MECHANICAL CHARACTERIZATION OF ADHESIVE TAPE-MEMBRANE JOINTS

MEZeroE
Measuring Envelope systems for Zero Energy buildings

ROTHO BLAAS

Product: FLEXI BAND UV tape + TRASPIR EVO UV 115 membrane and SMART BAND tape + TRASPIR EVO 160 membrane

The tapes are universal single-side adhesive and the membranes are highly breathable monolithic.

ROTHO BLAAS is an Italian multinational, leading developer and provider of high technology products and services dedicated to wood carpentry.

Preparation and testing of tape-membrane joints at M&S Lab

Pilot Measurement & Verification Line 6

Managed by: Politecnico di Milano (POLIMI)

PM&VL6

PM&VL6 offers a comprehensive characterization of building envelope components, thanks to its two infrastructures: the Materials & Structures Laboratory (**M&S Lab**, mechanical characterization) and the **BEEpilot** (thermal, hygrothermal, air quality and airtightness performances).

SAFETY HEALTH EFFICIENCY

Which is the need covered by this service?

The mechanical characterization of different types of products to compare their properties and characteristics and evaluate the possible influence of different external conditioning on the mechanical properties of the elements.

Design of Experiments

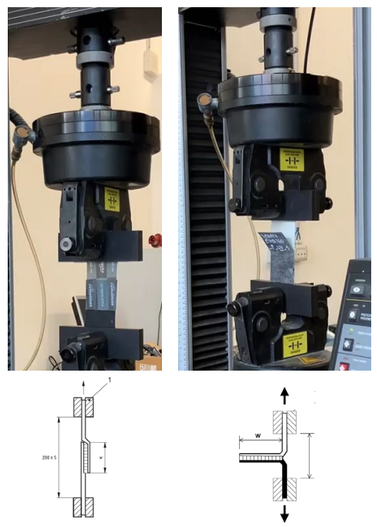
Shear resistance of joints

The samples were clamped in an electromechanical press and a tensile force, sufficient to cause the failure or the separation of the joints, was applied vertically to pull the samples in shear. The shear resistance of joint was determined (EN 12317-1:2010)

Peel resistance of joints

The samples were clamped in an electromechanical press and a tensile force, sufficient to cause the failure or the separation of the joints, was applied vertically. The resistance to peeling of joints was determined (EN 12316-1:2000).

The tests were performed after standard conditioning, after one year of UV exposure and after freeze and thaw cycles.



Shear and Peel resistance of joint test

Results

Shear resistance of joints

Table 1 summarizes the average values of the shear resistance of joint, expressed in N/50mm. The repeatability of tests for each type of sample was equal to three.

Peel resistance of joints

Table 2 summarizes the mean values of the maximum peel resistance and of the average peel resistance, expressed in N/50mm. The repeatability of tests for each type of sample was equal to three.

Sample name	Average shear resistance [N/50mm]
FLEXI+EVO115_S	118.1
FLEXI+EVO115_S_UV	107.4
FLEXI+EVO115_S_FT	141.3
SMART+EVO160_S	82.6
SMART+EVO160_S_UV	86.1
SMART+EVO160_S_FT	132.0

Table 1

Sample name	Maximum peel resistance [N/50mm]	Average peel resistance [N/50mm]
FLEXI+EVO115_P	45.9	43.3
FLEXI+EVO115_P_UV	47.1	44.5
FLEXI+EVO115_P_FT	88.8	76.9
SMART+EVO160_P	30.6	28.5
SMART+EVO160_P_UV	35.8	31.5
SMART+EVO160_P_FT	60.5	53.6

Table 2

The sample name is composed of a first part that represents the abbreviation of the product name and 'S' or 'P' which represents the type of test (shear resistance or peel resistance of joints). If there is no additional letters after 'S' or 'P', it means that the test is performed under normal conditions, otherwise 'UV' represents the samples exposed to UV radiation for one year, and 'FT' represents the samples subjected to freeze-thaw cycles.

Conclusions

It was possible to mechanically characterize the component, specifically defining the shear and the peel resistance of the joint. It is also possible to compare the various types of specimens by evaluating the influence that different conditionings have on the mechanical properties of the component.

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