SINTEF Technical Approval

TG 20660

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Revises:
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Valid until 01.10.2025
Provided listed on
www.sintefcertification.no

SINTEF confirms that

Norac Standard bathroom modules

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

Norac badekabiner AS
Kystveien 18
4841 Arendal
www.badekabiner.no

2. Product description

General

Norac Standard is a system of prefabricated bathroom modules to be placed in a building structure as separate units. The bathroom modules are supplied with sanitary installations, and piping installed and made ready for connection to the water and drainage systems. The modules are produced in sizes and with sanitary equipment customized to each individual building project. A typical bathroom module with a floor area of 5 m^2 weights approximately 2000 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 Norac Standard relating to SINTEF Technical Approval No. 20660". This collection of construction details constitutes a formal part of the approval, and the version filed at SINTEF Building and Infrastructure applies.

The modules can be delivered with ventilation, electrical -or warm water floor heating, light fittings and electrical installation installed in factory. This is not evaluated by SINTEF and is not covered in this approval.

Floor

The floor consists of a reinforced concrete slab in a steel frame. Waterproofing membrane as described in table 1 is applied to the concrete surface. Ceramic tiles are applied above the waterproofing membrane, see figure 2. The bathroom modules may be supplied with floor heating in the form of electric heating cables or pipes for warm water heating.

The floor outside the shower area has a slope of minimum 1:100. The floor in the shower area has a slope of minimum 1:50. The height difference between the drain grid and the membrane by the door opening is minimum 25 mm.

Fig. 1
Norac Standard is delivered complete with tiled surfaces and sanitary installations
Figure: Norac badekabiner AS

Walls

The wall construction consists of 20 mm thick XPS wet room boards (600 mm x 2400 mm) mounted on galvanized steel studs. The modules can be delivered with Litex or Tulppa wet room boards, see figure 2 and 3. The Tulppa wet room boards must be covered with Schönox AB foil membrane. The walls are covered with ceramic tiles. The construction is not dimensioned to support other building parts.

Reinforcements of plywood boards and steel profiles are installed on the outside of the walls for installation of the sanitary installations and equipment in connection with universal design.

Ceiling

The ceiling is a self-supporting sandwich construction plate with an XPS-core and 0,9 mm steel plates on each side. The inside surface is a white PVC-coating. The modules are supplied with a hole in the ceiling or in the wall for connection of a ventilation system.

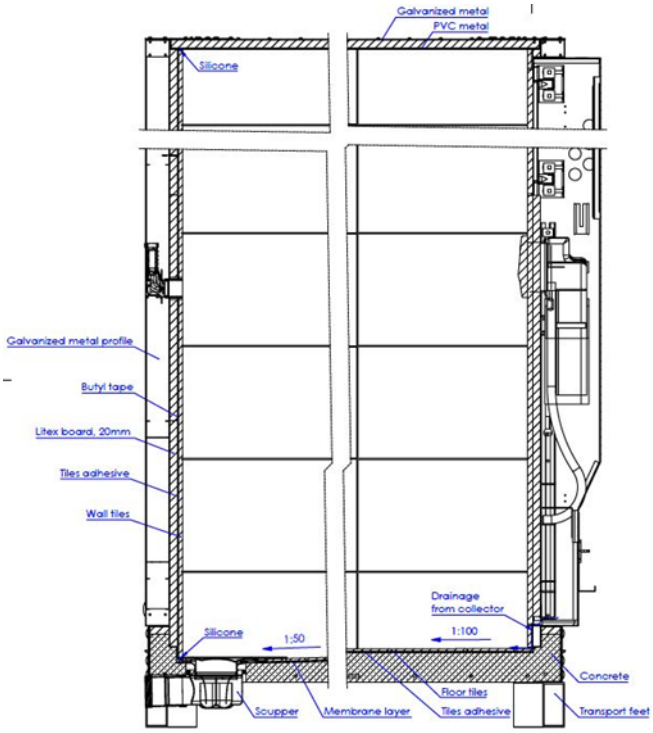

Fig. 2 Alternative 1
Vertikal section showing the structure of floor, walls and ceiling as well as the membrane and distribution box/cistern box
Figure: Norac badekabiner AS

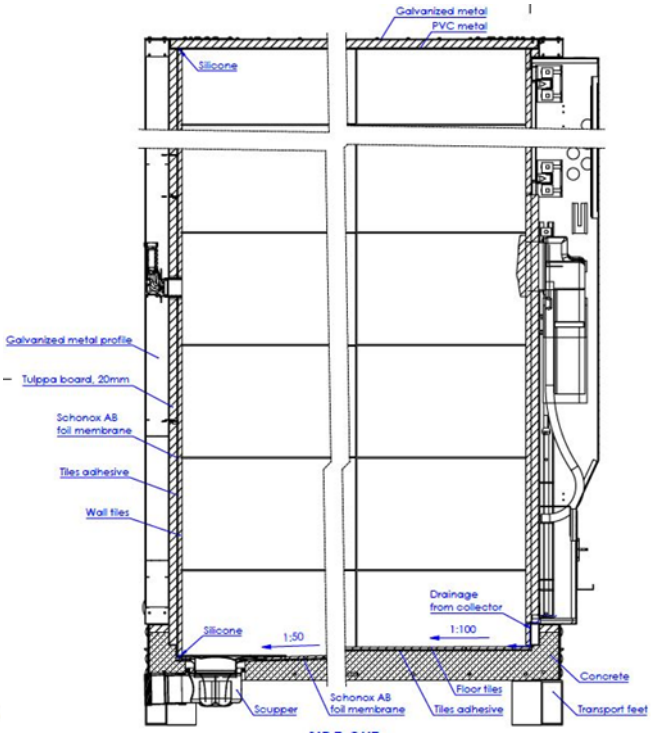

Fig. 3 Alternative 2
Vertikal section showing the structure of floor, walls and ceiling as well as the membrane and distribution box/cistern box
Figure: Norac badekabiner AS

Installations

All piping and sanitary fittings installed in the modules are documented by separate product certificates or approvals. The water supply is based on a pipe-in-tube system with a distribution box. Norac Standard has a combined manifold cabinet/ and cistern cabinet, recessed in the wall so that the front door is accessible above the toilet. A water closing valve is located inside the distribution box. All pipe penetrations in walls are sealed with sleeves belonging to the waterproofing membrane system.

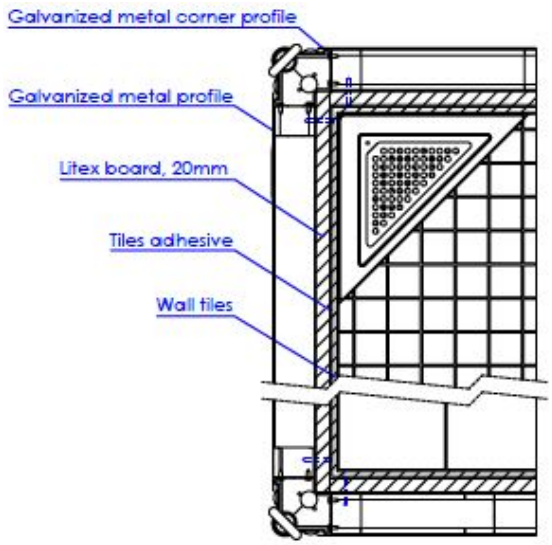

Fig. 3 Alternative 1
Horizontal section of the corner with drain.
Figure: Norac badekabiner AS

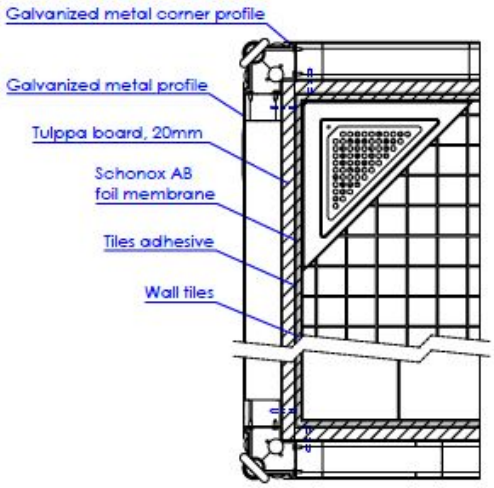

Fig. 3 Alternative 2
Horizontal section of the corner with drain.
Figure: Norac badekabiner AS

Table 1 Product specifications, Alternative 1 and 2

Component / material	Specification
Floor	Steel frame, 2 mm steel profiles Concrete B25, B35/M35 according to EN 206-1 Reinforcing mesh type 131 150x150x8
Steel profiles in wall	Galvanized steel profiles from Arcelor Mittal, 1,2x65 mm, according to EN 10204
Alternative 1	
Waterproofing membrane floor	Mapei Mapegum WPS, SINTEF TG 2402
Walls	Litex Membrane plate, 20 mm, SINTEF TG 20006. s_d-value 7800 m
Alternative 2	
Waterproofing membrane floor	Schönox AB foil membrane system with iFix glue, SINTEF TG 20673
Walls	Tulppa 20 mm wet room plate, SINTEF TG 20575. s_d-value 1,54 m. Mounting glue Ardex CA 20 P. Schönox AB foil membrane s_d -value 96,4 m.
Ceiling plates	Self-supporting sandwich plates; Finnfoam XPS-core Metalcolour galvanized steel plate. Internal PVC-coating,
Ceramic tiles	According to EN 14411
Tile adhesive	Mapei Megafix and Mapei Kerabond T
Mortar for grouting	Mapei Keracolor FF
Elatic sealant	Casco Sanitary Silicone, Mapei AC or Schönox ES
Drain	Blücher design gully SINTEF TG 2484 Unidrain gully SINTEF TG 2552 The drain is placed in the corner of the shower area.
Pipe-in-tube system	JRG Sanipex pipe-in-tube, SINTEF TG 2464 Uponor tap water system, SINTEF TG 20013 Roth MultiPex pipe system. SINTEF TG 2556 TECEflex nordic pipe-in-tube. SINTEF TG 20468 Manifold and WC cistern are placed in Norac cabinet in the wall behind WC Ref. SINTEF Test report 2018:00984.
Wastewater pipe	Pipelife Smartline PP, SINTEF PS 0373 according to EN 1451-1
Distribution box/ Cistern box	Norac ref SINTEF Report 2018-00984
WC	Certified products according to EN 997, Insta SBC 0402 or NT VVS 120.
WC - cistern	Certified products according to EN 14055
Basin mixer	Certified products according to EN 817 and NKB 4
Shower mixer	Certified products according to EN 817 or EN 1111

3. Fields of application

Norac Standard can be used for bathrooms in dwellings, hotels and other buildings with equivalent conditions for the use as stated in chapter 6. If no fire technical assessment is performed for the individual building project, the modules size is limited to 10 m^2 floor surface area.

4. Properties

Load-carrying capacity

The floor structure is designed for an imposed load category A according to Norwegian Standard NS 3491-1.

Safety in case of fire

Litex membrane plate or Tulppa board of XPS with 20 mm thickness has fire classification F. Internal surfaces with ceramic tiles according to EN 14411 has fire classification A1. The classifications are according to EN 13501-1.

Water tightness

The performance of Norac Standard has been tested according to ETAG 022, Annex A and F, with satisfactory results.

Sound insulation

Sound insulation performance has not been determined. The need for sound insulation must be assessed and projected in each individual construction project.

Thermal insulation

The bathroom modules are unisolated. The need for thermal insulation must be assessed and projected in each individual construction project.

Durability

The pipes-and sanitary installations, waterproofing membrane and tiles given in table 1, is evaluated to have satisfactory durability. The durability of the module floor-, wall- and ceiling constructions are not assessed.

Management, operation and maintenance

MOM-documentation is not evaluated by SINTEF and have to be obtained from the manufacturer.

5. Environmental aspects

Substances hazardous to health and environment

Norac Standard 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

Norac Standard 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.

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 Norac Standard.

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 drain.

Accessibility
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 rearding 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 module for inspection, repair or possible replacement, i.e by shafts. Leaks in shafts must be made visible and not damage the building.

Leaks from external cistern is lead into the module by a drainage pipe from the cistern box.

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 400:2018. Installations placed outside of the bathroom module shall be facilitated for replacement.

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.

Protection against spreading of fire
The wall plates of combustible insulation shall be protected against combustion during a fire on all external sides of the modules. All cavities between the modules and adjoining wall construction shall be filled with incombustible mineral wool or equivalent.

If the modules are installed against walls with wood or steel posts, all cavities in the walls shall be filled with incombustible insulation and have a cladding with a fire resistance in class $K_2$10 according to EN 13501-2.

The shafts connected to the modules shall have a fire resistance according to "Regulations on technical requirements for construction works (TEK17) with guidance" and the fire classification of the building, set for each individual building project. The shafts shall be divided for each floor with a fire-resistant penetration of all technical installations. A sealing system with documented fire resistance must be used.

Norac Standard used in buildings with fire class 3 or higher shall be fire evaluated for each individual building project.

Installation
The modules must be adjusted and 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

Norac Standard is produced in Panevezys, Litauen for Norac Badekabiner AS.

The holder of the approval is responsible for the factory production control to ensure that Norac Standard is produced in accordance with the preconditions applying to this approval.

The manufacturing of Norac Standard 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 Norac Standard 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

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 the building project.
The approval mark for Technical Approval No. 20660 shall be used, visible inside the 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
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