Characterization of sealants and expanding foams

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1. IMPORTANT UNIMPORTANCE

Constructions joints occur everywhere where several construction materials meet. That's many meters that need to be taken care off, respecting the function that the materials or the joint need to fulfill. Typically a joint filled with sealing material has to account for water tightness, or is applied for esthetical reasons. Insulating materials can also be injected for thermal or acoustical insulation. A combination of joint materials often guarantees more advanced functions, fire resistance is a typical example. Of course a combination of functions can also be fulfilled and nearly every time the jointing material needs to take up movement of the surrounding construction elements, which is definitely the case for an expansion joint. These requirements call for specialized quality products. Airtightness certainly adds to this list, putting a new challenge to construction products and jointing materials.

It is quite clear that airleaks often occur where construction elements meet and that they can account for a big part of the total amount of leaks. Air lost in and around windows for instance can easily make up 30 to 40% of all airleaks. Window connection joints are notoriously infamous for being thermal bridges too. No wonder Soudal primarily concentrated on these area's offering solutions based on product combinations that are adapted to local building practice and tested accordingly.

2. CHARACTERIZING PRODUCTS

Characterizing building products in terms of airtightness however is not so easy. Basically EN 12114 provides a rough procedure to test airtightness of a building product in laboratory conditions. It obviously doesn't specify how test samples need to be prepared or how the test should be set up because of the vast number of construction materials.

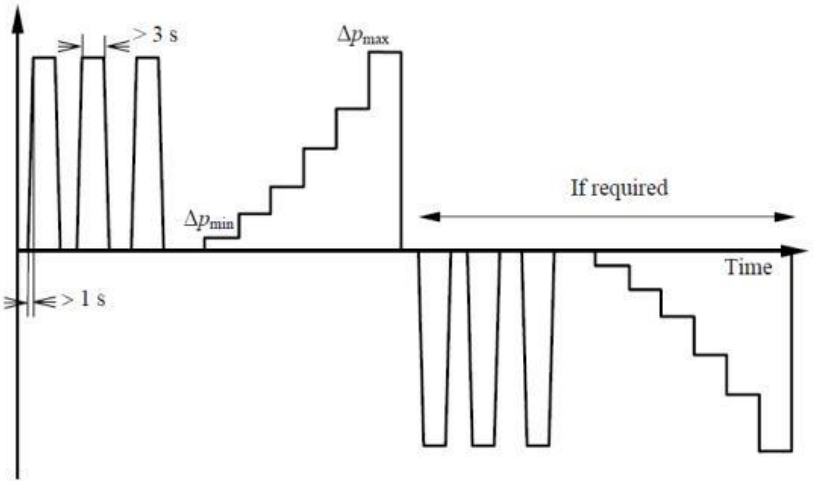

Figure 2: Test procedure provided by EN 12114

A lot of building products are therefore not tested according to this norm as they are for instance accepted to be air tight from their nature, as this the case for sealants for instance. Others rely on measured Sd-values although vapourtightness and airtightness are not the same. A material can be vapour open yet still be airtight. PU-foams are a typical example. That's why quality foams are tested on airtightness according to EN 12114 all the same, providing proof that they can combine thermal and acoustical insulation with airtightness. Newer generation flexible PU-foams can even come with test reports on their elasticity, as is the case for Flexifoam ®. For sealants this essential characteristic has been normed many years ago. EN ISO 11600 provided classes which correspond to movement capacity, ranging from 7,5 to 25. The new CE marking for sealants is to a large extent based on the still existing EN ISO 11600, generalizing the use of these classes and imposing clear communication with regards to the characteristics on the packaging. Movement capacity should be in line with the intended application, so that a sealant remains intact (cohesion) and keeps on adhering to the adjacent materials (adhesion).

CE
NB 0749
13
Soudal N.V.
EN 15651-1: F
EXT-INT-CC, 25LM
EN 15651-2:G
CC, 25LM

Figure 1: CE marking for sealants: reference for end users

Movement capacity of building materials and jointing materials in particular mean that will perform well for many years, and test reports, technical data sheets and packaging will be of significant help to the (professional) end user. Ultimate proof on how well certain product combinations will perform over the years is almost impossible to organize though, since the number of parameters and boundary conditions mean that there are just too many combinations to be tested. However, the German MO-01/1 directive from ift Rosenheim (Institut für Fenstertechnik) comes close to enabling this. A given product combination for window to wall connection is tested on water-and airtightness

before AND after ageing, giving a clear indication on durability of the solution tested. Several combinations within the Soudal Window System have been granted an OK after being submitted to this thorough and extensive test procedure.

3. RESEARCH

Apart from legal requirements, building contractors and professional end-users look for products that are reliable, user-friendly and time-saving at an acceptable cost. To match these typical requirements with the new demands on airtightness, Soudal invests a lot in R&D, constantly trying to improve products and solutions. A typical innovation along this path is Soudatight LQ, which will later be followed by Soudatight SP (sprayable version). Soudatight LQ is a fiber reinforced polymer dispersion, ready for use – to be applied with a brush, and curing to an elastic, vapour and airtight membrane which can be painted or plastered after drying. It is odourless, solvent free and low-emission (meets the high EC1 Plus standard). It is used to be applied in and around window joints, floor-wall joints, wall-ceiling joints and roof joints. Due to the fibre structure, cracks up to a few millimetres wide can be sealed easily. The sprayable version of course offers the added benefit of treating larger area's in short time. New requirements and user friendliness can go hand in hand!

4. CONCLUSIONS

Solutions and products that enable high levels of airtightness are available. However, due to the many parameters and situations, it is very difficult for the industry to come up with test reports for every imaginable situation, yet decent market players will try to do so whenever possible. Furthermore, for a product to perform, craftsmen or end users should always check the manufacturers advice on how to use it, and check technical data sheets as much as possible.