

SINTEF Building and Infrastructure confirms that

## PrevPex pipe-in-tube system for water mist applications

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  
 Fåberggata 126  
 2615 Lillehammer  
 Norway

### 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, see fig 1.

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.

Table 2 specifies the main components included in the approval. The control description for SINTEF Technical Approval no. 20574 includes a more detailed description of system components. This document constitutes a formal part of the approval, and the latest version filed at SINTEF Building and Infrastructures always applies.

### 3. Fields of application

The approval concerns cold water distribution inside buildings to Prevent Systems low-pressure water mist nozzles. The system is tested and approved for use in buildings with classifications in accordance with table 1.

### 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

The pipe-in-tube system has passed type testing for 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.



Fig. 1  
 Prev2exp and Prev3con low-pressure water mist nozzles  
 (Source: Prevent Systems AS)

Table 1  
 Risk class and fields of application

Type	Example	Min. coverage
NS-INSTA 900-1 Risk class 4		
1	House, town house	30 min (1-2 nozzles)
2	Apartment buildings (max. 8 floors), student housing	30 min (1-4 nozzles)
3	Buildings with 9 floors or more, hotels.	60 min (4 nozzles)
NS-EN 12845 Low - Ordinary risk class		
LH	Offices and schools with no fire cell larger than 126 m <sup>2</sup>	30 min
OH-1	Offices, hotels, restaurants	60 min (72 m <sup>2</sup> ) <sup>1)</sup>
OH-2	Parking garage, museum	60 min (144 m <sup>2</sup> ) <sup>1)</sup>

<sup>1)</sup> of the hydraulically least favourable activation area

#### Exchangability

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) is not documented with regards to exchangeability. The system does not have a suitable wall box for 20 x 1.9 mm.

#### Fire performance

The system has documented fire performance, as required for installation, for the fields of application specified in this document.

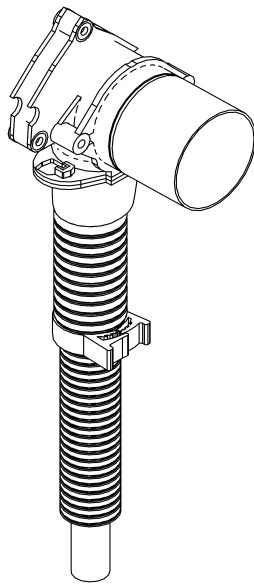


Fig. 2  
PrevPex – Wall box with clamp

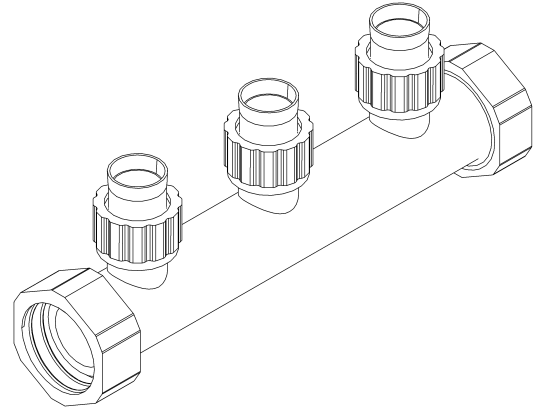


Fig. 3  
PrevPex - Manifold

Table 2  
Product specifications for PrevPex pipe-in-tube system

Component	Description
Water mist nozzles	Prev2exp, Prev3exp, Prev3con, Prev4sw, Prev5exp, Prev5exp20
PEX-pipe and protection tube	GF JRG PEX-pipes 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). External diameter of the belonging corrugated PE protection tubes is given in parenthesis. NRF-no.: 5720.012, 5720.016 and 5720.020.
Fittings for PEX-pipe	GF JRG fitting system for PEX- pipe. SINTEF Product Certificate no. 0049. NRF-no.: 511 20 XX, 511 21 XX, 511 22 XX, 511 23 XX, 511 26 XX, 511 27 XX, 511 30 XX, 511 31 XX and 511 32 XX.
Wall box	Wall 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. NRF-no.: 511 16 32 and 511 16 34.
Locking clip for wall box	The locking clip secures grip and tightening between wall box and protection tube. NRF-no.: 511 25 71 and 511 25 72.
Bracket for wall box	Bracket to fix the wall box to the studding.
Manifold	Manifold made of bronze for distribution of water. NRF-no.: 511 17 51 and 511 17 95.
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. NRF-no.: 511 27 01, 511 27 04, 511 27 05, 511 32 84, 511 32 85 and 511 32 86.
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. NRF-no.: 511 26 31, 511 26 33 and 511 26 34.
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. NRF-no.: 511 28 49
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). NRF-no.: 511 17 27.
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.

### *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*

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. Intact thermo bulb in the water mist nozzle contains a mixture of hydrocarbons and shall be sorted as hazardous waste and delivered to an authorized treatment facility for chemicals.

### *Environmental declaration*

No environmental declaration has been worked out for the product.

## 6. Special conditions for use and installation

### *Design considerations*

The PEX-pipes shall be easily accessible for replacement after installation. The protection tubes shall be installed so that damaged PEX-pipes can be replaced without damaging any building construction. Leakages shall be easily discovered and shall 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 shall be directed through the manifold cabinet's draining tube to a visible spot, not into the floor gully directly. The pipe-in-tube system shall be installed behind wall and ceiling boards with a minimum fire resistance equivalent to D-s2, d0 [In2].

### *Installation*

PrevPex pipe-in-tube system shall be installed in accordance with the manufacturer's installation instructions. Only components, as described in Table 1, shall be used when installing PrevPex pipe-in-tube system. The internal control form, accompanying the manifold cabinet, shall be completed before commissioning.

### *Dimensioning*

Every PrevPex pipe-in-tube system shall be hydraulically calculated to ensure that required water flow and pressure is delivered to each water mist nozzle. Programs approved by accredited certification body must be used for the calculations.

The exchangeability of the PEX-pipe must be controlled before finishing the building construction if the pipe lengths are more than 10 meters. If 20 x 1.9 mm PEX-pipes is used, the exchangeability needs to be documented in each single case. The system does not have a suitable wall box for 20 x 1.9 mm.

### *Manifold cabinet*

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

Protection tubes must be fastened to the cabinet by using bushings. The protection tubes must be cut above the sill height in the bottom of the cabinet. The drain tube must be cut as close as possible to the cabinet's bottom as described in Fig. 4. Only tools from GF JRG shall be used.

Manifold cabinets for wall installation shall be mounted at a height that ensures the protection tubes come straight into the cabinet.

Draining of water leakage from the cabinet to the floor gully must be guided through a protection tube with an outside diameter of 25 mm and the following drainage components. The drainage components must be used when the draining penetrates the wall in a wet zone. The drain tube has a capacity  $\geq 0.25$  l/s. The drain tube cannot be more than 1.5 meters.

When the manifold cabinet is installed in the ceiling, then it must be mounted in a wet room with draining ability to a watertight floor with gully. The front door must be installed level with the ceiling and the water splash protector must be removed.

Bushings in the cabinet shall be controlled for watertightness before completion of the building construction. The water capacity of the drainage tube shall also be controlled before finishing the wall.

The water splash protector shall always be placed inside the manifold cabinet with exception of when the cabinet is mounted in a ceiling.

The manifolds shall be fixed inside the cabinet with supplied clamps.

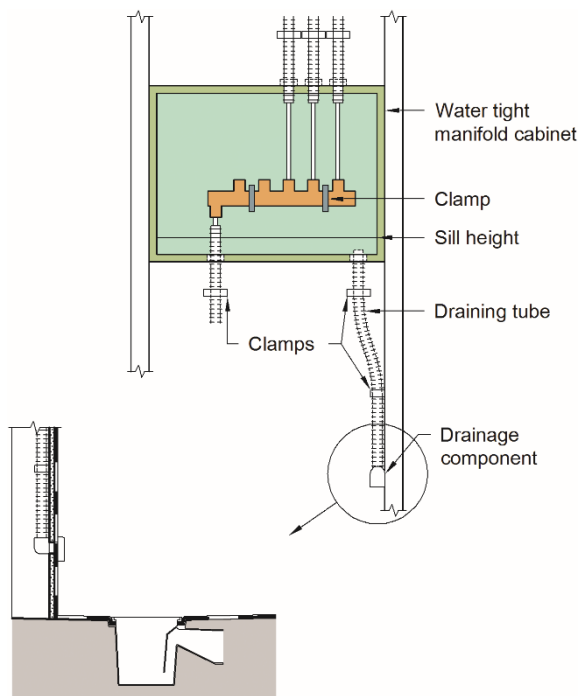


Fig. 4  
Example of installation of PreVPex Manifold Cabinet in wet Rooms

### Manifolds

Manifolds should preferably be installed inside a manifold cabinet. They can also be installed visibly in a water leakage protected shaft with access for inspection and replacement, and a minimum fire resistance equivalent to D-s2, d0 [In2]. 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 also where tubes pass through a building part and in conjunction with wall boxes and manifold cabinets.

Protection tubes should be clamped in conjunction with wall 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 boxes

Wall 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 unit should be installed in stud partitions where there is a risk of penetrating the pipes with nails, screws etc. Expansion forces and water hammers can destroy protection tubes when they go through steel partitions, but this can be avoided by protecting the tubes. 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.

### Protection against frost

When the pipe-in-tube-system is installed in constructions subject to frost, the water pipes must be placed on the warmest side of the insulated construction to avoid the pipes from freezing.

### Penetration of fire walls

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 solution, as described in Building Research Design Sheet 520.342, must be used. If a cabinet is installed in a fire-classified building wall, then the fire resistance of the wall must not be weakened.

### Pressure testing of the system

The pipe-in-tube system shall be pressure tested in accordance with the installation instructions and *Prevent Systems Design, Installation, Operating and Maintenance Manual* before handing it over to the owner.

### 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.

## 7. Factory production control

The water mist nozzles are produced by Prevent Systems AS, Fåberggaten 126, 2615 Lillehammer, Norway. The company have a management system certificate in conformity with ISO 9001.

The pipe-in-tube system is produced by Georg Fischer JRG AG, Hauptstrasse 130, 4450 Sissach, Switzerland. The company have a management system certificate in conformity with ISO 9001 and an environmental management system that meets the requirements of ISO 14001.

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 based on a system assessment, documentation of the properties of the subcomponents and type testing of a complete system as documented in the following reports:

- SINTEF Building and Infrastructure. Test report 2017:00144 Trykk- og kapasitetsprøving av *PrevPex rør-i-rør-system for vannåkeanlegg*
- SINTEF Building and Infrastructure. Test report SBF2016F0496 Trykk- og kapasitetsprøving av *PrevPex rør-i-rør-system for vannåkeanlegg*, datert 22.11.2016
- SINTEF Building and Infrastructure. Test report B0999805 *Delprøving av "nye" Sanipex fordelerskap*, datert 19.6.2008.
- SINTEF Building and Infrastructure. Test report 3B040902 *Prøving av Sanipex miniskap iht. NT VVS 129*, datert 10.11.2012.
- SINTEF Building and Infrastructure. Test report 3B040939 *Prøving av JRG Sanipex varerør*, datert 6.8.2012.
- SINTEF Building and Infrastructure. Test report 102003700 *Utlekking av tungmetaller fra JRG Sanipex fordeler iht. NKB 4*, datert 18.3.2013.
- SINTEF Building and Infrastructure. Test report 102003701 *Prøving av Sanipex rør-i-rør-system iht. NT VVS 129 og ETAG 022, Annex F*, datert 16.4.2013.
- SINTEF Building and Infrastructure. Test report 102004276-9 *Prøving av dreneringsklips til fordelerskap*, datert 30.10.2013.
- SINTEF Product certificate no. 0017
- SINTEF Product certificate no. 0049
- BRE Global assessment report P106045-1001 *Assessment report for Prevent low pressure water mist system tested to BS 8489-7 (Prev5exp)* dated 19.1.2017.
- BRE Global test report 266829 *Fire testing of a low pressure water mist system to Annex A of DD8458-1: 2010 (Prev3v)*, dated 10.3.2011.

- BRE Global test report 269754 *Prevent Systems AS residential sidewall water mist fire tests (Prev4sw)*, dated 23.8.2011.
- BRE Global test report 293115 *Fire tests to DD 8489-7:2011 (Clauses 6.7, 6.8 and 6.9) with a Prevent Systems A/S low pressure water mist fire suppression system (Prev5)*, dated 23.4.2014.
- SINTEF NBL test report NBL 107492-A *Prevent Systems AS Fire extinguishing tests according to IMO Res.265(84) – Public Space (Prev2)*, dated 4.1.2010.

## 9. Marking

All packaging should be marked with the manufacturer's name, product name and production date. The approval mark for SINTEF Technical Approval No. 20574 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