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No “wonder foam” in sight

PU foam insulates well, but is not sufficient sealing and fastening

Whichever installer of windows and external pedestrian doorsets does not dream of PU foam that is easy, fast and safe to use, cost-effective and that meets all the requirements for installation in accordance with the recognized rules of technology? In addition to joint insulation, this also includes safe load transfer of the dead weight, the wind forces occurring and the torques generated during operation, as well as protection against driving rain and an airtight seal on the room side, which the Energy Saving Regulations has long required.

The performance of PU in-situ foams with regard to thermal insulation in the connecting joint and the improvement of acoustic insulation have been proven by ift Rosenheim in a large number of tests and investigations. The adhesive effect, which is possible with careful processing, has also been used for a long time for internal doors, as the mechanical and climatic loads there are significantly lower than with windows and external pedestrian doorsets. The frames of internal doors have significantly larger adhesive surfaces and have been optimized for fastening using PU foam. For this purpose, ift Rosenheim has carried out appropriate research work in order to check and guarantee safe fastening (see also ifz info TU-02/1 “Installing interior doors properly – Prerequisites – Alignment – Mounting – Sealing” (German only)).

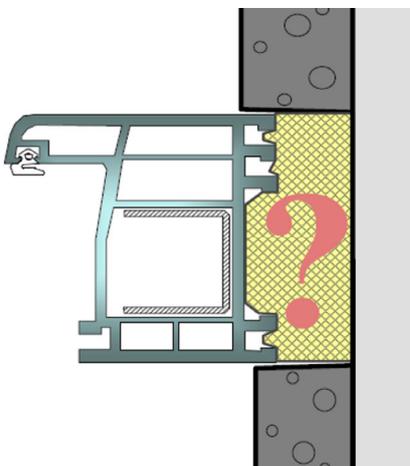


Fig. 1 Basic sketch
„PU wonder foam“

The installation of windows and external pedestrian doorsets in a manner that is both physically and statically correct is considered the most underestimated task; suppliers, licensers and the building material industry are constantly developing new installation and sealing systems that are intended to make the installation process safer, more functional and easier. Therefore, ift Rosenheim developed the ift Guideline "MO-01/1 Wall connection of windows; Part 1 Method to determine the fitness for use of weatherproofing systems" together with the industry in

2007 in order to be able to test the practical suitability and durability of new systems in advance on the basis of scientific rules. Since then, a large number of tested new systems have come onto the market that offer alternatives to the proven sealant joint that has been used for many years. These include, for example, impregnated sealing tapes, sealing films, sealing profiles or multifunctional tapes. All have their advantages and disadvantages and limitations.

The wonder foam that does not require any additional sealing and fixings is unknown to us. Although in-situ foams have repeatedly been tested, to our knowledge they are only suitable to a very limited extent for permanent sealing of assembly joints and the fastening of windows and external pedestrian doorsets, as the movements to be expected in the joint and the forces occurring are usually too great.

Improper fastening, non-permanently airtight joints on the room side and watertight sealing on the outside result in countless damages amounting to millions every year. For this reason, it is recommended that fitters and assemblers only use systems for which suitable verifications are available. Furthermore, the boundary conditions (e.g. required minimum joint widths, condition of joint faces and adhesive surfaces, fastening and load transfer, special requirements such as burglar resistance, etc.) under which the sealing properties are fulfilled must be strictly observed for the execution. These are part of the manufacturers' processing guidelines and can also be found in the test certificates.

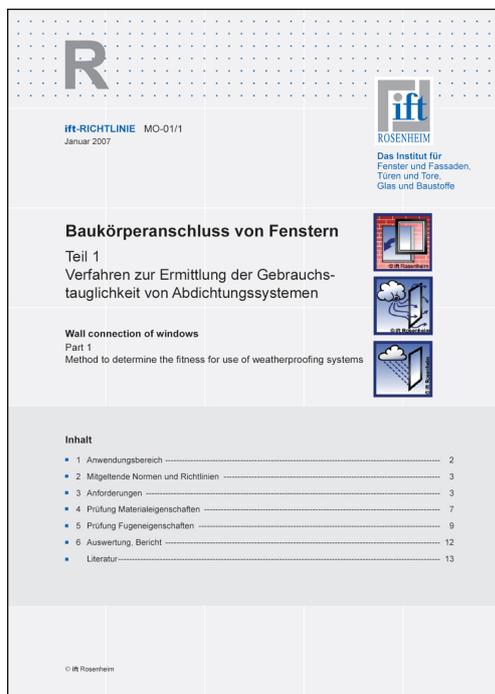


Fig. 2 ift Guideline MO-01/1 Wall connections of windows, Part 1 – Method to determine the fitness for use of sealing systems (German)

Those who do not adhere to these rules of the game and the recognized rules of technology risk building damage and high claims for damages. Anyone who advertises or reports on "miracle materials" without appropriate evidence will lead fitters up the legal garden path, because it is very difficult to prove the proper execution of complaints and damage in accordance with the rules of technology.

Professional installation in accordance with the recognized rules of technology is explained in detail and practically in many current guidelines and rules as well as in the "Installation Guideline" (published by RAL Quality Associations Windows and Doors e.V. and Bundesinnungsverband des Glaserhandwerks) with a large number of drawings, checklists, etc. The systems for fastening and sealing described here have proven themselves and offer legal security against the demands of building owners or architects when professionally planned and executed.

Table 7.15 Data sheet on multifunctional sealing tapes

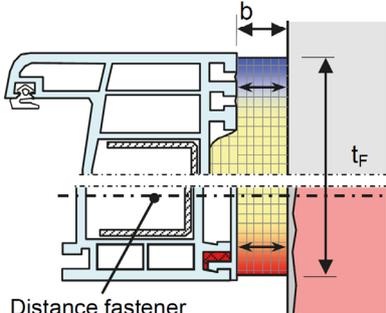
Multifunctional sealing tapes (see also Chapter 6.4.3) (on the basis of impregnated, pre-compressed joint sealing tapes)	
Scope of application	For sealing and insulating building component joints and connecting joints of building components
Properties	<p>Multifunctional sealing tapes have been developed from pre-compressed joint sealing tapes. Their special characteristic is that they combine the 3 planes of airtightness, functional area and weather protection in one product, i.e. multifunctional sealing tapes provide an air tight seal of the connecting joint on the inside, provide weatherproofing on the outside and have the necessary properties for thermally insulating the joint. This means that multifunctional sealing tapes fill almost the entire joint space between window and wall.</p> <p>Multifunctional sealing tapes have to comply with the specification for durability groups BG 1, BG 2 or BG R. In addition, thermal insulation properties are important. Since with this sealing system there is no space for bearing pads in the joint, the fastening system has to be suitable for this method of sealing, i.e. the mechanical fasteners must be capable of safely transferring the loads from the self-weight at the window level (distance fastener) to the wall.</p>
Substrate	Multifunctional sealing tapes are suitable for the placing of elements which are placed within the depth of the reveal of the wall opening. The substrates/contact surfaces must be smooth and level (this normally requires a skim coating to the reveal and possibly filler profiles at the back of the frame) and provide adequate resistance to the expansion pressure of the sealing tape. Remove any soiling (e.g. remains of mortar).
Application	<ol style="list-style-type: none"> 1. Determine the actual joint width. 2. Clean the joint, leaving the joint edges smooth. 3. Select the required size of sealing tape for the respective width and depth of the joint. 4. If appropriate, pre-install the fastening system. 5. Attach the tape to a suitable bonding surface of the window frame (fit groove filler profile if necessary) without stretching the sealing tape; tape and corner joints to manufacturer's instructions. 6. Check that the sealing tape "fits well" throughout the joint. 7. Place the window between the reveals, with the multifunctional sealing tape attached. 8. Align and attach the element in the wall opening. 9. Visually check the corners and tape joints once the joint has been completely filled. 10. If necessary, use the system's bonding compound to fill any small gaps, as directed by the manufacturer. <p>Furthermore, observe the manufacturer's application instructions.</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>The contact surfaces at the back of the window frame must be wide enough to allow adequate sealing at plane 1 and plane 3; if necessary, fit groove filler profiles.</p> </div> </div>

Fig. 3 Description of suitable sealing systems in the "Installation Guideline" using multifunctional tapes as an example