FEICA The European voice of the adhesive and sealant industry

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Determination of the Shear Strength of an OCF[1] Canister Foam

1. Scope

This method displays the behaviour of a foam system towards shear forces. It shows the strength and the bonding power of the foam as the sandwich element between wooden plates. The test is conducted according to EN 12090.

2. Short description of the procedure

The foam is dispensed in the gap between two boards. After full curing, the boards are moved in opposite but parallel directions to each other (sheared) while the applied force is measured.

3. Background and purpose

The shear strength is an important property of the foam, needed to evaluate its fixing power, particularly for the fixation of doorframes. It is useful to calculate the necessary area of fixation (for given door wing weight) or vice versa. This test also indicates the breaking point of the fixation, which can be either within the foam (cohesion failure) or between foam and the bonded surface (adhesion failure).

4. Equipment

For each measurement:

- 2 wooden boards (P3 or P5 to EN 312), size: 140 mm x 100 mm
- 2 spacers, thickness: 20 mm
- 2 screw clamps

Further tools:

- Sharp cutter
- Controlled climate chamber, providing norm climate
- Tensile testing machine (e. g. Zwick or Instron)

5. Procedure

It is necessary to complete at least three measurements to obtain a statistically relevant mean value.

4.1 Preparation

a) Acclimatise the wooden panels to the test climate for at least 24 hours.
b) Test conditions: 23 °C, 50 % r. h. (norm climate)

[1] **OCF**: Generic term for moisture-curing or physically drying foam as well as self-curing activatable foam extruded as a froth from single pressurised containers.

c) Prepare the specimen with two chipboard plates, separated by a spacer and fix them with two clamps. The remaining space to be filled with foam should be ca. 10 cm x 10 cm.
d) Bring the test canister to the test temperature for at least 24 hours
e) Place the fixed boards vertically.
f) When moisturized, the boards are immersed in water for 20 sec, taken out and stored vertically for two minutes, until excess water drips off. For the test of 1.5 or 2 c foams do not moisturize.
g) Shake the canister vigorously 20 times
h) Discard the first 50 g of foam
i) Spray the foam into the joint
j) Remove the excess of foam after 1 day
k) Allow the foam to cure for six more days
l) Remove the spacers

4.2 Experimental procedure

a) Fix one board to the tensile testing machine to avoid movement. Attach the other board to the towing clamps of the testing machine. This board will be moved for the measurement (see fig.1).
b) Fix the specimen without deforming or damaging the foam layer. The shear power must be applied by moving the boards parallel to each other.
c) Adjust the tear speed to 3 mm/min.
d) The measurement is completed when the curve passed its maximum value.

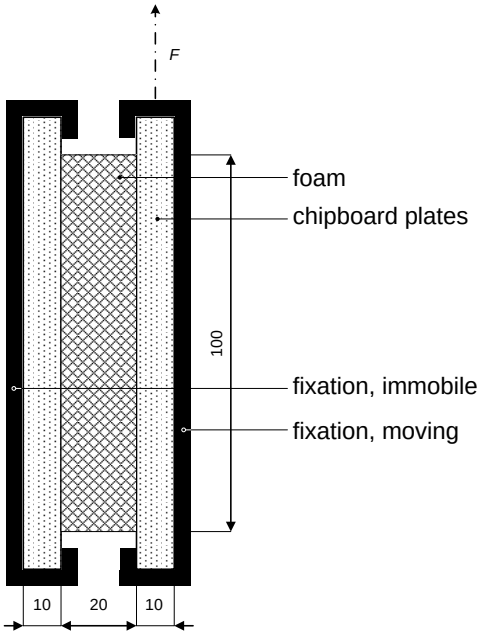

Figure 1: Specimen ready for test

6. Evaluation

Report the mean of the measurements and kind of break (Cohesion or adhesion). Units: kPa
Report whether the specimen was moisturized or not.

7. Revision

Version	Date	Remarks
2	19 February 2013	Released at the OCF TTF meeting on 19 February 2013.

8. Contact

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