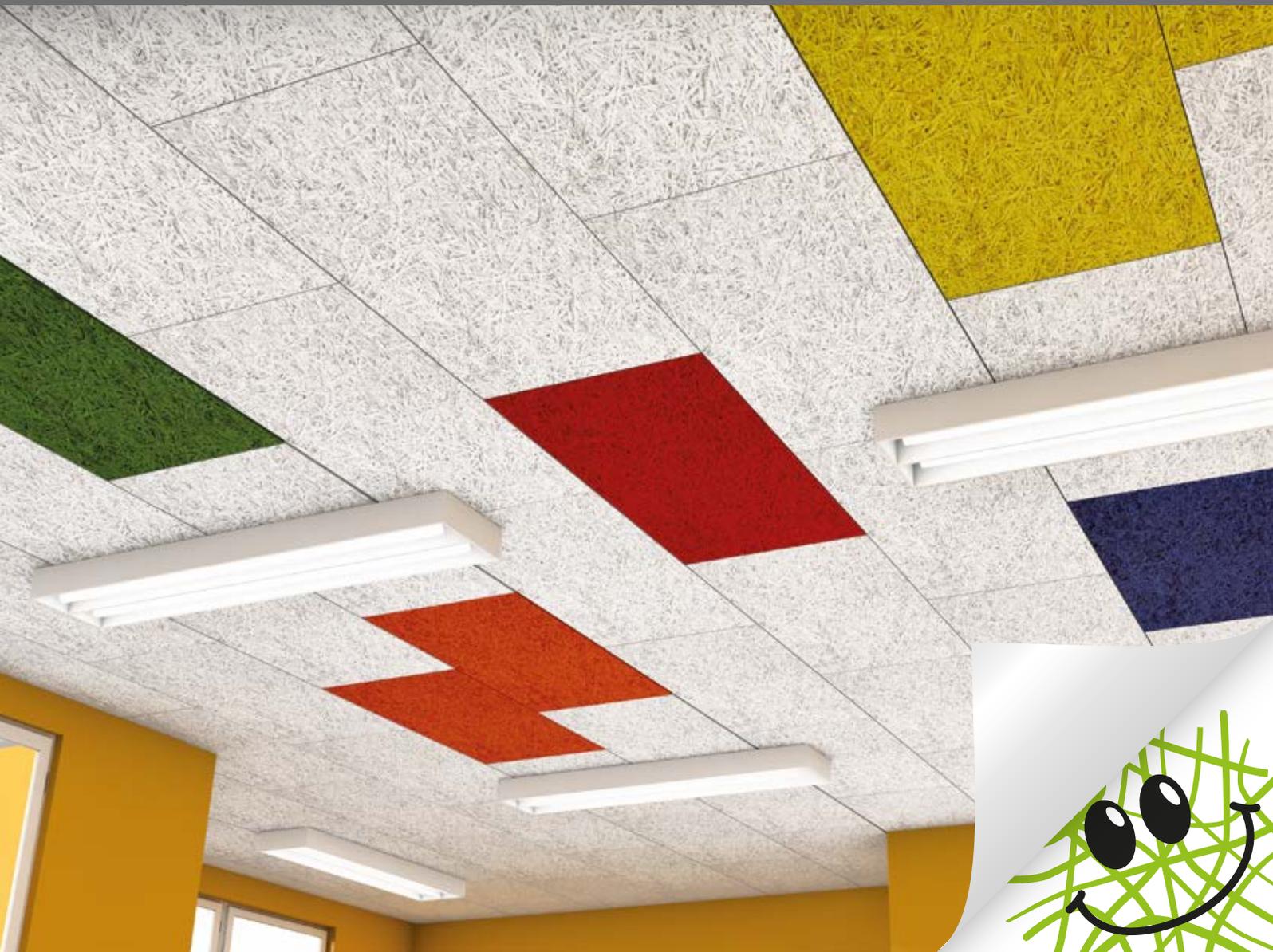


# Relaxation for your ears

Fibro-Kustik for room acoustic solutions





# Fibrolith insulation materials

Fibrolith wood-wool light-weight boards are used not only in basement garages, but also offer unimagined interior design possibilities. With their characteristic appearance the boards meet the architectural spirit of the times, where purist and natural materials are in high demand.

## Company

The Fibrolith Dämmstoffe GmbH is a subsidiary of Siniat GmbH and a company of the global Etex Group. With innovative and environmentally friendly production, Fibrolith annually produces hundreds of thousands of proven wood-wool light-weight and multi-layer boards for thermal, acoustic and fire protection applications – made in the Eifel (Kempenich, Germany).

## We rely on the region

When choosing the raw materials to be used, we prefer regional suppliers and partners from the Vulkaneifel region for ecological reasons.



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# Room acoustics

Acoustics is a central aspect for a pleasant sense of space. If the reverberation time of spoken words or sounds is too long, you quickly feel uncomfortable. The causes of this unpleasant effect are generally hard and smooth surfaces that are not sufficiently sound absorbent.

## Room acoustic requirements

The basis for recommendations for the acoustical design of small to medium-sized rooms is DIN 18041 "Acoustical Quality in Rooms- Requirements, Recommendations and Notes on Planning" (as of 2016).

## Room acoustical parameters

The reverberation time is regarded as the essential characteristic for the assessment of the acoustical quality of a room. It specifies the amount of time a sound level drops by 60 dB after the end of the sound.

Speech intelligibility is another room acoustic parameter. In different rooms with the same reverberation time, speech intelligibility can also differ. Basically you can say: The shorter the reverberation time, the better the speech intelligibility.

## Sound absorbing materials

Sound-absorbing materials must be used if reverberation times are to be optimized. The higher the sound absorption rate of a material, the more the reverberation time can be reduced.

## Optimal solution – acoustic ceilings

Since the ceiling usually offers the largest free area of a room, an acoustic ceiling makes it possible to achieve the greatest reduction in reverberation times. If there is no possibility to install a full acoustic ceiling, ceiling panels and wall absorbers can also provide the required sound absorption.

Due to their sound-absorbing wood-wool structure, Fibro-Kustik boards can be used to produce individually designed and highly effective acoustic ceilings, ceiling panels, and wall absorbers.



# Fibro-Kustik acoustic boards

Ceiling panels, room dividers, wall elements, or full-surface wall and ceiling cladding made of Fibro-Kustik boards improve the room acoustics and create a natural coziness. Due to the open pore structure with numerous cavities, they achieve very good sound absorption values.

The characteristic surface texture of the wood-wool boards offers creative design possibilities.

## Fibro-Kustik

The Fibro-Kustik acoustic boards are manufactured with renewable raw materials from the region. Like the people, the landscape, and the weather, the boards also have their special characteristics: strong and robust, of course.

Whether in residential, commercial, industrial, or public buildings such as gastronomy, offices, schools, kindergartens, sports halls, sports facilities, production facilities, halls, theaters, movie theaters, or shops – wherever spatial acoustics are to be improved with creative aspiration, our wood-wool boards come into play.

## Board types

Fibro-Kustik acoustic boards are available in four types: Florence, Barcelona, Paris, and Berlin. They differ in fire resistance and fiber widths.

Scroll through and go on a city trip with us!

## Product characteristics / benefits

- General building approval: AbZ 2-23.15-1622
- Acoustic board according to DIN EN 13168, WW DI dm / WI dm
- Wood-wool, minerally bound
- Ecologically sound
- High vapor permeability
- Good sound absorption values of  $\alpha_w$  up to 0.85
- Robust and resistant surface
- Impact resistance
- Easy installation
- Multiple applications
- Creative design

## Fire protection

- Non-flammable A2- s1, d0 as per DIN EN 13501-1
- Flame retardant B- s1, d0 as per DIN EN 13501-1



## Impact resistance

Above 25 mm thick Fibro-Kustik boards are ball impact resistant – an important prerequisite for use in sports and leisure facilities.

- Test report (wall):  
903 1238 000-1/MAN/H, MPA Stuttgart
- Test report (ceiling):  
903 1238 000-2/MAN/H, MPA Stuttgart

## Sound absorption rate $\alpha_s$

The sound absorption rate  $\alpha_s$  of unplastered Fibro-Kustik boards are influenced by the pore structure and the design of the construction. In closed buildings, they lower noise levels, improve room acoustics, and regulate resonance times.

## Ballistic resistance

One special feature of the 25 mm and above thick Fibro-Kustik boards is the recoil retarding effect or ballistic impact and recoil safety. This is required for linings of ceilings and walls in shooting ranges.

- Expert opinion: No. 2011/007

## Color and design

Whether natural or colored, with fine or superfine structure – Fibro-Kustik boards meet the architectural spirit of the times with their characteristic optics, in which puristic and natural materials are in great demand.

Fibro-Kustik boards are available from the factory with their natural appearance and with RAL or NCS colors.





# The Fibro-Kustik city trips



## Fibro-Kustik *Florence*

- Fire behavior: A2- s1, d0 non-flammable
- Wood-wool: super fine, approx. 1 mm
- Dimensions (mm): 1200x600, 1000x600\*, 600x600
- Board thicknesses (mm): 15\*, 25\*



## Fibro-Kustik *Barcelona*

- Fire behavior: B- s1, d0 flame retardant
- Wood-wool: super fine, approx. 1 mm
- Dimensions (mm): 1200x600, 1000x600\*, 600x600
- Board thicknesses (mm): 15\*, 25\*, 35, 50

\* Board format 1000 x 600 mm in 15 and 25 mm thickness upon request





## Fibro-Kustik *Paris*

- Fire behavior: A2- s1, d0 non-flammable
- Wood-wool: fine, approx. 2 mm
- Dimensions (mm): 1200x600, 1000x600\*, 600x600
- Board thicknesses (mm): 15\*, 25\*



## Fibro-Kustik *Berlin*

- Fire behavior: B- s1, d0 flame retardant
- Wood-wool: fine, approx. 2 mm
- Dimensions (mm): 1200x600, 1000x600\*, 600x600
- Board thicknesses (mm): 15\*, 25\*, 35, 50

\* Board format 1000 x 600 mm in 15 and 25 mm thickness upon request





# Schools and kindergartens

For ceiling renovations in educational institutions, it is not only a case of improving the acoustics, but also of minimizing health hazards, something which employers and supporters of schools and child-care centers are obliged to observe. The noise exposure for staff and children has been neglected here for a long time.

## Requirements

DIN 18041 describes the different room usage types and volumes of space for optimized reverberation time for the appropriate application. A distinction is made between the three types of use: music, language, and education.

For the child-care center multi-purpose room (see right page "practical example"), the usage to be applied was "education".

The permitted reverberation time for the measured area with a volume of approximately 175 m<sup>3</sup> had a target reverberation time according to DIN 18041:2004 of 0.55 s ± 20%. This requirement was not met by the existing ceiling.

## Solution



The open-pore and sound-absorbing material of the Fibro-Kustik wood-wool acoustic boards, with mineral wool, is the ideal solution to improve reverberation times in rooms.

The branching structure of the wood-wool boards and the underlying mineral wool literally swallow the sound waves.



At the same time, Fibro-Kustik boards meet the fire-protection requirements with their fire resistance B1-s1, d0 or A2-s1, d0 (building material classes according to DIN EN 13501-1).

In addition, the five colors of the care groups should be integrated into the ceiling design. Inspiration for the geometric look of the ceiling was the puzzle-like computer game "Tetris" from the 80s, whose angular shapes and bright colors are fully back in vogue while also bringing to mind the building blocks you play with.



## Practical example

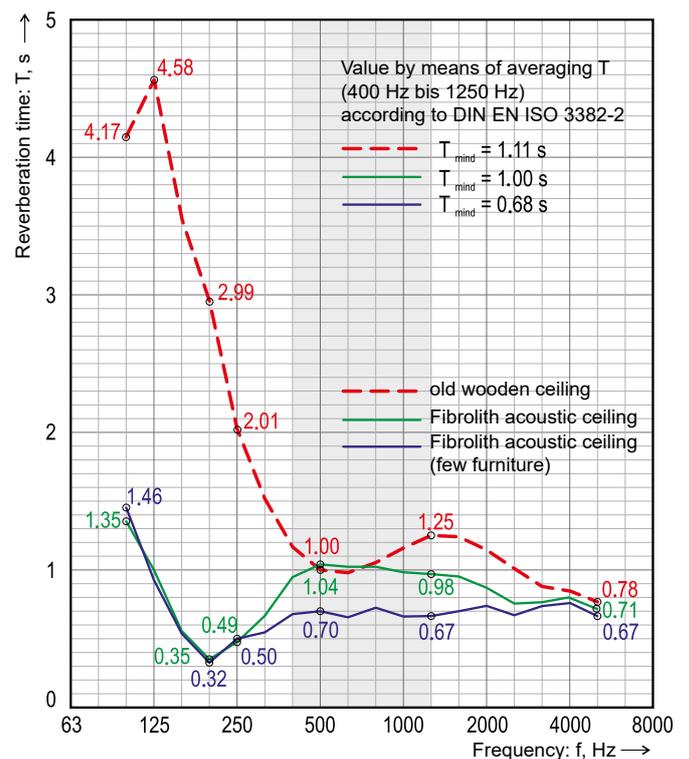
With the new acoustic ceiling made of Fibro-Kustik boards, the reverberation times in some areas can be reduced by more than 50 %. Quote from an educator: *“Relaxation for your ears”*



Multi-purpose room of the child-care center before the ceiling renovation.



New acoustic ceiling in the RAL colors of the five child-care groups.



The comparison clearly shows the reduction of the reverberation time by more than 2 seconds. Testing institute: BAE Fiedler - Büro für Akustik & Engineering, Test report No. BAE 16-302.

# Sports facilities and recreational buildings

In gyms, swimming pools, fitness studios, or indoor playgrounds, a relatively large number of people move in a limited area. Due to calling out, shouts, clapping or music, it can be correspondingly loud. Architectural conditions as well as smooth, hard floor and wall surfaces also reinforce the noise level.

## Requirements

The construction of sports halls is regulated, among other things, by the following standards:

- DIN 18041 and DIN 18032-1 "Sports halls- Halls and rooms for sports and multi-purpose use, Part 1: "Principles of Planning".
- DIN 18032-4 "Sports halls – Halls for gymnastics, games and multi-purpose use, Part 4: Double-shell separating curtains".

For pure sports halls without an audience in one-off teaching activities with 2,200- 8,500 m<sup>3</sup>, DIN 18041 provides reverberation times of 1.7- 2.5 seconds.

For multi-field halls with several lessons 1.4- 2.0 seconds.  
For multipurpose halls and sports halls with public for linguistic use 1.1 and 1.4 seconds.

To meet these requirements, ball impact resistant wall and ceiling claddings are required.

## Solution



The sound-absorbing acoustic boards from Fibrolith can be used to produce wall and ceiling claddings which meet the required reverberation times in sports halls.



The Materials Testing Institute University of Stuttgart (MPA) confirms that Fibro-Kustik boards with a thickness  $\geq 25$  mm are ball impact resistant:

- Test report wall:  
903 1238 000-1/MAN/H, MPA Stuttgart
- Test report ceiling:  
903 1238 000-2/MAN/H, MPA Stuttgart

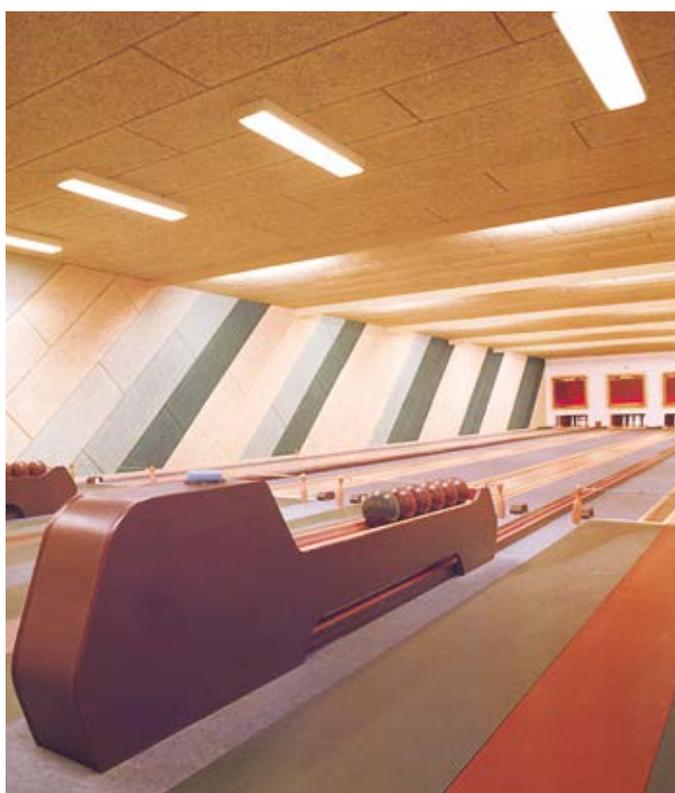


Due to the good fire-protection properties, Fibro-Kustik boards can also be used for fire-protection requirements.



## Practical examples

In addition to the acoustic advantages, wall and ceiling claddings with Fibro-Kustik boards in sports facilities and recreational buildings provide for a friendly and modern ambiance as well as a good room climate. With different board formats, fine and super fine fiber widths in the color WD natural or with colored surfaces, Fibro-Kustik boards can be used for creative designs.



# Offices and administrative buildings

In modern office and administrative buildings, open and generous spatial concepts are increasingly being implemented, which contribute to better internal communication and reduce hierarchical levels. Without appropriate acoustic measures that reduce the sound level, bad room acoustics in large and open workplaces can have a negative effect on the productivity and well-being of employees.

## Requirements

Both DIN 18041 "Acoustical Quality in Rooms - Requirements, Recommendations and Notes on Planning" (as of 2016) and the guideline VDI 2569 "Sound Protection and Acoustic Design in the Office" recommend sound-absorbing materials to reduce the noise level in office rooms. The DIN 18041 differentiates between rooms in group A and B. Offices belong to the rooms of group B.

For open-plan offices, however, the requirements of DIN EN ISO 3382-3 "Acoustics - Measurement of Parameters of Room Acoustics - Part 3: Open-Plan Offices".

Download from: [www.beuth.de](http://www.beuth.de)

Keywords: DIN 18041, VDI 2569, DIN EN ISO 3382-3

## Solution



With Fibro-Kustik boards you can also create variable room dividers in office and administrative buildings in addition to sound-absorbing wall and ceiling claddings. Reverberation times can be significantly reduced, for example in open-plan offices or in confidential areas.



Fibro-Kustik boards are produced from natural raw materials in an environmentally friendly manner. They are biologically harmless, have a high vapor permeability and thus ensure a balanced room climate.



Due to the good fire-protection properties, Fibro-Kustik boards can also be used for fire-protection requirements.



## Practical examples

Natural or colored wall and ceiling claddings in stairwells or freestanding room dividers with sound-absorbing Fibro-Kustik boards ensure good room acoustics in offices. Directly fastened or suspended acoustic panels optimize the reverberation times and improve the language comprehension.



# Catering

Modern restaurants or bars often have relatively large areas and high ceilings. In addition, they are open and purist, according to the spirit of the times. This can have a negative effect on the noise level. In order to make the guests feel comfortable, so they can enjoy their food and drinks and relax, good room acoustics is decisive. A German expression says "Your eye and ear also eat", this is true, gastronomy is not just about the pure function of the acoustic measures, but also about their design.

## Requirements

For the acoustic design of restaurants DIN 18041, rooms of group B, "Acoustical Quality over Small Distances" applies. A simplified procedure is proposed for eating places, dining rooms and canteens with a floor area of over 50 m<sup>2</sup>. Table 6 of the standard provides corresponding orientation values.

However, the practice shows that, despite the DIN requirements and the reverberation times, noise disturbances and aggravated speech intelligibility can occur.

In restaurants, acoustic ceilings made of Fibro-Kustik boards have proven their worth in the interruption of the sound propagation. In addition, room dividers made of Fibro-Kustik boards can help to improve the room acoustics.

## Solution

Fibro-Kustik boards with their distinctive wood-wool structure meet the current spirit of the times of interior architecture. In modern restaurants, cafes or bars, puristic and rustic products made from natural materials are in demand.

The Fibrolith acoustic boards are suitable for both creative ceiling claddings and room dividers. Individually designed ceiling panels or wall absorbers can also be produced with Fibro-Kustik without problems and simply "do-it-yourself". The boards can be delivered in all RAL or NCS colors from the factory. There is something suitable for every gastronomic concept.



## Ideas and inspiration

The natural acoustic boards fit harmoniously into the coffered ceiling with exposed wooden beams in a wellness and recreational pool (picture bottom left). Just as timeless and in matching gold tone- Fibro-Kustik boards in a traditional cocktail bar in colonial style (picture bottom right).





# Shops and sales areas

In order to be able to sell goods or services successfully, the sales areas have to meet all the senses so that the consumers feel comfortable in them. Noise or disturbing sound can degrade communication and can lead to stress. Both are bad conditions for buying and selling. In addition to good acoustic properties, the materials used for wall and ceiling claddings should also meet visual requirements and be harmoniously integrated into the design concept of the shop.

## Requirements

Similar to the "gastronomy" application area, sales rooms according to DIN 18041 belong to rooms in group B, "Acoustical Quality over Small Distances".

Furthermore, sales centers are a publicly accessible area with goods presentation. Special requirements for accessibility apply to their planning, implementation and equipment (DIN 18040-1 "Barrier-free Construction - Planning Principles - Part 1: Publicly Accessible Buildings"). This is not only about people with motor impairments or visual impairments, but also about people with hearing impairments. This includes a correspondingly good room acoustics.

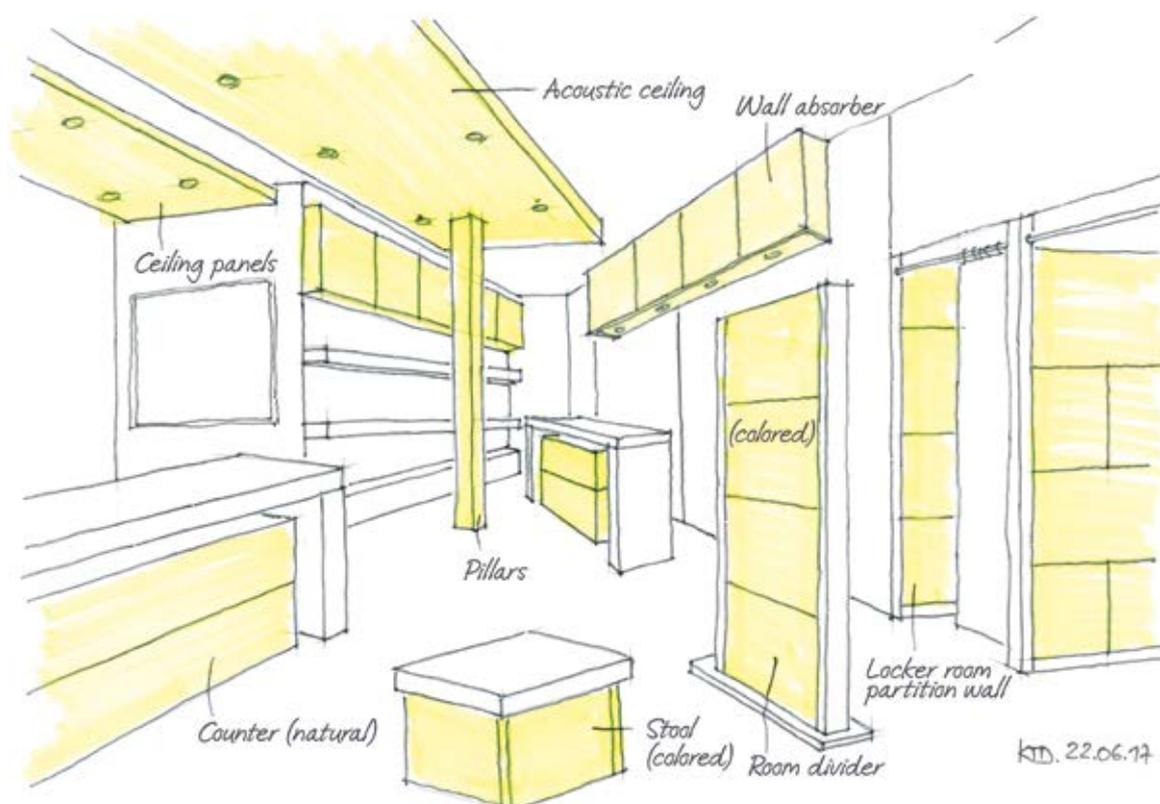
## Solution

In modern shops and sales areas, Fibro-Kustik boards offer nearly unlimited possibilities of use. The double advantage: Acoustic boards firstly, with their natural and puristic surface-structure, which can be designed in any color, meet the spirit of the times of modern shop concepts. Secondly, in addition to the walls and ceilings, almost all surfaces in the sales room can be clad with the sound-absorbing boards.

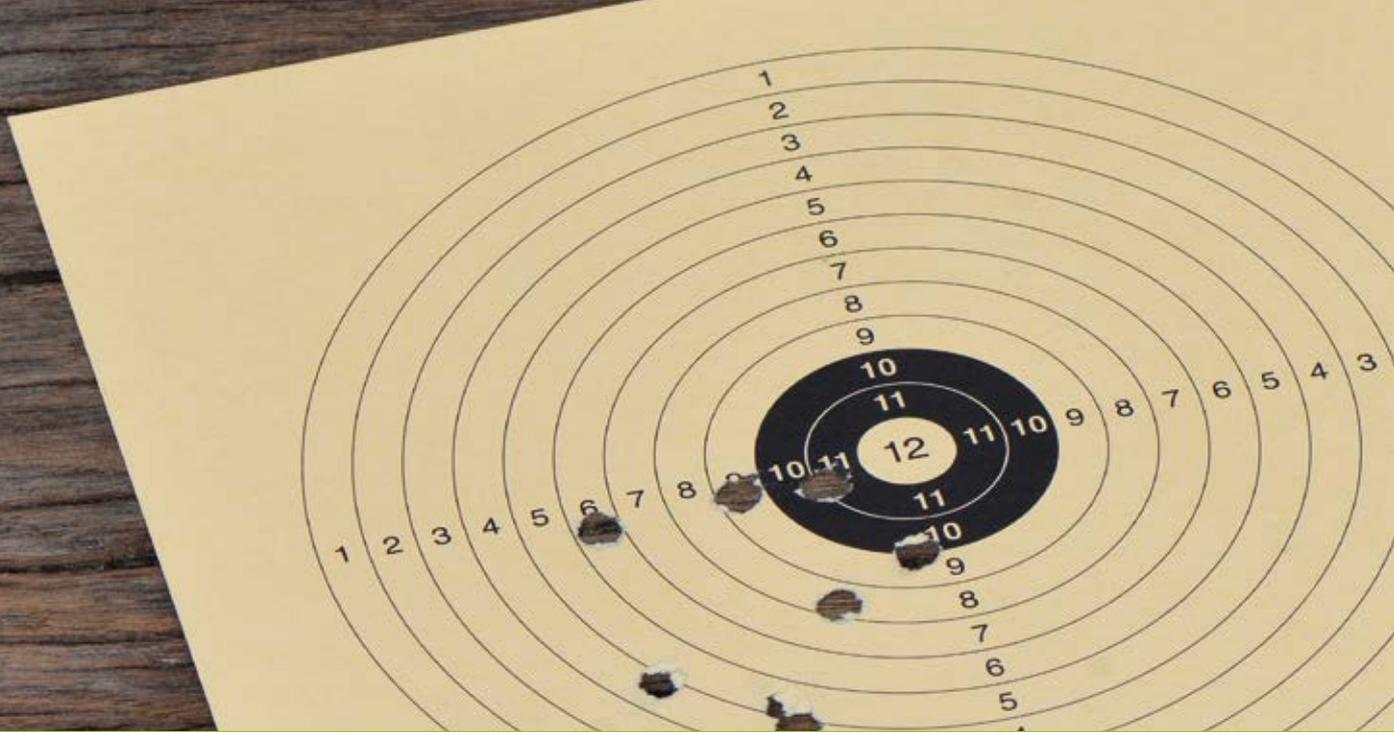


## Ideas and inspiration

Whether ceiling panels, ceiling claddings, wall absorbers, partition walls in changing rooms, room dividers, cladding of pillars, counter-fronts, or seat stools- Fibro-Kustik boards give the shop a modern and natural look and at the same time ensure pleasant room acoustics. Try it!



Idea sketches and inspiration: versatile application and management possibilities with Fibro-Kustik boards, which can lead to the improvement of room acoustics.



# Shooting ranges

Shooting ranges must comply with special rules of the Weapons Act. They are intended to ensure that the internal and external safety of a shooting range is provided for sporting and professional practice and shooting. In addition to acoustic requirements, basic building materials with suitable mechanical properties are to be used for the production of shooting ranges - especially with a recoil-retardant effect.

## Requirements

Basically, enclosing elements of a shooting path (side walls and ceilings) must be designed to be bullet-proof and recoil-proof in the direction of fire. The Federal Ministry of the Interior regulates the constructional requirements for the erection, acceptance and operation of shooting ranges in accordance with § 12, Paragraph 3, Sentence 2 of the General Weapons Act (Shooting Range Guidelines).

Download from: [www.bundesanzeiger.de](http://www.bundesanzeiger.de)

Keyword: Shooting directives



## Solution



Due to their excellent sound absorption values, Fibro-Kustik boards are particularly suitable for the sound insulation of sports and area shooting ranges. The characteristic structure of the wood-wool boards with fine or super fine wool literally "swallows" the sound of shots and ensures acoustically pleasant surroundings.



As far as safety is concerned, Fibro-Kustik boards have excellent rebound- and recoil-retardant properties. An expert report on the audit concerning the inhibitory sound recoil properties with Fibro-Kustik boards with respect to compliance with the shooting directive is available.



Due to the good fire-protection properties, Fibro-Kustik boards can also be used for fire-protection requirements.



## Practical example

In the shooting range of a sports club, not only were the walls and ceilings covered with Fibro-Kustik boards, but also the columns and beams. In addition to the functional properties, the bacteriological harmlessness of the boards was an important criterion for the club.

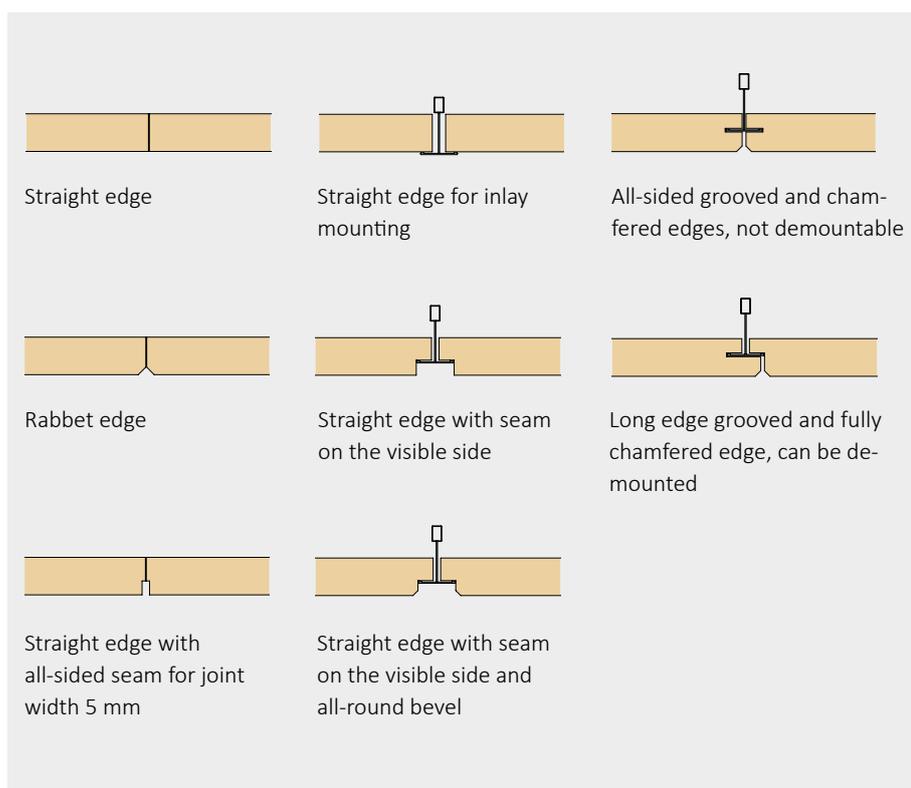


# Engineering and assembly

## Edge designs

For different applications there are Fibro-Kustik boards with different edge designs.

## Direct mounting Inlay mounting Concealed mounting



## Accessories and screws

Fibro-Kustik boards can be directly mounted on all common metal substructures from CD ceiling profiles.

For timber substructures, slat cross-sections of  $\geq 80 \times 30$  mm should be used.

We recommend our rail systems for acoustic ceilings with inlay mounting.

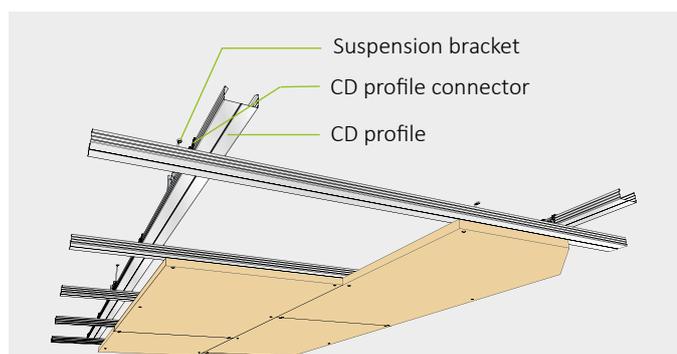
For secure fastening of the Fibro-Kustik boards to metal or wooden substructures there are rust-proof quick-release screws with white or light-beige heads suitable for the board thickness and boards color.



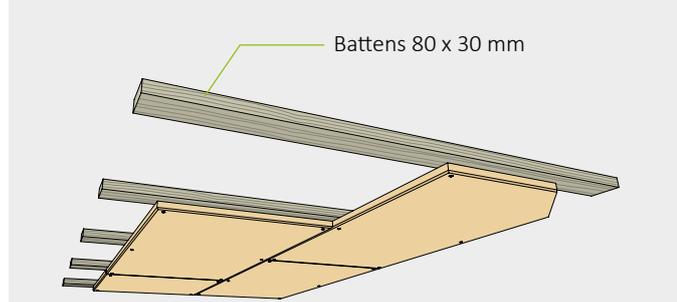


## Ceiling constructions

Fibro-Kustik boards can be screwed directly onto metal or wooden substructures.



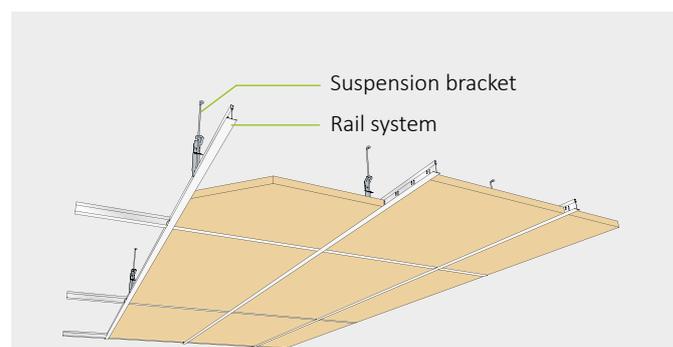
**Example:** Fibro-Kustik boards 1200 x 600 mm with straight edges. Direct mounting on metal substructure out of CD profiles.



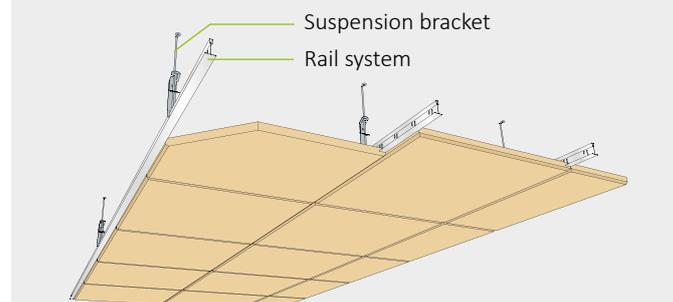
**Example:** Fibro-Kustik boards 1200 x 600 mm with beveled edges. Direct mounting on wooden substructure made of 80 x 30 mm wooden boards.

## Inlay mounting

Various rail systems can be used for inlay mounting in ceilings.



**Example:** Fibro-Kustik boards 1200 x 600 mm with straight edges. Inlay mounting with visible rail system.



**Example:** Fibro-Kustik boards 600 x 600 mm with long-sided grooved and all-sided chamfered edges. Inlay mounting can be demounted.



# Spirit of Wood<sup>®</sup>

From the classic plain-colored wood-wool board to the individual design acoustic board – we understand this as the "Spirit of Wood<sup>®</sup>".



Creative idea: Unique "square" design: Ann-Kristin Büttner

We give planners and builders plenty of scope in the design of acoustic wall and ceiling claddings. "Spirit of Wood<sup>®</sup>" is not a product a product that we deliver, but an idea, a thought, a "spirit" that sleeps in each of us.

Are you planning child-care centers, schools, or office buildings? Then just close your eyes and imagine your individual and unique acoustic solution.

Whether color, structure or shape – let us share your ideas.



Creative idea: Unique "light and shadow" – design: Ann-Kristin Büttner



## Practical example – Meditation Center

A pleasant feeling of space, excellent acoustic properties and an appealing ceiling design, these are important requirements for relaxing and meditating. We call that "Spirit of Wood®".

Healing awareness trainer Judith Pick speaking about the acoustic situation before and after the acoustic ceiling renovation in her practice for awareness expansion: *"Thanks to the ceiling boards "Spirit of Wood®" the acoustics have improved considerably in my seminar facility. For my seminars, the new, soothing acoustics without noise is very encouraging. At the same time the boards with their beautiful optical design are a real eye-catcher. "*

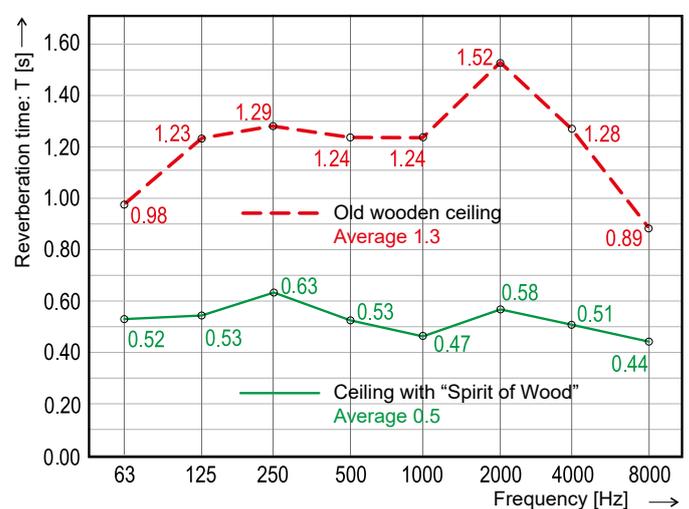
The ceilings of the meditation rooms were covered with Fibro-Kustik boards from the "Spirit of Wood®" edition in the design "golden ray of sunlight" made of superfine wood-wool in the format of 1200 x 600 mm with small bevel.



In addition to the visual enhancement, the room acoustics have also been significantly improved.



Acoustic ceiling: Edition "Spirit of Wood®" – Design "golden ray of sunlight"



The comparison clearly shows the reduction of the reverberation time.  
Testing institute: Peutz Consult GmbH, test report no. M 6334-1.



For further information and contact persons for your individual questions and requests, please visit [www.fibrolith.de](http://www.fibrolith.de)

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**Fibrolith Dämmstoffe GmbH**

An der L83

D-56746 Kempenich

Tel.: +49 (0) 26 55 / 95 92-0

Fax: +49 (0) 26 55 / 95 92-18

E-mail: [info@fibrolith.de](mailto:info@fibrolith.de)