

SINTEF Building and Infrastructure confirms that

## Bathsystem prefabricated bathroom modules

meets the provisions regarding product documentation given in Norwegian building regulations, with properties, fields of application and conditions as stated in this document

### 1. Holder of the approval

Bathsystem S.p.A.  
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25010 Calcinato (BS)  
Italia  
www.bathsystem.com

### 2. Manufacturer

Bathsystem S.p.A, Calcinato, Italy

### 3. Product description

#### General

Bathsystem prefabricated bathroom modules is a system of prefabricated bathrooms to be placed in a building structure as separate units. The bathroom modules are supplied with sanitary installations, light fittings and piping installed and made ready for connection to the water and drainage systems. The modules are produced in sizes and with sanitary equipment customised to each individual building project. A typical bathroom module with a floor area of 5m<sup>2</sup> weights approx. 3200 kg.

Table 1 gives product specifications for the most important components and materials incorporated in the modules. A detailed description of the module construction is given in "Standard construction details for Bathsystem prefabricated bathroom modules relating to SINTEF Technical Approval No. 20012". This collection of construction details constitutes a formal part of the approval, and the version filed at SINTEF Building and Infrastructure at all times applies.

#### Floor

The floor consists of a reinforced concrete plate, and has a liquid applied waterproofing membrane and ceramic tiles on top as illustrated in fig. 2. The bathroom modules may be supplied with floor heating in the form of electric heating cables or pipes for water-borne heat.

The floor has a slope of approx. 1:100. The shower area is depressed by 5 mm relative to the remainder of the floor and has a slope of approx. 1:50. The height difference between the drain grid and the floor by the door opening is approx. 25 mm.

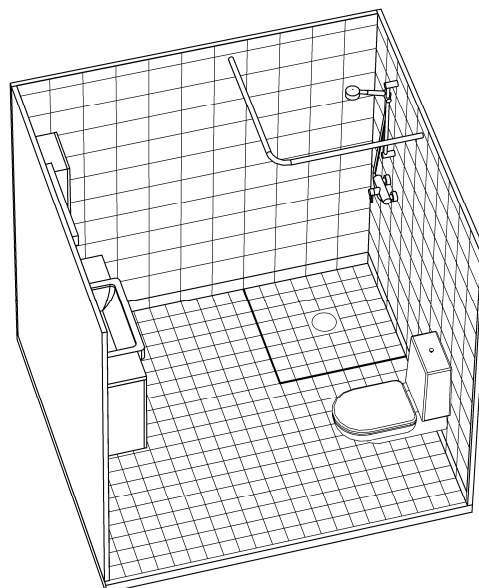


Fig. 1  
Bathsystem prefabricated bathroom modules are supplied complete with tiled surfaces and pre-fitted sanitary equipment.

#### Walls and ceiling

The wall consists of 50 mm reinforced concrete and has a liquid applied waterproofing membrane and ceramic tiles on top. The ceiling consists of 60 mm reinforced. The modules are supplied with a hole in the ceiling or in the wall for connection of a ventilation system.

#### Fittings

All piping and sanitary fittings installed in the modules have their properties documented by separate product certificates or approvals. The water supply is based on a pipe-in-tube system with a distribution box and stopcock located on the wall of the module. All pipe penetrations in walls are sealed with rubber sleeves.

### 4. Fields of application

The prefabricated bathroom modules can be used for bathrooms in dwellings, hotels and other buildings with equivalent conditions for the use of wet rooms.

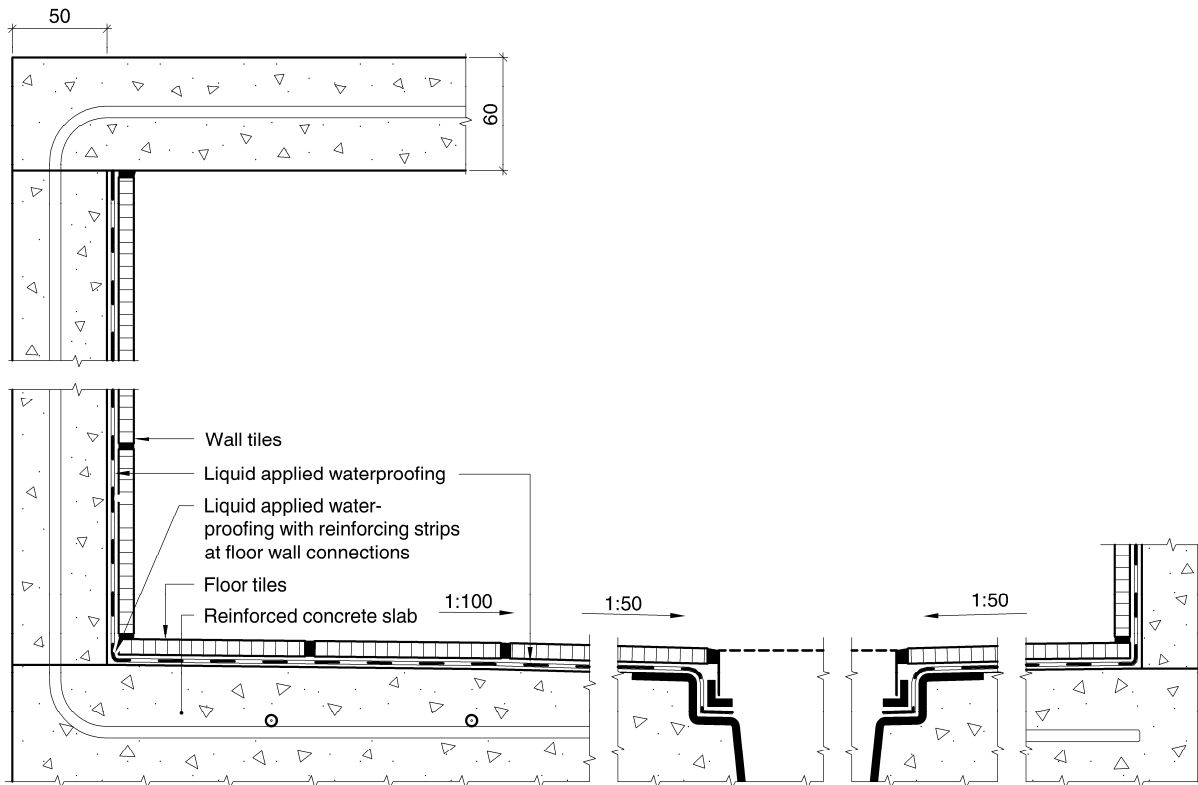


Fig. 2  
Principle design of floor, wall and ceiling structures. Vertical section.

Table 1  
Product specification

Component	Specification
Concrete	C 25/30, En 206-1
Reinforcement in floor	Reinforcing mesh, 2,55 cm <sup>2</sup> /m
Reinforcement in wall and roof	Reinforcing mesh, 1,98 cm <sup>2</sup> /m
Tiles on floor and wall	Tiles to EN 87 and EN 14411
Tile adhesive	Mapei Keraflex S1
Mortar for grouting	Mapei Keracolor
Waterproofing membrane	Mapei, Mapegum WPS with related components. SINTEF Technical Approval No 2402
Elastic sealant	Otto—Chemi, Novasil S70
Pipe-in-tube system	Uponor with related components
Gully	Vieser Serres. Product certified according to EN 1253.
Drain sleeve	Vieser Serres drain sleeve
WC	Product certified according to EN 997 or NT VVS 120
Basin mixer and shower mixer	Product certified according to EN 200, EN 817 or EN 1111
Seal around pipe penetrations for walls washbasin	Valsir 518007, SINTEF Product Certificate No. 0377. Otto—Chemi, Novasil S70
Connections pipe to the wash basin an WC	Product certified according to prEN 13618

## 5. Properties

### Load-carrying capacity

The floor structure is designed for an imposed load category A according to Norwegian Standard NS 3491-1, i.e. 2 kN/m<sup>2</sup>.

Wall-mounted toilet has been tested with a 4.0 kN load according to EN 997, and wall-mounted washbasin has been tested with a 1.5 kN load according to ETAG 022 (Guideline for European Technical Approval of watertight covering kits for wet room floors and or walls), Annex E.

### Water tightness

The performance of Bathsystem prefabricated bathroom modules has been tested according to ETAG 022, Annex A and E, with satisfactory results.

### Properties related to fire

The reaction to fire of interior surfaces is class B-s1, d0 according to EN 13501-1 (class In1 according to Norwegian Standard NS 3919). Fire resistance is not determined.

### Sound insulation

Sound insulation performance has not been determined.

### Thermal insulation

The bathroom modules have no thermal insulation.

### Effect on indoor climate

The bathroom modules are regarded as not emitting any particles, gases or radiation that have a negative impact on the indoor climate, or having any significant impact on health.

*Environmental declaration*

The modules contain no chemical substances listed on the Norwegian environmental authorities' observation list of substances being dangerous to human health or the environment.

*Waste treatment/recycling*

The bathroom module can be delivered to ordinary public waste disposal facilities at the end of the working life.

**6. Special conditions for use and installation***Foundation*

The bathroom modules must be installed on floors or foundations that are structurally designed for the weight of the module and its imposed load. The structure must be sufficiently rigid to prevent deformations that may cause insufficient slope towards the floor drain.

*Availability*

The bathroom modules must be designed and fitted in such a way that the requirements of the technical regulations under the Planning and Construction Act regarding accessibility for persons with impaired vision and mobility are met.

*External sanitation systems*

The modules must be placed in the building in a way that gives access to external sanitation systems outside the modul for inspection, repair or possible replacement, f.ex. by shafts. Leaks in shafts must be made visible.

*Electrical wiring*

By delivery of the bathroom modules to Norway, the electrical installations shall be carried out in accordance with "Regulations for low voltage (SEL) with guidance, NEK 400"

*Sound and fire*

For each individual building project the use of the bathroom modules shall be evaluated and planned in accordance with the relevant fire resistance and sound insulation requirements of the building.

*Installation*

The modules are placed on 6 mm thick rubber pads at the corners, and must be levelled accurately in order to ensure that the floor has a slope to the drain.

*Transport and storage*

During transport and storage, the modules must be placed on a level, stable foundation, and protected by packaging to prevents effects of moisture on the outside of the modules.

**7. Factory production control**

Bathsystem prefabricated bathroom modules are subject to supervisory factory production and product control according to contract between SINTEF Building and Infrastructure and Bathsystem S.p.A.

The quality system by Bathsystem S.p.A. is certified by the Swiss Association for Quality and Management System SQS according to ISO 9001:20089, Certificate No. CH-35624.

**8. Basis for the approval**

The approval is based on a system assessment, documentation of the properties of subcomponents, and type testing of complete module documented in the following report:

- SINTEF Building and Infrastructure. Report 3D070901. Testing of prefabricated bathroom from Bathsystem S.p.A, dated 06.08.2009.

**9. Marking**

Delivery shall be accompanied by delivery documents including as a minimum the manufacturer's name and address, the project identification and the installation specifications drawn up for every single building project. The approval mark for Technical Approval No. 20012 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.

**11. Technical management**

Project manager for this approval is Morten Lian, SINTEF Building and Infrastructure, dep. Building materials and construction, Oslo.

for SINTEF Building and Infrastructure

Trond Ø. Ramstad  
Approval Manager