SINTEF Technical Approval

TG 20574

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Provided listed on
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SINTEF confirms that

PrevPex pipe-in-tube-system for Prevent Systems low pressure water mist system

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

Prevent Systems AS
Fåberggaten 126
2615 Lillehammer, Norge
www.prevent-systems.com

2. Product description

PrevPex pipe-in-tube-system is a system for distribution of cold water in buildings to Prevent Systems low-pressure water mist nozzles in wet systems. Prevent Systems low-pressure water mist system is an automatic fire suppression system made up of the following main components: water mist nozzles, distribution pipework, and either a control valve set or pump set. This approval concerns PrevPex pipe-in-tube-system.

Tabel 1 specifies components included in SINTEF Technical Approval no. 20574 for PrevPex pipe-in-tube-system.

3. Fields of application

PrevPex pipe-in-tube system shall be used in Prevent Systems wet automatic low-pressure water mist systems designed and constructed according to EN 14972-1 and Prevent Systems associated DIOM-manual. Where other relevant standards are used, the system shall apply in full to this standard, and its relevance and validity shall be considered and documented.

4. Properties

PEX-pipes

PEX-pipes have an oxygen barrier and the following product characteristics, as specified by the supplier:

- Maximum allowed pressure 1,6 MPa (16 bar)
- Maximum allowed ambient temperature during short periods (< 1 month): 50° C
- Maximum allowed continuous ambient temperature: 35° C

Water tightness

PEX-pipes and fittings with dimensions 12 x 1,1 mm, 16 x 1,5 mm and 20 x 1,9 mm have passed pressure testing at 25 bar according to EN ISO 1167-1.
The pipe-in-tube system has passed type testing of water tightness for PEX-pipes with dimensions 12 x 1,1 mm, 16 x 1,5 mm and 20 x 1,9 mm. Fittings are certified in accordance with current product standards.

Fire performance

Fire performance according to EN 13501-1 is not given for PrevPex pipe-in-tube system. The product can be used according to descriptions in this approval.

Exchangeability

PEX-pipe dimension 12 x 1,1 mm (18 mm protection tube) and 16 x 1,5 (25 mm protection tube) are documented to be exchangeable for up to 10 meters length, included four bends with an angle of 90 degrees. PEX-pipe with dimension 20 x 1,9 mm (28 mm protection tube) and wall/ ceiling box for embedding in concrete are not documented with regards to exchangeability. The system does not have a suitable wall/ ceiling box for 20 x 1,9 mm.

Durability

The durability of the pipe-in-tube-system is considered satisfactory for the intended fields of application, based on the material properties for system components.

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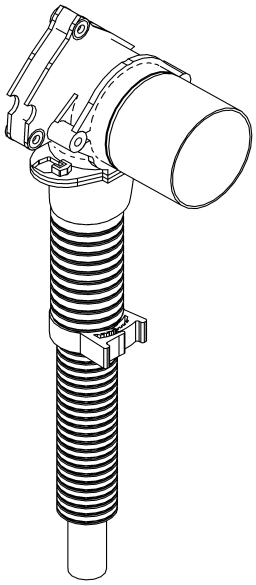


Fig. 1
PrevPex – Wall/ ceiling box with clamp

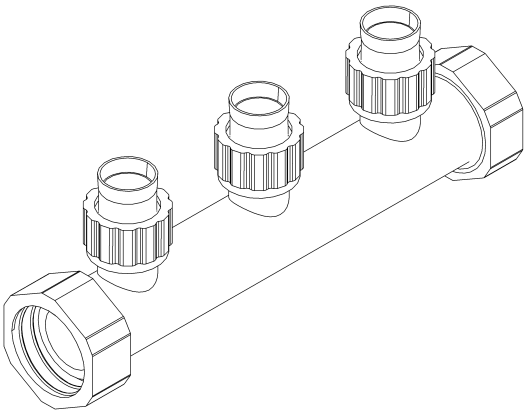


Fig. 2
PrevPex - Manifold

Table 1
Components included in the approval

Component	Description
PEX-pipe and protection tube	Dimension 12 x 1,1 mm (18 mm protection tube), 16 x 1,5 mm (25 mm protection tube) and 20 x 1,9 mm (28 mm protection tube). External diameter of the belonging corrugated PE protection tubes is given in parenthesis.
Fittings for PEX-pipe	GF JRG fitting system for PEX- pipe. SINTEF Product Certificate no. 0049
Wall/ ceiling box	Wall/ ceiling box for 12 x 1,1 mm, 16 x 1,5 mm and 20 x 1,9 mm PEX-pipe with 18 mm, 25 mm and 28 mm protection tube respectively, se fig. 1.
Locking clip for wall/ ceiling box	The locking clip secures grip and tightening between wall/ ceiling box and protection tube.
Bracket for wall/ ceiling box	Bracket to fix the wall/ ceiling box to the studding.
Manifold	Manifold made of bronze for distribution of water, se fig. 2
Manifold cabinet	Galvanized steel manifold cabinet for installation in ceiling or in wall in both wet and dry zones. The cabinet is delivered with splash protection, front door with frame, manifold bracket, bushings, drainage clip and drainage components.
Fixing clamps	For use inside the manifold cabinet when replacing PEX-pipes through protection tubes.
Clamps for protection tube	Clamps for fixing/support of protection tubes with external diameters 18 mm, 25 mm and 28 mm.
Pipe protection unit for nails and screws	Pipe protection unit is used for protection of 18 mm, 25 mm, and 28 mm protection tubes from penetration of nails and screws.
End sleeve	End sleeves are used to make a watertight connection between PEX-pipes and protection tubes with dimension 12 x 1,1 mm (18 mm protection tube), 16 x 1,5 mm (25 mm protection tube) and 20 x 1,9 mm (28 mm protection tube).
Fitting connector	Fitting connector is used for fixing/ support of protection tube, for instance in kitchen units.
Pipe support	Pipe support made of plastic ensuring correct pipe bending radius between transition floor/ wall and ceiling/ wall.
Installation suitcase with special tools	Installation suitcase with special tools for installation of the pipe-in-tube system.

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 or vPvB substances.

Waste treatment/recycling

The product shall be sorted as metal and residual waste. The product shall be delivered to an authorized waste treatment plant for material and energy recovery.

Environmental declaration

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

6. Special conditions for use and installation

Design considerations

The pipe-in-tube system shall be placed behind wall/ceiling claddings with minimum the same fire resistance that was used in the test protocol for verifying the water mist system as given in Prevent Systems DIOM-manual. In areas that are not covered by an automatic suppression system, the pipe-in-tube system shall be protected against fire for the required operation time of the water mist system. This does not apply to permitted exceptions of areas with little/no combustible materials according to the relevant standard.

The PEX-pipes can be easily accessible for replacement after installation. The protection tubes can be installed so that damaged PEX-pipes can be replaced without damaging any building construction. Leakages should be easily discovered and should not damage other installations or building parts. The main goal for the protection tube is to drain potential leakages to the floor gully in a wet room. Water leakages should be directed through the manifold cabinet's draining tube to a visible spot, not into the floor gully directly. It is up to the designer in the individual building project to assess the need for an installation of PrevPex pipe-in-tube that is water damage safe, exchangeable, and where leakages could be easily discovered.

Pipe sizing

Hydraulic calculations shall be performed for every Prevent Systems low pressure water mist system to ensure that the pipe system delivers the required water flow and pressure. Only programs approved by accredited certification body must be used for the calculations.

Installation

PrevPex pipe-in-tube-system shall be installed in accordance with the manufacturer's installation instructions. Only components listed in Table 1 shall be used when installing PrevPex pipe-in-tube-system. The exchangeability of the PEX-pipe should be controlled before finishing the building construction if the pipe lengths are more than 10 meters. If 20 x 1,9 mm PEX-pipes and/ or wall/ ceiling box for embedding in concrete is used, the exchangeability should be documented in each single case. The system does not have a suitable wall/ ceiling box for 20 x 1,9 mm.

Embedding of pipes in concrete

Embedding the protection tube in concrete give the pipes stability, protection and a good starting point when exchanging the inner pipes. To avoid displacement of pipes, it is important to secure the pipes properly to the reinforcement mesh. Use pipe supports to ensure correct pipe bending radius where the pipes transition from the screed.

Manifold cabinet

When manifold cabinets are installed in a wet room, then the cabinets shall be placed in dry zones.

To obtain a water damage safe and exchangeable PrevPex pipe-in-tube system, all instructions in the section below must be followed. Fasten protection tubes to the cabinet by using bushings. Cut the protection tubes above the sill height in the bottom of the cabinet. Cut the drain tube as close as possible to the cabinet's bottom as described in Fig. 3. Only tools from GF JRG shall be used.

Mount manifold cabinets for wall installation at a height that ensures the protection tubes to come straight into the cabinet.

Use a protection tube with an outside diameter of 25 mm for draining of water leakage from the cabinet to the floor gully together with drainage components. When the draining penetrates the wall in a wet zone, use drainage components. The drain tube has a capacity ≥ 0,25 l/s. The drain tube cannot be more than 1,5 meters.

When a manifold cabinet is installed in the ceiling, mount it in a wet room with draining ability to a watertight floor with gully. Install the front door in level with the ceiling and remove the water splash protector.

Control the watertightness of bushings in the cabinet before completion of the building construction. Also control the water capacity of the drainage tube before finishing the wall. Place a water splash protector inside the manifold cabinet unless the cabinet is mounted in a ceiling. Use supplied clamps to fix the manifolds inside the cabinet.

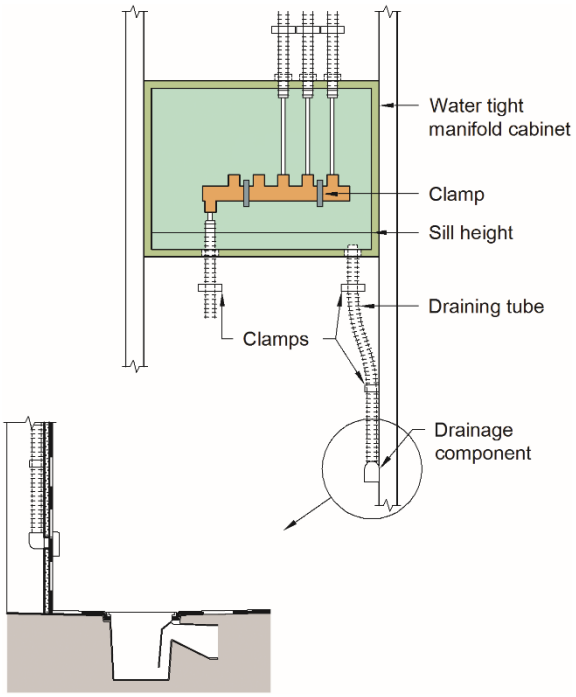


Fig. 3
Manifold cabinet in wet room

Manifolds
Manifolds should preferably be installed inside a manifold cabinet. They can also be installed visibly in a shaft with sufficient fire resistance according to clause 3 and 6 of this approval, and with access for inspection and replacement. Shafts with only water mist systems should preferable be water damage safe. If the water mist system is installed in a shaft with water installations, the shaft shall be water damage safe as described in Building Research Design Sheet 553.002. It is important to fix the manifolds well to the building construction. Manifold brackets for fixing/supporting of the manifolds shall be used.

Clamping of protection tubes
Clamps that fix the protection tubes well to the building construction shall be used. Clamping of protection tubes is especially important before and after a bend, in the middle of a bend, and where tubes pass through a building part and in conjunction with wall/ ceiling boxes and manifold cabinets.

Protection tubes should be clamped in conjunction with wall/ ceiling boxes and manifold cabinets with a distance of 150- 300 mm. The clamp space on straight pipes should not exceed 0,6 m.

Fixing clamps for use inside the manifold cabinet shall be used when replacing PEX-pipes through protection tubes.

Installation of wall/ ceiling box
Wall/ ceiling boxes shall be installed as described in the installation instruction from GF JRG/ importer.

Tools
Only special tools provided by GF JRG shall be used for installation of the pipe-in-tube-system.

Pipe protection
Pipe protection units should be installed in stud partitions where there is a risk of penetrating the pipes with nails, screws etc. Protection tubes installed through steel partitions must be protected against damages caused by expansion forces.

PEX-pipes must not be exposed to solvents, and tape cannot be used on the outside of the pipes. PEX-pipes must not be exposed to sunlight (UV- radiation) for a long period.

Fire safety
Penetrating fire-classified building walls or floors must not weaken the building construction's fire resistance. If pipes do penetrate fire-classified building walls or floors, then a well-documented construction, as described in Building Research Design Sheet 520.342, must be used. If a manifold cabinet is installed in a fire-classified building wall, the fire resistance of the wall must not be weakened.

Protection against frost
When the pipe-in-tube-system is installed in constructions subject to frost, e.g., cold attics, the water pipes must be placed on the warmest side of the insulated construction to avoid the pipes from freezing. Insulation alone is not sufficient to avoid the pipes from freezing, but it can postpone the freezing. Stagnant water will be cooled down and freeze, even though the pipes are insulated.

Marking of water circuits
The water circuit shall be marked somewhere inside the manifold cabinet with exact length and where it delivers water. A circuit form, accompanying the cabinet, should be used.
Hand over
The pipe-in-tube system shall be pressure tested in accordance with the instructions in Prevent Systems DIOM-Manual before handing it over to the owner. The internal control form shall be completed before commissioning.

Maintenance
Regular controls and necessary maintenance should be performed according to instructions from the holder of the approval.

7. Factory production control
PrevPex pipe-in-tube-system is produced by Georg Fischer Pfci Srl, Valeggio Sul Mincio, Italy and GF JRG AG, Sissach, Switzerland. The producers have a quality and environmental management system certified according to ISO 9001 and ISO 14001.

The holder of the approval is responsible for the factory production control to ensure that PrevPex pipe-in-tube-system is produced in accordance with the preconditions applying to this approval.

The manufacturing of the product(s) and the manufacturer's system for factory production control (FPC) is subject to continuous surveillance in accordance with the contract regarding SINTEF Technical Approval.

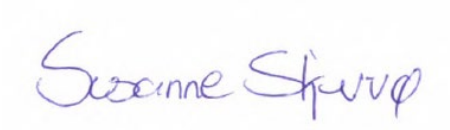
8. Basis for the approval
The evaluation of PrevPex pipe-in-tube-system is based on reports owned by the holder of the approval.

The evaluation of design and technical solutions are based on recommendations given in SINTEF Building Research Design Guides.

9. Marking
Components in the system should be marked with the manufacturer's name or logo, product name and production date. The approval mark for SINTEF Technical Approval TG 20574 may also be used.

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



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