FEICA The European voice of the adhesive and sealant industry

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Determination of the Sagging Behaviour of an OCF[1] Canister Foam

1. Scope

This test method describes how to evaluate the sagging behaviour and determine the biggest joint possible before a liquid OCF (froth) slips off.

2. Short description of the procedure

The foam is sprayed into vertical joints of different dimensions. The joints are enlarged until the foam slips off.

3. Background and purpose

One of the most important physical properties of an OCF is the ability to set itself in a cavity and thus fill up joints. This property is dependent upon the temperature of both the canister, the environment and the dimensions of the joints, particularly vertical joints. The typical factors for sagging are low temperatures and wide joints.
This method has two objectives:

a) To judge the sagging behaviour of an OCF at given conditions: canister and ambient temperature and the joint width.

b) To define the maximum joint width for the usability of the OCF at given temperatures where the foam does not slide down.

4. Equipment

For each measurement:

- 2 wooden boards, size: 900 mm x 90 mm x 10 mm
- 2 spacers of each size. The size depends on the individual product. Typical thickness: from 30 mm upwards in 5 mm or 10 mm steps.
- Paper or uncoated carton
- 2 screw clamps

Further tools:

- Controlled climate chamber, providing normal climate

[1] **OCF**: Generic for moisture curing One Component Foams dispensed from pressurised containers ("aerosol cans") as well as self-curing two component foams dispensed from pressurised containers ("1,5 component foams")

5. Procedure

5.1 Preparation

a) Bring the test canister to the test temperature for at least 24 h
b) Recommendation: In order to avoid overfilling and overexpansion of the foam, it is helpful to draw two orientation lines on the inner sides of both boards. The lines should be placed along the long side of the board, each distanced for 2 cm from the long edges.
c) Prepare the joints with the spacers and panels and fix them with the clamps.
d) **Sagging behaviour at given joint width**: Build a joint with the desired width with the boards and the spacers (see fig. 2).

Evaluation of maximal joint width: Build several joints beginning from the smallest width (typically 30 mm) up to the largest expected width in suitable steps like 5 mm or 10 mm.
e) Acclimatize the setup to the test climate for at least 24 h

5.2 Experimental procedure

a) Shake the canister vigorously 20 times
b) Discard the first 50 g of foam
c) Fill the joint from the bottom to the top, but not completely (leave the last 5 cm at the top free in order to avoid bonding to the top surface). Spray without interruption until you reach the top.
d) Avoid overexpansion of the cured foam and use the orientation lines, fill according to the manufacturer's instructions (typical: gun foam 70 - 80 %, straw foam 40 – 50 %of joint height)
e) The initial filling should be as uniform as possible so that the foam surface is as straight as possible (in order to allow more precise measurement in subsequent steps). Dispensing speed should be about 50 g/min - 70 g/min for gun foam and about 150 g/min – 200 g/min for straw foam. At given conditions, if the flow rates cannot be achieved, lower rates can be accepted.
f) Store the filled joints at the desired ambient test temperature for further 24 hours.

5.3 Evaluation

After this time for each joint one can judge the behaviour of the foam as follows:

Measuring points for obtaining this difference value should be at about 5 cm (d_{down}) and about 70 cm (d_{up}) from the bottom of the joint and
$d = (d_{down} - d_{up}) / 2$.

a) No sagging.
The foam is still equally spread and set in the joint (d=<1)
b) Slight sagging.
The foam is still set in the joint but is somewhat sagged towards the bottom (for typical illustration see Fig. 4) (d=<3)
c) Strong sagging
The foam is not set equally in the joint. It has sagged partly
(d > 3 cm) or has flowed/sagged completely out of the joint.

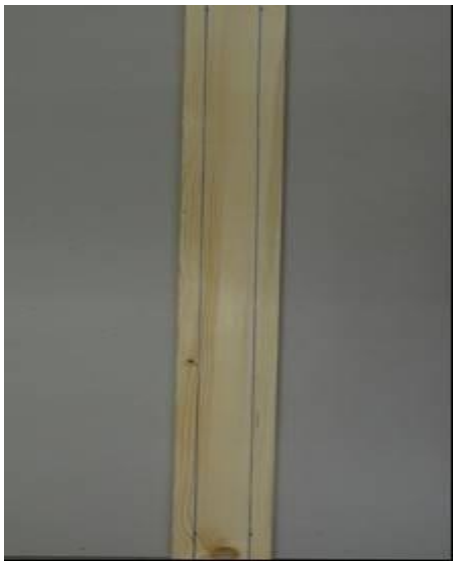

Figure 1: Marking lines at the boards

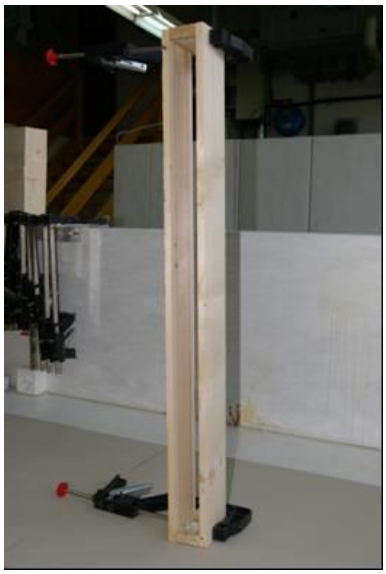

Figure 2: Vertical joint for test (empty)

Figure 3: Filled joint

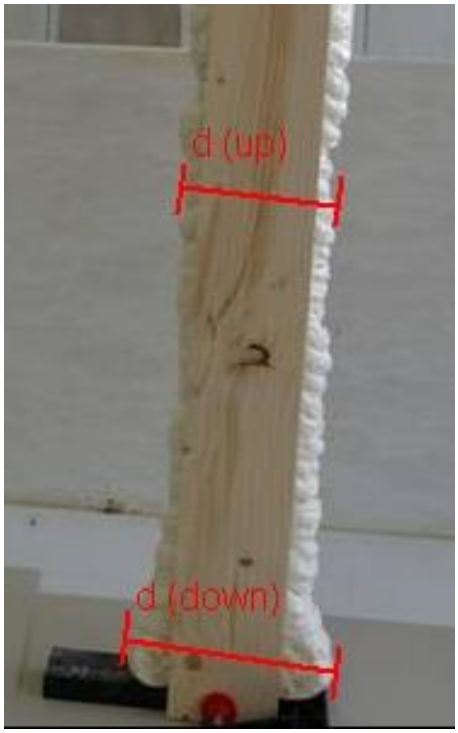

Figure 4: Partly sagged foam

6. Revision

Version	Date	Remarks
2	09.03.2013	Released at the OCF TTF meeting on 19 February 2013.

7. Contact

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