



Building Airtightness

2017

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BUILD THE FUTURE

Soudal, based in Belgium, is Europe's leading independent manufacturer of sealants, construction foams and adhesives. The company, established in 1966 by Mr Vic Swerts, is 100% family owned. Soudal offers innovative products, providing solutions to most bonding, sealing, waterproofing and jointing applications. Our products are used in three principal market segments: construction, industry and DIY/hardware. In 2011, Soudal was named "Enterprise of the Year" in Belgium. The Soudal group now has a worldwide staff of more than 2500 employees, of which more than a third work at the company head quarter in Turnhout (Belgium) where the main production lines, as well as the logistics, R&D and marketing departments are located. Soudal worldwide operates in its own branches in more than 54 countries in all continents and exports its products to more than 110 countries worldwide. In 2016, the estimated turnover is approximately EUR 670 million. For more information on Soudal please consult our website: www.soudal.com.

Professional Quality

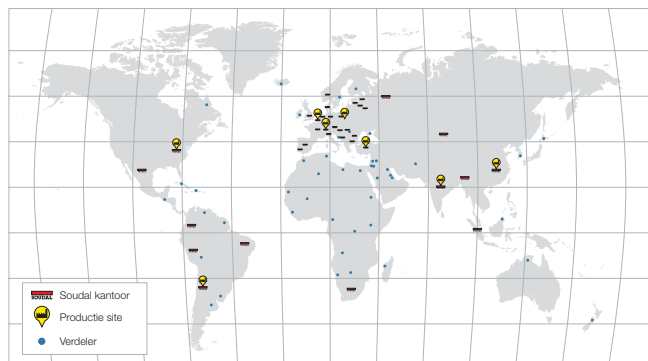
- Extensive R&D department
- Continuous investments in production lines and product development
- Production to ISO 9001 and ISO 14000 standards

Complete Range

- Sealants
- Construction Foams
- Adhesives
- Technical Aerosols
- Ancillary products

Target groups

- Professional Building Trade
- Retail
- Industry



R&D labo



R&D labo

EUROPE

The energy performance of buildings is based on European legislation, in particular the original directive 2002/91/EC, also called the EPBD. This directive was in line with the **"20-20-20 targets"** of the European Union: to reduce CO₂ gas emissions by 20%, to reduce energy consumption by 20% and to increase the share of renewable energy to 20% (reference year: 1990). Other considerations played a role as well, such as a reduced dependency on non-European energy sources. The subject of renewable energy is further detailed in European Directive 2009/28/EC; a minimum renewable energy share will also be slowly introduced into the energy performance requirements for new buildings.

Because the current path could not ensure a 20% reduction in energy consumption by 2020, Europe created the 2012/27/EC Directive. This directive covers the general subject "energy efficiency" and came into effect in December 2012. It mainly affects existing houses and buildings. Belgium, for example, has set targets for each of its 3 regions, which should result in an annual energy saving of 1.5% for the period 2014-2020. Energy policy agreements for companies are an example of this, just like the better known premium systems through distribution network operators.



NZEB?

The recast of the energy performance directive (2010/31/EC) included not only stricter requirements for new buildings and renovations, and a stronger role for the energy performance certificate, but also the introduction of the term NZEB (Nearly Zero Energy Building). The description in the recast was:

"A building with a very high energy performance, as set out in Appendix I. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby."

As from 2021, this will be the standard for all newly built houses in the whole of Europe!



ENERGY PERFORMANCE IN THE COMING YEARS

In the run-up to 2021, the energy performance requirement for new buildings will gradually become more strict. The final objective is the transfer to NZEB at the beginning of 2021 and for public buildings this will already apply as from 2019. Simultaneously, an increasingly large mandatory share of renewable energy will have to be realised. As this European legislation has been set out in a Directive, the member states will have to convert this European policy into national legislation and integrate it into local energy policies. In Flanders (Belgium) the entire process for up to 2021 has been set out and a mandatory minimum share of renewable energy has been imposed as from the beginning of 2015; the legislator prioritises six possible sources: solar heaters, PV (photovoltaic) panels, biomass, heat pumps, district heating, and participation in energy projects. The Flemish Energy Agency is campaigning on this subject and is involving the industry sector: they will, after all, have to come up with the necessary solutions.

PASSIVE HOUSE

The passive house concept is based on the ideas developed by Dr. Feist at the University of Darmstadt (Germany) in the 1990s. It was founded on the Trias Energetica:



- 1- Prevention: limit energy consumption by avoiding waste.
- 2- Use sustainable sources of energy as much as possible.
- 3- Use fossil fuels as efficiently as possible to meet the remaining energy needs.

For translating this principle into building practice, it is of prime importance to take great care ensuring the building envelope is very well insulated and airtight. Attention should also be paid to good compactness, good orientation and, of course, controlled ventilation. In the original concept the ventilation ducts were also used for heating purposes; due to the absence of a classic 'active' heating system this type of house was called a passive house. Meanwhile other "heating aids" are being used but the basic criteria for a passive house have remained the same:

- 1- Net energy need for heating $\leq 15 \text{ kWh/m}^2$ per year
- 2- Airtightness n_{50} -value $\leq 0.6 \text{ vol/h}$
- 3- Temperature exceedance factor above $25^\circ\text{C} \leq 5\%$

This translates into a building which has, in winter as well as summer, a very comfortable interior climate and requires only a minimum amount of heating. It is obvious that a passive house is the ideal way to achieve an NZEB as the limited energy need can easily be met by renewable energy. Meaning: Zero Energy Ready! For this reason, in 2015, the Brussels District (Belgium) opted for the passive house standard for all newly built houses in the run-up to 2021. Brussels obviously wants to play a pioneering role as the European capital!



THERMAL BRIDGES

In many European countries, the energy performance calculation must take into consideration any thermal bridges (cold bridges) in a building. This is quite logical as poorly executed building knots may lead to large transmission losses resulting in an average heat loss of 5% (for an average house). Designers must therefore pay attention to joints, especially joints between various construction elements. Window-to-wall joints, for example, are important potential thermal bridges, which easily amount to 100 meters for an average house.

The Soudal Window System (SWS) can contribute to lowering heat loss, as thanks to the use of Flexifoam in the SWS details the, possibly pre-calculated, ψ -value can be kept low and, as the case may be, below the limit imposed by legislation (e.g. 0.1 W/mK) (for more see the subsequent pages).

AIRTIGHTNESS?

It will be clear that it has gradually become very difficult to meet the requirements without paying attention to airtightness. Which is logical as uncontrolled ventilation losses are the reason for quite a lot of heat loss, draft, poor acous-

tics and damp or moisture problems. Good airtightness and a high quality building envelope go hand in hand. Furthermore, good airtightness is one of the most economical ways to improve the energy performance of a building. The website of the Flemish Energy Agency, www.energiesparen.be, states the following: *"A limited investment with a big impact on the E-value: attention to airtightness when building a house (e.g. a leak flow of 2 to 3 m³ per hour per m²) may result in a reduction of the E-value by 5 to 15 E-value points. This is measured by way of an airtightness test. If a house is not tested, it is assumed that it has a lesser airtightness of 12 m³ per hour per m². The net energy requirement will also substantially decrease.* This airtightness test is also regulated and its working method is set out in the European standard EN13829 (method A or B). For example, in Flanders method A must be followed. The leak flow is measured at underpressure and overpressure; the result of the measurement is leak flow at a pressure difference of 50 Pa between the inside and outside. In some countries the value for the report is recalculated at 4 Pa (France) or 10 Pa (the Netherlands). In order to achieve accurate measurements, many countries have implemented a quality framework for testers. Window-to-wall joints are of crucial importance; poor execution accounts for an estimated 15% of the total air loss in an average detached house. The Soudal Window System (SWS) is therefore able to make an important contribution to good airtightness (for more see subsequent pages)!

Tight Vent®
Europe
BUILDING AND DUCTWORK AIRTIGHTNESS PLATFORM

JOINTS

In comparison to other aspects of construction, joints are often not given the attention they require. Building joints need to be thoroughly planned and are necessary to compensate for the expansion and contraction of building materials or to create fitting tolerances. In practice however the result can be irregular joint dimensions or even unplanned joints. Fortunately designers and contractors can rely on the products and technical support of Soudal when considering these problems.

The sealing of joints can result in one of the following functions or a combination thereof:

- Airtightness • Protection against driving rain and humidity • Aesthetics • Thermal insulation
- Fire protection • Acoustics • Protection against burglary

Sealing of joints is an important unimportance!

EPB LEGEND



AIRTIGHTNESS

In the context of airtightness we don't only refer to joints (planned), but also to seams and crevices, which are mostly undesired or irregular joints or interfaces. For products able to seal seams, crevices and joints, the current product standards contain no or very few specifications or requirements regarding airtightness. There is, however, a European standard, EN12114, which describes a general testing method to measure the air permeability of building products (in laboratory conditions). The result is a value indicating the leak flow per m or m². Several Soudal products are suitable (see further in this brochure). For sealants and adhesives it generally applies that there should be sufficient cohesion (the material does not tear) and adhesion (bonding) to guarantee the airtightness over a longer period. For sealants the cohesion is linked to the movement capability of the product; the adhesion is strongly determined by the preparation and condition of the surface. In brief: selection of the correct product for the application, due care when applying the product and choosing a good quality product will always lead to the best results.



THERMAL INSULATION

A number of products, especially construction foams, score very well in terms of heat insulation. The lambda-value (λ) is used as indicator. In particular in wider joints, thermal bridges need to be avoided. The 3D correction factor in a joint between 2 insulating surfaces is called the psi-value (ψ). The minimum requirement in Belgium for window-to-wall interfaces is set at 0.10 W/mK.



RESISTANCE AGAINST DRIVING RAIN

These are, in fact, products which are not simply watertight, but can also keep water from entering when it is combined with an increased (wind) pressure. This pressure increases in proportion to the height of the building. For instance, at a building height of 50 m or more this pressure may increase to 600Pa or more. As a primary barrier, these are mainly joint sealants suitable for use in facades and glazing, which also have good movement capability. They have been classified in accordance with the new CE marking (harmonised standard EN15651) or the EN ISO11600 standard: 'F' for façade, 'G' for glazing – 20% or 25% movement capability. As we are talking about outside applications, these products must also be UV resistant.



ACOUSTICS

For quite some time now, tightened requirements with regard to acoustics (NBN S 01-400-1) apply in many countries. But the saying "a chain is as strong as its weakest link" certainly applies to soundproofing. An elastic filling material or a combination of these materials is particularly suitable to reduce the transmission of sound. A reduction of air sound is expressed in a reduction index 'R'.



AESTHETICS

Joints, and especially the correct finish of joints, can contribute to a smooth appearance, of the inside as well as the outside of a building or construction. The texture, but also the colour of the sealant play an important role.



PROTECTION AGAINST BURGLARY

For exterior joinery this characteristic is classified in accordance with EN1627 to EN1630. Elastic glazing sealants can certainly have advantages here and will also ensure better airtightness and watertightness of the window.



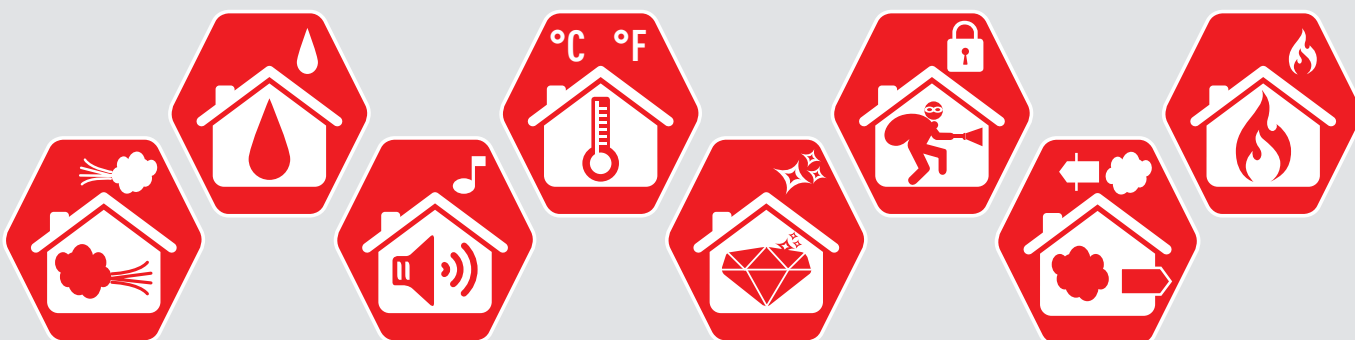
VAPOUR CONTROL

Damp protection and vapour control is also an important issue for a healthy building. It can therefore be important to include the μ -value of a substance when sealing joints or even the Sd-value of a specific building material.



PROTECTION AGAINST FIRE

Joints and penetration seals are an important link in the finish of compartments. Compartmentalisation forms an essential part of passive fire protection in buildings. The relevant standards are EN1366-3 for penetration seals and EN1366-4 for joints. Fire resistance is expressed in minutes; for joints and penetration seals mostly related to flame integrity and insulation.





- ◆ AIRTIGHT
- ◆ LASTING THERMAL & ACOUSTIC INSULATION
- ◆ WEATHER RESISTANT

AIRTIGHTNESS AND SWS

STUDY BY THE UNIVERSITY OF GHENT (BELGIUM)

As the insulation of houses is improving the importance of ventilation is increasing with regard to energy loss. Part of this loss is caused by the infiltration and exfiltration of air through materials and openings in the building envelope. To limit this loss, the aim is to achieve good 'airtightness' of the building's envelope, which will also reduce the risk of damage and draft.

WHAT?

The airtightness of buildings is measured based on a pressurisation test or blower door test in accordance with EN 13829. During a test a pressure difference of 50 Pa between the inside and outside is created with the aid of a ventilator and then the flow which is blown through the building envelope by this ventilator is measured. The airtightness of a building can be expressed in two ways: the n50-value and the q50-value.

$$n_{50} = \dot{V}_{50} / V_n [h^{-1}] \quad q_{50} = \dot{V}_{50} / A_t [m^3 / h / m^2]$$

The n50-value is the proportion of the measured flow at 50Pa of the net interior volume of the building. The q50-value is the proportion of the flow at 50Pa of the total surface of the building envelope.

The total leak flow measured is caused by leaks in the following elements:

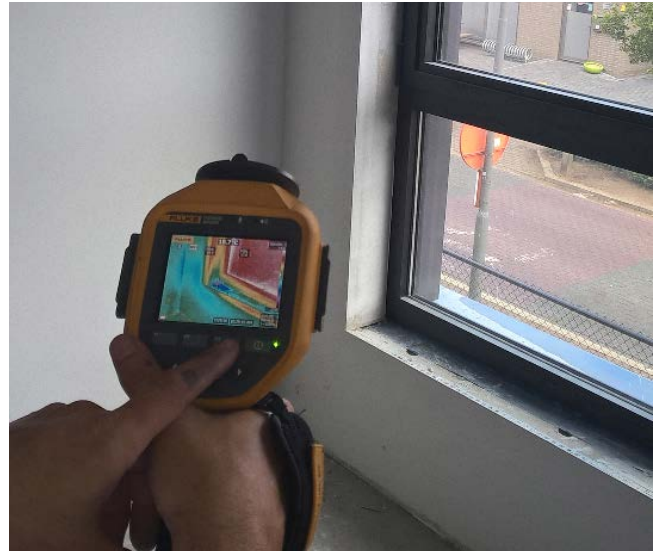
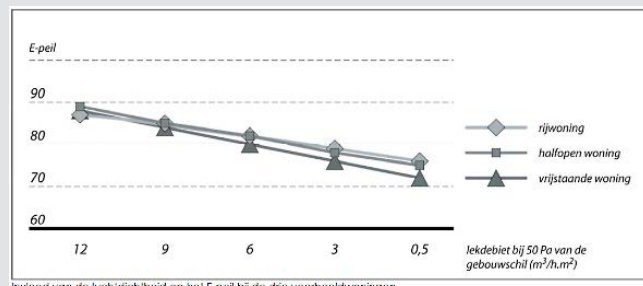
- walls, floors and roofs
- joints between floors, walls and roofs
- joints between walls and exterior joinery
- pipe lead-throughs
- joinery, gates
- ...

This study has two objectives:

- to determine the importance of wall-to-joinery joints for the total airtightness
- to measure the airtightness of a number of wall-to-joinery joints based on ISO 6589

IMPORTANCE

The EPB regulations attach great importance to the airtightness of buildings: the diagram below shows the effect of airtightness on the E-value (source: www.energiesparen.be). An airtight house which is measured is able to easily gain 10 E-value points. A study of 9 different airtightness assessment methods shows a great variation in the airtightness of wall-to-joinery joints. It varies between 0.01 m³/h/m (AIVC) to 10.2 m³/h/m (ASHRAE), a factor of 1000 difference.



THERMAL BRIDGES & THERMAL PERFORMANCE

Linear thermal bridges form an important part of the total heat loss of a building. Heat loss calculation at thermal bridges is a correction for the simplified two-dimensional simplification based on interior dimensions (NBN B 62-002, transmission reference document) and is strongly dependant on geometry. The amended calculation method has been in effect since the beginning of 2010.

WHY?

For analysing the thermal performance of building joints, numerical calculation methods for two- or three-dimensional heat transmission are mostly used. Based on these calculations, two criteria can be evaluated:

- Temperature factor f [-]
- Linear heat transmission coefficient Ψ [W/m.K]

TEMPERATURE FACTOR

The temperature factor f is an indicator for the lowest interior surface temperature θ_{si} of a particular joint. This is, in fact, a dimensionless temperature describing the interior surface temperature independent of the exact boundary conditions, with a value between 0 and 1. The building parts must ensure that the risk of local mould development and surface condensation on the interior surface remains limited. In Belgium the Technical Instructions set out that the dimensionless minimum temperature at all points on the interior surface must be greater than 0.7 (WTCB 1984). For joints of exterior joinery this is, however, of less importance because the surface temperature is mainly determined by the performance of the joinery.

LINEAR THERMAL TRANSMISSION COEFFICIENT

The influence of two-dimensional heat transmission is expressed by the linear heat transmission coefficient Ψ (in W/m.K). This Ψ -value shows the extent of additional heat loss per running meter of joint and per degree of temperature difference in comparison with a one-dimensional reference, whereby the actual part is represented by a chain of flat parts with a known surface A and a known U -value. The agreement on the 1-dimensional reference and the definition of the dimensions of a structural element (measured on the outside or inside) is important here. In Belgium normally the linear heat transmission coefficient is calculated based on the surfaces measured on the outside.

The Ψ -value of a joint must be carefully interpreted. A thermal bridge with a higher Ψ -value than another thermal bridge is not necessarily less well designed. The Ψ -value must be interpreted, based on the definition, as a correction factor on the 1D transmission losses, whereby geometric aspects as well as the influence of 2D and 3D heat transmission play a role.

IMPLEMENTATION IN EPB

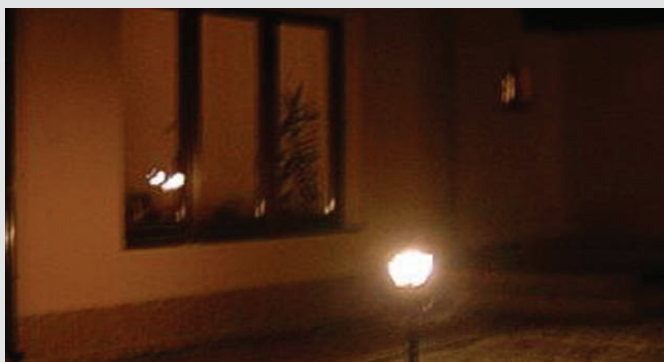
The Flemish Energy Agency has published an informative document on the treatment of thermal bridges in the EPB. There are three ways of including thermal bridges in the EPB calculation:

- Option A: a detailed calculation of all thermal bridges
- Option B: using EPB-compliant thermal bridges
- Option C: a fixed surcharge

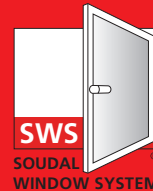
With option C, no attention is paid to the joints, but the K -value is increased by an additional 10 points. For option A all joints must be calculated and entered separately. Which is the most accurate option, but this requires quite a lot of work. The easiest way to include thermal bridges is option B. If a building contains only EPB-compliant thermal bridges the K -value is increased by only 3 points.

There are two ways in which a thermal bridge can be EPB-compliant:

- the thermal bridge fulfils one of the basic rules for a joint without a thermal bridge (see the information on thermal bridges).
- the thermal bridge fulfils the applicable limit value for the linear heat transmission coefficient. For wall-to-window and wall-to-door joints this is 0.10 W/m.K.



SOUDAL WINDOW SYSTEM



THE SOUDAL WINDOW SYSTEM

The professional window-joint system SWS is a combination of several products which provide the seal between exterior joinery and the structural envelope. In new buildings this is a joint of ± 2 cm, but SWS can, of course, also be used for renovation of all sorts of exterior joinery: aluminium, wood and PVC. SWS also offers solutions for passive houses and timber framed houses.

SWS has been officially tested in conjunction with various parameters and in various setups. When properly installed SWS offers:

- Airtightness and damp protection on the inside
- Optimum thermal and acoustic insulation in the centre
- Weather and wind protection on the outside

SWS is therefore active on 3 levels.



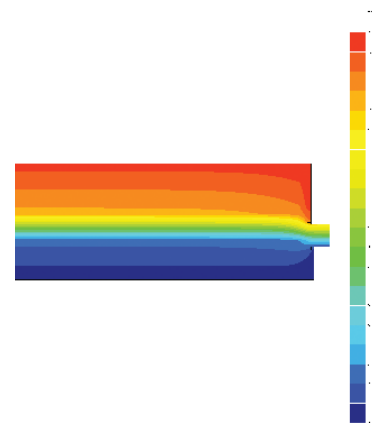
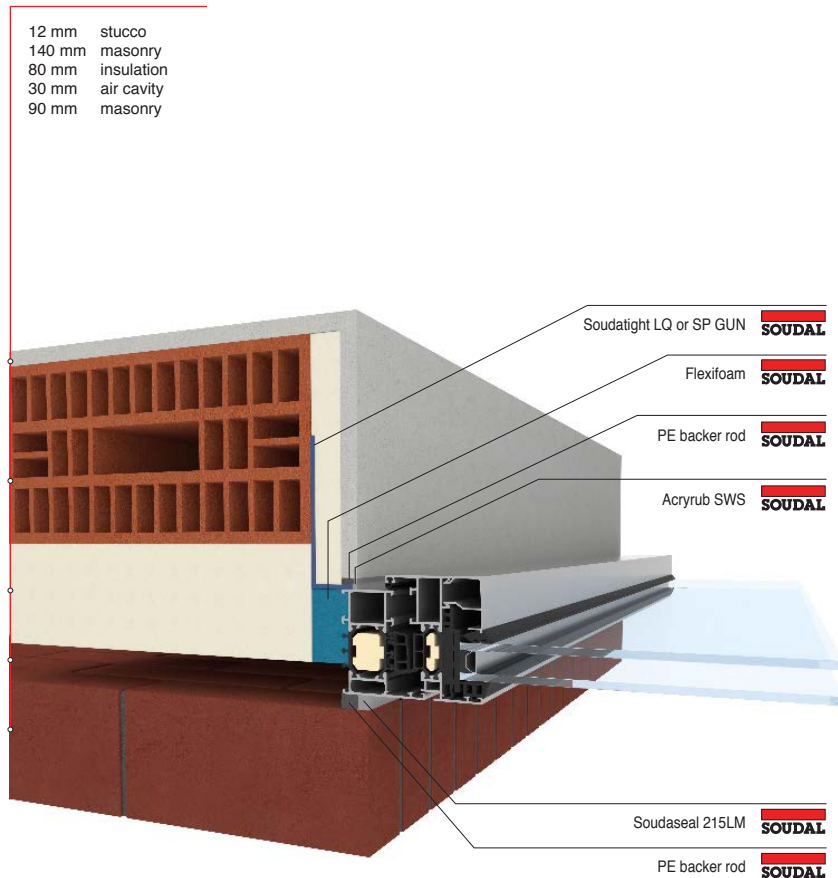
For more information:

www.soudalwindowssystem.com

www.soudalwindowssystem.be

- **Product overview**
- **Downloads:**
 - details
 - specification texts
 - technical files
 - certificates
- **Installation Manual / Practice**

ALU – STANDARD - PLASTER - HORIZONTAL CUT



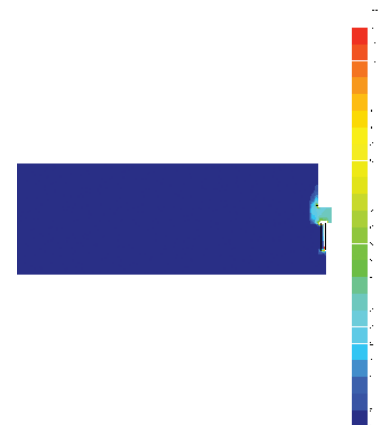
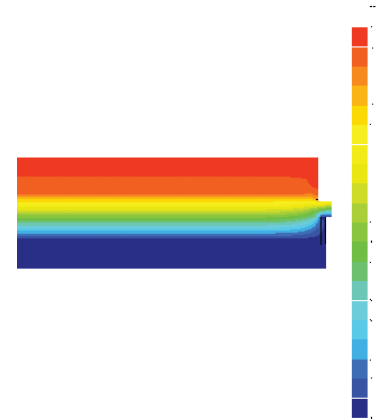
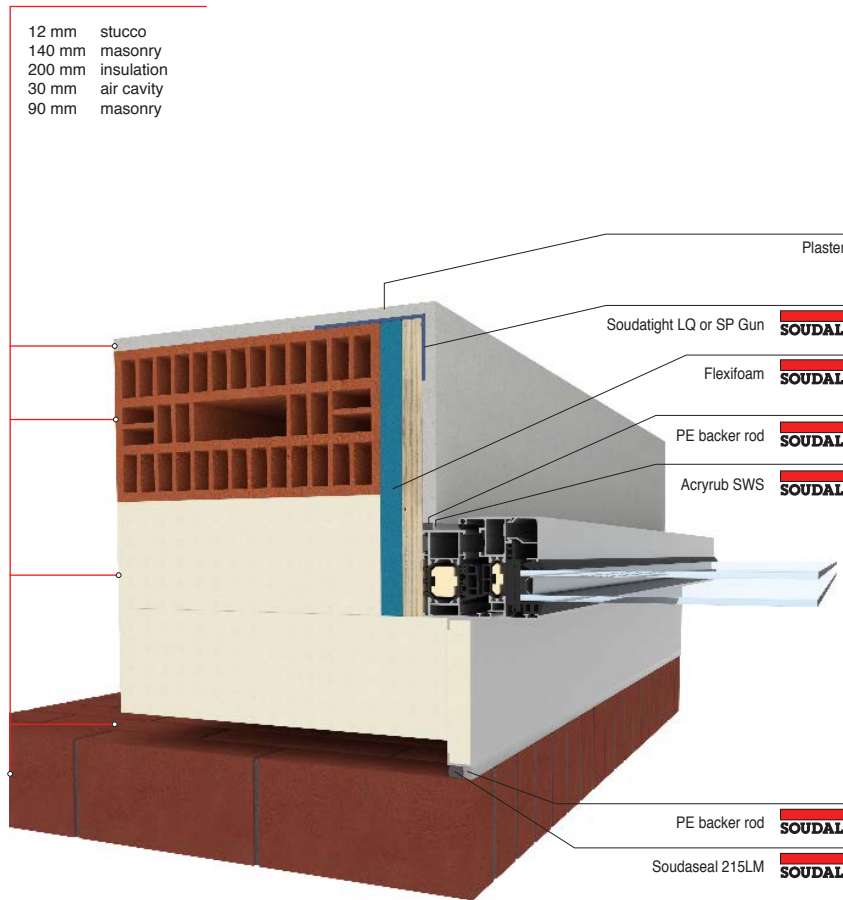
Joinery: Aluminium	Date: 07/2016
SWS Standard: Casing Horizontal cut	

Description:

- If reveal area shows cracks/gaps of > 2mm, eg between inner leaf and insulation plate, apply Soudatight Geotextile in combination with Soudatight LQ or SP GUN (wet in wet).
- After installation of the joinery, apply masking tape to the inside of the window profile leaving a few mm of the latter uncovered (2 to 5mm). This will allow for a continuous air- and vapourtight layer of Soudatight later on.
- Now fill the joint between frame and wall with Flexifoam after slightly moistening it. Fill the joint for 2/3, working upwards from below. Cut away excess of foam after curing, to ease application of Soudatight afterwards.
- Apply a first layer of Soudatight LQ (with brush) or Soudatight SP GUN (with Soudatight GUN) and cover the complete reveal area from frame to wall, also

- covering the cut Flexifoam. Make sure you apply a continuous and even layer.
- After approximately 1 hour, apply a second layer of Soudatight LQ or SP GUN until the desired thickness has been reached. Apply further layers of product if needed.
- The blue version of Soudatight will turn black after physical drying, which means it is ready to be plastered or painted over. Remark: the white version of Soudatight does not have a colour indicator.
- Leave a seam between the plaster and the frame. Insert a backer rod and seal with Acryrub SWS for a perfectly airtight result!
- Finish off on the outside using Soudaseal 215LM in combination with a backer rod (or precompressed tape) to ensure perfect weather resistance.

ALU – PASSIVE HOUSE - PLASTER - HORIZONTAL CUT



Joinery:	Date:
Aluminium	07/2016
SWS Passive House: Plaster Horizontal cut	

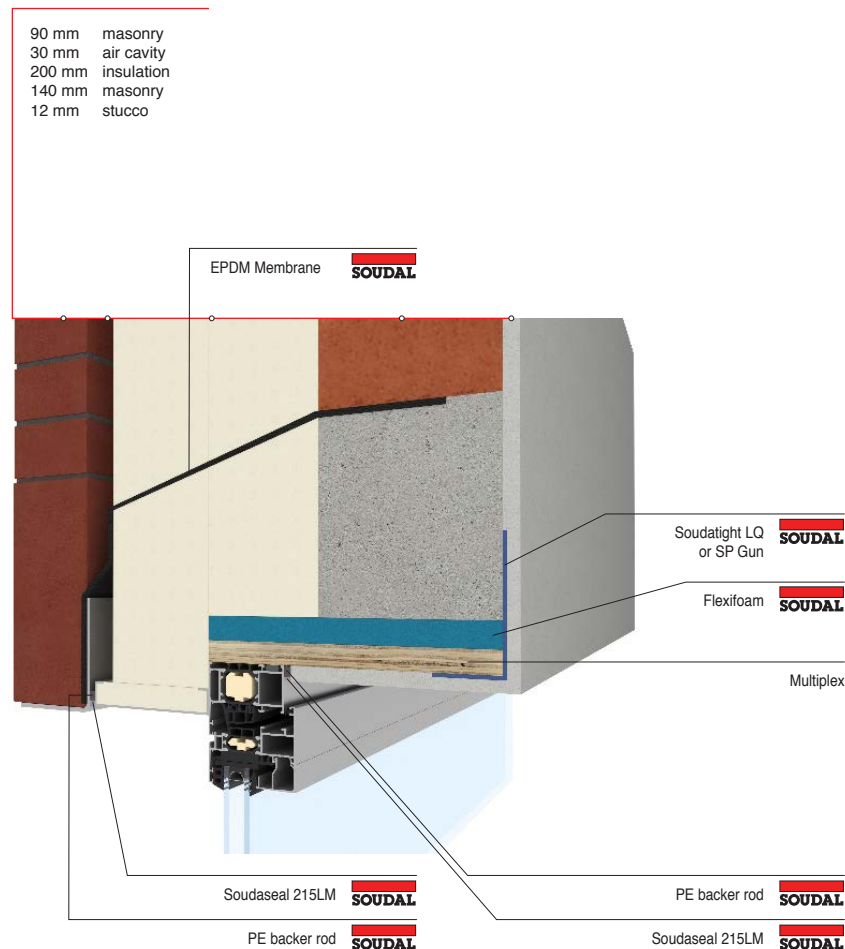
Description:

- Solid passive setup with 2 insulation sheets. For an optimum thermal performance it is recommended that the check reveal is formed by the outer insulation sheet, instead of the outer cavity wall.
- The window frame has a multiplex surround/casing. Use Soudafoil 360H between these to achieve an airtight seal. This is a hybrid, elastic sealant which does not contain any water or silicone. Alternatively Soudal Vapourseal can be used.
- After installation of the joinery, the gap between casing and the insulation and/or wall must be filled completely with Flexifoam, an elastic PU foam (moisten!). Pay extra attention that the foam layer around the spacers, which must be kept as small as possible, is not interrupted. If required, the extension tube can be placed on the foam gun (depending on the depth of the joint) or the 45 cm gun can be used.
- After cutting away excess of foam after curing, apply a first layer of Soudatight

LQ (with brush) or Soudatight SP GUN (with Soudatight GUN) and cover the complete reveal area from frame to wall, also covering the cut Flexifoam. Make sure you apply a continuous and even layer.

- After approximately 1 hour, apply a second layer of Soudatight LQ or SP GUN until the desired thickness has been reached. Apply further layers of product if needed.
- The blue version of Soudatight will turn black after physical drying, which means it is ready to be plastered or painted over. Remark: the white version of Soudatight does not have a colour indicator.
- Leave a seam between the plaster and the frame. Insert a backer rod and seal with Acryrub SWS for a perfectly airtight result!
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ALU - PASSIVE HOUSE - PLASTER - LINTEL



Isotherms 0°C – 20°C



Heat flux 0 W – 120W

Joinery: Aluminium	Date: 07/2016
SWS Passive House: Plaster Lintel	

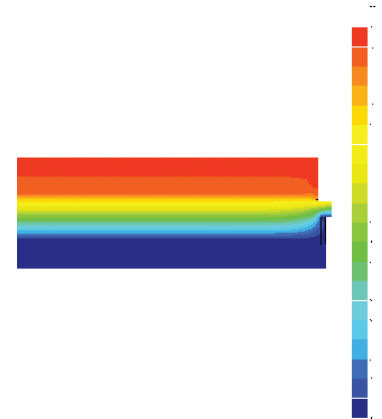
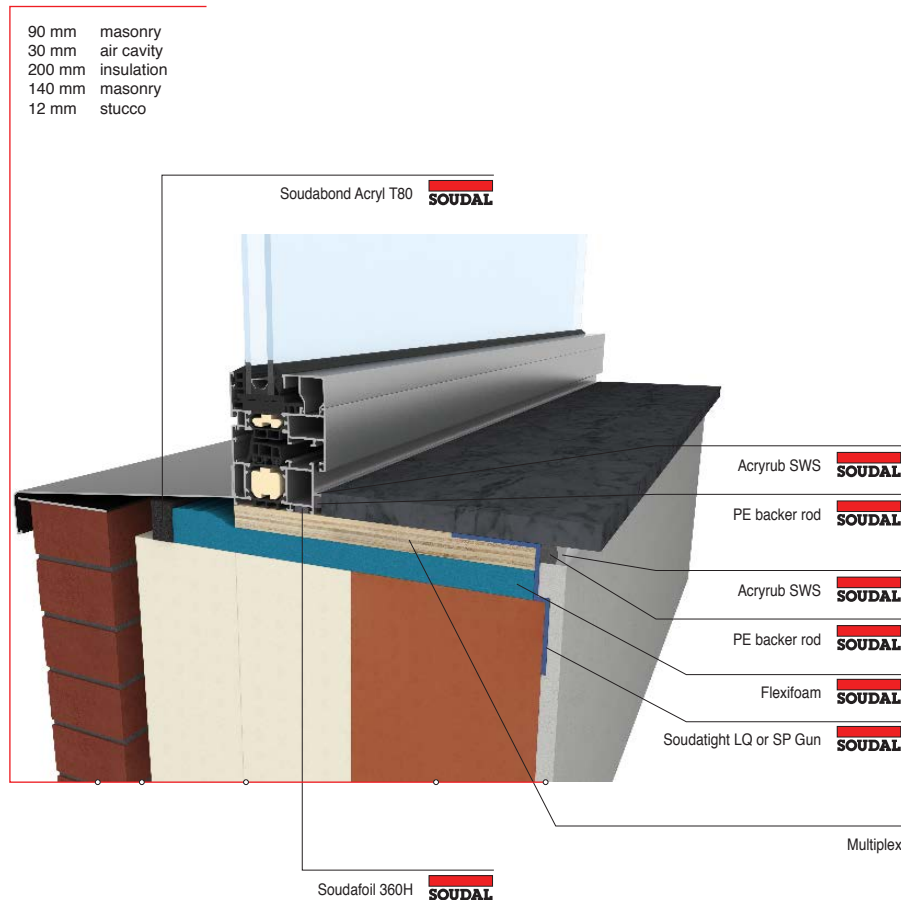
Description:

- Solid passive setup with 2 insulation sheets. For an optimum thermal performance it is recommended that the check reveal is formed by the outer insulation sheet, instead of the outer cavity wall.
- The window frame has a multiplex surround/casing. Use Soudafoam 360H between these to achieve an airtight seal. This is a hybrid, elastic sealant which does not contain any water or silicone. Alternatively Soudal Vapourseal can be used.
- After installation of the joinery, the gap between casing and the insulation and/or wall must be filled completely with Flexifoam, an elastic PU foam (moisten!). Pay extra attention that the foam layer around the spacers, which must be kept as small as possible, is not interrupted. If required, the extension tube can be placed on the foam gun (depending on the depth of the joint) or the 45 cm gun can be used.
- After cutting away excess of foam after curing, apply a first layer of Soudatight

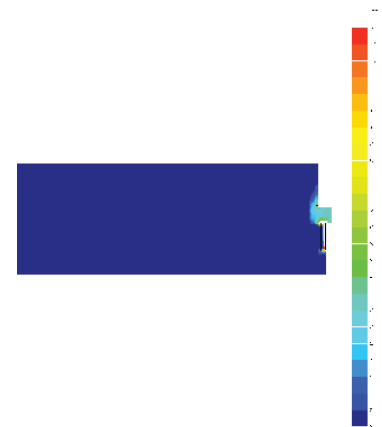
LQ (with brush) or Soudatight SP GUN (with Soudatight GUN) and cover the complete reveal area from frame to wall, also covering the cut Flexifoam. Make sure you apply a continuous and even layer.

- After approximately 1 hour, apply a second layer of Soudatight LQ or SP GUN until the desired thickness has been reached. Apply further layers of product if needed.
- The blue version of Soudatight will turn black after physical drying, which means it is ready to be plastered or painted over. Remark: the white version of Soudatight does not have a colour indicator.
- Leave a seam between the plaster and the frame. Insert a backer rod and seal with Acryrub SWS for a perfectly airtight result!
- Finish off on the outside using Soudaseal 215LM in combination with a backer rod (or precompressed tape) to ensure perfect weather resistance.

ALU – PASSIVE HOUSE - PLASTER - TABLET



Isotherms 0°C – 20°C



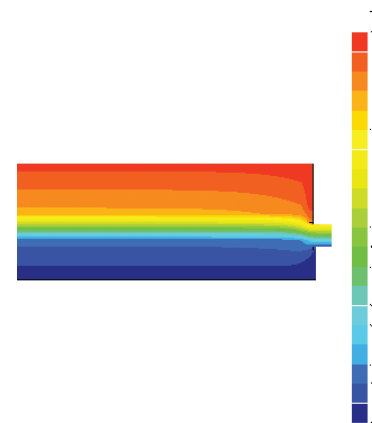
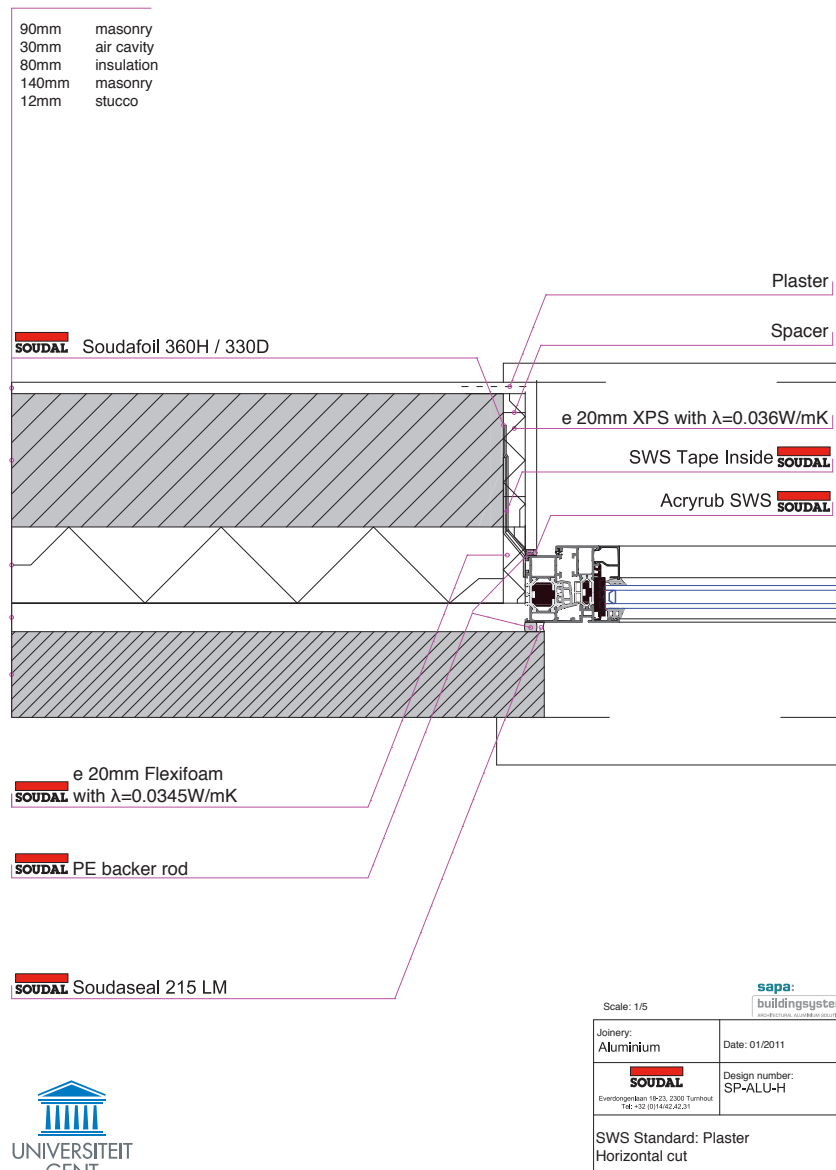
Heat flux 0 W – 120 W

Joinery: Aluminium	Date: 07/2016
SWS Passive House: Plaster Tablet	

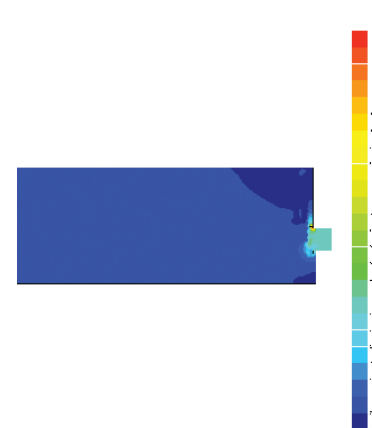
Description:

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- The window frame has a multiplex surround/casing. Use Soudafoil 360H between these to achieve an airtight seal. This is a hybrid, elastic sealant which does not contain any water or silicone. Alternatively Soudal Vapourseal can be used.
- After installation of the joinery, the gap between casing and the insulation and/or wall must be filled completely with Flexifoam, an elastic PU foam (moisten!). Pay extra attention that the foam layer around the spacers, which must be kept as small as possible, is not interrupted. If required, the extension tube can be placed on the foam gun (depending on the depth of the joint) or the 45 cm gun can be used.
- After cutting away excess of foam after curing, apply a first layer of Soudatight LQ (with brush) or Soudatight SP GUN (with Soudatight GUN) and cover the complete reveal area from frame to wall, also covering the cut Flexifoam. Make sure you apply a continuous and even layer.
- After approximately 1 hour, apply a second layer of Soudatight LQ or SP GUN until the desired thickness has been reached. Apply further layers of product if needed.
- The blue version of Soudatight will turn black after physical drying, which means it is ready to be plastered or painted over. Remark: the white version of Soudatight does not have a colour indicator.
- When applying a tablet on the surround, leave a seam between tablet and frame. Insert a backer rod and seal with Acryrub SWS for a perfectly airtight result!

ALU - STANDARD - PLASTER - HORIZONTAL CUT



Isotherms 0°C – 20°C



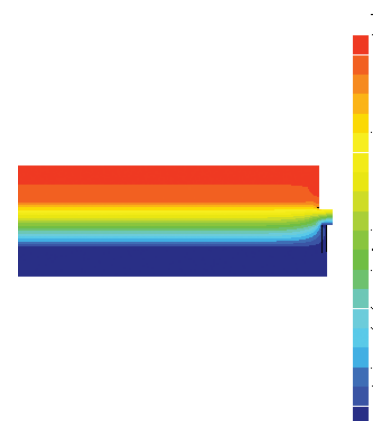
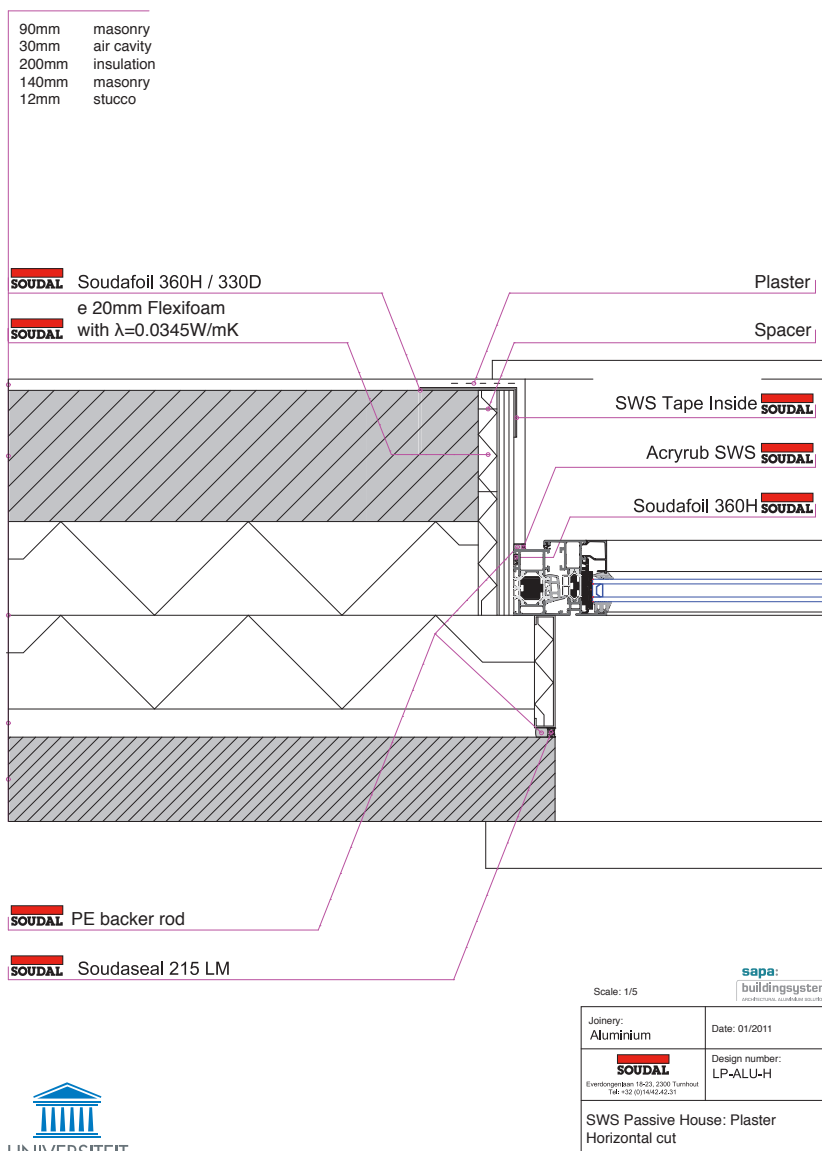
Heat flux 0 W – 120 W

f	\geq	0,76
$\theta_{si \text{ min}}$	\geq	15,2 °C
Ψ	\leq	0,040 W/mK
$\Psi_{\text{max (epb)}}$		0,10 W/mK

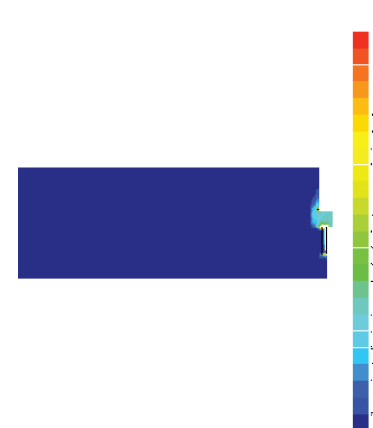
Description:

- Apply the SWS tape on the joinery before attaching the window fixing brackets and before installing the joinery. Use the blue adhesive strip and apply this to the side of the window frame. It can also be applied to the front of the window frame (after which the tape is folded over) but check that sufficient space remains for plastering (hinges). It can be applied as one strip (pinching several centimetres of the tape together in the corners) or it can be applied as four separate strips, whereby the SWS tape must overlap diagonally over approximately 10 to 15 cm in the corners.
- After installation of the joinery, the joint must be filled with Flexifoam. Make the area sufficiently damp and fill the joint by 2/3, working upwards from below. When applying the foam, the SWS tape serves as an additional protection for the joinery.
- Apply Soudafoil 330D or preferably 360H to the reveal (continuous zig-zagging bead).
- Push the SWS tape in the adhesive and roll down. The grey butylene adhesive strip ensures the initial bond to the wall during the curing of the adhesive.
- Apply Soudafoil around the window fixing brackets, overlaps and in the corners to ensure airtightness.
- the SWS tape can now be plastered over.
- Leave a seam between the plaster and the frame. Insert a backer rod and seal with Acryrub SWS for a perfectly airtight result!
- Finish off on the outside using Soudaseal 215LM in combination with a backer rod (or precompressed tape) to ensure perfect weather resistance.

ALU - PASSIVE HOUSE - PLASTER - HORIZONTAL CUT



Isotherms 0°C – 20°C



Heat flux 0 W – 120 W

f	\geq	0,77	
$\theta_{si \text{ min}}$	\geq	15,5	°C
Ψ	\leq	0,092	W/mK
$\Psi_{\text{max (epb)}}$		0,10	W/mK

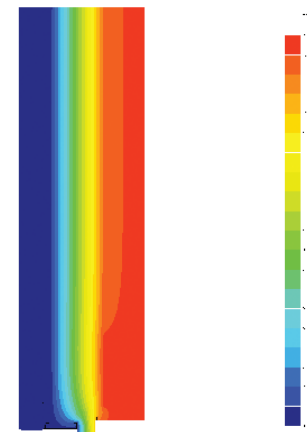
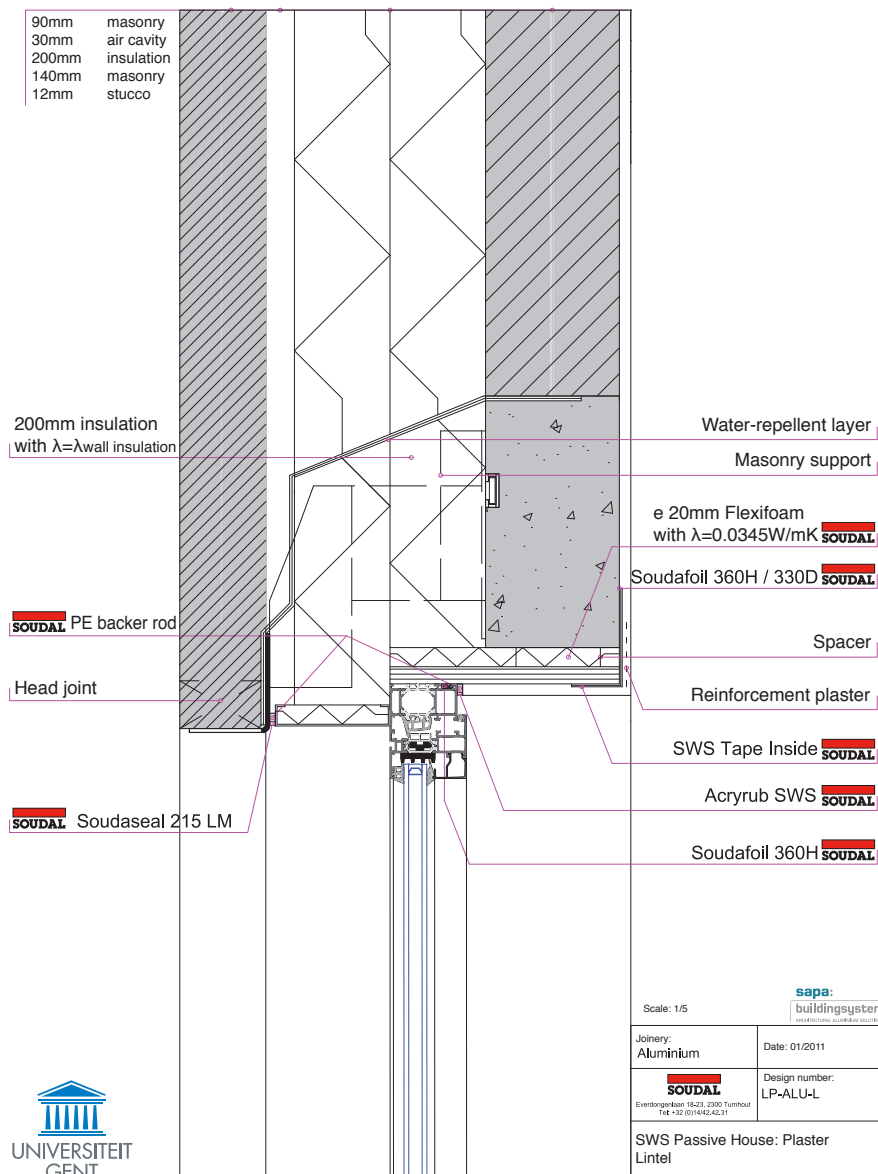
Description:

- Solid passive setup with at least 2 insulation sheets. For an optimum thermal performance it is recommended that the check reveal is formed by the outer insulation sheet, instead of the outer cavity wall.
- The window frame has a multiplex surround/casing. Use Soudafoil 360H between these to achieve an airtight seal. This is a hybrid, elastic sealant which does not contain any water or silicone. Alternatively Soudal Vapourseal can be used.
- After installation of the joinery, the gap between casing and the insulation and/or wall must be filled completely with Flexifoam, an elastic PU foam (moisten!). Pay extra attention that the foam layer around the spacers, which must be kept as small as possible, is not interrupted. If required, the extension tube can be placed on the foam gun (depending on the depth of the joint) or the 45 cm gun

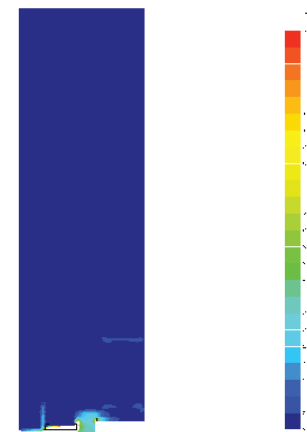
can be used. Airtightness is reached at this point.

- When the area is to be plastered, finish the joint with SWS Tape Inside, if required after cutting away any excess foam: apply the blue adhesive strip on the surround and the butylene adhesive strip on the wall. Make a small cut in the corners and apply an extra strip. Use Soudafoil 330D or 360H if an additional sealant is required. After applying the SWS tape, the window-to-wall joint is also damp proof. When the area is not plastered, Soudatape Façade is a user-friendly alternative.
- When plastering the casing, leave a seam between the plaster and the window frame. Insert a backer rod and seal with Acryrub SWS for a perfectly airtight result!
- Finish off on the outside using Soudaseal 215LM in combination with a backer rod (or precompressed tape) to ensure perfect weather resistance.

ALU - STANDARD - PLASTER - LINTEL



Isotherms 0°C – 20°C



Heat flux 0 W – 120W

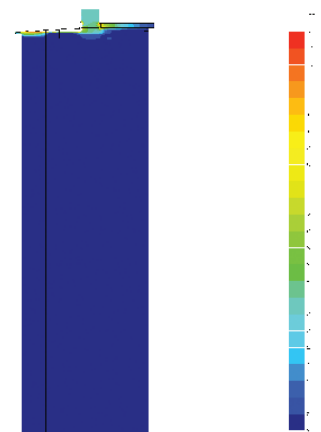
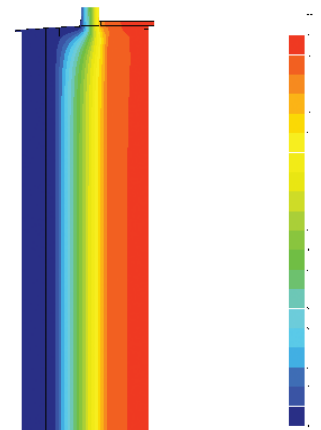
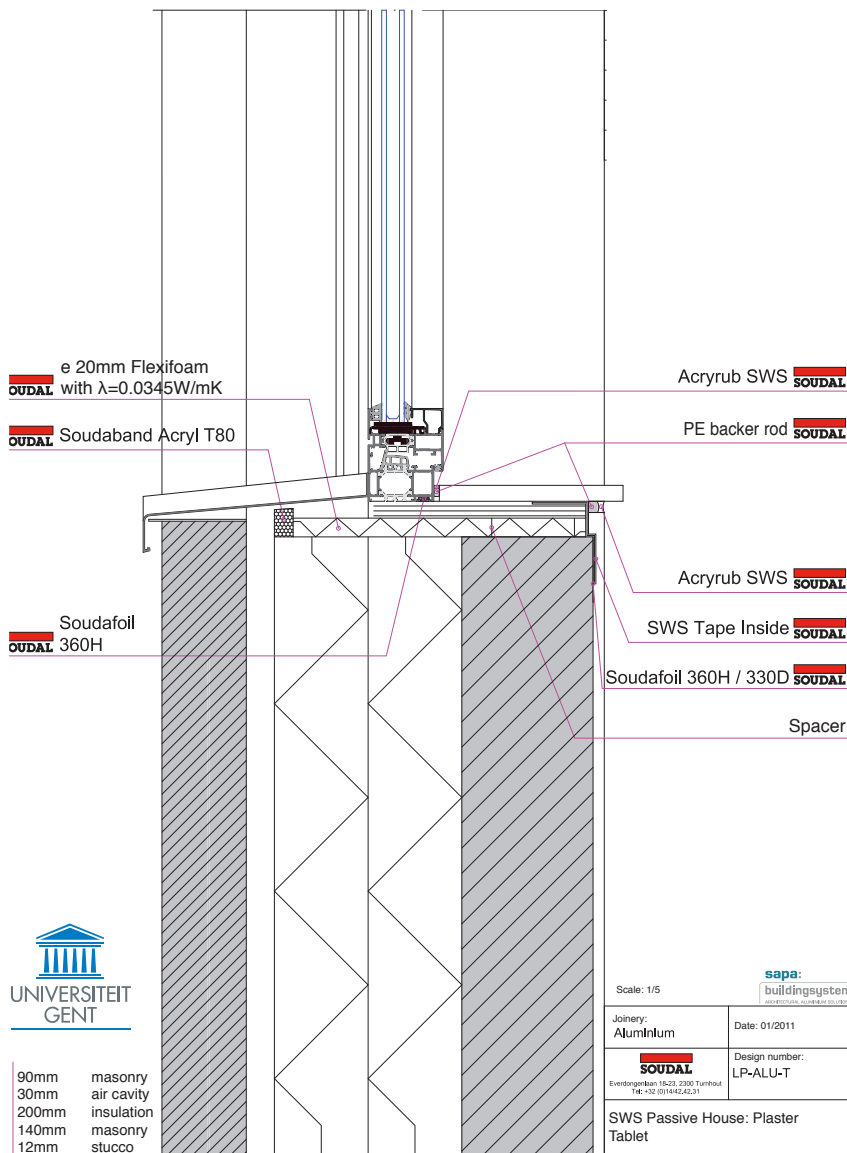
f	\geq	0,75
$\theta_{si \min}$	\geq	15,0 °C
Ψ	\leq	0,040 W/mK
$\Psi_{\max} (epb)$		0,10 W/mK

Description:

- First of all, fill the joint between the wall and the exterior joinery with Flexifoam. Ensure that near the window fixing brackets the foam is applied correctly and without interruption. Moistening by spraying the area lightly with, for example, a plant sprayer before applying the PU foam significantly improves the elastic and thermal characteristics of the foam after curing!
- Complete airtightness can be achieved when the surround/casing is also filled with Flexifoam after it has been installed. Pay special attention to the areas around the spacers, which should be kept as small as possible. If required, cut back the foam and install the cover of the surround.
- Finish the joint between the surround and the exterior joinery with Acryrub SWS; a paintable, elastic and airtight sealant.
- In this way the joint becomes an EPB-compliant building knot.
- Finish off on the outside using Soudaseal 215LM in combination with a backer rod (or precompressed tape) to ensure perfect weather resistance.

SWS FOR SPECIFIERS

ALU - PASSIVE HOUSE - PLASTER - TABLET



f	\geq	0,76
$\theta_{si \text{ min}}$	\geq	15,2 °C
Ψ	\leq	0,050 W/mK
$\Psi_{\text{max (epb)}}$		0,10 W/mK

Description:

- Solid passive setup with at least 2 insulation sheets. For an optimum thermal performance it is recommended that the check reveal is formed by the outer insulation sheet, instead of the outer cavity wall.
- The window frame has a multiplex surround. Use Soudafoil 360H between these to achieve an airtight seal. This is a hybrid, elastic sealant which does not contain any water or silicone. Alternatively Vapourseal can be used.
- After installation of the joinery, the gap between the casing and the insulation and/or wall must be filled completely with Flexifoam, an elastic PU foam (moisten!). Pay extra attention that the foam layer around the spacers, which must be kept as small as possible, is not interrupted. If required, the extension tube can be placed on the foam gun (depending on the depth of

the joint) or the 45 cm gun can be used. Airtightness is reached at this point.

- When the area is to be plastered, finish the joint with SWS Tape Inside, if required after cutting away any excess foam: apply the blue adhesive strip on the surround and the butylene adhesive strip on the wall. Make a small cut in the corners and apply an extra strip. Use Soudafoil 330D or 360H if an additional sealant is required. After applying the SWS tape, the window-to-wall joint is also damp proof. When the area is not plastered, Soudatape Façade is a user-friendly alternative.
- When applying a tablet on the surround, a seam must be left between the joinery which can then be filled with Acryrub SWS.

SWS + AIRTIGHTNESS



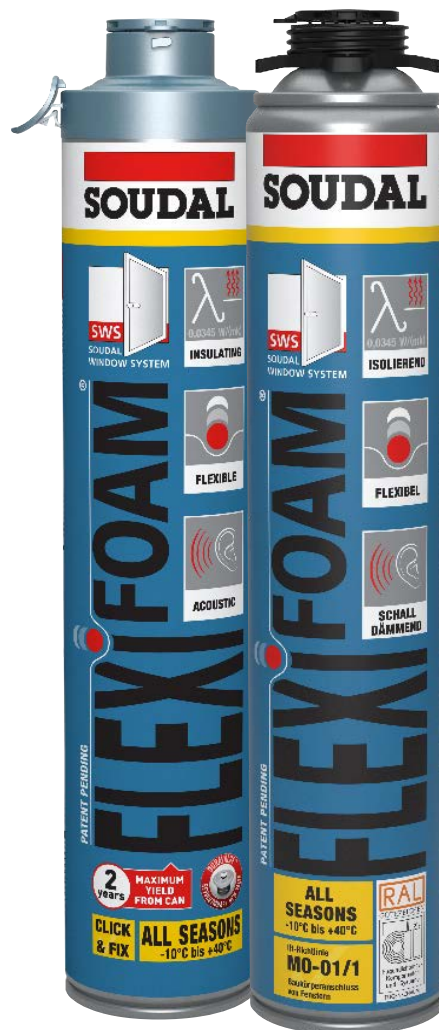
Building airtight ... is the future!

FLEXIFOAM

Super insulating and airtight



Top grade gun applied PU foam with outstanding insulation characteristics combined with ease of use. Very precise application, low post expansion, very economic in use. Fast skin formation and curing, which results in shorter waiting times. Can also be used in winter at below 0°C temperatures. Its elasticity makes it a good long-term thermal and acoustic insulator. Especially developed for window installation in accordance with the EPB rules by avoiding thermal bridges. Recognisable blue colour. Available in standard thread and Click&Fix®. Very low VOC emissions (EC1 Plus).



FLEXIFOAM

Elasticity

(Report IFT-Rosenheim 10535276)

Thermal insulation

$\lambda = 0.0345 \text{ W/(m.K)}$

(Report MPA Hannover 070598.1)

Airtightness

$A < 0,1 \text{ m}^3 / (\text{h.m} (\text{daPa})^{2/3})$

(Report IFT-Rosenheim 10535276)

Acoustic insulation

$\text{RST,w} = 60 \text{ dB} (-1, -4)$

(Report IFT-Rosenheim 10533428)



SOUDATIGHT LQ

Liquid membrane



Soudatight LQ is a high quality fiber reinforced polymer paste which forms an air and vapor tight elastic membrane after drying. The product can easily be applied with any wall paint brush in the desired layer thickness (or in several layers) on almost any substrate. Soudatight LQ is very low emission (EC1+ standard according to GEV Emission). Fills cracks up to 2mm thanks to the fibers and changes colour once dried (from blue to black), after which it can be painted or plastered over.

Application area: general airtightness in connection and penetration areas. In window to wall connection it can be used to treat the check reveal area before window installation. It can also be used after window installation and after Flexifoam has been applied, thus replacing membranes (SWS Inside Tape).

Soudatight LQ is also suited for floor to wall or wall to ceiling application in combination with Soudatight SP.

Diffusion resistance factor (μ -value):

10241 μ (bbri-report DE621XB622-3)

Ability to be plastered over:

once dried, it can be painted and plastered over
(bbri-report DE621XB622-2)

Adhesion strength: very good adhesion on many porous substrates
(bbri-report DE621XB622)

Equivalent air layer thickness (Sd-value): 10,9 m



SWS FOR INSTALLERS

SOUDATIGHT SP

Sprayable liquid membrane



Soudatight SP is the sprayable version of Soudatight, only the fibers are left out for obvious reasons. Very low Emission (EC1 Plus according to GEV Emicode). This product allows for very easy, fast and economical application of a liquid, airtight membrane on larger surface areas and connections in between those surfaces (floor to wall, wall to ceiling, etc). Forms an elastic film after drying, changing from blue to black, and forming an ideal basis for paint or plaster. Ideally combined with Soudatight LQ for optimal results.

Soudatight SP is applied with an airless gun connected to either a plunger or a membrane pump. Soudatight SP has been tested in combination with the following equipment: Wagner PP119XT, ProSpray 3.20 and SuperFinish 23+.

Diffusion resistance factor (μ -value):

10241 μ (bbri-report DE621XB622-3)

Ability to be plastered over:

once dried, it can be painted and plastered over (bbri-report DE621XB622-2)

Adhesion strength:

very good adhesion on many porous substrates (bbri-report DE621XB622)

Equivalent air layer thickness (S_d -value):

10,96 m



SOUDATIGHT SP GUN

Sprayable liquid membrane



Soudatight SP GUN is the sprayable version of Soudatight LQ, only the fibers are left out for obvious reasons. Very low Emission (EC1 Plus according to GEV Emicode). This product allows for very easy, fast and economical application of an air- and vapour tight membrane on window to wall connections. Forms an elastic film after drying, changing from blue to black, and forming an ideal basis for paint or plaster. Ideally combined with Soudatight LQ for optimal results. Soudatight SP GUN is applied with the Soudatight GUN connected to a compressor. Turn the especially developed nozzle to switch between a vertical to a horizontal application.

Diffusion resistance factor (μ -value):

10241 μ (bbri-report DE621XB622-3)

Ability to be plastered over:

once dried, it can be painted and plastered over (bbri-report DE621XB622-2)

Adhesion strength:

very good adhesion on many porous substrates (bbri-report DE621XB622)

Equivalent air layer thickness (Sd-value):

10,96 m



SWS FOR INSTALLERS

SOUDATIGHT HYBRID

Brushable and sprayable liquid membrane

Soudatight Hybrid is the hybrid version of the Soudatight range and can be used for both in- and outdoor applications. Very low Emission (EC1 Plus according to GEV Emission). This product allows for very easy, fast and economical application of an air- and watertight membrane on penetrations, connections and surfaces (no roof applications). Forms an elastic film after drying and acts as an ideal basis for paint or plaster. Soudatight Hybrid can be applied as a bead with a manual, battery or pneumatic caulking gun or as a bead or sprayed as a coating with the pneumatic spray gun Jetflow 3 Sachet 600.

Diffusion resistance factor (μ -value):

1464 μ

(ift report 16-001592 PR01)

Ability to be plastered over:

once dried, it can be plastered over

Adhesion strength:

very good adhesion on many substrates

Equivalent air layer thickness (S_d -value):

1,40 m



EPDM MEMBRANE FIX

EPDM sealing membrane for façade applications, with 20mm butyl selfadhesive strip. Soudal EPDM Membrane FIX cladding will render window to wall connections water-and airtight. To be used in combination with Soudaseal EPDM (adhesive).

Thickness: 0,8mm

Roll				
Art. Nr.: 130283	0,8x150 mm	5411183134133	20 m	/Box
Art. Nr.: 130284	0,8x200 mm	5411183134126	20 m	/Box
Art. Nr.: 130285	0,8x250 mm	5411183134140	20 m	/Box
Art. Nr.: 130286	0,8x300 mm	5411183134119	20 m	/Box



EN13984



EPDM MEMBRANE

EPDM sealing membrane for façade applications. Soudal EPDM Membrane cladding will render window to wall connections water-and airtight. Ideal to render the windowsill area watertight, as well as the area under tablets. To be used in combination with Soudaseal EPDM (adhesive).

Thickness: 0,8mm

Roll				
Art. Nr.: 130287	1,2x200 mm	5411183134157	20 m	/Box
Art. Nr.: 130288	1,2x250 mm	5411183134164	20 m	/Box
Art. Nr.: 130289	1,2x300 mm	5411183134171	20 m	/Box
Art. Nr.: 130290	1,2x400 mm	5411183134188	20 m	/Box



EN13984



SOUDATIGHT GEOTEXTILE

Geotextile membrane

Soudatight Geotextile is an innovative non-woven fabric to cover up cracks, joints and gaps > 2 mm. Use it in combination with Soudatight (preferably Soudatight LQ) to fixate the fabric and finish with a second layer of a Soudatight product of choice.

Specific weight: 110 g/m²

Thickness: 0,80 mm

Weatherability: max 30 days

Colour: white

Packaging: roll 15 cm x 20 m



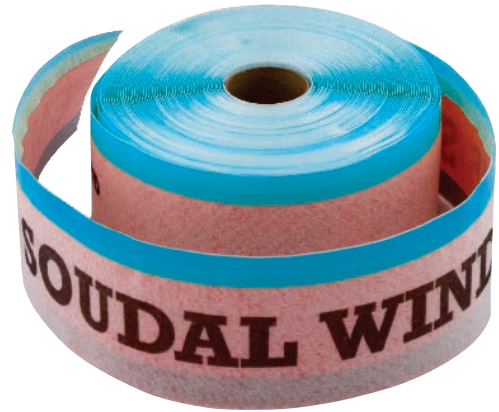
SWS INSIDE TAPE

Airtight and damp-proof membrane to be used on the inside of all types of window-to-wall joints. Can be plastered over on both sides. Self adhesive on the window-side and equipped with a butylene adhesive strip for the initial bond on the inner cavity wall leaf. Always use Soudafoil 330D or 360H for full surface bonding.

Properties:

Integral laminated PE foil: no delamination • pink • double-sided polyester cladding: excellent bond with plaster • $S_d \geq 50$ m

Roll		
Art. N°: 123884	70mm	25m/box
Art. N°: 123883	100mm	25m/box
Art. N°: 123885	150mm	25m/box
Art. N°: 123886	200mm	25m/box
Art. N°: 124453	400mm	20m/box



SWS OUTSIDE TAPE

Damp-open membrane for use on the outside of window-to-wall joints. To be used in combination with SWS Inside Tape, in a so-called 'tunnel installation' (solid walls). Can be covered with plaster or outer facade insulation system (ETICS). Self adhesive on the window-side and equipped with a butylene adhesive strip for the initial bond on the building envelope. Must always be bonded with Soudafoil 360H.

Properties:

Integral laminated PE foil: no delamination • white • double-sided polyester cladding: excellent bond with plaster • $S_d \leq 0.04$ m, breathing

Roll		
Art. N°: 123887	70mm	25m/box
Art. N°: 123888	100mm	25m/box
Art. N°: 123889	150mm	25m/box



SOUDAFOIL 330D

Plasto elastic seal-adhesive based on acrylic dispersion for bonding SWS Inside Tape. Only for interior use. White. 600 ml sausages.

SOUDAFOIL 360H

Airtight hybrid, elastic polymer seal-adhesive for full surface bonding of SWS Inside Tape and SWS Outside Tape to the building envelope. Excellent adhesion to many materials, even when slightly damp. Does not contain isocyanates or solvents. Grey. 600 ml sausages. Very low emission (EC1R Plus).



SOUDABAND PRO BG1 / CLASS 1

Standardised, pre-compressed joint tape to seal facade joints against driving rain. Fulfils class BG1 in accordance with DIN18542:2009. Resistant against driving rain up to at least 600Pa, suitable for uncovered joints (UV resistant). Product has ATG (production control) and Socotec specification. Ideal as sealant between sill and window or as backer rod in check reveal installation.

Available in several dimensions: see table p. 31



SOUDABAND AKTIV PLUS

Soudaband Aktiv Plus is an impregnated, multifunctional joint sealant tape for the simple installation of exterior joinery with one single product. Suitable for so-called "tunnel installation", such as in a solid wall or timber framed building. Fulfils 3 functions:

- exterior sealing against (driving) rain up to at least 600Pa (BG1)
- airtight sealing on the inside (BGR)
- thermal and acoustic insulation in the centre

Available in several dimensions: see table p. 31



BUTYBAND FLEECE

Self adhesive flashing tape for the airtight sealing of seams and crevices, based on butylene. Excellent bond to almost all porous and mineral surfaces. Ideal as an airtight seal between a cavity closer/frame and interior cavity wall leaf or between concrete slabs (project build). Can be plastered over.

- very airtight and damp proof
- equipped with plasterable PP foil on one side
- excellent 2-part protective strip, easy to remove
- available in 100 and 150 mm width



BUTYBAND

The well known lead and aluminium finished butylene flashing tape can also be used for airtightness, especially during the structural work. Very pliable product, does not spread on vertical surfaces. Excellent bond to many surfaces, even at lower temperatures.



SOUDATAPE CONNECT

Adhesive tape for long-term, airtight bonding of overlaps of vapour barrier. Also ideal for repairing small holes and tears in damp-proof layers.

- Carrier made from splash-resistant paper
- Solvent-free powerful layer of adhesive
- Good temperature resistance
- Yellow
- 60 mm x 40 m



SOUDATAPE FLEX

Elastic adhesive tape for long-term, airtight bonding of overlaps and lead-throughs (pipes, ducts, beams) through vapour barrier.

- Carrier made from strengthened PE
- Solvent-free powerful layer of adhesive
- Good temperature resistance
- White, 60 mm x 25 m



SOUDATAPE FAÇADE

Adhesive tape for general use, on the inside and outside of the building envelope. Particularly suitable for the airtight bonding of joints between wood derivative board (timber framed houses) and the joints with neighbouring materials, such as skylights. Can also be used on black damp-proof sheets behind ventilated facade cladding.

- Carrier made from special PP fleece
- Particularly suitable for joints between wood derivative board (timber frame)
- 3 months full weather and UV resistance
- Black, 60 mm x 25 m



ACRYRUB SWS

Plastering up to the window frame will cause small tears and debonding after only a short time, which will have a negative impact on the airtightness. To avoid this, it is best to use a paintable sealant with sufficient movement capability. Acryrub SWS was developed especially for this application, about the only acrylic sealant meeting the class 12.5 E requirements (CE marking F-EXT-INT-12.5E). The bonding capacity of this silanised acrylic to PVC is better than that of a classic acrylic.

- Very airtight
- Silanised acrylic, paintable
- Remains elastic, meets the class 12.5E Façade INT/EXT (CE) requirements
- Very good adhesion on PVC
- Low emission, fulfils EC1 Plus



VAPOURSEAL

VAPOURSEAL is a ready-to-use plasto-elastic one-component seal-adhesive, based on innovative polyacrylics, to achieve airtight and damp-proof interior joints with all types of vapour barrier foils, even those made from PP and PE. Ideal for bonding a damp-proof layer to a mineral surface: brick, concrete, prefabricated materials.

Vapourseal is also particularly suitable for the airtight sealing of wood derivatives in timber framed houses, such as bonding multiplex surrounds to exterior joinery.

Odourless, solvent-free and plasticiser-free



EXTERIOR FINISH



SOUDASEAL 215LM

ATG approved facade sealant based on MS polymer®. This high quality sealant has a large movement capability (class F-EXT-INT-CC- 25LM in accordance with the new CE marking - harmonised standard EN15651 or 25 F in accordance with the EN ISO11600 standard; "F" for facade). Excellent UV resistance and broad bonding spectrum on porous and non-porous materials, particularly suitable as a long-term sealant for expansion joints exposed to all weather conditions. Also bonds to slightly damp surfaces, non-staining on most types of natural stone. Ideal for sealing joints between exterior joinery and the outer cavity wall leaf, even for natural stone (threshold). Available in many colours. Can also be used for long-term airtightness on the inside of joints subject to a lot of movement; paintable with water-based paint!



SOUDASEAL 225 LM

Neutral cure, elastic sealant based on hybrid polymer. Scope of application: as Soudaseal 215LM. Sets a little harder, more "body" when finishing. Large movement capability (CE class F-EXT-INT-CC- 25HM), ideal for exterior weather resistant sealing or interior airtightness. Large colour range. Paintable with water-based paint.



SILIRUB 2

Top grade, neutral cure silicone for a wide range of applications. ATG approved for use in facade and glazing joints. Very large movement capability (class F-EXT-INT-CC- 25LM and G-CC-25LM in accordance with the new CE marking - harmonised standard EN15651 or 25 F/G in accordance with the EN ISO11600 standard). Ideal as a sealant between exterior joinery and the exterior cavity wall leaf (not suitable for natural stone) or for glazing applications.



BACKER ROD

All sealants for facades are used with a suitable backer rod. The elastic material ensures there will be no triangular bonding and that the sealant does not tear due to tension from three sides. The backer rod also ensures correct joint dimensions and good bond to the joint sides. Available as open-cell PU or closed-cell PE.



SOUDABAND PRO BG1 / CLASS 1

Standardised, pre-compressed sealant tape for the sealing of facade joints. Fulfills class BG1 in accordance with DIN18542:2009. Resistant against driving rain up to at least 600Pa, suitable for uncovered joints (UV resistant). Product has ATG (production control) and Socotec specification. Type designation indicates joint capacity.



Item no.	Description	Joint capacity	Width of expanding tape	Meter / roll	Rolls / box	Total m / box
110265	Soudaband PRO BG1 10/1-2	1-2	10	20	30	600
110267	Soudaband PRO BG1 15/1-4	1-4	15	13	20	260
121843	Soudaband PRO BG1 20/1-4	1-4	20	13	15	195
121842	Soudaband PRO BG1 12/2-6	2-6	12	12	25	300
110268	Soudaband PRO BG1 15/2-6	2-6	15	12	20	240
121841	Soudaband PRO BG1 20/2-6	2-6	20	12	15	180
121840	Soudaband PRO BG1 15/4-9	4-9	15	8	20	160
122338	Soudaband PRO BG1 20/4-9	4-9	20	8	15	120
123455	Soudaband PRO BG1 30/4-9	4-9	30	8	10	80
122844	Soudaband PRO BG1 15/5-12	5-12	15	5,6	20	112
122339	Soudaband PRO BG1 15/6-15	6-15	15	4,3	20	86
121839	Soudaband PRO BG1 20/6-15	6-15	20	4,3	15	64,5
122845	Soudaband PRO BG1 20/9-20	9-20	20	3,3	15	49,5
124794	Soudaband PRO BG1 25/11-25	11-25	25	2,6	12	31,2
124793	Soudaband PRO BG1 35/18-34	18-34	35	3,3	8	26,4
124795	Soudaband PRO BG1 40/24-42	24-42	40	2,6	7	18,2

SOUDABAND AKTIV PLUS



Rolls • Joints

123045	54/5-10	5411183099692	5,6m	5/Box
123044	64/5-10	5411183099685	5,6m	4/Box
123046	74/5-10	5411183099661	5,6m	4/Box
123043	84/5-10	5411183107922	5,6m	3/Box
123042	54/7-15	5411183099678	4,3m	5/Box
123041	64/7-15	5411183099654	4,3m	4/Box
123040	74/7-15	5411183099647	4,3m	4/Box
123035	84/7-15	5411183107908	4,3m	3/Box
123039	54/10-20	5411183099623	3,3m	5/Box
123034	64/10-20	5411183099630	3,3m	4/Box
123038	74/10-20	5411183100114	3,3m	4/Box
123037	84/10-20	5411183107915	3,3m	3/Box

Expert in Sealants, PU Foams & Adhesives

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