


Testing of waterproof membranes for bathrooms

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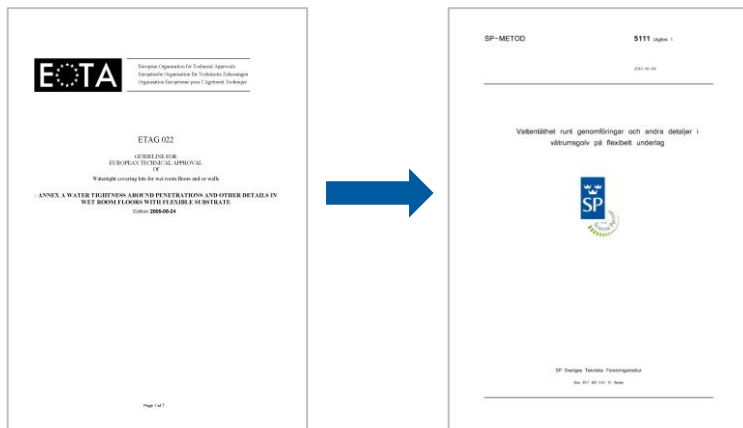
“Länsförsäkringar is working to reduce the numbers of cases of water damage in wet rooms by encouraging manufacturers of waterproof membranes to improve their membrane systems.”

Background



- Many cases of expensive moisture damage in wet rooms with ceramic surfaces.
- Testing conducted in 2014 and 2016 demonstrated deficiencies in many systems.
- In 2014, only three out of twenty systems passed the test and as many as six systems had serious deficiencies.
- In 2016, eight out of twenty passed the test.
- We have now conducted the test once again in 2019.

Original method and new method



The function test was conducted in accordance with a version of ETAG 022 Annex A, now designated SP method 5111, which is adapted to Swedish conditions.

RISE (Research Institutes of Sweden) in Borås performed the tests

It is self-evident for us to remove the waterproof membrane after testing to also uncover small leaks

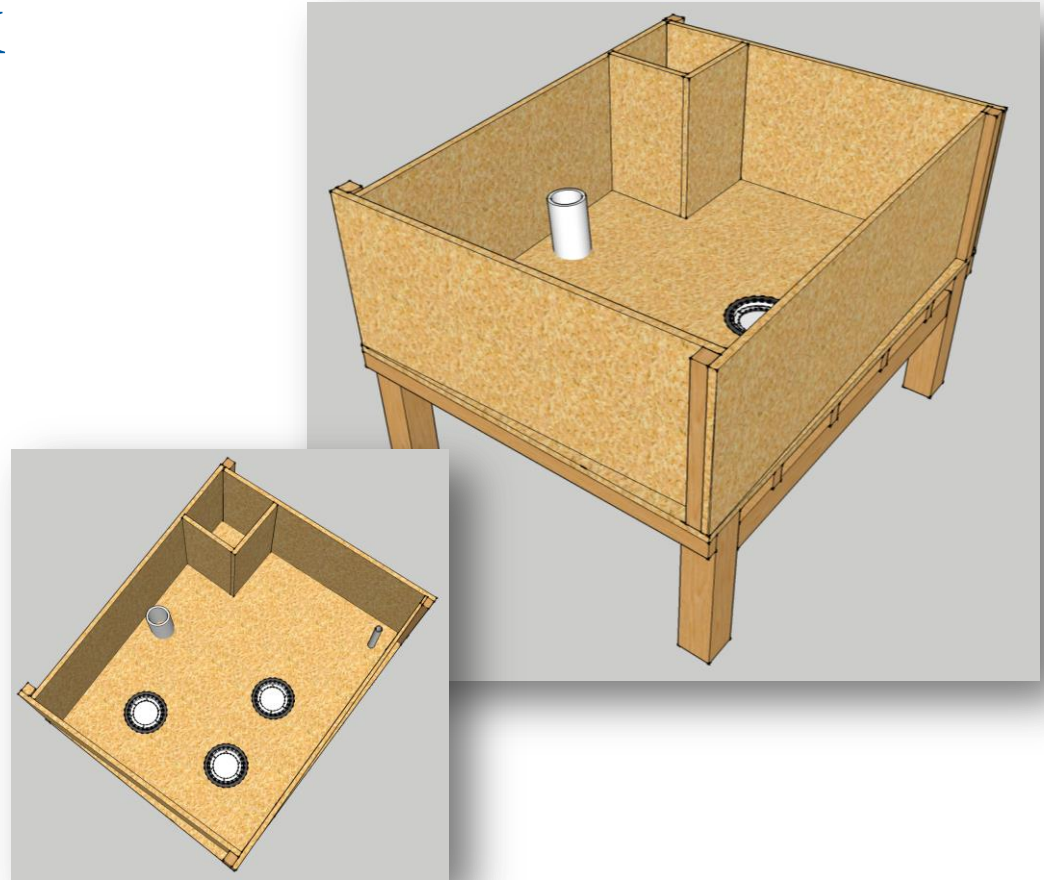
New in 2019

We tested two different types of waterproof membranes:

- *Sealing foils* (18 tested). The foil systems function as a membrane under ceramic and natural stone in wet rooms.
- *PVC cladding* (1 tested). The PVC cladding we tested is developed to be a membrane under ceramic and natural stone in wet rooms.

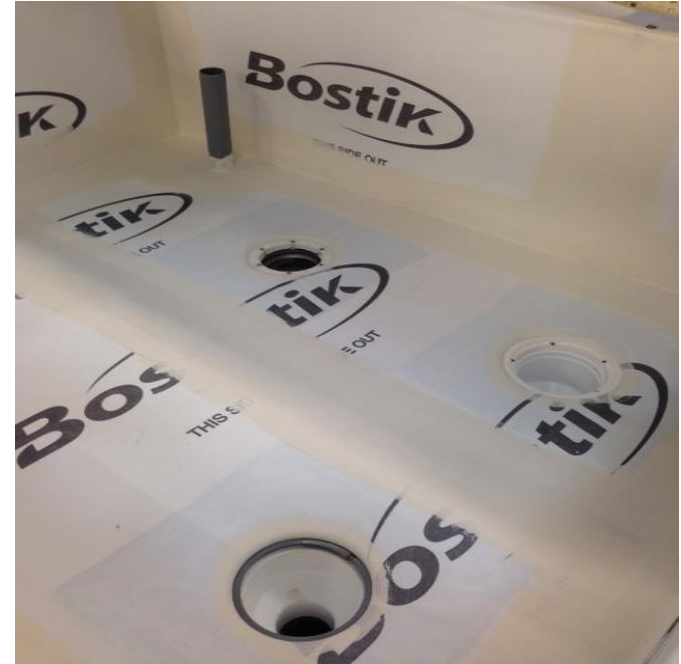
Contents of the test box

- Three different floor drains
 - Stainless steel floor drain made with a screw clamp ring.
Blücher adjustable shower drain square.
 - Plastic floor drain with screw clamp ring.
Jafo PB75 MP.
 - Plastic floor drain with a spring-loaded clamp ring.
Purus Brage 75 PP.
- Drainpipes 50 and 100 mm
- Five inner corners
- One outer corner



Assembly

- According to the manufacturer's assembly instructions
- Foil system: conducted by staff from RISE
- PVC cladding: conducted by a flooring contractor with GVK (Swedish Flooring Trade Association Wetroom Control) authorisation
- The supplier/manufacturer was involved in assembly and disassembly



Function testing

1. Floor construction is put under water (100 mm) for 24 hours
2. A sandbag (30 kg) is allowed to fall three times on five different points
3. Floor construction is put under water (100 mm) for 24 hours
4. Hot (90°C) and cold (10°C) water is run alternately 100 times on the floor drains
5. Hot (60°C) and cold (10°C) water is run alternately 1,500 times on the drains, ducts, corners
6. Floor construction is put under water (100 mm) for seven days

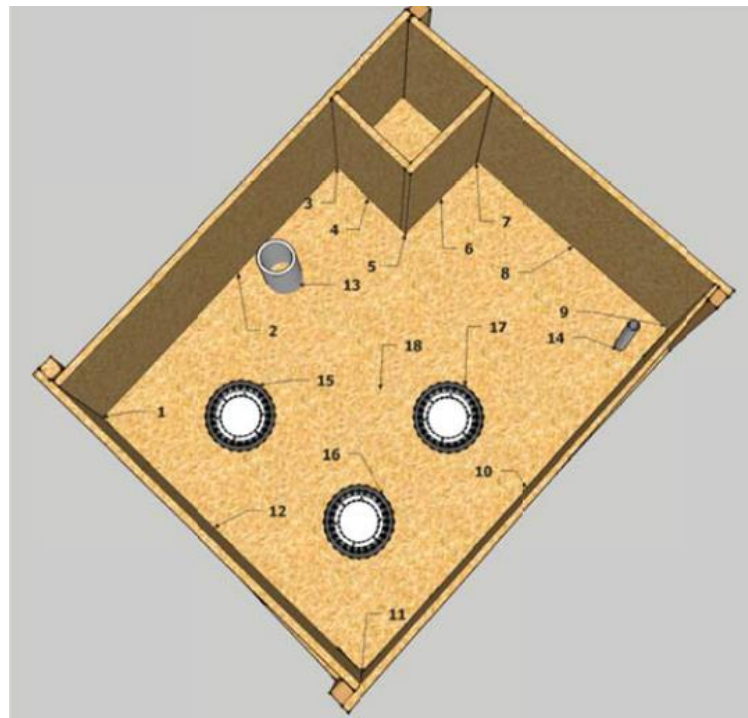
NB!

An inspection is performed during and after all stages to uncover any leakage.

We remove the membrane on inspection.

Testpunkter

Kontrollpunkt nr	Placering
1	Innerhörn
2	Golv-vägg vinkel
3	Innerhörn
4	Golv-vägg vinkel
5	Ytterhörn
6	Golv-vägg vinkel
7	Innerhörn
8	Golv-vägg vinkel
9	Innerhörn
10	Golv-vägg vinkel
11	Innerhörn
12	Golv-vägg vinkel
13	Stort avloppsrör. DN110
14	Litet avloppsrör. DN50
15	Vid Purusbrunn
16	Vid Jafobrunn
17	Vid Blücherbrunn
18	Vid mittskarv



Analyses

- Water vapour penetration resistance in the waterproof membrane systems
- Basis weight
- Polymer type of sealing foil
- Age changes

The manufacturers are making the sealing foil thinner and thinner



Sealing materials that we tested in 2019

Company/Supplier	Waterproof membrane systems
Alfix A/S	Alfix wet room cladding mounted in Alfix 2K sealant
Ardex AB	Tricom system with Ardex 7+8
Bauhaus & Co KB	Probau
Bostik AB	Pro Foil membrane
Byggmax	Foil system
Centro Kakel och Klinker AB	TM# F-System
Finja	Finja sealing system
Hornbach	Megaduk foil system
CC-Höganäs Byggkeramik AB	Foil systems G12-3b and V12-3b

Company/Supplier	Waterproof membrane systems
Kakeldax	KDX
Kiilto AB	KeraSafe + Foil system
LIP Sweden AB	Foil systems 27
Mapei AB	Mapeguard WP90 foil system
Mira Byggeprodukter A/S	Sealing materials SE1
BASF AB/PCI Sweden	PCI VG2014
Sika Sweden AB	Schönox Foil 1
Tarkett AB	Tarkodry
Weber, Saint-Gobain Byggprodukter AB	Tec Foil system
Zebra Interni	Zebra Systems F1

Six systems passed the test in 2019

Company/Supplier	Membrane systems
Ardex AB	Tricom system with Ardex 7+8
Bauhaus & Co KB	Probau
Finja	Finja sealing system
LIP Sweden AB	LIP Foil system 27
Kiilto AB	KeraSafe + Foliesystem
Mira Byggeprodukter A/S	Sealing materials SE1



Progress is being made in the wrong direction – 68 percent leak

- 3 of 20 passed the test in 2014
- 8 of 20 passed the test in 2016
- 6 of 19 passed the test in 2019
- Leakage was minor in this year's test, but small leaks can also cause major damage
- No total damage in this year's test.
- Of the 13 leakages, seven were only discovered after the membrane was disassembled

The testing method for CE labelling and industry approval must be changed

Problem areas 2019

- The test shows that leakage is most common in connection with
 - Floor drains
 - Pipe ducts as drainpipes for wash-basins and WCs
- Not all parts of the waterproof membrane systems are currently fully developed – a chain is only as strong as its weakest link.

