

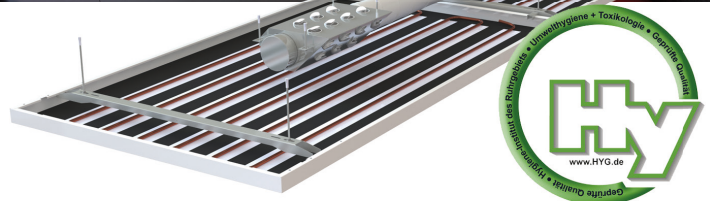
# FAVO

Integrated supply air diffuser with thermal building mass connection



## QUICK FACTS

- Thermal comfort according to EN ISO 7730, SIA 382/1
- In combination with A11-S, SPECTRA M-S and SOFTLINE WOOD
- Very high heating and cooling capacity
- Superior sound absorption values (class A)
- Building mass can be used as an additional thermal storage mass
- Sound power level  $L_w < 30 \text{ dB(A)}$
- Silent and draught-free fresh air supply
- Connection to conventional ventilation ducts



# Technical description

## General

Thanks to its versatile properties, our patented FAVO Hybrid system, in combination with the A11-S or SPECTRA M-S radiant ceiling sail or the SOFTLINE WOOD high performance module, combines different functions for room climate control. The solution offers very high heating and cooling capacity as well as a silent and draught-free fresh air supply.

FAVO also integrates the building mass into the overall thermal concept. The building mass acts as an additional thermal storage mass and can absorb heat and release it again at a later time. This allows the thermal storage mass of the building to be incorporated specifically into the heating and cooling concept.

## Activation

**Water system:** The radiant ceiling is a passive system that in the case of cooling absorbs heat from the room via the ceiling surface, transfers it to the water, which is conducted in activation registers, and dissipates it, respectively emits heat in the case of heating.

### Activation register A11-S

Copper pipe meanders welded to aluminum heat-conducting rails. Connected to the ceiling panel using adhesive technology.

### Activation register SPECTRA M-S

Copper pipe meanders pressed into aluminum heat-conducting profile with magnetic tape. Connected to the ceiling panel using magnet technology. Advantages: The registers can be supplied, fixed and hydraulically connected independently of the ceiling panels. These can be assembled at the end of the installation work. This reduces construction time and the risk of contamination.

### High performance module SOFTLINE WOOD

The activation of the SOFTLINE WOOD modules consists of copper pipe meanders (outside diameter 12 mm), which are press-fitted into the aluminium fins. The wooden slats are positioned between the aluminium profiles.

## Functions

In addition to the thermal functions of cooling/heating and the active concrete management, there is the possibility of further integration: acoustically effective inserts or baffles for A11-S (ARCHISONIC®), various built-in components (e.g. smoke detectors, lighting).

## Combination

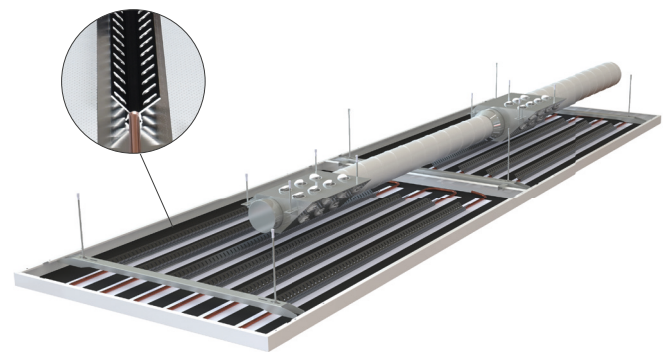
- FAVO + A11-S + ARCHISONIC®
- FAVO + SPECTRA M-S
- FAVO + SOFTLINE WOOD



## Optional performance plus: Convector Wings

When using the activation register A11, a further increase in performance can be achieved by using the Convector Wings developed by Barcol-Air.

Convector Wings are matt black anodized aluminum profiles with slotted «wings» on both sides. With the profile that opens downwards, the Convector Wings can be attached to the straight sections of a pipe meander. This multiplies the heat exchange surface of the radiant ceiling sail, which leads to an increase in water capacity.

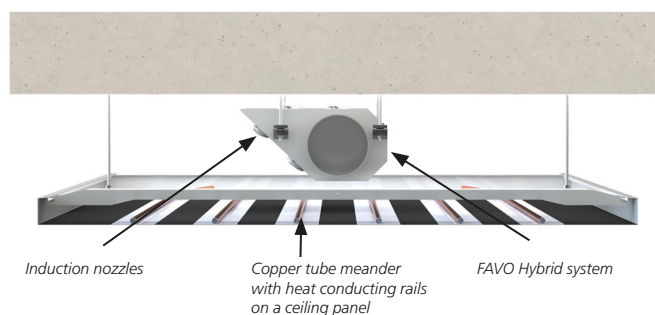


Optional performance plus: Convector Wings

## Functional description

Specially developed high-performance induction nozzles deliver up to 120 m<sup>3</sup>/h of fresh air per FAVO. The escaping air creates negative pressure behind the diffuser, which induces warm room air onto the upper side of the ceiling sail. The patented wing shape of the supply air diffuser reduces the speed of this recirculating air above the wing, ensuring a high energy transfer into the building mass of more than 10 W/m<sup>2</sup>. The accelerated flow under the wing removes the cold air pool from the ceiling panel. This increases the energy transfer to the water by 15 % compared to conventional ceiling sails.

The fan-shaped air flow creates a draught-free, complete mixing of the room air with a homogeneous temperature profile in the occupied area.

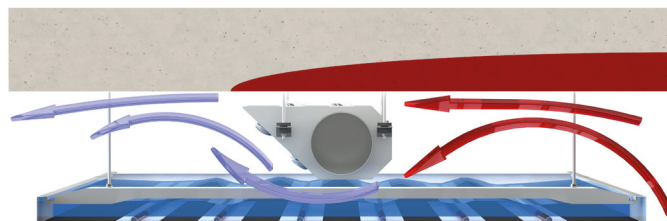


## Building mass connection

The concrete ceiling is the most solid component of a room. Due to its high heat capacity, it can store a lot of energy. The FAVO supply air diffuser provides additional building mass connection, which means that less cooling is required during the day when electricity is expensive and the COP of the cooling system is low due to the outside temperature.

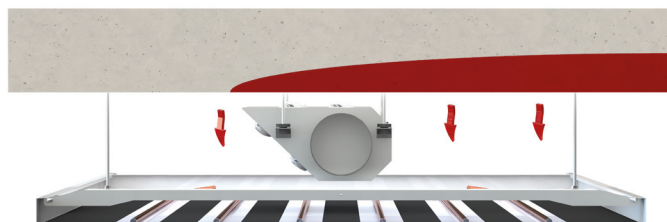
### Day

In addition to the portion of energy directly transferred to the water, warm air also flows above the FAVO supply air outlet along the concrete, heating it in the process. This energy does not need to be dissipated during the day but is temporarily stored until the night.



### Night

At night, no supply air is required in the building. The water can be cooled by free cooling (without the use of the refrigerator). Through the exchange of radiation between warm concrete and cold heat conducting rails, the energy is extracted from the concrete and prepared for the absorption of excess energy the next day.



## Technical data

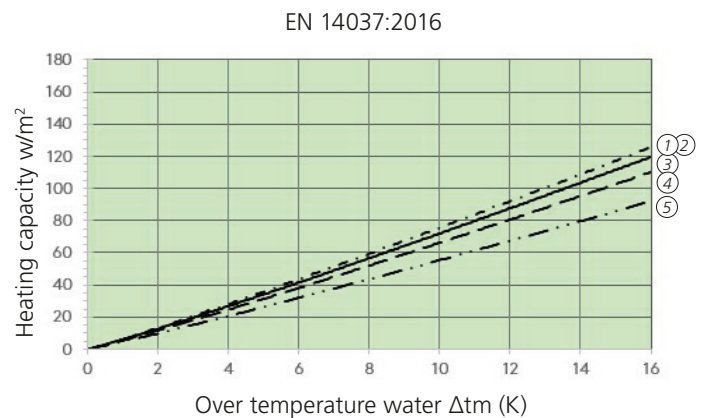
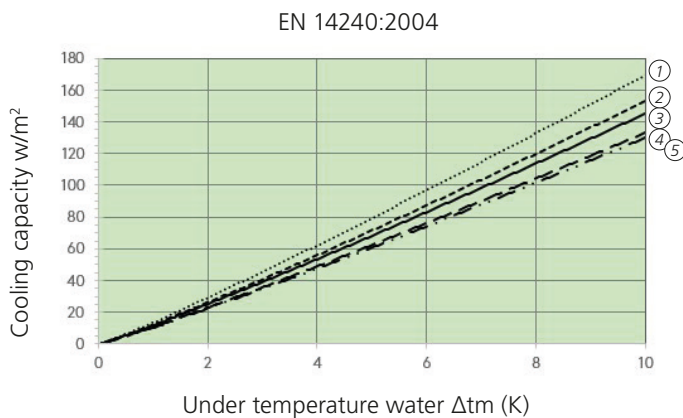
## Capacity

## Water

Initial data is presented below.

| Material ceiling panel                                        | Aluminium     | Steel                                                           |
|---------------------------------------------------------------|---------------|-----------------------------------------------------------------|
| Perforation                                                   | Rg 1,5 – 11 % | Rg 1,5 – 11 %                                                   |
| Activation<br>(Distance heat conducting rails hcr:<br>100 mm) | A11 ---- ②    | A11 + Convector Wings ..... ①<br>A11 ——— ③<br>Spectra M - - - ④ |
| Activation method                                             | on fleece     | on fleece                                                       |

(Capacity specifications without object-specific performance-increasing factors. Depending on the configuration, an additional output of 20 w/m<sup>2</sup> of panel area is achieved through concrete management.)



| Activation    | Version                   | Cooling 8 K                | Cooling 10 K               | Heating 15 K <sup>(1)</sup>       |
|---------------|---------------------------|----------------------------|----------------------------|-----------------------------------|
| A11-S         | ① Steel + Convector Wings | up to 133 w/m <sup>2</sup> | up to 170 w/m <sup>2</sup> | up to 117 w/m <sup>2</sup> (---→) |
| A11-S         | ② Aluminium               | up to 120 w/m <sup>2</sup> | up to 154 w/m <sup>2</sup> | up to 117 w/m <sup>2</sup> (---)  |
| A11-S         | ③ Steel                   | up to 114 w/m <sup>2</sup> | up to 145 w/m <sup>2</sup> | up to 112 w/m <sup>2</sup> (→)    |
| Spectra M-S   | ④ Steel                   | up to 104 w/m <sup>2</sup> | up to 133 w/m <sup>2</sup> | up to 102 w/m <sup>2</sup> (---)  |
| SOFTLINE WOOD | ⑤ Aluminium fins and wood | up to 102 w/m <sup>2</sup> | up to 130 w/m <sup>2</sup> | up to 86 w/m <sup>2</sup> (-----) |

<sup>1)</sup> When the supply air is running, there is a 20 to 40 % higher heating capacity.

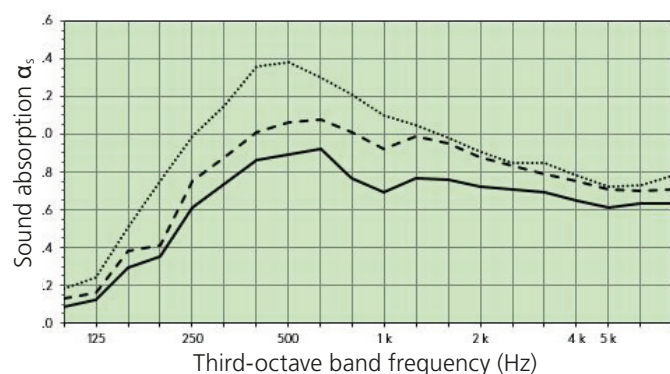
## Notice

- SN EN 14240: The cooling capacity is related to the active area according to SN EN 14240:2004. The active area is calculated according to SN EN 14240 from the number of heat-conducting rails x length of heat conducting rail x distance between heat-conducting rails.
- SN EN 14037: The heating capacity is related to the active area according to SN EN 14037:2016. The active area is calculated according to SN EN 14037 from the length of the ceiling panel x the width of the ceiling panel.

## Acoustics

### Sound absorption (Ceiling panel)

Initial data: Radiant metal ceiling sail perforated, distance hcr 100 mm, installation height 205 mm.

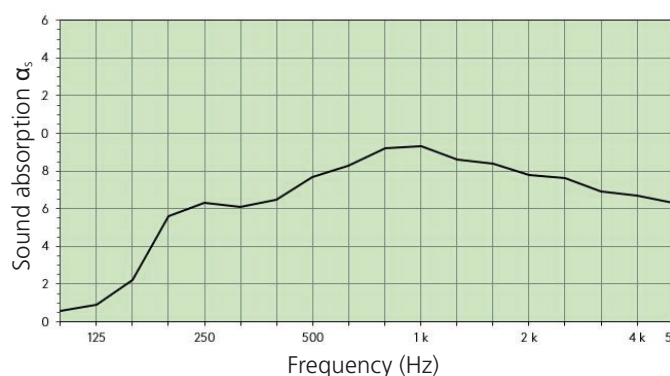


Perforation 1,5 mm – 11 %, with acoustic fleece

| Additional inlay                         | without<br>————                                            | 1 strip on the<br>long sides<br>of cp<br>-----             | Strips between<br>hcr<br>.....                             |
|------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|
| Practical<br>sound absorption $\alpha_p$ | 250: 0,55<br>500: 0,90<br>1k: 0,75<br>2k: 0,75<br>4k: 0,65 | 250: 0,70<br>500: 1,00<br>1k: 0,95<br>2k: 0,90<br>4k: 0,75 | 250: 0,95<br>500: 1,00<br>1k: 1,00<br>2k: 0,90<br>4k: 0,80 |
| sound absorption $\alpha_{pw}$           | $\alpha_w$ : 0,75                                          | $\alpha_w$ : 0,90                                          | $\alpha_w$ : 0,95                                          |
| Sound absorption class                   | C                                                          | A                                                          | A                                                          |

### Sound absorption SOFTLINE WOOD

Baseline data: SOFTLINE WOOD high-performance module, perforated, WLS spacing 240 mm, installation height min. 205 mm.



| Additional inlay                         | Strips between the WLS                                     |
|------------------------------------------|------------------------------------------------------------|
| Practical sound<br>absorption $\alpha_p$ | 250: 0,63<br>500: 0,77<br>1k: 0,93<br>2k: 0,78<br>4k: 0,67 |
| Sound absorption $\alpha_w$              | $\alpha_w$ : 0,85                                          |
| Sound absorption class                   | B                                                          |

### Sound power level $L_{WA}$ / Pressure loss

| Air volume per outlet | Air volume per nozzle<br>with 14 nozzles | Pressure loss<br>[Pa] | Sound power level<br>[dB(A)] |
|-----------------------|------------------------------------------|-----------------------|------------------------------|
| 120 m <sup>3</sup> /h | 8.5 m <sup>3</sup> /h                    | 12.3                  | 30.7                         |
| 90 m <sup>3</sup> /h  | 6.5 m <sup>3</sup> /h                    | 8.8                   | 29.2                         |
| 60 m <sup>3</sup> /h  | 4.3 m <sup>3</sup> /h                    | 4.6                   | 26.9                         |

# System

## Ceiling system

- Sail
  - Rectangular panels
- High performance module
  - SOFTLINE WOOD

## System components

- Nozzle channel with induction nozzles

## Installation systems

- Installation high: min. 205 mm
  - Hook-on systems
  - Threaded rods or ropes

## Installation high

| Panel height | Ø Connection nozzle | min. installation high |
|--------------|---------------------|------------------------|
| 30 – 50 mm   | 100 mm              | 205 mm                 |
| 30 – 50 mm   | 125 mm              | 230 mm                 |
| 30 – 50 mm   | 160 mm              | 265 mm                 |

# Materials, weight and dimensions

## Materials and weight

| Activation    | Material                                                     | Weight<br>(incl. activation, water)             | Building material class <sup>(1)</sup><br>(EN 13501-1) |
|---------------|--------------------------------------------------------------|-------------------------------------------------|--------------------------------------------------------|
| A11-S         | Aluminium 1,00 mm                                            | 3,8 – 6,5 kg/m <sup>2</sup>                     | A2-s1, d0                                              |
| A11-S         | Steel 0,70 mm                                                | 6,5 – 9,0 kg/m <sup>2</sup>                     | A2-s1, d0                                              |
| Spectra M-S   | Steel 0,70 mm                                                | 10,0 – 13,3 kg/m <sup>2</sup>                   | B-s2, d0                                               |
| SOFTLINE WOOD | Aluminium fins and wooden fins with frame<br>(without frame) | 10,0 kg/m <sup>2</sup> (9,0 kg/m <sup>2</sup> ) | B-s1, d0                                               |

<sup>1)</sup> Also depends on the acoustic inserts.

## Dimensions A11-S and SPECTRA M-S

| Sail length      | Sail width   | Sail height                                  |
|------------------|--------------|----------------------------------------------|
| min. 800 mm      | min. 400 mm  | min. 30 mm <sup>(1)</sup>                    |
| project specific | max. 1200 mm | A11-S: max. 50 mm<br>SPECTRA M-S: max. 40 mm |

<sup>1)</sup> System structure without tolerance of the concrete ceiling.

## Dimensions SOFTLINE WOOD

|               | Length            | Width            | Height | Pipe rows | Pipe spacing |
|---------------|-------------------|------------------|--------|-----------|--------------|
| With frame    | 1050 mm – 2550 mm | 650 mm – 1370 mm | 60 mm  | 3 – 6     | 240 mm       |
| Without frame | 1000 mm – 2500 mm | 600 mm – 1320 mm | 50 mm  | 3 – 6     | 240 mm       |

Custom dimensions on request.

## Surface

### Versions

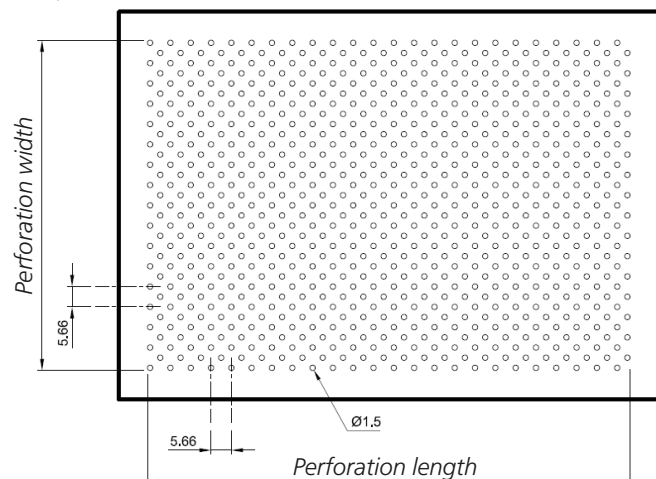
- Powder coating
- Digital printing on request

### Colors

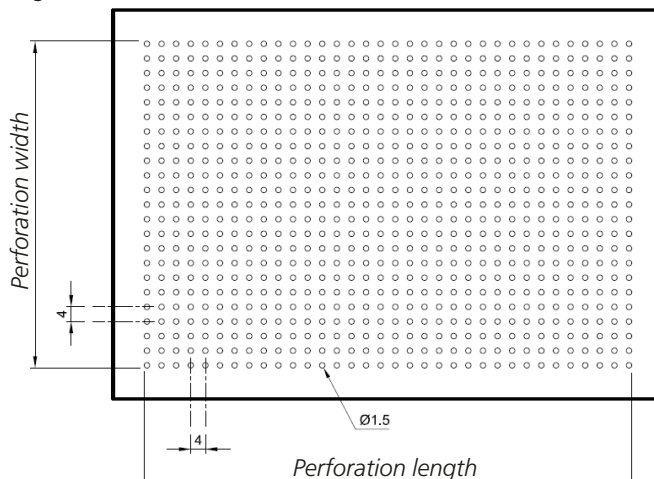
- Standard RAL 9010
- Other RAL / NCS colors on request

Standard perforations:

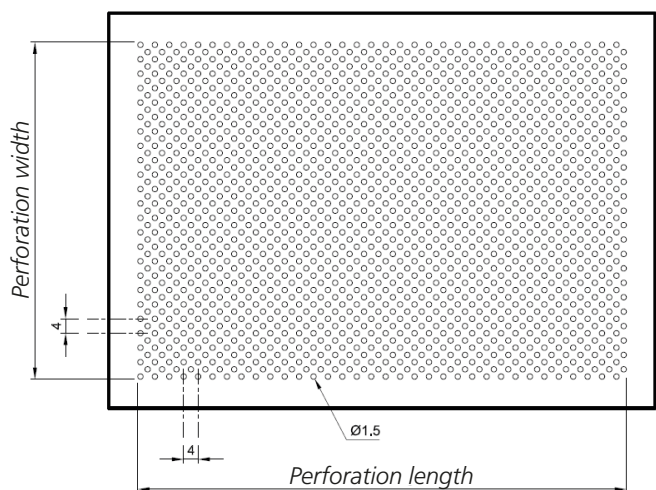
Rd 1,5 – 11 %



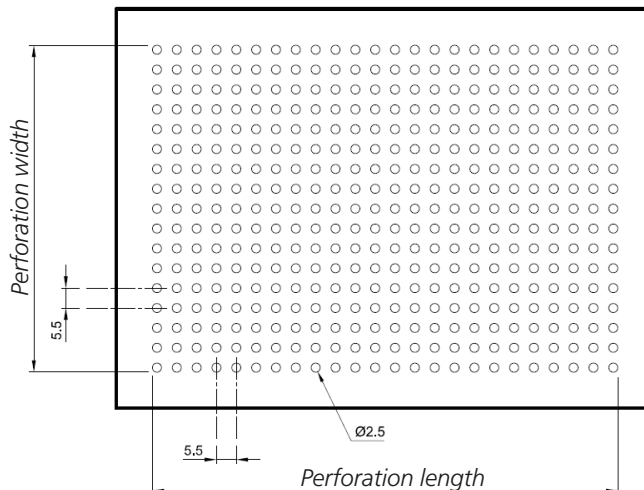
Rg 1,5 – 11 %



Rd 1,5 – 22 %



Rg 2,5 – 16 %



## SOFTLINE WOOD - Real wood veneers

Surfaces

| 3-layer panel<br>white fir | MDF veneered<br>European oak | MDF veneered<br>American walnut |
|----------------------------|------------------------------|---------------------------------|
|                            |                              |                                 |

Perforations

| Classic 14/2 M | ARIA-Plus 28/4 M | Micro 2/2/0.5 M |
|----------------|------------------|-----------------|
|                |                  |                 |

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