

European Organisation for Technical Approvals
Europäische Organisation für Technische Zulassungen
Organisation Européenne pour l'Agrément Technique

ETAG 022

GUIDELINE FOR
EUROPEAN TECHNICAL APPROVAL
Of

Watertight covering kits for wet room floors and or walls

- ANNEX F WATER TIGHTNESS AROUND PENETRATIONS AND OTHER DETAILS IN WET ROOM WALLS WITH FLEXIBLE SUBSTRATE

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1 Scope

The aim of this method is to evaluate the watertightness of normally used details, e.g. joints and bushings for water pipes and taps of watertight walls or wall coverings for wetrooms. The test procedure is intended to simulate the mechanical loads and exposure to hot and cold water that can be expected during long-term use in order to verify satisfactory performance.

2 Field of application

The method is applicable to all walls intended for use as watertight walls in wet rooms. The method is intended for walls with flexible substrate, i.e. plywood, chipboard, gypsum, anhydrite and similar material vulnerable to water, but is not restricted to those.

3 References

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4 Definitions

The watertightness of a membrane including its attachment to bushings of water pipes and taps etc. is defined as its ability to prevent penetration of water during the test.

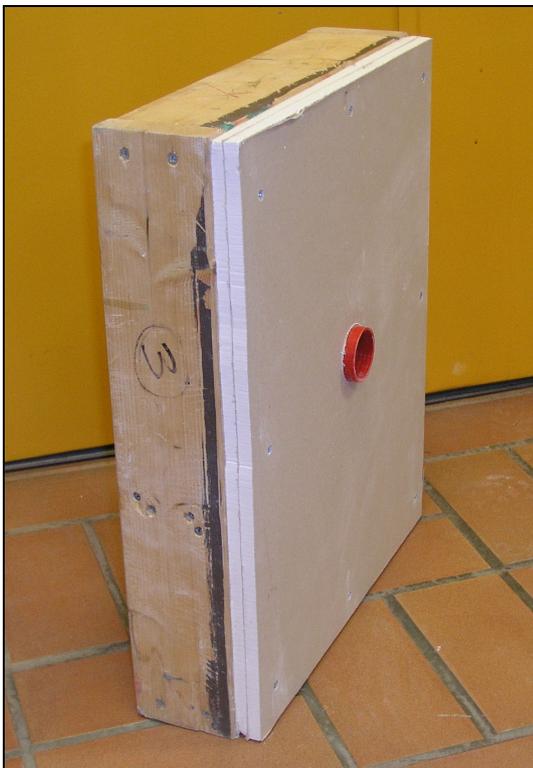


Figure 1. Test piece of 2 layers of 13 mm gypsum fixed to a frame of steel or wood.

5 Preparation of test pieces

At least 2 test pieces for each detail to be assessed e.g. :

- 2 test pieces for wall boxes belonging to pipe in tube system
- 2 test pieces for water pipes
- 2 test pieces for wall joints in the board materials (only relevant for testing according to part 3 of the Guideline)

are used. If nothing else is agreed upon the test piece is made from 13 mm gypsum board measuring approximately 535 mm x 435 mm and fixed to a frame made from steel or wood

Note: The gypsum board shall have specific water absorbing properties, i.e. if the test is carried out with the gypsum board alone (without waterproofing) the test results for 1 layer of gypsum board shall be 1,0-1,5 kg water absorbed per m² (after 1 week).

The test pieces are made with normally used details, e.g. including bushings, mounting boxes etc. The mounting of bushings etc. shall be in accordance with the manufacturers instructions. A suitable tap/piece of pipe - closed at the end - is mounted in the bushing and/or mounting box.

The waterproofing layer is attached to the front and on all four edges. Besides it shall preferably cover the outermost 10 mm of the backside in order to prevent water from entering this way. For some bushings etc. application of ceramic tiles may be necessary in order to get a proper mounting/functioning of the bushing.

6. Test method

6.1. Principle

The test specimens are exposed to cycles of hot water spraying, cold water spraying, drying, and mechanical forces. The accumulation of moisture in the test specimens is recorded.

6.2 Apparatus

The following is used for the test:

- Frames for mounting the test pieces. The frames shall have an opening of 400 x 500 mm and shall form a watertight joint with the watertight layer or the wall surface depending on the type of specimen. A seal with a soft, hollow rubber profile is suitable, see Fig. 2 and 3.
- A chamber for mounting the test pieces and exposing to alternating hot and cold water
- Nozzles giving 0.05 l/sec water. The nozzles shall distribute the water evenly over the surface of the specimen, see Fig. 4.

Note: A suitable nozzle is manufactured by Spraying Systems Inc, USA and is marked 1/4 G 10 (female) or 1 GG 10 (male)

- Facilities to provide the test pieces with hot (60±3°C) and cold (10±3°C) water

- Mounting steel frame for the test pieces under exposure to dynamic load, see Fig. 5.
- A device to test the resistance of the water pipes to mechanical forces 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 dead-weight at the end. The length of the rotating arm is 250 mm and the dead weight has a mass of 0.3 kg. The arm shall rotate at 45 revolutions per minute. The motor is provided with e.g. a piece of pipe on the back so that it can be connected to the pipe penetrating the wall. The mass of the entire device is 2,3 kg. The rotating arm shall be placed at a distance of approx. 200 mm from the wall surface, see Fig. 5.
- A moisture meter (resistance) used for measurement of moisture content in wood. A moisture meter is also applicable for detecting of changes in the humidity of gypsum boards during the test.
- A climate chamber with 23 ± 2 °C and 50 ± 5 % RH.



Figure 2. Sealing with a soft (hollow) rubber profile.



Figure 3. Close up of rubber profile



Figure 4. Nozzles for water spraying.



*Figure 5. Device for testing of bushings to dynamic load **Note: the photo is of an earlier device giving a more harsh load.***

6.3 Preparation of test pieces

The test specimens are conditioned for at least a week in a climate of 23 ± 2 °C and 50 ± 5 % RH.

6.4 Procedure

6.4.1 After conditioning the test pieces are mounted in the frames and the test pieces are exposed to the following cycles:

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

After 1500 cycles the test pieces are demounted and exposed to a dynamic load.

6.4.2 The device for dynamic loading is mounted on one of the water pipes at a distance of 0,2 m from the wall surface. The motor shall run for 24 hours.

6.4.3 Hereafter the test pieces are remounted in the frames and exposed to further 1500 cycles of hot and cold water as described above.

After the 1500 cycles the test pieces are demounted.

Any detection of moisture penetration or changes in appearance are registered. Opening of the test pieces around the details investigated is recommended to get the best basis for evaluation.

6.5. Expression of results

The results of the tests are given as the difference between the moisture content near the water pipe bushings and the rest of the board or as changes in moisture content of the gypsum board near the details, e.g. around penetrations or joints during the test.

7 Test report

The test report shall include the following information, if relevant:

- a) Name and address of the testing laboratory
- b) Identification number of the test report
- c) Name and address of the organization or the person who ordered the test
- d) Purpose of the test
- e) Method of sampling and other circumstances, detail drawings and photos (date and person responsible for sampling)
- f) Name and address of manufacturer or supplier of the tested object
- g) Name and other identification marks of the tested object
- h) Description of the tested object
- i) Date of supply of the sample
- j) Date of the test
- k) Test method

- l) Conditioning of the test specimens (temperature, RH, etc.)
- m) Identification of the test equipment and instruments used
- n) Any deviations form the test method
- o) Test result (use SI units)
- p) Date and signature