FAQ – Use of wall sandwich panels as ceiling panels indoors

The use of wall sandwich panels with lightly profiled faces as ceiling panels in interior areas is not regulated in the German technical approvals. Below are a few notes on this for the design in SandStat, which do not claim to be complete.

Explanations

Especially for interior constructions, wall sandwich panels are often used as ceiling panels. This use is not covered by the German technical approvals.

The following instructions must be observed:

- By default, the wall sandwich panels are not included as (roof and) ceiling panels in the SandStat database, as this use is not covered by the approval. If necessary, they can be selected as special sandwich panels as soon as they have been activated after consultation between iS-engineering and the manufacturer concerned. If panel management input is enabled in SandStat, the user can carry out the customisation themselves.

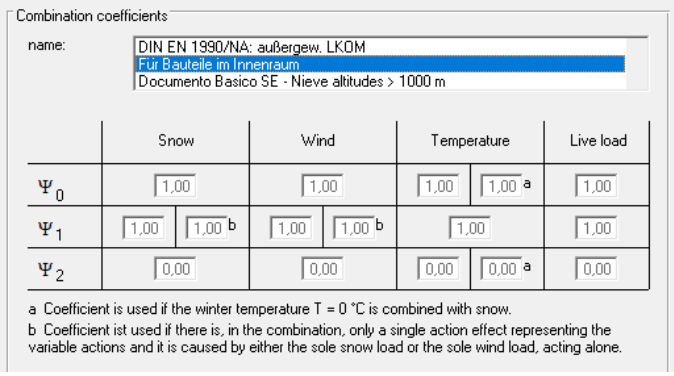
- The installation direction must be observed so that the wrinkling stresses of the outer and inner cover layer are correctly applied (keyword: production top and bottom side). If necessary, the sandwich panel must be dimensioned "in negative position".

- In the tests to determine the characteristic values of wall sandwich panels, the long-term effects are not considered (keyword: creep coefficients and long term shear strength). If the approval also includes roof sandwich panels with the identical core material or if this was carried out separately for the wall elements, these values may be available. In the markings (e.g. CE mark or declarations of performance), these long-term values must also be stated when used as ceiling panels.

- The load case "live loads" does not include actions from existing immobile objects (e.g. furniture) that also act on the component over a longer period of time. This influence on the long-term behaviour is currently not taken into account by SandStat.

- When applying "live loads", make sure that these are also correctly superimposed with the other loads. To do this, select the "Load factors" button on the "Project control" screen and make the appropriate selection for the corresponding project.

  Perhaps the following entry is the appropriate one:



  („Für Bauteile im Innenraum" ≡ „for interior components")

- Wind loads (or positive internal pressure as well as negative internal pressure) also act on interior components. An internal pressure coefficient c_{pi} is to be applied as wind pressure and wind suction according to EN 1991-1-4/NA, para. 7.2.9.

- Temperature loads are to be applied according to the existing conditions. Particularly in the case of high temperature differences outside the colour groups I to III mentioned in the approvals (keyword: cold storages or strongly heated buildings), special attention must be paid to the deflections expected in the calculations as well as the detailed design.

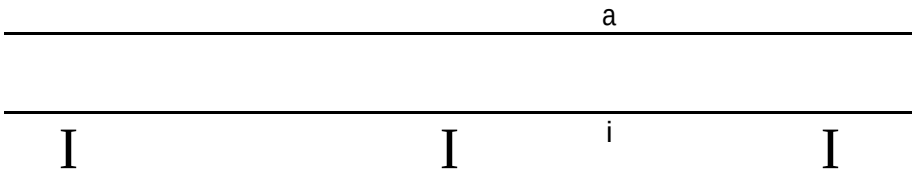
  When determining the temperature effects, maintenance, assembly or intermediate states (e.g. in the case of cold rooms, these can be left in the building for maintenance purposes without cooling) must also be taken into account if necessary.

Special features of the arrangement:

There are several ways in which the arrangement can be carried out:

Variant A) supported on substructure:

Sketch:



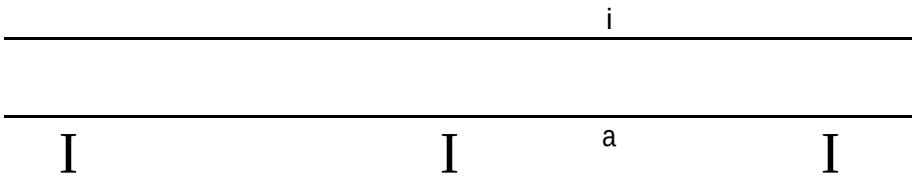
a: outside (at SandStat) ≡ production bottom side
i: inside (at SandStat) ≡ production up side

The loads are to be entered in SandStat as standard:

- downwards as a positive value, such as self weight, wind pressure (overpressure), live load, etc.
- upwards as negative value wind suction (negative pressure)
- temperature loads according to the conditions

Variant B) supported on substructure with turned sandwich panel

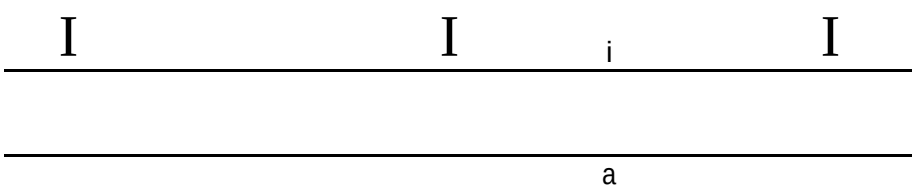
Sketch:



Here, the sandwich panel - in comparison to A) - is to be used as a negative layer (if included in SandStat database).

Variant C) hanging from the substructure:

Sketch:



a: outside (at SandStat) ≡ production bottom side
i: inside (at SandStat) ≡ production up side

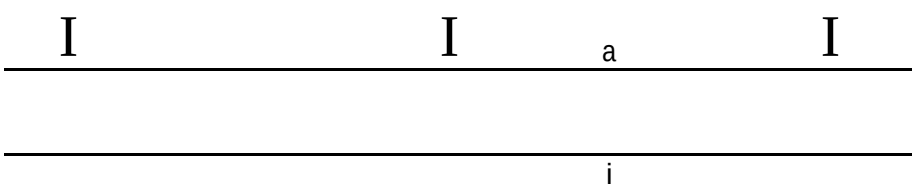
The system is to be "turned upside down". The corresponding loads are to be entered into SandStat with changing signs:

- Self weight, wind pressure (overpressure) and live load with negative sign
- wind suction (negative pressure) with positive sign
- temperature loads according to the specifications, also with exchanged signs.

During the design, the influences from long-term, the crushing of the core at support and the fastener checks are then carried out correctly.

Variant D) hanging from the substructure with turned sandwich panel:

Sketch:



Here the sandwich panel - in comparison to C) - is to be used as a negative layer (if included in SandStat database). The instructions for C) apply accordingly.