FEICA The European voice of the adhesive and sealant industry

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TM 1007:2013

Determination of the Volume by Water Displacement

1. Scope

This test method describes how to determine the real volume of cured foam, respecting eventual cavities inside the foam structure.

2. Short description of the procedure

A test sample, preferably prepared according to TM 1003, is cut in several pieces and immersed underwater. The displaced quantity of water or the lifting power shows the foam volume.

3. Background and purpose

The yield of the foam can be determined in a various ways; as joint yield or as free foamed yield. In a curing process the foam is changing its dimensions and the final shape of the cured foam is irregular, thus the problems with determination of the foam's volume may appear. Purpose of this procedure is to describe the water displacement test method to measuring the irregular shaped foam's yield.

4. Equipment

- 200 litre drum containing water
- Grid basket that fits in the drum.
- Bucket for water which flows out from the drum
- Eventually a weighing scale

5. Procedure

5.1 Preparation and procedure

a) Fill the drum with water up to the drainpipe level.
b) Open the drainpipe.
c) Put the grid basket in the drum in such a way that it is totally under water level and that excess water flows out of the drain (to eliminate measurement errors due to tool volume.
d) Wait until the drain stops giving water, so the water level is just below the drain pipe. Take the basket out of the water and put one foam piece (or more if possible) in it.
e) Put the basket back in the drum in such a way that it is fully under water.
f) Collect the water that flows out of the drain.
g) Weigh the collected amount of water (or determine by basket scale marking)
h) Repeat steps a)- g) for each piece of foam.

5.2 Evaluation

The weight of all collected water is the measure for the volumetric yield of the free foamed foam:

$$Y(l) = \frac{m_{water}}{\partial_{water}}$$

where
- $Y(l)$ is the volumetric yield in litres [L]
- m_{water} is the weight of the collected water in kg
- ∂_{water} is the density of the water at test temperature in [kg/L]

Figure 1: 200 L drum, grid and bucket

6. Revision

Version	Date	Remarks
2	19.02.2013	Released at the OCF[1] TTF meeting on 19 February 2013.

[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")

7. Contact

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