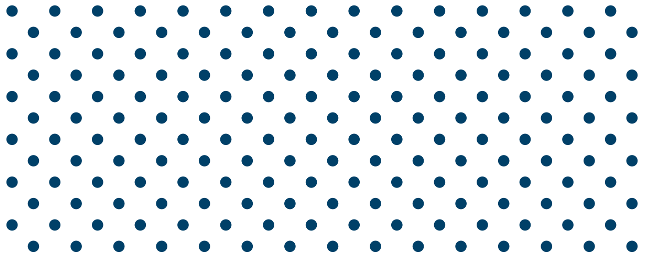


Fural
Rd 0.9 - 14 %

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

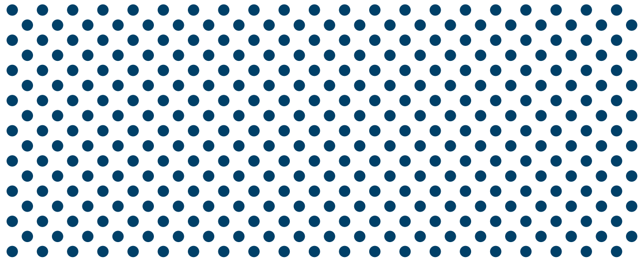
Tested perforations 2



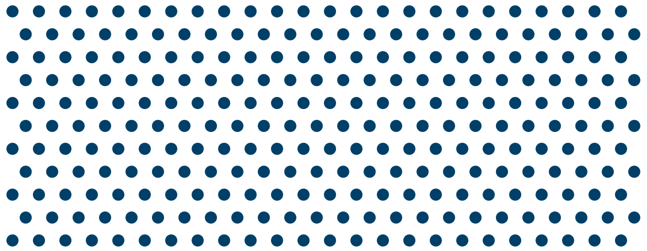


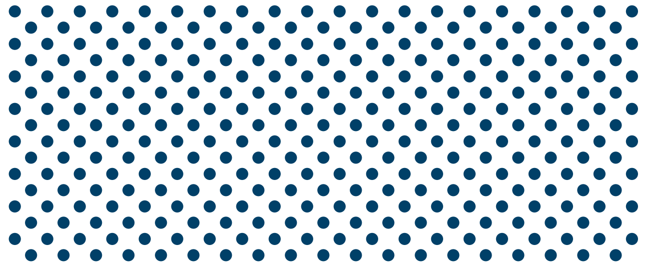
	Fural
	Rg 1.5 - 11 %
Perforation Ø	1.5 mm
Hole content	11 %
Max. perforation width	1,488 mm
Des. acc. to DIN 24041	Rg 1.50 - 4.00
Horizontal spacing	4.00 mm →
Vertical spacing	4.00 mm ↓
Diagonal spacing	5.65 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	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



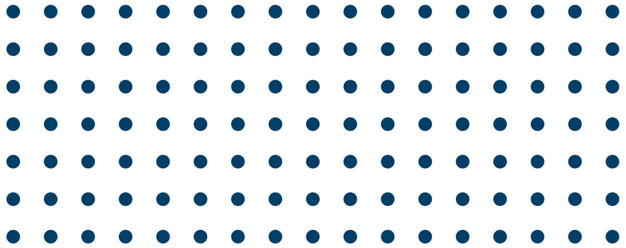
	Fural
	Rd 1.5 - 22 %
Perforation Ø	1.5 mm
Hole content	22 %
Max. perforation width	1,488 mm
Des. acc. to DIN 24041	Rd 1.50 - 2.83
Horizontal spacing	4.00 mm →
Vertical spacing	2.00 mm ↓
Diagonal spacing	2.83 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate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

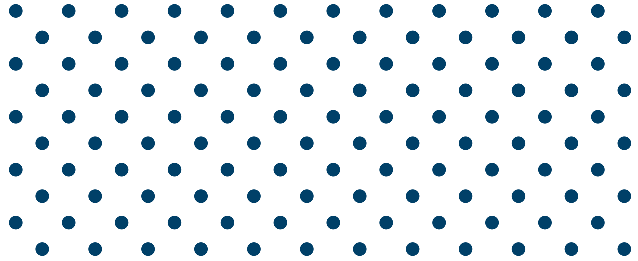




	Fural
	Rv 1.6 - 20 %
Perforation Ø	1.6 mm
Hole content	20 %
Max. perforation width	1,450 mm
Des. acc. to DIN 24041	Rv 1.60 - 3.50
Horizontal spacing	3.50 mm →
Vertical spacing	3.03 mm ↓
Offset spacing 60°	3.50 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	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

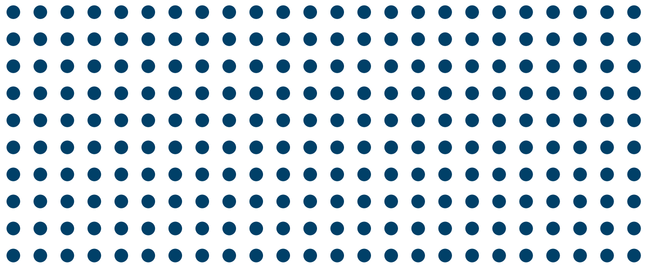




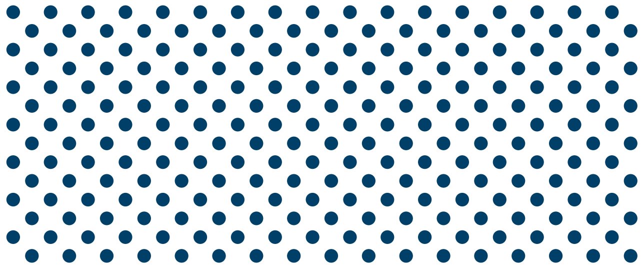
	Fural
	Rg 1.8 - 10 %
Perforation Ø	1.8 mm
Hole content	10 %
Max. perforation width	1,400 mm
Des. acc. to DIN 24041	Rg 1.80 - 4.95
Horizontal spacing	4.95 mm →
Vertical spacing	4.95 mm ↓
Diagonal spacing	7.00 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	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

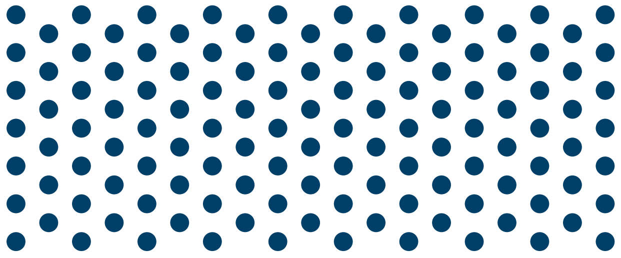
Tested perforations 3



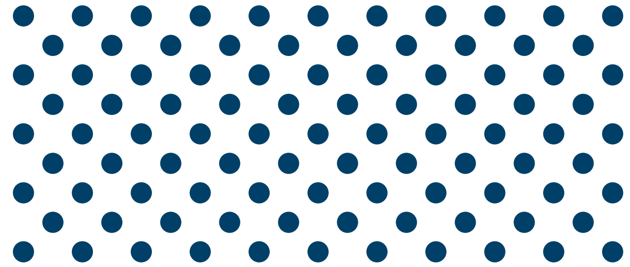
	Fural
	Rg 1.8 - 20 %
Perforation Ø	1.8 mm
Hole content	20 %
Max. perforation width	1.460 mm
Des. acc. to DIN 24041	Rg 1.80 - 3.50
Horizontal spacing	3.50 mm →
Vertical spacing	3.50 mm ↓
Diagonal spacing	4.95 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate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



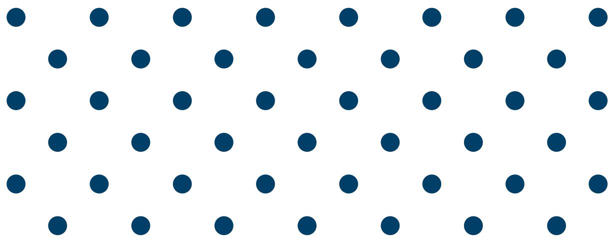
	Fural
	Rd 1.8 - 21 %
Perforation Ø	1.8 mm
Hole content	21 %
Max. perforation width	1,400 mm
Des. acc. to DIN 24041	Rd 1.80 - 3.50
Horizontal spacing	4.96 mm →
Vertical spacing	2.48 mm ↓
Diagonal spacing	3.50 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	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



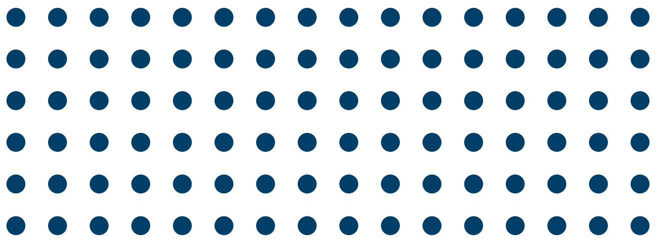
	Fural
	Rv 2.5 - 23 %
Perforation Ø	2.5 mm
Hole content	23 %
Max. perforation width	1,467 mm
Des. acc. to DIN 24041	Rv 2.50 - 5.00
Horizontal spacing	8.66 mm →
Vertical spacing	2.50 mm ↓
Offset spacing 60°	5.00 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	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



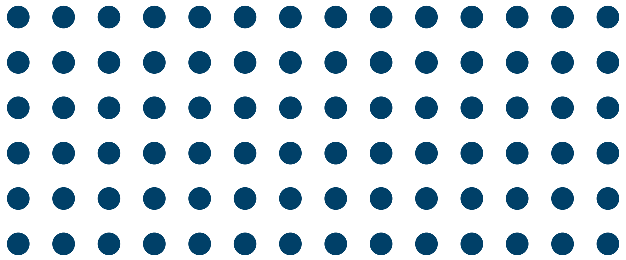
	Fural
	Rd 2.8 - 20 %
Perforation Ø	2.8 mm
Hole content	20 %
Max. perforation width	627.9 mm
Des. acc. to DIN 24041	Rd 2.80 - 5.50
Horizontal spacing	7.80 mm →
Vertical spacing	3.90 mm ↓
Diagonal spacing	5.50 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate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



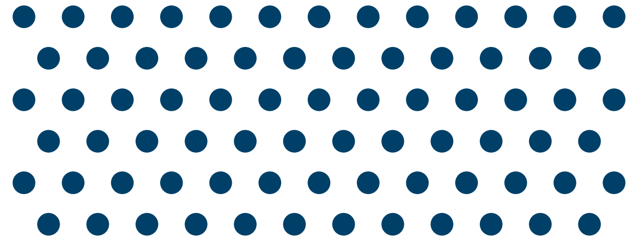
	Fural
	Rd 2.5 - 8 %
Perforation Ø	2.5 mm
Hole content	8 %
Max. perforation width	1,460 mm
Des. acc. to DIN 24041	Rd 2.50 - 7.80
Horizontal spacing	11.0 mm →
Vertical spacing	5.50 mm ↓
Diagonal spacing	7.78 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	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

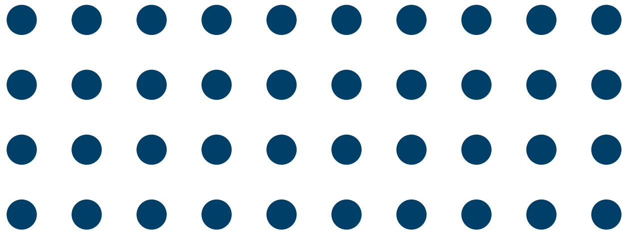


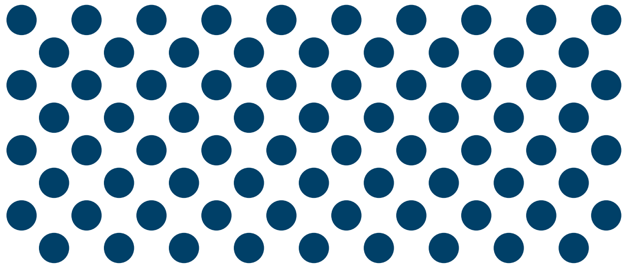
	Fural
	Rg 3.0 - 20 %
Perforation Ø	3.0 mm
Hole content	20 %
Max. perforation width	1,434 mm
Des. acc. to DIN 24041	Rg 3.00 - 6.00
Horizontal spacing	6.0 mm →
Vertical spacing	6.0 mm ↓
Diagonal spacing	8.48 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	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

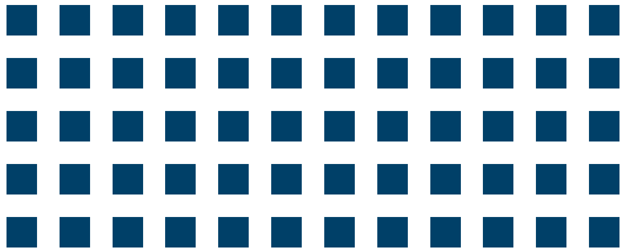
Tested perforations 4

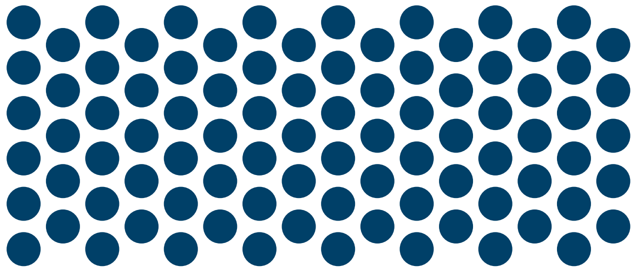




	Fural
	Rg 4.0 - 17 %
Perforation Ø	4.0 mm
Hole content	17 %
Max. perforation width	1,453 mm
Des. acc. to DIN 24041	Rg 4.00 - 8.60
Horizontal spacing	8.60 mm →
Vertical spacing	8.60 mm ↓
Diagonal spacing	12.1 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate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

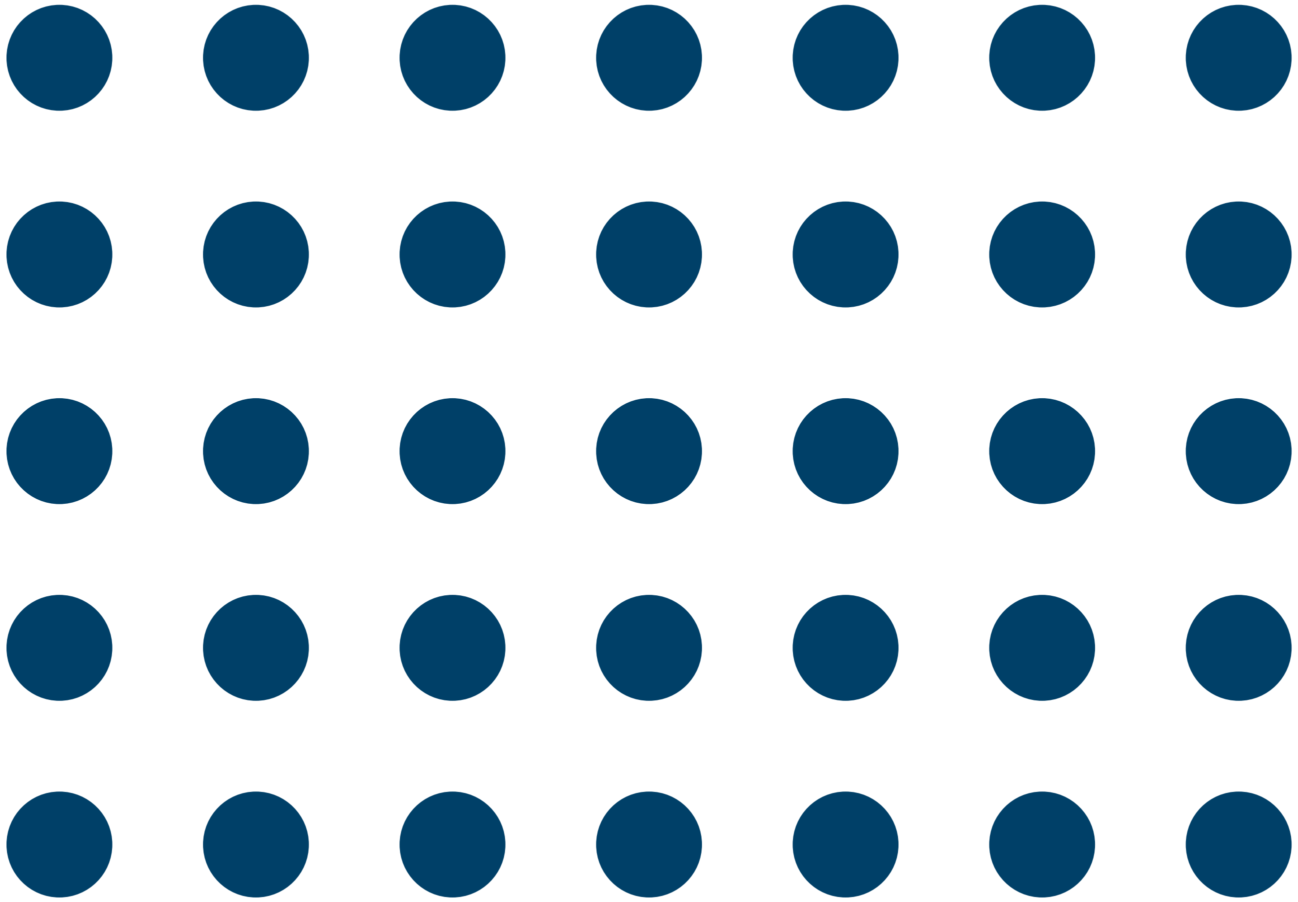
	Fural
	Rd 4.0 - 33 %
Perforation Ø	4.0 mm
Hole content	33 %
Max. perforation width	1,450 mm
Des. acc. to DIN 24041	Rd 4.00 - 6.10
Horizontal spacing	8.60 mm →
Vertical spacing	4.30 mm ↓
Diagonal spacing	6.10 mm ↘
Perforation direction	→
Overall structure	200 mm
Fleece	Bonded acoustic fleece
Test certificate	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

We are 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.

Disinfectability

Hygiene and sterility

In hygiene-sensitive buildings such as hospitals, cleanliness and sterility are paramount. Metal ceilings from Fural Metalit Dipling provide the necessary conditions for this. They not only prevent dust particles from settling, but also ensure that surfaces are easy to clean. The plasterboard behind the metal layer of our fire protection cassettes remains completely sealed and does not allow dust to accumulate. Our metal ceilings offer optimum disinfectability thanks to the closed and painted surface. An additional antibacterial coating is therefore no longer necessary. A variety of commercially available disinfectants are suitable for disinfecting our metal ceilings. In addition, our special ventilation ceilings with HEPA filters ensure low particle entry and promote optimum air exchange.

Disinfection

Suitable disinfectants (e.g. Sagrotan or similar) can be added to the cleaning water to disinfect the metal ceilings of Fural Metalit Dipling. In this case, however, it should be determined by testing in an inconspicuous area whether the disinfectant additive causes a change or discoloration of the paint surface.

Colored disinfectants

Colored cleaning agents or disinfectants are often used in hospitals to visually check the cleaning process. However, these cannot be used on ceilings made of plasterboard or mineral fiber, as they would leave marks. However, their use is not a problem with metal ceilings from Fural Metalit Dipling.

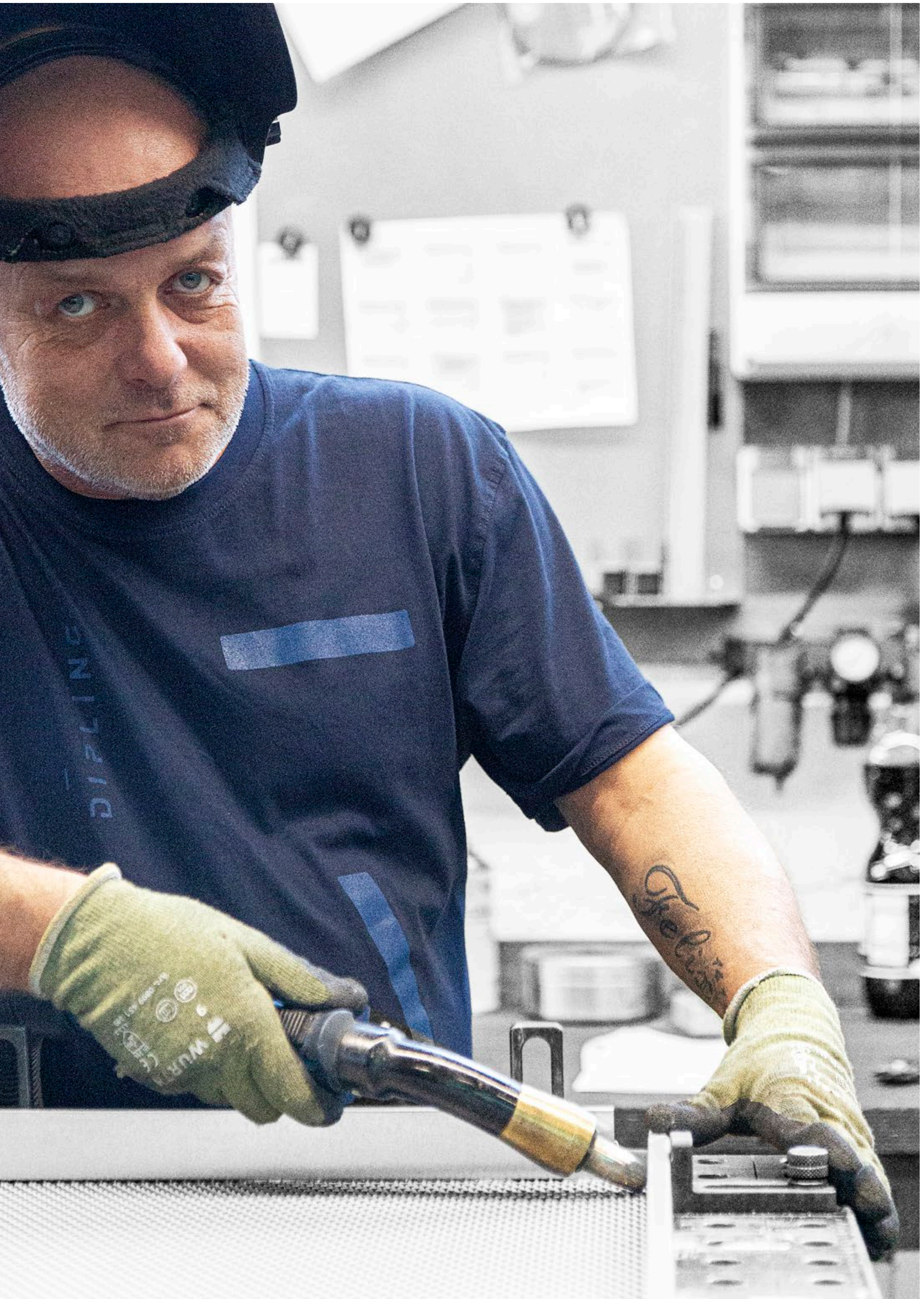
Tests

Certain disinfectants have been tested in-house and found to be harmless. Please contact us for more information. We are also happy to test new agents on our surfaces for you or provide you with samples.

We are precision.
We are industry.
We are hundredths of a millimeter.

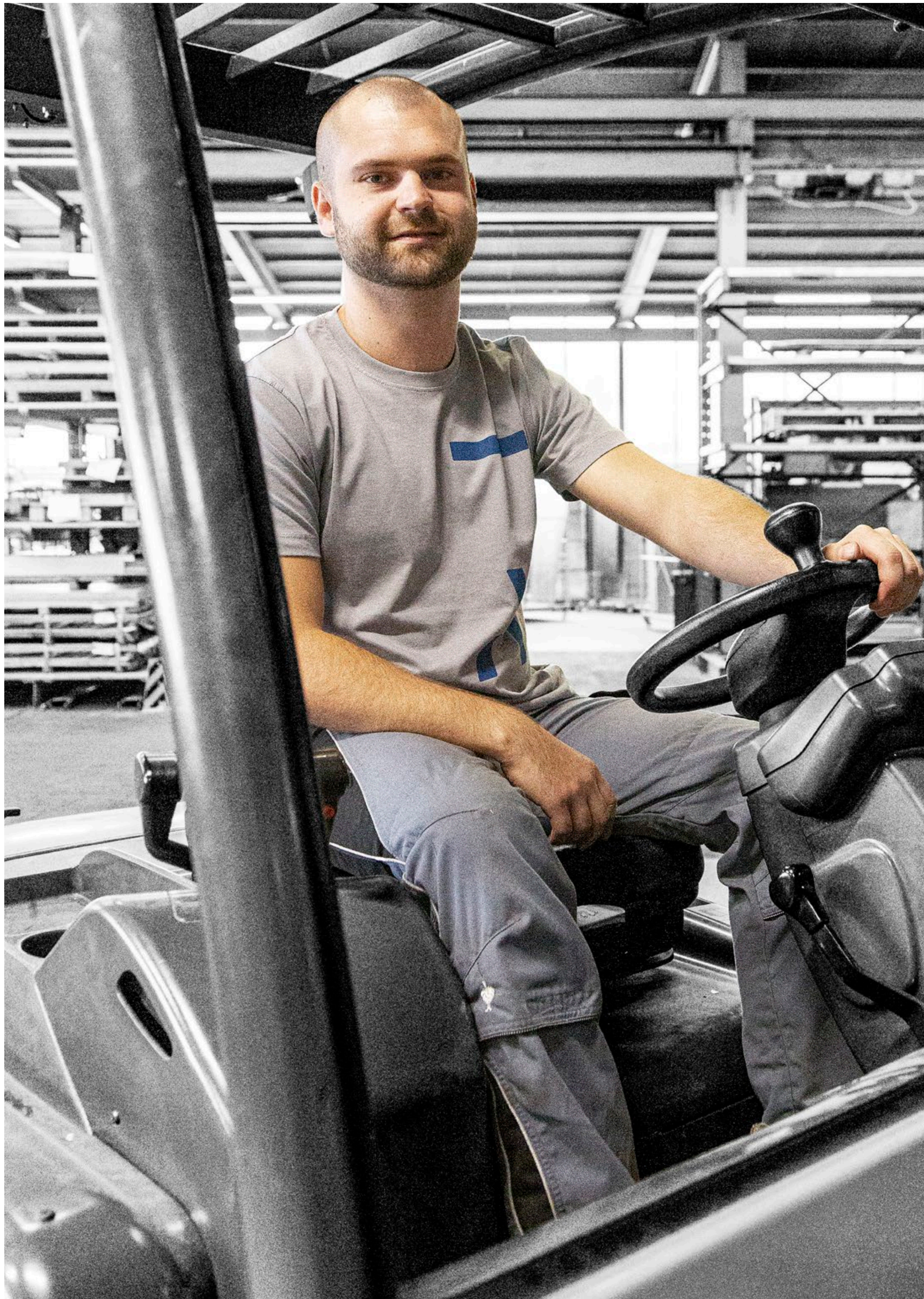
New values

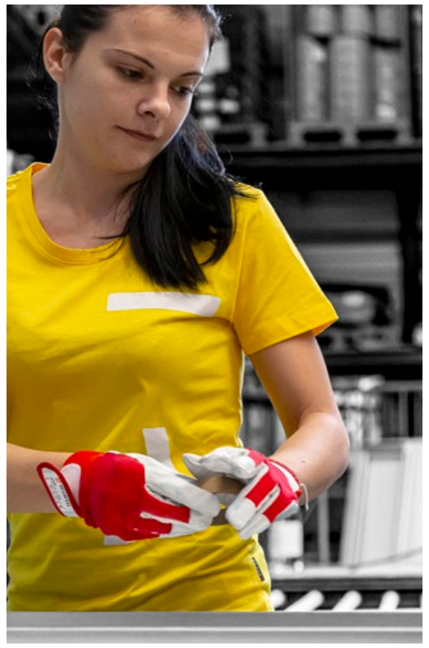
Fural Metalit Dipling has invested continuously over the decades: technical innovations that have inspired us and our employees, increased precision and expanded the possibilities. We have often been market leaders and have expanded our machinery with foresight in order to achieve the optimum for our customers. Today, we are proud to be able to offer unique solutions, respond to individual requirements and realize products that are otherwise not found in the industry. Continuous, sustainable growth guarantees smooth production processes and leaves room for innovations to be put to good use.

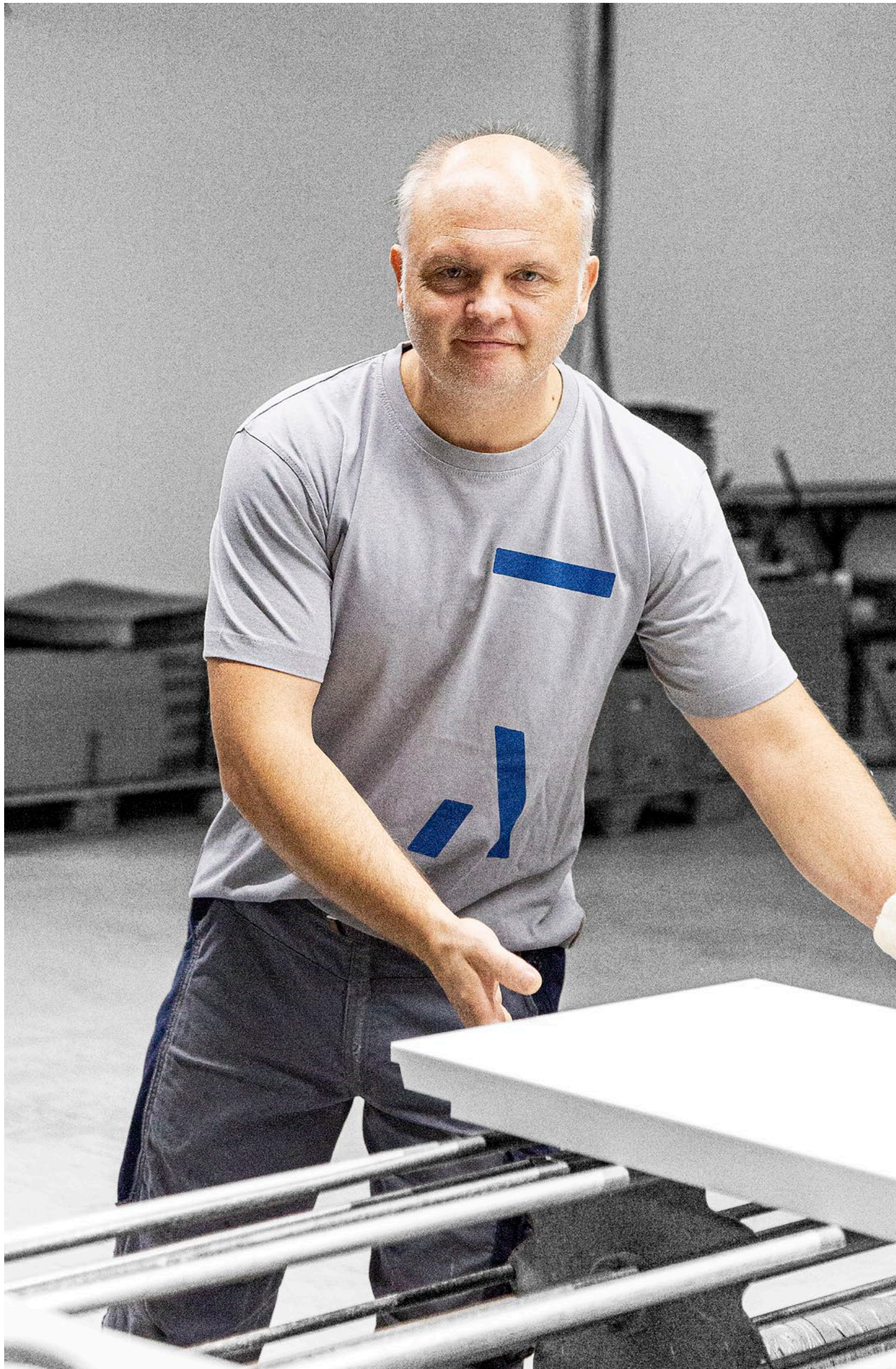


People with passion

Much more than just a part of our new image: our shirt collection in the company colors also reflects the attitude of our outstanding employees - their full commitment and quality awareness are dedicated to the Fural Metalit Dipling group of companies. A team that works together on products to be proud of. This visible sign of being part of a group of companies that has grown together and is focusing on the future by joining forces was well received by everyone involved. In other words, a living corporate culture that presents itself uniformly to the outside world.







High - tech and craftsmanship

Despite all the optimization and innovative precision machines, our most important asset is our highly qualified employees. 268 employees ensure smooth production processes, punctual production, flawless products, but also innovative developments and new ideas. High-tech and craftsmanship go hand in hand and characterize Fural Metalit Dipling as an employee-friendly and customer-oriented company.

The built environment is an essential factor in the fight against Climate Change.

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)

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