

8. Fixation of Panels and Recommended Fasteners

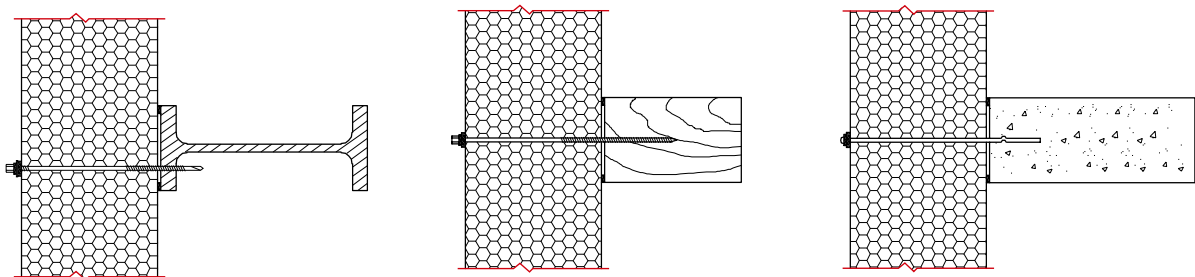
Sandwich panels are fixed horizontally or vertically to metal, concrete or wood frames. Screws, profiles, a combination of screws and profiles are used to fix the panels to the frame. Fixation of screws is the fastest way to fix the panels.

It is necessary to protect panels with dark colour coating (group 3 according to RAL colour classification) from lasting direct sunlight impact during installation. The deformation resulting from heating can impede the installation of panels.

8.1. Fixation of Wall and Roof Panels

Depending on the material of the supporting structure (frame) the panels are fixed:

- a) to metal structures – with chill iron self-drilling screws with min. \varnothing 5.5 mm and min. washer \varnothing 19 mm. Washers must be coated with self-vulcanising EPDM rubber. Prior drilling in joint area is not allowed when using self-drilling screws. Screw length = thickness of the panel + 25 mm;
- b) to wood structures – with chill iron self-drilling screws with min. \varnothing 5.5 mm and min. washer \varnothing 19 mm. Washers must be coated with self-vulcanising EPDM rubber. Screw length = thickness of the panel + 60 mm;
- c) to concrete structures – with special spikes.

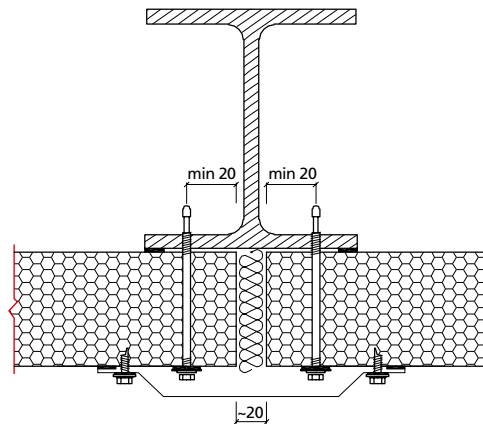


a) self-drilling screw for metal b) self-drilling screw for wood c) spike for concrete

Pic.8.1 Sandwich panel fasteners depending on the type of supporting structure

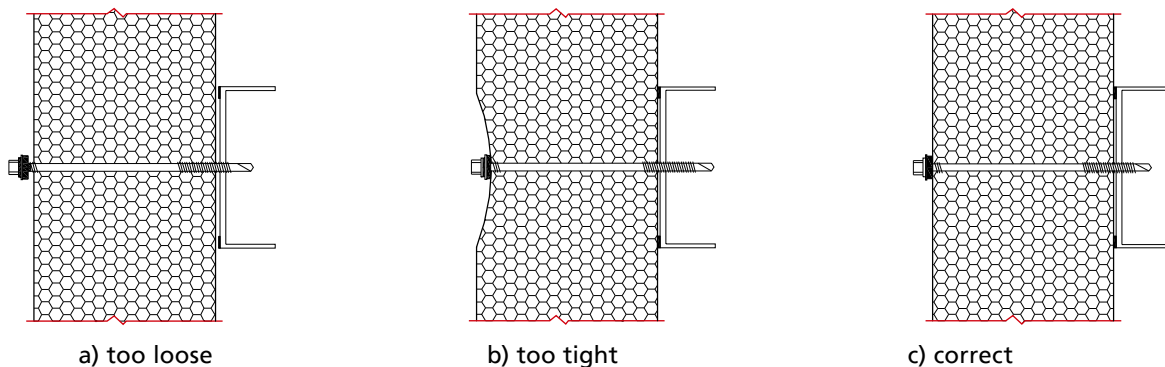
The fixing of panels with self-drilling screws is extremely efficient, because the prior preparation of drill holes, placing gasket rubber and screwing is replaced with just one action – screwing of the self-drilling screw.

The supporting width of panels on the frame must be at least 50 mm for side supports and at least 60 mm for intermediate supports. Fasteners must be placed at least 20 mm from the panel edge.



Pic.8.2 Supporting sandwich panels on the supporting column

When using screws for fixation of panels, screws must not be too tight or too loose. It is recommended to use a drilling machine with variable speed. The recommended torque with self-drilling screws is 2500 rpm.



a) too loose

b) too tight

c) correct

Pic.8.3 Screwing of sandwich panels

The number of screws required for one end of the panel is calculated using formula 8.1

$$N = \frac{0,5 \cdot L \cdot b \cdot C_p \cdot q_w}{F_{stip}}, \quad (8.1)$$

where: N – number of screws in end of panel;

L – length of panel, m;

b – width of panel, m;

C_p – aerodynamic coefficient of wind load;

q_w - wind load, kN/m^2 , based on LVS ENV 1991-2-4

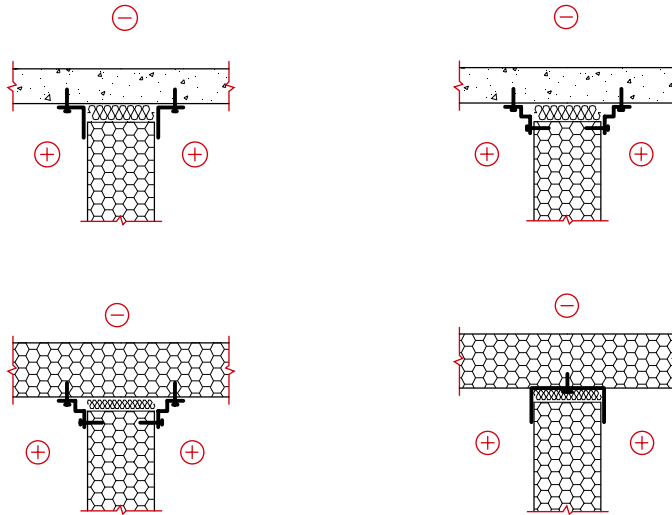
F_{stip} – allowable load on screw, kN, see table 8.1

Allowable load for a screw

Table 8.1

Screws with \varnothing 5,5/6,3 mm	Allowable load F_{stip} , kN	
	Yield	Shear
With washer \varnothing 19 mm	1,0	1,0
With washer \varnothing 29 mm	1,1	1,0

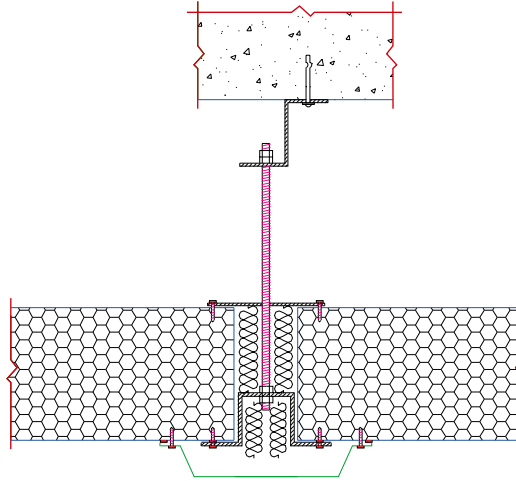
Fixation of panels in vertical partition wall structures – at first profiles are fixed to ceiling and floor constructions to ensure support for one surface of the sandwich panel. After installation of the panel, it is fixed to floor and ceiling profiles. Profiles are mounted on the opposite side of the panel. Various profile solutions and types can be used for vertical installation of panels in partition wall structures. TENAX Ltd. produces and offers such fixing profiles for each separate order.



Pic.8.4 Ways to fix partition wall sandwich panels

8.2. Fixing Panels in Hanging Ceiling Constructions

Top hat profiles are used for fixing panels in hanging ceiling constructions. The thickness of profiles is determined according to the dimensioned load on the panel. The profiles are fixed to the supporting structure with suspension device. The type of suspension device depends on the type of supporting structure and dimensioned load on the panel. Panels are fixed to top hat profiles with self-drilling screws and joints are covered with cover plates.



Pic.8.5 Hanging ceiling construction