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ETAG 022

GUIDELINE FOR
EUROPEAN TECHNICAL APPROVAL
Of

Watertight covering kits for wet room floors and or walls

- ANNEX E WALLS IN WET ROOMS: WATER TIGHTNESS AND RESISTANCE TO WATER AND MOISTURE OF WALLS WITH FLEXIBLE SUBSTRATE

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1. Scope

The scope of this method is to evaluate the suitability of walls and/or wall coverings in wetrooms, i.e. bathrooms or other rooms with a similar exposure to water. The test is intended to simulate the effect of long-term use.

2. Field of application

The method is applicable to all walls and/or wall coverings intended for use as watertight coverings on walls in wetrooms with flexible substrate.

3. References

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4. Definitions

Watertightness in this connection refers to the resistance to water penetrating into or through the wall during the test.

5. Sampling

Only one sample is used for the test. The sample is constructed in the laboratory as a test wall between adjoining floor and ceiling (which is normally permanent and not part of the system).

For the test of watertight membranes a commonly used wall type should be selected as substrate in collaboration with the client, for example gypsum boards on a steel framed partition. Preferably the type of test wall selected shall be the one assessed to be most critical for the membrane to be tested. If relevant the test may be performed on the watertight membrane without the final cladding, e.g. ceramic tiles.
The test wall shall be made in accordance with the manufacturers and/or suppliers instructions and shall be made in the same way as intended to be used in practice. The wall shall be at least 2,3 m high and shall be specified by number and type of studs, fastenings, reinforcement for wash basin, toilet etc. For membranes or other watertight layers the application shall be in accordance with the instructions/directions of the manufacturer/supplier.

The test wall shall have at least one salient corner (facing into the room) and one window situated approximately 1.2 m above floor level and 0.3 m from adjoining walls. Four water pipes and one

drainpipe shall penetrate the wall. Two of the water pipes shall be perpendicular to the surface of the wall and the penetration shall be made and fixed to the wall in the same way as specified by the supplier. Two of the water pipes shall be PEX pipes connected via 2 junction boxes mounted according to the supplier's description. The ends of the pipes shall be plugged.
Two supports for a wash basin are mounted approximately 0.8 m above floor level.
When relevant the test specimen might include other details than described above, e.g. support railings for disabled persons.

In order to facilitate the assessment of whether water is penetrating into or through the wall during the test, a moisture indicator might be applied to parts of the wall and/or the moisture content in wood, gypsum boards etc. might be recorded during the test by means of a moisture meter.

6. Method of test

6.1 Principle

The wall is exposed to alternating influences from hot and cold water. The pipe penetrations and the support for the wash basin are exposed to short term mechanical loads.

6.2 Apparatus

A test rig consisting of a watertight floor with a floor gully, a ceiling and two walls. In the walls of the test rig there shall be a door and an inlet for air near the floor, e.g. under the door and an outlet for air near the ceiling. The test rig shall allow test walls to be made with realistic details.

7 nozzles mounted about 1 m above floor level and at a distance of about 300 mm from the surface of the wall. The nozzles shall be connected to water pipes or tubes. The spray of water from the nozzles shall form a cone of about 60° and shall be evenly distributed. The nozzles shall each give approximately 0.05 l/sec.

Note: A suitable nozzle is produced by Spraying Systems Inc., USA. It is marked:
¼ G 10 (female) or
¼ GG 10 (male)

Facilities to provide the test rig with hot and cold water and to control the relative humidity according to the following schedule:

- Hot water (60±3°C) for 60 sec
- Pause for 60 sec
- Cold water for (10±3°C) for 60 sec
- Pause for 60 sec

The temperature is measured at the nozzle

The cycle is repeated 1500 times

A device to test the resistance to dynamic forces of the pipes penetrating the walls simulating the use – including repair – of the installation. The device consists of a small electric motor, e.g. Bosch 12 V wiper motor, equipped with a rotating arm with a weight at the end. The length of the rotating arm is 250 mm and the mass of the deadweight is 0.3 kg. The arm shall rotate at 45 revolutions per minute. The motor shall be provided with means for connecting it to the pipe penetrating the wall. The mass of the entire device is 2.3 kg. The rotating arm shall be at a distance of approximately 200 mm from the wall surface

Moisture indicator, e.g. 1 part methylene blue and 200 parts talcum by weight, and/or moisture sensors or moisture meters.

6.3 Preparation of test samples

The test sample is constructed as described above (Section 5). If necessary, for example to allow curing of membranes or adhesives, the entire construction is left in the test laboratory for sufficient time to allow hardening, drying out etc. There are no specific requirements to the temperature and humidity in the laboratory during the conditioning. For finished wall surfaces the surface is washed with water with an admixture of neutral detergent immediately before the testing.
To facilitate the assessment of the watertightness of the bushing for the water pipes it is recommended to record the moisture content around the bushing during the test, e.g. by mounting moisture sensors in the wall.

6.4 Procedure

6.4.1 A static load of 1500 N facing vertical down is applied via a crossbar in the centre between the wash basin supports at a distance of 300 mm from the wall (simulating a load on the front of a wash basin) or alternatively the load is applied with 750 N on each support. The load is removed after 5 minutes. The deflections of the supports are measured at a distance of 300 mm from the wall prior to the loading and 10 minutes after the load has been removed. Any signs of damage are recorded.

6.4.2 The nozzles are placed so the spray points towards the most critical parts of the wall, e.g. joints, corners and pipe penetrations.

The walls are exposed to hot water and cold water, according to the schedule in section 6.2. The exposure is repeated 1500 times.

After 1500 cycles the device for mechanical testing is in turn mounted on one penetration for water pipes of each type (at a distance of 0.4 m from the wall surface). The motor shall run for 24 hours.

The exposure to hot and cold water according to the schedule in section 6.2 for 1500 cycles is repeated.

Any penetrations of water, change in appearance, change in moisture content etc., shall be recorded.

Finally the wall is dismounted and any water penetrations, dimensional changes or other factors, which may have influence on the durability, are noted.

6.5 Expression of results

The wall is said to be watertight if there is no sign of water penetrating the wall.
If no damage, e.g. dimensional changes, has occurred the wall is said to be water-resistant.
The loads applied on wash basin etc. should not result in major residual deflections.

7 Test report

The test report should give the following information:

a) Name and address of the testing laboratory
b) Identification number of the test report
c) Name and address of the organisation or the person who ordered the test
d) Purpose of the test
e) Method of sampling and other circumstances (date and person responsible for sampling)
f) Name and address of manufacturer or supplier of the tested material or system.
g) Name or identification marks of the tested product or products
h) Description of the tested object
i) Date of supply of the tested object
j) Date of test
k) Test method
l) Conditioning of the test specimens, environmetal data during the test (temperature, relative humidity etc.)
m) Identification of the test equipment and instruments used
n) Any deviations from the test method
o) Test results
p) Inaccuracy or uncertainty of the test results
q) Date and signature