

SINTEF Building and Infrastructure confirms that

Litex Membrane Board

has been found to be fit for use in Norway and to meet the provisions regarding product documentation given in the regulation relating to the marketing of products for construction works (DOK) and regulations on technical requirements for building works (TEK), with the properties, fields of application and conditions for use as stated in this document

1. Holder of the approval

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2. Product description

Litex Membrane Board is a wet room board with a core of extruded polystyrene (XPS) coated on both sides with an aluminium layer, a reinforcement mesh and a top layer of water-based epoxy, see fig. 1. The surface is light grey, while the core material is light blue. Supplementary sealing products which are part of the membrane system are listed in table 1.

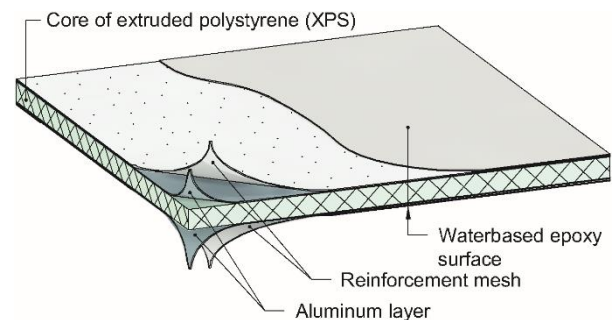


Fig. 1
 Litex Membrane Board design

Table 1
 Overview of supplementary sealing products included in the approval together with Litex Membrane Board

Product	Description
Litex Fiber Strip	Polypropylene
Litex Jointing Strip	NBR rubber band with polypropylene on the backside
Litex Jointing Strip, self-adhesive	Butyl, aluminum and polyester coating
Litex Pipe Collar 28 mm	Fibre reinforced NBR rubber
Litex Pipe Collar 40 mm	Fibre reinforced NBR rubber
Litex Pipe Collar 65 mm	Fibre reinforced NBR rubber
Pipe collar belonging to Sanipex wall box	Sanipex pipe collar
Litex Collar Internal and External Corner	Fibre reinforced NBR rubber
Litex Floor Drain Collar, Joti	Fibre reinforced NBR rubber
Litex Floor Drain Collar, Serres	Fibre reinforced NBR rubber
Litex Floor Drain Collar, Universal	Fibre reinforced NBR rubber
Litex mounting discs and mounting screws	
Litex adhesive	Adhesive of polyeterpolymer

Table 2
 Standard board dimensions

Thickness [mm]	Width x Length [mm x mm]
13	600 x 2440
20	
30	
50	

3. Fields of application

Litex Membrane Board can be used as a vapour- and watertight layer on walls and floors in bathrooms and washrooms in houses, hotels and rooms with equivalent conditions. The application as a watertight layer requires the use of reinforcement strips over joints, fasteners and connections between floor and wall. Other conditions for use are given in chapter 6.

The boards may be installed directly on a wall framework or other substrate such as brickwork or concrete, including walls below ground level. The boards shall always be covered by ceramic tiles or an equivalent non-combustible lining, e.g. 8 mm thick wall rendering.

4. Properties

Material properties

Table 3 shows the material characteristics for Litex Membrane Board determined by type testing.

Table 3
Product characteristics determined by type testing

Property	Value	Test method
Water vapour resistance, equiv. air layer thickness, s_d	7800 m	NS-EN-ISO 12572
Watertightness at 1,5 bar water pressure in 7 days	Passed	NS-EN 14891 Annex A.7
Watertightness around pipe penetrations in walls ¹⁾	Passed	ETAG 022 Annex E
Watertightness around pipe penetrations in floors	Passed	ETAG 022 Annex A
Crack bridging properties: - tensile strength - shear strength	2 mm – Passed 2 mm – Passed	ETAG 022, Annex B
Bond strength ²⁾	0,3 N/mm ²	NS-EN 14891, Annex A 6.2
Soft body impact resistance ³⁾	3x120 Nm	ETAG 003

¹⁾ Penetrations: Copper pipe Ø22 mm and wall box Ø46 mm

²⁾ Tile adhesive: Maxit Serpo Flislim 610 Multi

³⁾ 20 mm boards covered with 20 x 20 cm ceramic "project tiles", Hey'di Cemfix tile adhesive and Hey'di Fugemasse grout, installed on studs spaced c/c 600 mm, resists 3 x 120 Nm and 1 x 240 Nm.

20 mm boards without tiles, installed on studs spaced c/c 300 mm resists 3 x 120 Nm.

Safety in case of fire

Fire classification according to EN 13501-1 has not been determined. Covered by ceramic tiles, the surface complies with class In1 according to NS 3919.

5. Environmental aspects

Substances hazardous to health and environment

The product contains no hazardous substances with priority in quantities that pose any increased risk for human health and environment. Chemicals with priority include CMR, PBT and vPvB substances.

Effect on indoor environment

The product is not regarded as emitting any particles, gases or radiation that have a perceptible impact on the indoor climate, or to have any significant impact on health.

Waste treatment/recycling

For disposal Litex Membrane Board, supplementary sealing products, dry liquid applied membrane, and dry adhesive shall be sorted as residual waste on the building site. The products shall be delivered to an authorized waste treatment plant for energy recovery.

Wet liquid applied membrane and adhesive are defined as hazardous waste (according to the Norwegian regulations on waste treatment – Avfallsforskriften). The products must be sorted as hazardous waste on the building site and delivered to an authorized waste treatment plant for hazardous waste.

Environmental declaration

No environmental declaration (EPD) has been worked out for the product.

6. Special conditions for use and installation

Storage and conditioning

The boards shall be covered during storage and transportation to avoid dust or dirt that may reduce the adhesive bond properties of the board surface. The boards must not be exposed to flames, other ignition sources or organic solvents. The product should be protected from UV radiation during long-term storage.

Substrate

The substrate for installation of Litex Membrane Board shall fulfil the requirements for directional- and surface tolerance class PB as given in NS 3420 Part 1 General requirements.

Membranes

Liquid applied membranes listed in table 4 can be used together with Litex Membrane Board and supplementary sealing products (see table 1) as waterproof sealing over joints, screws and pipe penetrations. The membranes shall be applied according to the manufacturers' instructions.

Table 4
Liquid applied membranes compatible with Litex Membrane Board and sealing products

Membrane
Hey'di K10
Norflis våtromsmembran
Hey'di smøremembran
Optiform Ultipromembran
Alfix 1k tetningsmasse

Wall joint sealing

In wet zones, one of the following alternatives may be used:

- Alternative 1: Litex Jointing Strip (self-adhesive) is used to cover wall joints, corners, and screw fixings without liquid applied membrane, see fig. 2.
- Alternative 2: All joints and screw fixings are covered with Litex Jointing Strip or Litex Fiber Strip in combination with a liquid applied membrane listed in table 4. The liquid applied membrane shall cover the reinforcement strip completely (wider than the strip), see fig. 2.

Joint sealing at floors and floor/ wall connections

Litex Jointing Strip (rubber) is used over board joints and at floor/wall connections together with a liquid applied membrane listed in table 4. The liquid membrane shall cover the reinforcement strip completely (wider than the strip).

Litex Collar for Internal and External Corner are used at external and internal corners, bonded to the membrane board with Litex adhesive. The collars are covered with a liquid applied membrane listed in table 4.

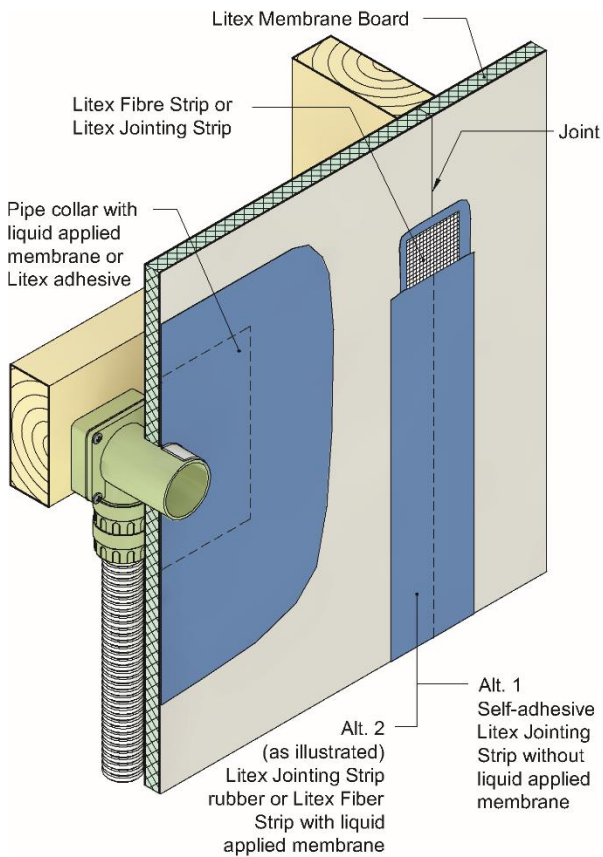


Fig. 2
Principle for sealing around pipe penetrations, over joints and screw fixings

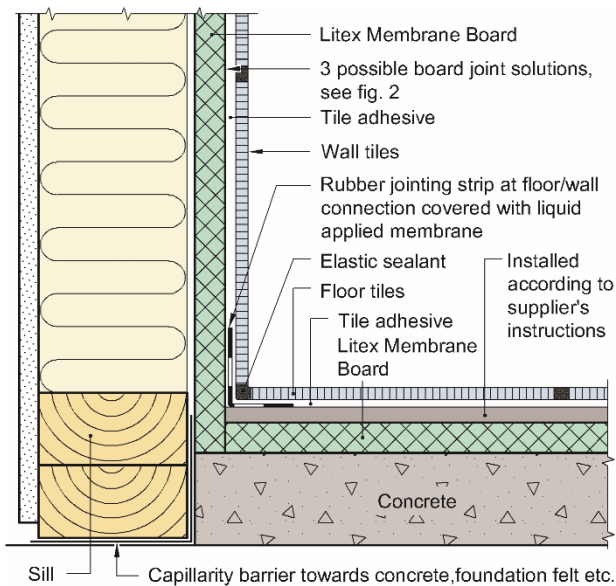


Fig. 3
Example of connection between floor and wall with tiles

Sealing of pipe penetrations in floors and walls

Litex Pipe Collars are bonded to the substrate with Litex adhesive. The collars are then covered with a liquid applied membrane listed in table 4, with a width that is wider than the collar, see fig. 2.

Water vapour control layer

Litex Membrane Board meets the required water vapour resistance for external walls and walls towards rooms without heating or with limited heating. Only sealing over joints, screw fixings and penetrations are necessary. Any plastic foil in external walls shall be removed before the membrane boards are installed.

Installation on framework

Boards with a thickness of 20 mm may be installed directly on studs spaced maximum c/c 300 mm. Thinner boards require a continuous substrate of panels or boards. Extra horizontal noggings must be used for installation of heavy objects like washstands, cabinets etc.

The boards shall be fixed along the edges with screws and washers intended for installation of the board system. Recommended spacing between screws is max. 250 mm for 13 mm boards, 300 mm for 20 mm boards, 400 mm for 30 mm boards, and at least one fixing point at every horizontal noggings.

For boards fixed to a continuous substrate it is recommended to use 3 additional screws with washers, evenly spaced along the center of the board, and with one screw in the center of the board at the top and bottom sill. All screws shall be at least 20 mm longer than the board thickness.

Installation on masonry or concrete

Fixing to masonry or concrete substrates can be done with tile adhesive, see fig. 4. Boards with a minimum thickness of 20 mm can be fastened with adhesive applied at 15 – 20 spots spread throughout the board. Thinner boards shall be fastened with a continuous adhesive layer. All loose wallpaper, plaster, paint and dust must be removed before fixing the boards. Absorbing surfaces must be primed.

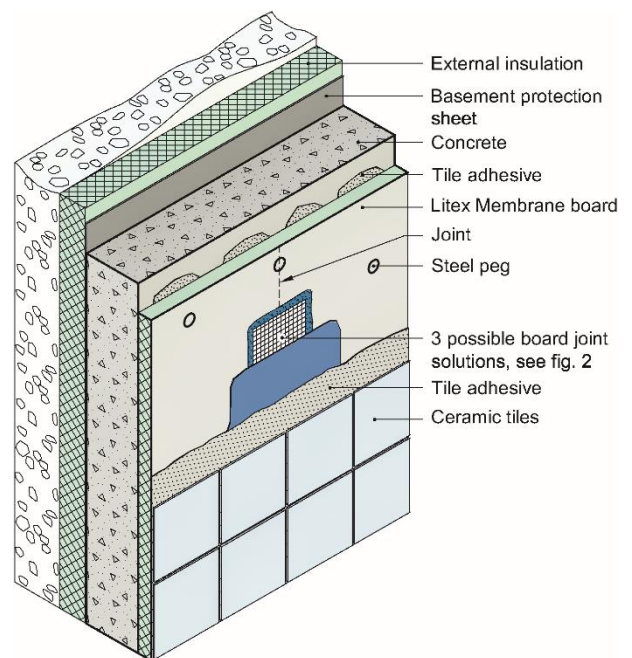


Fig. 4.
Example of Litex Membrane Plate used on a wall below ground level

Installation on floor

In a distance of 0,8 m from the floor gully, the boards shall be installed with a slope of 1:50 towards the gully. The other parts of the floor should have a 1:100 slope towards the gully. 13 mm or 20 mm boards can be installed on concrete floors or a subfloor with a stiffness and design details as described in SINTEF Building Research Design Guide 522.861 *Undergolv på trebjelkelag* and 541.805 *Golv i bad og andre våtrom*.

When used on floors, the boards shall always be covered with minimum 10 mm mortar/adhesive before tile installation. The liquid applied membrane used for joints shall be approved for this application.

Sealing around floor gully

When Litex Floor Drain Collar in NBR rubber is used, Litex adhesive shall be used to bond the collar to the membrane board. See installation instructions for Litex wet room system.

Tiling

Litex Membrane Board shall always be covered with tiles. The maximum water absorption rate for the tiles shall be maximum 20 % for walls, 10 % for floors, and 6 % when used with a low-profile floor heating system.

7. Factory production control

The product is produced in Norway for Litex AS.

The holder of the approval is responsible for the factory production control in order to ensure that the product is produced in accordance with the preconditions applying to this approval.

The manufacturing of the product is subject to continuous surveillance of the factory production control in accordance with the contract regarding SINTEF Technical Approval.

8. Basis for the approval

The approval is primarily based on tested product properties documented in the following reports:

- SINTEF Building and Infrastructure, report 3B0547-01 dated 30.05.2011
- SINTEF Building and Infrastructure, report 3D1003-01 dated 17.04.2010
- SINTEF Building and Infrastructure, report 3D1014-01 dated 18.05.2010
- SINTEF Building and Infrastructure, report 3D017314 dated 04.03.2009
- SINTEF Building and Infrastructure, report 3D063901 C dated 24.04.2009.
- SINTEF Building and Infrastructure, report 3D063901 A dated 05.03.2009.
- SINTEF Building and Infrastructure, report SBF2013F0025 dated 15.2.2015
- VTT Technical research center of Finland, report VTT-S-01199-13 dated 13.04.2013
- VTT Certificate No. VTT-C-154207 dated 13.02.2009
- SP Technical Research institute of Sweden, report FX216776 dated 06.09.2012

9. Marking

The product shall be marked with the manufacturer's name, product name and time of production. The marking may be fixed directly on the boards or on the packaging. The approval mark for Technical Approval TG 20006 may also be used.



Approval mark

10. Liability

The holder/manufacturer has sole product responsibility according to existing law. Claims resulting from the use of the product cannot be brought against SINTEF beyond the provisions of Norwegian Standard NS 8402

for SINTEF Building and Infrastructure

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Approval Manager