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# Guideline for SINTEF Technical Approval

## Prefabricated bathroom modules

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### 1. General information about SINTEF Technical Approval

General information about SINTEF Technical Approval procedures is available at

<https://www.sintefcertification.no/portalpage/index/180>

### 2. Module description

Applicants for SINTEF Technical Approval (TG) concerning prefabricated bathroom modules must send a description of standard module design (drawings) to SINTEF, and a list of all materials and components used for the complete module design. The components must be described with the manufacturer's name and product type. Necessary documentation of product properties according to Regulation on marketing and documentation of construction products (DOK) must be available. This concerns f.ex.:

- Concrete and grouting compound
- Reinforcement
- Building boards
- Metal profiles
- Membranes
- Pipe-in-pipe system
- Drainage pipes
- Toilet with cistern
- Wash basin
- Tapware
- Shower doors
- Floor heating system

### 3. Properties which normally shall be included, and how these are determined

#### 3.1 Performance testing

SINTEF Technical Approval for prefabricated bathroom modules is primary based on performance testing of a typical module design. In addition the approval is based on documentation of product properties of materials and components used in the module design, and which is specified in the approval.

The purpose of the performance testing is to assess the complete system, and how the components function together. All components of a module ready for use have to be installed in the test module. The test module must have dimensions which are representative for modules used in the market. The following details shall be included in the test module:

- Floor, walls and roof with watertight layers according to the product description. One wall area shall be without ceramic tiles
  - Pipe system for water supply (pipe-in-tube system) including manifold cabinet and tapware for shower and wash basin
  - Pipe system for drainage from wash basin and shower/floor gully including water trap
  - Sanitary equipment like toilet with cistern, wash basin, shower and possible fixed bathroom furniture
  - Preparations for later installation of handicap equipment (shower seat + handle, arm supports at WC)
  - Door opening in the test module must have a 150 mm high watertight threshold
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Table 1 shows the properties normally determined by testing, and what minimum requirements applies.

Table 1  
Properties determined by type testing of bathroom modules

	Property	Test method	Minimum requirement
<b>Strength and stiffness</b>			
1	Concentrated static load on floor	EN 1195 or NT Build 230	Failure load $\geq 2,25$ kN, load applied through a $\varnothing 25$ mm steel surface
2	Load resistance of wall-hung wash basin	EN 14688 cl. 5.2	No damages or deformations of practical significance after 1500 N load in 60 min.
3	Load resistance of wall-hung toilet (if relevant)	EN 997 cl. 5.8.4	No damages or deformations of practical significance after 4000 N load in 60 min.
4	Load resistance of shower seat (if relevant)	EN 15200 cl. 6.14	No damages or deformations of practical significance after 2200 N load in 10 min.
<b>Water tightness</b>			
5	Tightness of floor exposed to static water pressure	ETAG 022 Annex A	No observed leaks after 24 hours with 100 mm water above floor gully grill, both before and after dynamic load with 30 kg sandbag and 0,45 m falling height (bag falling 3 times at each of 5 points)
6	Tightness of floor exposed to water spraying towards floor gully	ETAG 022 Annex A	No observed leaks after 100 cycles with - 60 sec. spraying with 90°C water - 60 sec. pause - 60 sec. spraying with 10°C water - 60 sec. pause
7	Tightness of penetrations, connections, joints etc.	ETAG 022 Annex A	No observed leaks after 1500 cycles over 5 days and nights with - 60 sec. spraying with 60°C water - 60 sec. pause - 60 sec. spraying with 10°C water - 60 sec. pause
8	Tightness of penetrations after dynamic loading	ETAG 022 Annex F	No observed leaks after 24 hours with rotating load exposure

### 3.2 Safety in case of fire

Reaction to fire shall be classified according to EN 13501-1 for materials used in the module design. Behaviour during a fire is assessed for the complete module.

### 3.3 Environmental characteristics

Self declarations concerning contents of substances which are harmful to health and environment, and emission classification concerning effect on indoor climate, shall be available for materials and components used in the module design. More detailed information is found at

<https://www.sintefcertification.no/file/index/4107>.

SINTEF offers preparation of EPD (Environmental Product Declaration).

### 3.4 Durability

The water tightening system of the modules shall have a durability according to ETAG 022, Part 1, cl. 2.4.6. The durability of the watertight membrane system and details is assessed towards preaccepted solutions given in the Building Research Design Guides (and "Våtromsnormen"). The durability of pipe installations and components is assessed on the basis of the available product documentation.

### 3.5 Properties of pipe installations

Products for fixed pipe installations shall have SINTEF Product Certificate (PS) or SINTEF Technical Approval (TG), or other documentation showing that the products meet the requirements for PS or TG.

### **3.6 Thermal insulation**

As a minimum it must be informed whether the modules have a specific thermal insulation layer or not, and whether the floor has thermal insulation as a preparation for the installation of a floor heating system.

### **3.7 Electrical installations**

The technical approval shall state that electrical installations made in the module factory shall be documented according to the norm NEK 400, performed by an electrician authorised for installations according to this norm.

## **4. Other requirements**

### **4.1 Universal design**

Modules must be in conformity with the requirements in the building regulations (TEK) concerning accessibility and universal design.

### **4.2 Slope towards floor gully and installation of watertight membrane**

The module must be designed with slope towards floor gully and installation of watertight layers that meet the preaccepted performance requirements in *Byggebransjens Våtromsnorm 30.100*.

## **5. Description of the manufacturer's factory production control**

The manufacturer must have a description of how the factory production control in the running production of the modules is performed. This may be part of the manufacturer's quality system. The quality system may be certified according to ISO 9001, or another documentation describing the factory production control. It must also be stated who is responsible for the manufacturer's production control.

## **6. Supervisory factory production control**

The production shall be subject to a supervisory product and production control performed by SINTEF. The purpose of the inspections is to check that the manufacturer's factory production control described in cl. 5 is carried out as intended. The supervisory control is performed by factory inspection, normally once a year. During the inspection the manufacturer's production control is assessed, and spot checks are made of incoming materials, production line, final products and filing of control documentation.

## **7. 5 year revision**

The approval is revised every 5<sup>th</sup> year. An assessment of the module system is performed, and possible new requirements are taken into account. New requirements may require testing of product properties. The approval is renewed when all new requirements are fulfilled.

## **8. Application for SINTEF Technical Approval and project realization**

Information on application for approval and project procedures is found her;  
<https://www.sintefcertification.no/file/index/2972>

## **9. Further information**

General information about SINTEF Technical Approval and valid approvals are published on [www.sintefcertification.no](http://www.sintefcertification.no).

Contact persons at SINTEF regarding bathroom modules are:

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