

SELECTION PROCESS SOLID AIR CHILLED BEAM

Room data:

Determine the ventilation requirement and requested cooling and heating capacities for the room. Cooling capacities follow from the cooling load calculation, heating capacities from the transmission calculation. The cooling load calculation results in a required 'sensible' and 'latent' power for the room. The chilled beams are suitable for 'dry' cooling (without condensation) and will only deliver the sensible capacities. The latent power must be supplied via primary air which contains sufficient dehumidification capacity to deliver the latent capacities.

So only include the sensible powers in the selection of the chilled beams.

If cooling and heating capacities are not yet available, a first step for the selection can be made based on a usual cooling and heating capacity of approximately 60 W/m².

At a later stage, the selection has to be adjusted to the final data.

Determine the data per chilled beam:

According to the standard installation advice, the chilled beams are placed in a continuous line, parallel to the façade, at half the room depth.

This gives maximum divisibility.

For room depths greater than 5.4 m, the units are often placed 2.7 m from the façade.

It is preferable not to let the chilled beams blow towards each other. If this is inevitable we use a minimum mutual heart to heart distance of 4 meters.

Between the chilled beams a descending area may possibly arise and therefore this space is labeled as a traffic area.

Basically, the product is placed "above" the user, who is generally near the façade and not at the inner wall.

Determine the number of chilled beams per room and the required volume flow of air (m³/h) and requested cooling and heating power (Watts) per unit.

Choose the type of system:

Choose a "standard" or a "change-over" system.

With a standard system, a 4-pipe building-sided system is connected to the 4-pipe chilled beam (control by means of two 2-way valves).

With a "change-over" system, a building-sided 4-pipe system with a 6-way valve is connected to the cooling circuit of the chilled beam.

In the latter case, the heating water also flows through the heat exchanger for cooling, which can achieve greater capacities.

Determine the general preconditions for the selection.

Think of temperature conditions, available static pressure at the chilled beam and noise requirements in the space. Below is an example of the most commonly used values and the range in which the values are usually chosen.

Summer condition:

- Design room temperature: 25 °C (range 24 - 26 °C).
- Primary air temperature: 16 °C (range 15 - 17 °C).
- Supply of water temperature: 15 °C (range 15 - 16 °C).

Winter condition:

- Design room temperature: 21 °C (range 21 - 22 °C).
- Primary air temperature: 20 °C (range 20 - 22 °C).
- Supply of water temperature: 45 °C (range 35 - 60 °C); maximum 90 °C.

Preferred area air and water side criteria:

Static plenum pressure of the chilled beam: 80 - 100 Pa (range 40 - 120 Pa).
Sound power of the chilled beam: maximum 36 dB(A).

Please note:

Presented sound data in SA-Select are sound powers. These sound powers shall be corrected with the room damping to calculate the sound pressure in the room.

Sound pressure in the room: maximum 35 dB(A).
Water side resistance: maximum 11 kPa.

Air and water side selection:

Check [SA-select](#) to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Determine the model size of the chilled beams based on the modular ceiling, for example model 1800 suitable for inlay in a standard T-bar ceiling with module size 300x1800.

For application in a bandraaster ceiling 100 mm the actual length can be specified a little shorter than standard.

For example, set the selection module in SA-Select to:

System type: Standard
Unit: OKNI
Type: 300
Model: 1800

Enter the required volume flow primary air (m³/h) and the desired total cooling (and heating) power (Watts) per chilled beam and click on the red button "Filter selection".

In the result set, the possible selections that meet the standard filter conditions appear. If no results are visible, you can set the field "filter data" to "No" in the "Filter" section.

All selections are visible so that you can see why no results are shown.

Please note:

If you leave this filter on "No", you are able to save wrong selections in the project list.

Air-sided selection:

Choose in [SA-select](#) a suitable nozzle type A1, A2, B1 etc. based on a plenum pressure of approximately 80 - 100 Pa, a maximum sound power of 36 dB(A) and appropriate hydronic selection with achieved requested capacities. Think of the addition of sound at multiple sources in the room, usually a maximum addition of 5 dB is used for multiple units in the room.

Choose a chilled beam with fixed nozzles, nozzle A1, A2, B1 etc. as a cost-effective solution.

Choose a chilled beam with adjustable nozzles (extravent version, nozzle BD or AD) for a larger flexibility of the building layout/functional use during the life of the building.

When changing the functional use and required volume flow of primary air, the free area can be adjusted manually.

Hydronic selection:

When selecting the water side, take into account a minimum volume flow of water of 50 l/h in connection with with the controllability of the unit.

Check the water side resistance and temperature difference (delta T) based on the volume flow of water at which the powers are achieved.

Save the selection to the project list.

When saving to the project list (by clicking on the plus sign for a selected product), the most common order options are pre-filled.

Most of the ordering options cannot be adjusted, such as the diameter of the air connection or the height of the plenum. For the performance of the chilled beam, these determined values are optimal.

With details to be filled in, a question mark (?) is entered in the order code as "place holder".

The most important ordering options that are often adjusted:

Order option "heat exchanger":

If a "change-over" system is chosen (in which the water side transport system is executed as a 4-pipe system on the building side), it is possible to opt for a 2-pipe chilled beam. Since the heat exchangers in 4-pipe version are in stock, this variant is usually chosen. Here too, you can only connect the cooling circuit by means of a 6-way valve if a "change-over" application is desired.

The most common solution for the order option "heat exchanger" is version V: cooling and heating.

For larger quantities, you can opt for a 2-pipe heat exchanger which must be specially ordered. This can result in a cost-technical advantage with sufficient scale and available delivery time.

Order option "actual length":

Here a custom length can be specified per model, for example to make the chilled beam suitable for a bandrastr ceiling.

Order option "color":

Chilled beams are supplied as standard in our standard color RAL 9010 with 55 % gloss degree.

At an additional cost, a different RAL color can be specified.

For other RAL colors, the gloss level can also be specified.

When adjusting the RAL color, the gloss level is set to satin (70 %).

For a more matte appearance, it is possible to choose a gloss level of 30 %.

Other color ranges on request.

If you have any further questions regarding the selection, we advise you to contact our sales department.