

Flexible wall underlay membranes

Technical document

DT 99038-01

- Description of the EJC classification
- Testing protocol for artificial ageing by exposure to UV radiation for 1000 hours and for heat
- Testing protocols on adhesives

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MODIFICATION HISTORY

Revision No.	Application date	Modifications
00	17/11/2017	Update to the document layout and reference
01	09/10/2018	Integration of the 1000 h ageing test methodology
02	05/02/2021	Addition of test protocol on adhesives

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1. EJC classification.

The EJC classification is based on three characteristics:

- Characteristic for the **substrate type** on which the flexible wall underlay may be installed according to its mechanical strength, symbolised by the letter 'E';
- Characteristic for the **exterior cladding type** installed on the sheet, symbolised by the letter 'J';
- Characteristic for the **sheet's exposure time during construction** installed on the sheet, symbolised by the letter 'C';

The classification is characterised by the combination of three letters (**EJC**) associated respectively with a rating: sc, 450, 600 or o, f, c or 1, 2, 3, corresponding to a performance or quality level.

1.1. E characteristic

E characterises the substrate type on which the flexible wall underlay may be installed according to its mechanical strength:

- **E_{sc}**: corresponds to installation of the flexible wall underlay on a continuous substrate (for example: structural sheathing or shear wall);
- **E₄₅₀**: corresponds to installation of the flexible wall underlay on a discontinuous support where the centre-to-centre distance between rows of fastenings is 450 mm;
- **E₆₀₀**: corresponds to installation of the flexible wall underlay on a discontinuous support where the centre-to-centre distance between rows of fastenings is 650 mm.

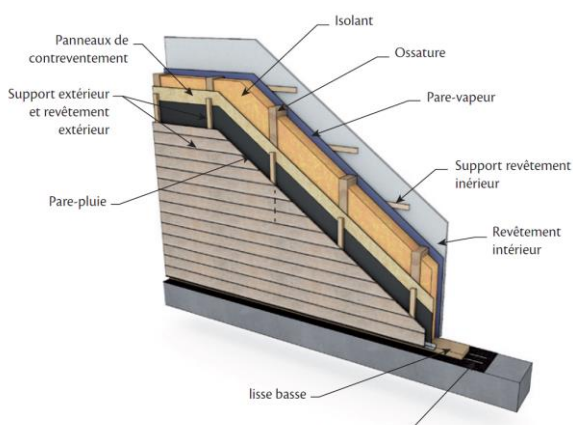


Figure 1: continuous substrate

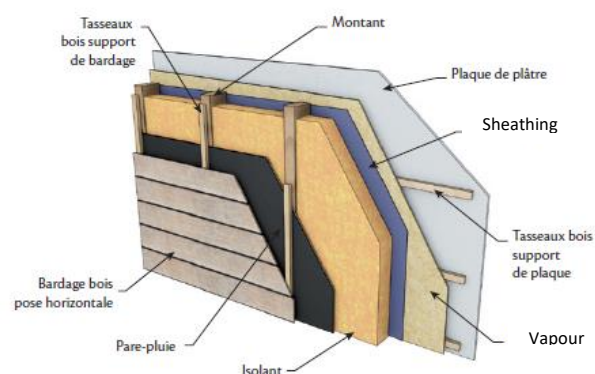


Figure 2: discontinuous substrate

Classification	Before ageing Minimum tensile and/or shear strength of overlaps between lengths (L x T) EN 12311-2	After ageing Minimum tensile and/or shear strength of overlaps between lengths (L x T) EN 12311-2	Minimal resistance to tearing on nail shank Minimum value (L x T) EN 12310-2
E _{sc}	100 N/50 mm	≥ 70% of the initial value With a minimum of 70 N/50 mm	75 N
E ₄₅₀	100 N/50 mm	≥ 70% of the initial value With a minimum of 70 N/50 mm	75 N
E ₆₅₀	140 N/50 mm	≥ 70% of the initial value With a minimum of 100 N/50 mm	100 N

1.2. J characteristic

J characterises the exterior cladding type installed on the sheet:

- **J_o**: corresponds to a flexible wall underlay installed behind an open-joint cladding ⁽¹⁾
- **J_f**: corresponds to a flexible wall underlay installed behind a closed-joint cladding
- **J_c**: corresponds to a flexible wall underlay installed behind openwork cladding, the characteristics of which are defined in the specific assessment for the membrane (such as ATec, ATE_x, etc.)

Classification	Type of cladding	Duration of artificial ageing
J _o	Open-joint cladding	5000 h
J _f	Closed-joint cladding	336 h 1000 h
J _c	Openwork cladding	5000 h

⁽¹⁾: cladding with open joints ≤ 10 mm, and the surface of open joints surrounding the cladding skin component must be $\leq 1.5\%$ of the surface of the component as specified by the Information Note of GS2.2 no. 6 version 2 'Definitions, Requirements and Traditionalism Criteria Applicable to Built-Up Cladding' (CSTB Specification 3251_v2 of December 2017), with an increased joint width of 8 to 10 mm.

1.3. C characteristic

C characterises the sheet's maximum exposure time during construction before being covered by the exterior cladding:

- **C₁**: the wall underlay underwent 336 h of UV ageing at 50°C and 90 days of exposure at 70°C in accordance with Standard NF EN 13859-2. The rain barrier must be covered within 15 days.
- **C₂**: the wall underlay underwent 1000 h of UV ageing at 50°C and 90 days of exposure at 70°C in accordance with the methodology described in this Technical Document. The rain barrier must be covered within 3 months.
- **C₃**: the wall underlay underwent 5000 h of UV ageing at 50°C and 90 days of exposure at 70°C in accordance with Standard NF EN 13859-2 – Appendix C. The rain barrier must be covered within 6 months.

Classification	Duration of the artificial ageing	Construction: Window for covering the flexible wall underlay
C ₁	336 h	≤ 15 days
C ₂	1000 h	≤ 3 months
C ₃	5000 h	≤ 6 months

2. Artificial ageing test protocol

The purpose of this document is to describe the artificial ageing test protocol (exposure to 1000 hours of UV radiation followed by long-term heat exposure for a flexible wall membrane). Water penetration resistance as well as tensile strength and elongation are to be determined after artificial ageing, pursuant to QB 38 certification for flexible wall membranes, in addition to standard NF EN 13859-2 Appendix C and DTU 31.2, which authorises an exposure time of 1000 hours according to an exposure during construction that differs from that set out in Standard NF EN 13859-2 § C.5.1.

2.1. Material

The apparatus used for UV-A radiation exposure at high temperature must be indicated in EN 1297.

A ventilated oven compliant with EN 1296 must be used for heat exposure.

2.2. Preparation of the test specimens

The test specimens conform to the dimensions specified in § 5.2.3, 5.2.4 and 5.2.7 of EN 13859-2.

To determine tensile properties, two series of five longitudinal test specimens and two series of five transverse test specimens shall be prepared. One series of test specimens in the series of five longitudinal test specimens and another in the transverse series are to be artificially aged.

The tensile properties of the two other series of test specimens shall be determined by a test without exposure.

To determine water penetration resistance, the test specimens defined in § 5.2.3 and 5.2.4 of EN 13859-2 must be prepared and exposed to artificial ageing.

2.3. Conditioning of the test specimens

Conditioning of the test specimens exposed to UV radiation shall be carried out in accordance with § C.4.3 of EN 13839-2.

2.4. Operating procedure

Exposure to UV radiation at high temperature

Amending EN 1297 for the requirements of this standard, the following test conditions shall be applied.

Black Standard Temperature (BST) of $(50 \pm 3/-0)^{\circ}\text{C}$ and exposure to UV light for 1000 hours.

Exposure to heat

Test specimens must be transferred into the ventilated oven in accordance with EN 1296 for an exposure time of 90 days at $(70 \pm 2)^{\circ}\text{C}$

2.5. Expression of the results

Complete a visual examination of exposed and unexposed test specimens and record all effects observed.

Record the water penetration resistance according to § 4.3.2 of EN 13859-2 after exposure. Calculate and record the maximum tensile strength and elongation force mean values in accordance with § 4.3.5 of EN 13859 before and after exposure including the confidence interval (in the unilateral case) at 95% in accordance with ISO 2602.

3. Testing protocol on adhesives

3.1. Peeling tests

Adhesive peeling test on a flexible wall underlay membrane

Adjustment of the test protocol in Standard NF EN 12316-2: 2103:

To check the effectiveness of the adhesive's bonding to associated flexible membranes, suitability testing must be carried out. The test consists of peeling an assembly composed of two flexible wall underlay membranes and adhesive tape. The suitability test must be done for each associated substrate membrane.

These tests are carried out in both new and aged conditions.

1- Apparatus:

Compliant with Standard EN 12316-2: 2013

2- Sampling:

Samples must be taken as shown in the figure below:

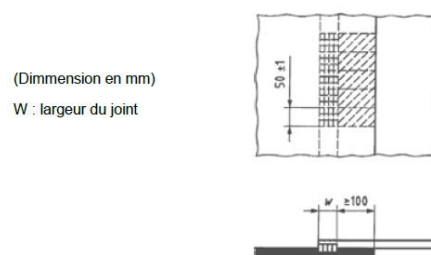


Figure 1 - Test specimen collection and dimensions (NF 12316-2)

Five (5) test specimens are cut out from the joint being tested. Test specimens are cut out perpendicular to the joint.

3- Preparing samples and test specimens:

Compliant with Standard EN 12316-2: 2013

4- Operating procedure:

Compliant with Standard EN 12316-2: 2013

5- Expressing the results:

5.1 - Failure mode (visual)

Indicate all information concerning the joint's failure mode.

Failure modes can be identified as follows:

- Adhesive failure (complete lack of adhesive material on the substrate);
- Cohesive failure in the adhesive (integral failure in the adhesive);
- Partial cohesive failure (partial failure in the substrate indicating weak bonding);
- Substrate membrane failure (integral failure of the substrate);
- Adhesive tape failure (tape tearing or splitting).

The shear test (in accordance with EN 12317-2) is not necessary if one of the substrates or the adhesive tape fails.

5.2- Assessment

Compliant with § 9 in Standard EN 12316-2: 2013

6- Test report:

Compliant with § 10 in Standard EN 12316-2: 2013