1. Holder of the approval

Bathsystem S.p.A.
Via Cavour n° 149
25010 Calcinato (BS)
Italy
www.bathsystem.com

2. Product description

General

Bathsystem Ultralight Bathroom Pod is a system of prefabricated bathroom modules to be placed in a building structure as separate units. The bathroom modules are waterproof and have ceramic tiles on floor and walls. They are equipped with sanitary installations and piping installed, ready for connection to the water and drainage systems (see Fig. 1 and 2). The modules are produced in different sizes and with sanitary equipment customized to the individual building project. A 5 m² bathroom module weights approx. 1500 kg.

Table 1 show product specifications for the most important components and materials incorporated in the modules. A detailed description of the module construction is filed in “Standard construction details for Bathsystem prefabricated bathroom modules relating to SINTEF Technical Approval No. 20374”. This collection of construction details constitutes a formal part of the approval, and the updated version filed at SINTEF Building and Infrastructure applies.

Floor

The floor is a reinforced concrete slab with a liquid waterproofing membrane applied and ceramic tiles on top, as illustrated in fig. 3. The bathroom modules may be equipped with electric heating cables or pipes for hot water system for floor heating.

The floor has a slope of min. 1:100. The shower area has a slope of min. 1:50. The height difference from the gully grate and the floor waterproofing membrane at the door opening is min. 25 mm.
Table 1
Product specification

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>LC 16/18, En 206:2013</td>
</tr>
<tr>
<td>Reinforcement in floor</td>
<td>Reinforcing mesh, 2.83 cm²/m</td>
</tr>
<tr>
<td>Floor steel frame</td>
<td>2 mm steel profiles</td>
</tr>
<tr>
<td>Wall and ceiling steel profile studs</td>
<td>1.2 mm steel profiles</td>
</tr>
<tr>
<td>Wall and ceiling boards</td>
<td>Fermacell fiber gypsum boards, 15 mm</td>
</tr>
<tr>
<td>Waterproofing liquid membrane</td>
<td>Mapei, Mapegum WPS with related components. SINTEF Technical Approval No 2402</td>
</tr>
<tr>
<td>Tile adhesive for floor</td>
<td>Mapei Keraflex</td>
</tr>
<tr>
<td>Tile adhesive for walls</td>
<td>Mapei Ultralite Si</td>
</tr>
<tr>
<td>Mortar for grouting</td>
<td>Mapei Keracolor</td>
</tr>
<tr>
<td>Tiles on floor and wall</td>
<td>Tiles to EN 87 and EN 14411</td>
</tr>
<tr>
<td>Elastic sealant</td>
<td>Otto—Chemi, Novasil S100 or Mapei MApesil AC</td>
</tr>
<tr>
<td>Pipe-in-tube system</td>
<td>Uponor, SINTEF TG20013 or LK Universal, SINTEF TG 20312</td>
</tr>
<tr>
<td>Gully</td>
<td>Vieser Serres. Product certified according to EN 1253.</td>
</tr>
<tr>
<td>WC</td>
<td>Product certified according to EN 997 or NT VVS 120</td>
</tr>
<tr>
<td>Basin mixer and shower mixer</td>
<td>Product certified according to EN 200, EN 817 or EN 1111</td>
</tr>
</tbody>
</table>

Fig. 3 Floor and wall cross section

Walls and ceiling
The walls consists of steel profile studs with 15 mm Fermacell fiber gypsum boards. The inside is covered with a waterproofing membrane system and ceramic tiles. The ceiling consists of painted 15 mm Fermacell fiber gypsum boards on steel profile studs.

Installations
Properties for all piping and sanitary fittings installed in the modules are documented by separate product certificates or approvals. Water supply is based on a pipe-in-tube system with a distribution box located in the module ceiling. All pipe penetrations in walls are sealed with appropriate water proofing parts.

3. Fields of application
The prefabricated bathroom modules are designed for use in private homes, hotels and other buildings with equivalent conditions for the use of wet rooms. The modules can be used in risk class 1-6 in fire class 1-3.

4. 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/m².
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. Seat for disabled in the shower area has been tested with a 2,2 kN load. Handbar has been tested with 1,2 kN load.

Water tightness
The performance of Bathsystem prefabricated bathroom modules has been tested according to ETAG 022, Annex A and E, with satisfactory results.
Safety in case of fire
Ceramic tiles are classified Fire Class A1 according to NS-EN 13501-1.

Sound insulation
Sound insulation performance has not been determined.

Thermal insulation
The bathroom modules have no thermal insulation.

5. Environmental aspects

Substances hazardous to health and environment
The product is regarded as not containing hazardous substances with priority in quantities that pose an 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.

Effect on drinking water
The product is evaluated to emit no substances to drinking water in amounts that can cause taste, smell or is dangerous to the health.

Waste treatment/recycling
The product shall be sorted as metal, concrete, residual waste or other appropriate waste fractions on the building/demolition site. The product shall be delivered to an authorized waste treatment plant for material recovery, energy recovery, disposal and/or treatment as hazardous waste.

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

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, water closing valve included, must be designed and assembled in accordance with the requirements for the technical regulations under the Planning and Construction Act regarding accessibility for persons with impaired vision and mobility.

External sanitation systems
The building infrastructure design must be coordinated with the module design to ensure access to external sanitation systems (i.e. toilet cisterns) on the module outside for inspection, repair or replacement. Leakages from sanitary installations must be detected and not cause any unnecessary damage.

Electrical wiring
Bathroom modules delivered to Norway requires electrical installations in accordance with "Regulations for low voltage (FEL) with guidance, NEK 400".

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 correct slope to the drain.

Transport and storage
During transport and storage, the modules must be placed on an even, stable foundation, and protected by packaging to prevent effects of moisture on the outside of the modules.

7. Factory production control

The product is produced by Bathsystem S.p.A., Via Cavour nº 149. 25010 Calcinato (BS), Italy.

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.

The quality system in use 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:

9. Marking
The product is to be marked with producer name, product name and production date. The approval mark for Technical Approval No. 20374 shall be used, visible inside the module after installation, i.e. in the pipe-in-tube manifold cabinet.

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

Marius Kvalvik
Approval Manager