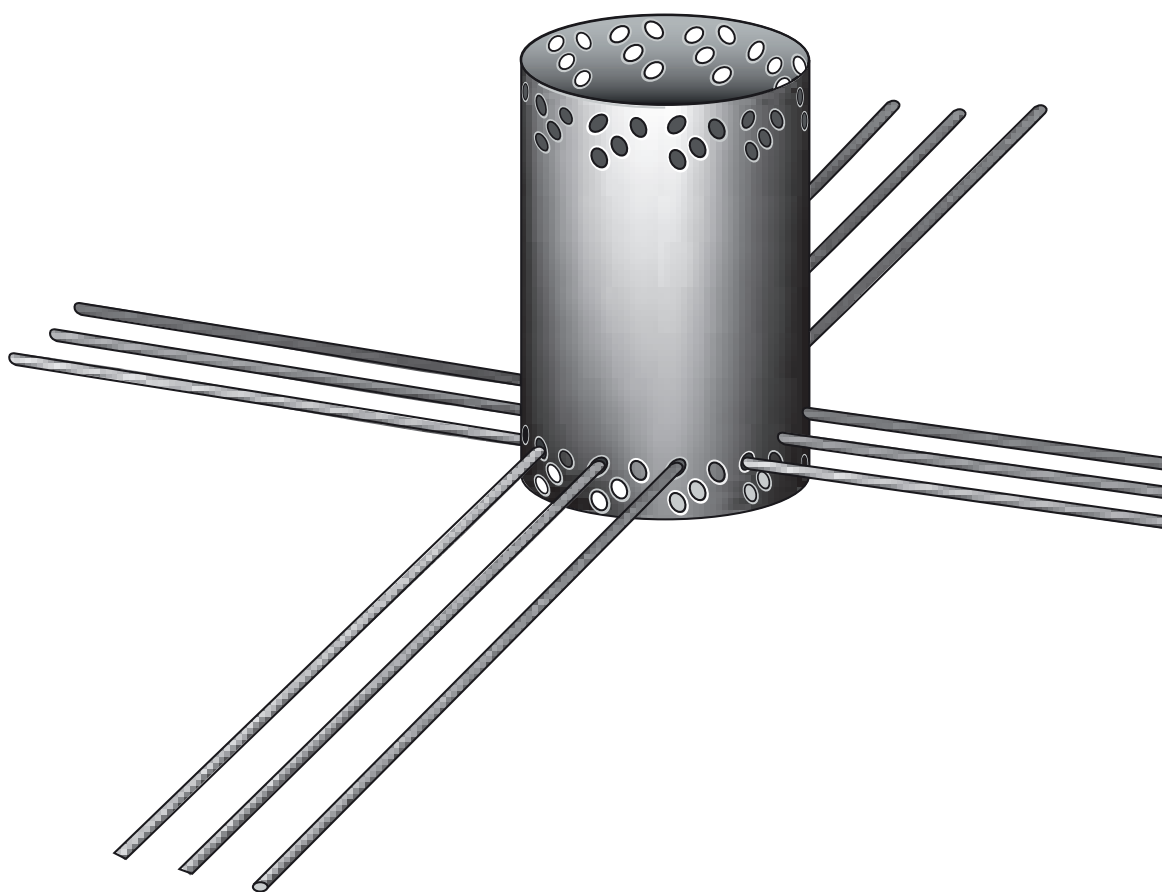


FIXINOX

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Precast panel insulation systems



FIXINOX GULF & MIDDLE EAST • Kessab Steel L.L.C. kessab@emirates.net.ae

FIXINOX France • 21 rue Jean-Pierre Timbaud – 75011 Paris
• Portable : +33 6 88 97 07 83 • Fax : +33 3 81 55 91 25
• Agence Commerciale Île-de-France : Tél. +33 1 42 28 22 27

FIXINOX Belgique • Rue Albert 1^{er} 35a – 6220 Lambusart • Tél. : +32 71 81 05 26 • Fax : +32 71 81 05 29



INTRODUCTION

Sandwich panels are reinforced concrete components consisting of several layers. These comprise an exterior layer, an insulating layer and a supporting layer (a 3-layer panel).

For reasons linked to the physical nature of the building, a layer of air can be provided between the insulating layer and the exterior layer (a 4-layer panel).

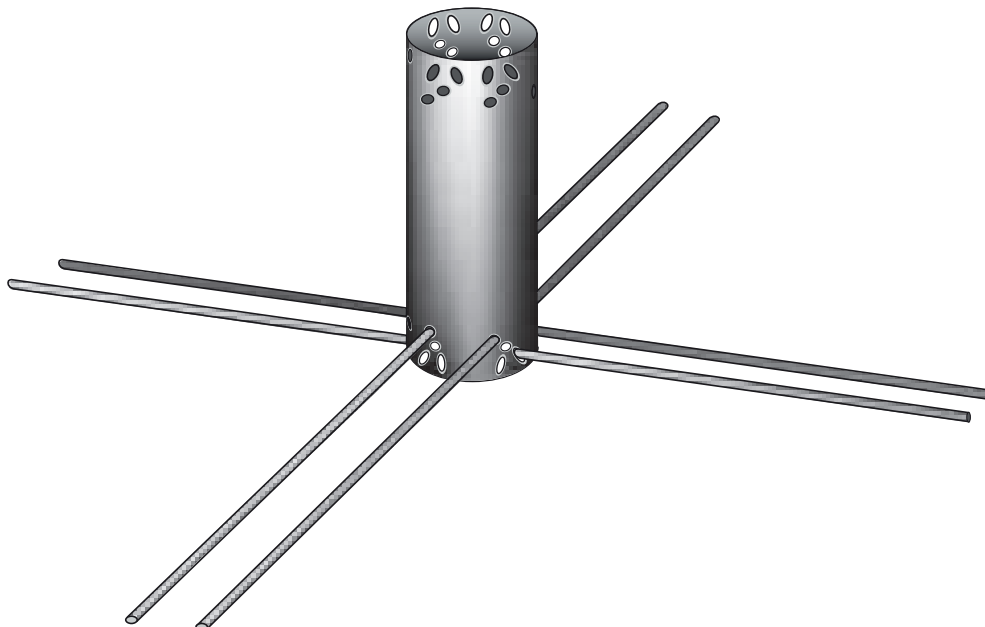
The sandwich panel anchorages are support, fixing and torsion anchorages. They provide the link between the exterior layer and the support layer and distribute the forces. The support anchorages must be chosen in accordance with the weight of the exterior layer.

The support anchorages are installed in such a way as to secure only one fixed point per panel, namely, the dead movement point. When the load is supported by only one anchorage, it is necessary to provide in

addition a torsion anchorage. This prevents the exterior layer from pivoting on the support anchorage. When calculating the torsion anchorage and its installation, it is necessary to take into account an eccentricity of the support anchorage (the support anchorage is not exactly in line with the centre gravity of the component). This offset is equal to 5 % of the length with respect to the fixed point with a minimum of 100 mm. The torsion anchorages are eliminated when the load is supported by at least 2 support anchorages (= principle of a joist resting on two points of support).

Moreover, the interior layer and the exterior layer will be linked by means of support anchorages (link ties).

The support anchorages or link ties serve to support normal loads exerted by wind, the adhesion of off-form concrete and the like.



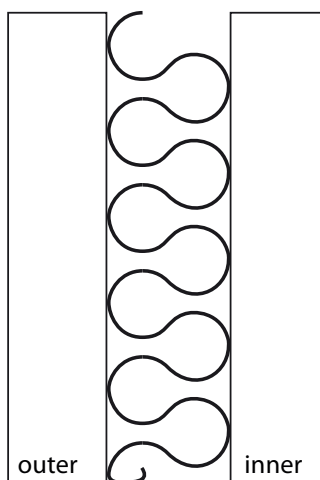
PRODUCTION INSTRUCTIONS FOR SANDWICH PANELS

In principle, it is necessary to avoid excessively long sandwich panels. If their length exceeds 6 metres, there is a high risk of deformation, particularly in the case of thin panels.

The minimum thickness of an exterior layer is 70 mm. A thickness of 60 mm is admissible only if the reinforcement is covered with an adequate layer of concrete to avoid the corrosion of steel reinforcements.

It is possible to provide in the sandwich panel a fourth layer of air (for example 40 mm thick) between the exterior layer and the insulating layer.

In that case, a special PVC sheet with honeycombs may be used. This is deposited on the concrete with the honeycombs pointing upwards. When the support and torsion anchorages are introduced, the insulating material is then replaced and can be fixed in the interior layer.



LINK CYLINDER FOR SANDWICH PANELS

The link cylinder is made from A4 stainless steel sheet (1.4571 material). This is a single anchorage which in conjunction with link ties serves as a support component for taking up loads.

The ends of the link cylinder are provided with round and oval holes. The round holes make it possible to cross the reinforcement meshes and to fix the link cylinder to the latter. The oval holes bring about a better adhesion of the concrete.

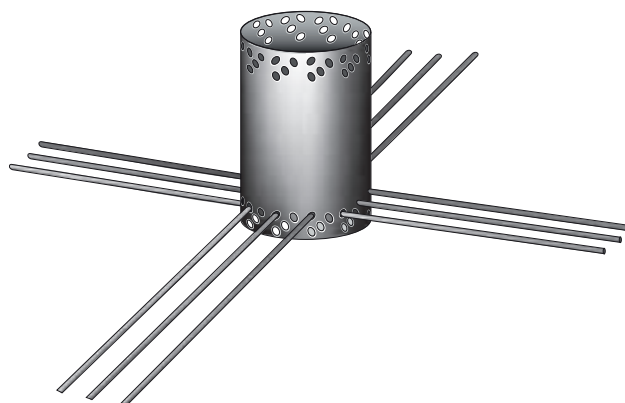
The diameter and the height are shown on the cylinder. Link cylinders are available in diameters from 51 to 280 mm inclusively and for heights from 125 to 260 mm inclusively.

FITTING

The link cylinder must be fixed to the reinforcement mesh by means of reinforcement bars. These reinforcements are inserted in the lower round holes in order that they should be parallel to the interior mesh reinforcements.

The other reinforcements must be inserted perpendicularly in to the upper round holes in such a way that these bars are lodged parallel to the reinforcement bars of the upper mesh.

By means of a rotation of the link cylinder through 45° the lower bars lock above and the upper bars are fixed above the mesh.



EXAMPLE OF AN ORDER LINK CYLINDER

- diameter : 76 mm (Ø)
- height : 150 mm (H)
- OSMA-150-076

PLATE ANCHORAGES FOR SANDWICH PANELS

Flat plate anchorages are made from A4 stainless steel sheet (1.4571 material). The plate anchorage cannot be used as a support or torsion anchorage otherwise than in conjunction with a link cylinder or several plate anchorages. Like the link cylinder, the plate anchorage is provided at its ends with round and oval holes. The round holes make it possible to cross the reinforcement meshes and to fix the plate anchorage to the latter. The oval holes bring about a better adhesion of the concrete.

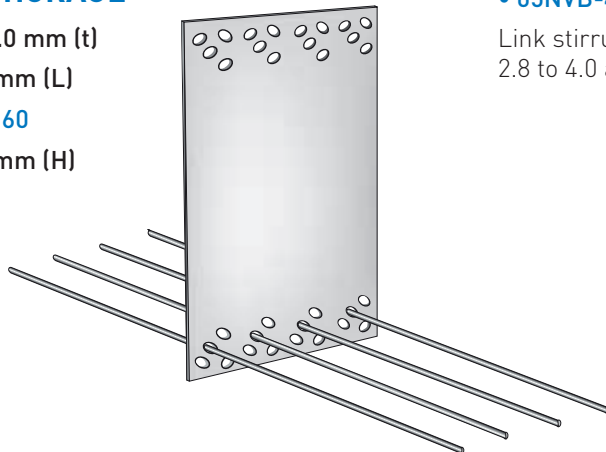
The plate anchorages are available in a thickness from 1.5 to 2.0 mm (also 3.0 mm on request) Available lengths are from 40 to 400 mm inclusively and heights from 150 to 260 mm inclusively.

FITTING AND INCORPORATION INTO THE REINFORCEMENT MESH

It is necessary to bend two reinforcement bars at an angle of 30°. These two bent bars are introduced into the upper holes of the series made at the bottom of the plate and arranged in the desired direction of the reinforcement mesh. The bent bars make it possible for the link plate to position itself under the mesh in order to allow the straight reinforcement bars to be positioned in the lower round holes. Next, the bent bars are pivoted towards the outside in such a way that the ends of the mesh can be tied in such a way that the link plate is pressed against the mesh. It is also possible to tie some reinforcement bars by passing them through the lower holes and the link plate will become more firmly fixed to the mesh.

EXAMPLE OF AN ORDER PLATE ANCHORAGE

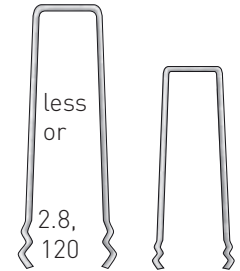
- thickness : 2.0 mm (t)
- length : 160 mm (L)
- 05FA2-175-160
- height : 175 mm (H)



TIES FOR SANDWICH PANELS

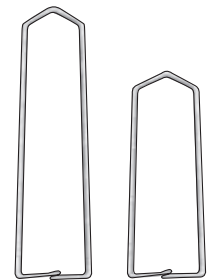
STRAIGHT TIES

The ties are made from A4 stainless steel round wire (1.4401 or 1.4571 materials). The ties are made in the form of U slightly wavy at their ends and are available in diameters 4.0 and 5.0 mm and heights from 2.8 to 320 mm inclusively. The ties are placed on the reinforcement mesh cross of the support layer and then pushed across the insulation and the exterior layer until they touch the formwork. To avoid the points of the ties being visible under the exterior walls of the component, the ties must be slightly withdrawn from where they have touched the formwork.



LINK STIRRUP

Link stirrups are made from A4 stainless steel wire (1.4401 or 1.4571 materials). They are used as an alternative to a straight link tie, but in contrast to the latter they are fixed to the lower mesh. The fitting of a link stirrup takes place in 4 stages, namely: 1 The stirrup is hooked on the ends of the upper reinforcement, 2 the stirrup is reset upright, 3 the sides of the stirrup are pressed to the right, 4 final position.



EXAMPLE OF AN ORDER LINK STIRRUP

- diameter : 4.0 mm (Ø)
- height : 176 mm (L)
- 05NVB-4.0-175

Link stirrups are available in the following diameters: 2.8 to 4.0 and 5.0 mm and heights of 155 to 250 mm.