

SINTEF confirms that

BD prefabricated bathroom module

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

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2. Product description

General

BD prefabricated bathroom module is a system of prefabricated bathrooms to be placed in a building structure as a separate unit. The bathroom modules are supplied with sanitary equipment and pipework and made ready for the connection to water and drainage systems. The bathroom modules are produced in sizes and with sanitary equipment customised to each individual construction project. A bathroom module with a floor space of 5 m² weights approx.. 900 kg.

Table 1 shows product specifications for the most important components and materials incorporated in the bathroom module. A detailed description of the bathroom module construction can be found in "Standard construction details for BD prefabricated bathroom modules relating to SINTEF Technical Approval No. 20424". This collection of construction details constitutes a formal part of the approval. The version filed at SINTEF Building and Infrastructure at any given time applies.

The bathroom modules are supplied with light fittings and electrical installations, included floor heating cables. All electrical installations must be in accordance with NEK 400.

Electrical installations, heating system and ventilation are not covered by this approval.

Floor

The floor consists of a frame of steel sections, sandwich floor panels (a core of Recoboard and fiberglass reinforced polyester on either side) which rests on a corrugated steel board, see fig. 2. Ceramic tiles on top of the floor. The bathroom modules can be supplied with electric heating cables or pipes for warm water underfloor heating.

The floor has a slope of minimum 1:50 in the shower area and minimum 1:100 outside the shower area. The height difference from the floor drain to the waterproofing surface at the door threshold is minimum 25 mm.

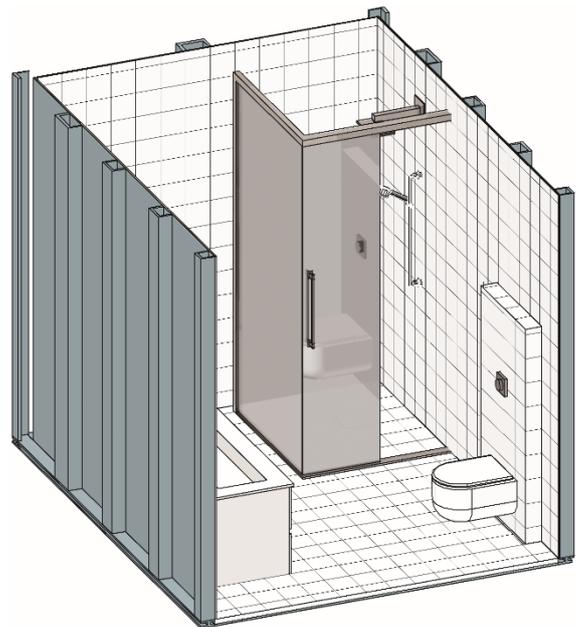


Fig. 1
PD prefabricated bathroom modules are supplied with tiled surfaces and pre-fitted sanitary equipment.

Walls

The wall construction consists of TSP panels (boards made of fiberglass reinforced polyester with ceramic tiles). TSP panels are water and steam tight, see table 1. The walls are reinforced on the outside with steel sections and glued reinforcements of steel in the corners, see fig. 2 and 3.

In the shower area, the walls are reinforced on the outside with a glued 3 mm steel sheet in order to enable the installation of a shower seat (universal design).

Ceiling

The ceiling is self-supported. The ceiling consists of sandwich panels (steel panels with a core of 50 mm rockwool insulation grade A1 – EN 13501-1). Beneath a layer of 2 mm fiberglass reinforced polyester is glued.

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Fittings

All pipework and sanitary fittings used in the bathroom module have product certificates or separate technical approvals which document their properties. The water supply is a pipe-in-tube system. The distribution box is placed in the bathroom module's ceiling or wall so that the front opening is accessible. The internal stopcock is placed inside the distribution box. Main stopcock must be easily accessible and cannot be located in the ceiling. All pipes penetrating the wall have sealing cuffs belonging to the waterproofing system, see table 1.

Table 1

Product specifications

Component / material	Specification
Wall panels, sandwich	TSP panel. Fiberglass reinforced polyester panel (water vapour resistance $s_d \geq 108$ m), with ceramic tiles.
Ceiling panels, sandwich	Sandwich panels: Steel sheets with a core of 50 mm rockwool insulation grade A1 (EN 13501-1). A sheet of 2 mm fiberglass reinforced polyester is glued to the inside.
Floor panels, sandwich	Ceramic tiles, fiberglass reinforced polyester, Recoboard, corrugated steel sheet
Constructional glue	BernerFix Speed
Steel frame	S 250GD 3mm
Floor steel sections	S 250GD 3mm
Gully	Blücher gully according to EN 1253
Waterproofing system	TSP panel, Fiberglass reinforced polyester panel
Grouting cement	Litochrom Starlike, epoxy based
Ceramic tiles	According to EN 14411
Elastic sealant	Ottoseal silicone S 110
Pipe-in-tube system	Roth MultiPex Rørssystem according to SINTEF Technical Approval No. 2556
Waste pipes	Pipelife Smartline
Wall penetration sealing	TTP sealing spacers, SINTEF Product Certificate No. 1017
WC	Certified products according to EN 997/NT VVS 120, EN 14055
Hand basin mixers	Certified products according to EN 200 or EN 817 and NKB4
Shower mixer	Certified products according to EN 1111

3. Fields of application

BD bathroom modules are designed for use in private dwellings, hotels and other buildings with similar area of use. Conditions for use are described in chapter 6.

BD bathroom modules can be used in fire cells in buildings risk category 1-5 in fire category 1, and in fire cells up to 200 m² in building risk category 1-5 in fire category 2.

4. Properties

Load-carrying capacity

The wall structure is not intended for support of other building components. The floor construction is dimensioned for a maximum load in category A according to NS 3491-1.

Wall mounted toilet has been tested with a 4 kN load according to EN 997. Wall mounted washbasin has been tested with a 1,5 kN load according to ETAG 022, Part 1 "Guideline for European Technical Approval of watertight covering kits for wet room floors and/or walls", Annex E.

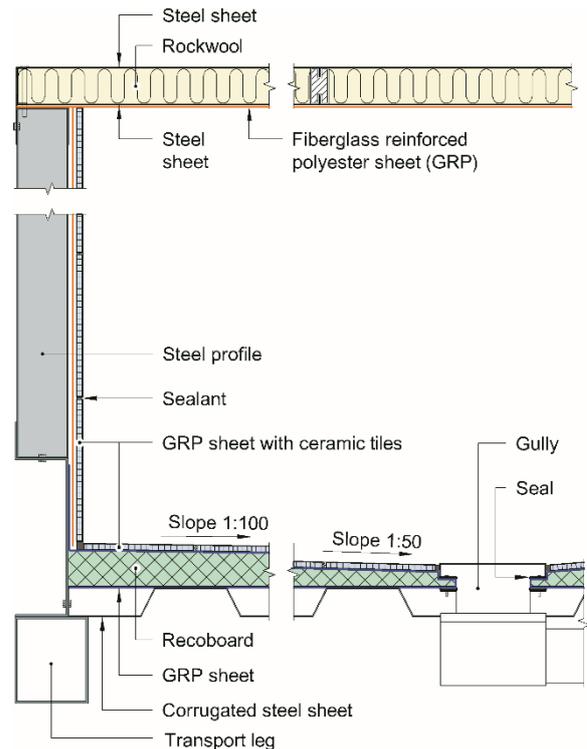


Fig. 2
Principal design of floor, walls and ceiling – vertical section

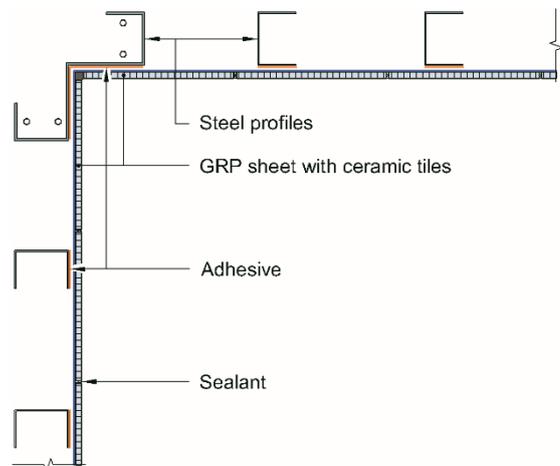


Fig. 3
Wall construction – horizontal section

Properties related to fire

Material- and surface classifications are according to EN 13501-1

- Internal surfaces of ceramic tiles according to EN 14411 is classified fire category A1
- 2 mm fiberglass reinforced polyester in wall and ceiling are classified fire category B-s1,d0
- Isolasjonen i himlingen har brannteknisk klasseThe insulation in the ceiling is classified fire category A1
- The fire category for the insulation in the floor is not determined.

Sound insulation

Air-sound or step-sound insulation properties are not determined for the module structure itself. Sound insulation has to be designed together with adjacent structures in each individual construction project.

Water tightness

The performance of BD prefabricated bathroom module has been tested according to ETAG 022 "Guideline for European Technical Approval of watertight covering kits for wet room floors and/or walls", Annex A and E, with satisfactory results.

5. Environmental aspects

Substances hazardous to health and environment

BD prefabricated bathroom module is regarded as not containing any hazardous substances with priority in quantities that pose an increased risk for human health or the environment. Chemicals with priority include CMR, PBT and vPvB substances.

Effect on indoor environment

BD prefabricated bathroom module is evaluated according to SINTEF Technical Approval – Health and Environmental Requirements version 09.05.2022. 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. The product meets the requirements in BREEAM-NOR v6.0, Emissions from building products according to Hea 02 Indoor air quality.

Effect on drinking water

BD prefabricated bathroom module 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

BD prefabricated bathroom module is to be sorted as plastic, metal, residual waste and other relevant waste fractions on site and on disposal. The product shall be delivered to an authorized waste treatment plant for material recovery, energy recovery or disposal.

Environmental declaration

No environmental declaration (EPD) has been issued for BD prefabricated bathroom module.

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 deformation that might cause insufficient slope towards the floor drain.

Availability

The bathroom modules 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.

The design has to meet the requirement for easily accessible stop valve.

External sanitation systems

WC installation has a waterproof shield with drainage of leakage water to the bathroom floor. Project design must ensure that installations and pipes can be accessed for inspection or repair. Leakage in must be alerted.

Electrical installations

Bathroom modules delivered to Norway require electrical installations in accordance with "Regulations for low voltage (FEL) with guidance, NEK 400:2014".

Installations on the outside of the bathroom module have to be accessible for possible replacement.

Installation

The bathroom modules must be adjusted and leveled to ensure correct slope towards the floor drain.

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. Flammable insulation must be covered as shown in Fig. 2.

Safety in case of fire

The size of the bathroom modules is restricted to 10 m² if no separate fire resistance assessment is carried out for each individual construction project.

Floors with flammable insulation shall be protected against ignition by fire at every external side of the bathroom module. Voids between the bathroom modules and adjacent floor structures shall be filled with mineral wool or equivalent. Alternatively, the bathroom modules can be installed close to the structures without any void in between if the floor structure is concrete or brick. Where the bathroom modules are installed against timber work or steel studs, voids have to be filled with incombustible insulation and have a cladding with fire resistance at least fire category K2010 A2-s1, d0 according to EN 13501-2 and EN 13501-1.

Safety in case of fire

Shafts that the bathroom modules are mounted against, must have a fire resistance in accordance to the guideline to TEK and the buildings fire class required for the particular project.

Transport and storage

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

7. Factory production control

BD prefabricated bathroom module is produced by Modulpanel srl. Strada Provinciale Cipressino, loc. Borgo Santa Rita, 58044 Cinigiano GR, Italy.

The holder of the approval is responsible for the factory production control in order to ensure that BD prefabricated bathroom module is produced in accordance with the preconditions applying to this approval.

The manufacturing of BD prefabricated bathroom module 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 evaluation of *BD prefabricated bathroom module* 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

Documentation containing at least the manufacturer's name and address, project identification, serial number and installation instructions.

The approval mark for SINTEF Technical Approval No. 20434 shall be visible inside the bathroom module after installation in the building.

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



Hans Boye Skogstad
Approval Manager