

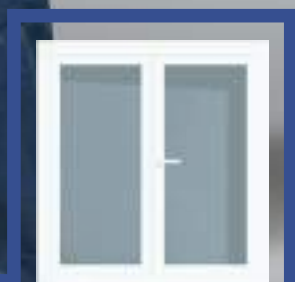
INSTRUCTIONS FOR SEALING AND INSULATION



INTEGRATED 3-LAYER WINDOW SEALING AND INSULATION SYSTEMS



Compliant with
**insulation and sealing joints
between the window
and the reveal standard
developed by Selena**



WINS - WINDOW INSULATION AND SEALING STANDARD
BASED ON LIQUID FOILS

COMPLIANT WITH:



Selena Group

Selena Group is a global manufacturer and distributor of construction chemistry products and one of the four largest manufacturers of construction foams in the world.

The Group offers foams, sealants, adhesives, waterproofing products, thermal insulation systems, fixings and complementary products.

The Group comprises 35 companies in 17 countries.

Selena's production plants are located in Poland, Brazil, South Korea, China, Romania, Turkey, Spain and Kazakhstan.

Selena's main R&D Center is Selena Labs. It is located in Dzierżonów in the "INVESTPARK" Wałbrzych Special Economic Zone and coordinates activities of R&D units from Poland, Italy, Spain, Turkey and China.

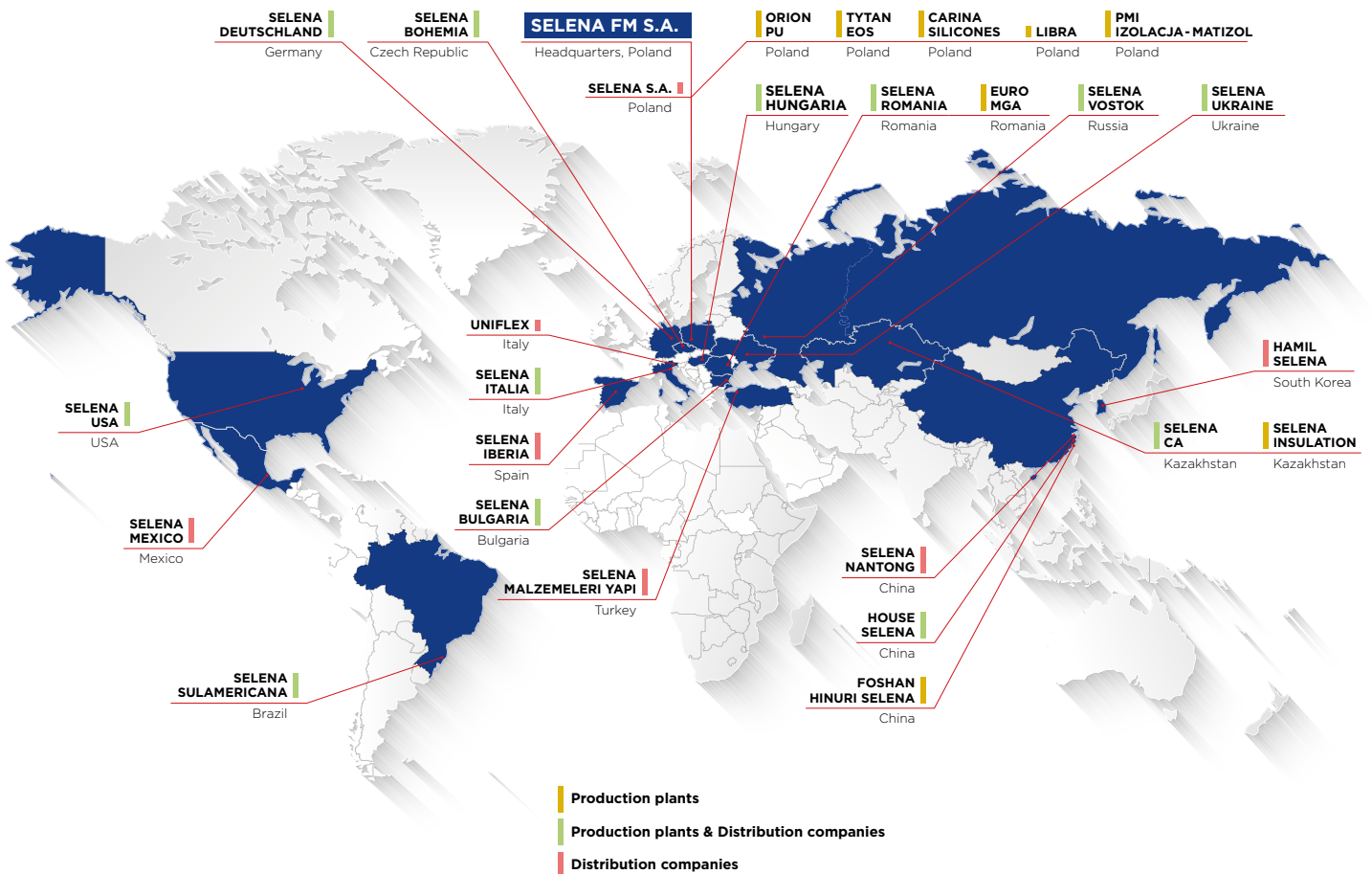
In this way, the globally integrated team works closely together, sharing experience and developing solutions for professional users in more than 100 countries around the world.

35 companies
in **17** countries

sales in **100** countries
around the world

17 production facilities
in Europe, Asia
and South America

5 R&D centers



Our solutions

In response to the needs of users, Selena provides solutions of the highest quality, taking into consideration the trends of the modern world, users comfort, safety, speed and efficiency of the construction process.

Selena consistently launches products that reduce heat losses in buildings and external noise, and which also increase the comfort of living in an apartment or a building. Tytan Professional WINS Fast is a foam characterised by high thermal insulation as it reduces heat loss at window edges to 60% – at relatively low environmental costs in terms of the foam’s production. When it comes to foam adhesives – a segment in which Selena is a world leader – the speed and ease of construction and bonding partition walls, polystyrene boards and plasterboards is very important. The process may be significantly less burdensome for the environment than building by means of any other technology. Furthermore, no water or electricity is needed on the construction site, which has a positive effect on the environment and projects costs while increasing the contractor’s comfort. Another example is the solutions which reduce the demand for energy – for both heating and cooling. One of such solutions is the COOL-R® waterproofing roof coating, which protects roofs in logistics centres and manufacturing plants against excessive absorption of heat from solar radiation. Selena Labs, our R&D team, is also involved in projects based on working with bio-renewable raw materials under the Horizon 2020 programme, the EENSULATE and BioMotive projects.



Our brands

By offering modern systems, we change the way contractors work at different latitudes. We create modern constructions thanks to innovative solutions which are appreciated by partners and customers in 100 countries. At the beginning of the Group’s brand portfolio we can name such top-notch brands as: Tytan Professional, Quilosa, Artelit, COOL-R®.

We care about education in the industry and sharing good practices. We want to make sure that we have a positive impact on the world in social and environmental terms.



The Selena Group has been repeatedly awarded in the most prestigious rankings. The company was awarded by the President of the Republic of Poland in the competition for the President’s Economic Award in the category “Sustainable Success” and received, among others, the title “Now Poland” (“Teraz Polska”) in the category “Foreign Investment” and for the product Tytan Szybki Pianoklej Uniwersalny 60 SEKUND. The Group has also received awards for product innovation; in 2020, for instance, for the eighth time, it was conferred the title of “Construction Company of the Year”.



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ENERGY-EFFICIENT INSULATION AND SEALING OF THE FRAME TO REVEAL JOINT

Through windows and exit doors we usually lose between 20 and 25% of the heat supplied to the building. No wonder that the selection, arrangement and proper installation of glass partitions is one of the most important elements of the process of designing and erecting energy-efficient buildings.

Windows being external partitions should meet the basic requirements for thermal protection of buildings, i.e. provide high thermal insulation and air tightness. Air infiltration is responsible for over 30% of costs of heating and ventilation in industrial and commercial buildings. It should not be considered as acceptable, natural ventilation as the air cannot be controlled or filtered. In addition the warm air that escapes from the building contains humidity, which can condense inside the partition, causing its damage. The airtight joint not only reduces heat loss, but also prevents the diffusion of water vapour. This increases thermal and acoustic insulation and enables better control of the microclimate inside the building.

The consequences of reduced joint tightness:

- ▶ uncontrolled air flow through fissures and cracks in the reveal,
- ▶ interlayer water vapour condensation in the joint,
- ▶ mould and biological degradation of window frames and joinery,
- ▶ deterioration of thermal insulation and durability of window joinery,
- ▶ deterioration of the quality of the indoor environment: local draughts and increased heat loss due to heating of the infiltrated air,
- ▶ additional heat losses have a significant impact on the energy performance of the building.

Table 2 below aligns the factors affecting the windows with their respective installation, insulation and sealing areas.

table 2

Factors and phenomena affecting the insulation and sealing of joints between the window and the reveal					
<div style="border: 1px solid gray; padding: 5px; width: 40px; margin: 0 auto;"> EXTERNAL 1 AREA </div>	External installation and sealing area	<div style="border: 1px solid orange; padding: 5px; width: 40px; margin: 0 auto;"> INSULATION 2 AREA </div>	Central installation and sealing area	<div style="border: 1px solid blue; padding: 5px; width: 40px; margin: 0 auto;"> INTERNAL 3 AREA </div>	Internal installation and sealing area
▶ rain		▶ movements of the structure		▶ interior temperature	
▶ wind		▶ linear expansion		▶ air humidity	
▶ sunrays		▶ deformations		▶ impacts	
▶ temperature changes		▶ dimensional tolerances		▶ fire	
▶ air humidity		▶ use and operation			
▶ noise					
▶ access and burglary attempts					
▶ impacts					
▶ fire					

STANDARD INSTALLATION COMPARED TO LAYER SEALING INSTALLATION - WARM INSTALLATION

The term **warm windows installation** has already entered the dictionary of common window technology terms for good. The basic difference between standard (PU foam only) window installation and the so-called warm installation comes down to the way the space between the building's structural wall and the window frame is sealed. In standard installation, the expansion joints around the window are filled with PU foam only. In warm installation the foam insulation is additionally protected from the outside with waterproof and vapour-permeable foils, and from the inside with vapour-tight foils, and more precisely with foils with higher diffusion resistance than the external foils.

According to the requirement indicated in point 2.3.1 of Annex 2 to the Regulation of the Minister of Infrastructure on technical conditions to be met by buildings and their location, which states: „Joints between the window and the reveal should be designed and executed in order to ensure their total air tightness”.

It is important for all energy-efficient builders to see the air permeability values through the joint insulated with foils for pressures from 10 Pa to 50 Pa. As a result of tests made, we provide permeability equal to 0 m³/h. This does not mean a complete lack of air flow through the joint. It only means that at this pressure value the air flow was so small to three decimal places that it was negligible, zero. Such insignificant infiltration will not affect the results of any **N50 leakage tests (Blower Door Test)**, which should be mandatory after completion of each energy-efficient construction project. Moreover, it is reasonable to assume that this value, or even all of the air permeability values given in the tables, will decrease if we test the level of infiltration through the gaps in fully finished buildings.

Compared to a joint filled only with PU foam, a warm installation using external and internal WINS liquid foils and PU foam as thermal insulation increases the average tightness of the joint by more than 75%, and in the low pressure range even eliminates the phenomenon of uncontrolled air infiltration through the joint.

This proves the technical gap between „standard” and „warm” installation with WINS liquid foils.

Therefore, the best solution is a tight, three-layer installation in the WINS system, in which the installation foam (forming a layer of thermal and acoustic insulation) is protected with appropriate insulation layers of liquid foils: vapour-tight and vapour-permeable one.



BASIC PARAMETERS OF THE ENERGY-SAVING JOINT BETWEEN THE REVEAL AND THE FRAME



AIR TIGHTNESS

WINS systems ensure the tightness of the joint 3 times higher than according to the legal requirements. In accordance with EN 12207 for pressure = 600 Pa, they provide for the joint class 4 which is one of the highest ones.

Air tightness affects operating costs, acoustic properties, thermal efficiency of the building, thermal comfort of users. One of the key points in which ensure tightness are the joints between the reveal and the frame. Poor air tightness of this joints constitutes about 15% of the total air loss in an average single-family house.

RAINWATER RESISTANCE

WINS systems are resistant to hurricanes - rain and wind impacts above 600 Pa, i.e. 160 km/h and provide for the joint class E1200, which is one of the highest ones according to EN 12208.

The occurrence of strong, turbulent gusts of wind is often associated with another adverse weather phenomenon - heavy rain. It is worth knowing whether the window structure and the joint between the reveal and the frame of a certain wind load strength will also maintain the tightness against the penetration of rainwater into the interior.

Water tightness is another property of the window and the joint, in which the pressure exerted on the structure by the wind plays a significant role.

Windows and joints bearing the E1200 class will only start to let water through to the structure at a pressure of 600 Pa, which means that leaks can occur if falling rain is accompanied by a hurricane blowing at more than 160 km/h.

TEMPERATURE COEFFICIENT

$$f_{Rsi} \geq 0,8$$

DIFFUSION TIGHTNESS

$$Sd \text{ internal} = 30$$
$$Sd \text{ external} = 2$$

EXTREME WEATHER RESISTANCE

$$= 1200 \text{ Pa}$$

AIR TIGHTNESS

$$a \leq 0,1$$
$$[m^3/hm(daPa)^{2/3}]$$

THERMAL INSULATION

$$\lambda \leq 0,036 \text{ W/mK}$$

ACOUSTIC INSULATION

$$Rw \geq 63 \text{ dB}$$

WATER VAPOUR DIFFUSION

WINS systems provide a controlled flow of water vapour in the joint: external liquid foil **Sd ≤ 2 m**, internal liquid foil **Sd ≤ 30 m**.

The diffusion tightness is strictly connected with humidity of building partitions, especially with the necessity of ensuring (securing) such humidity of partitions, which can be considered as correct, that is not causing negative thermal and operational consequences. Diffusion-tight partition is such partition, into which water vapour should not penetrate by diffusion and the type and arrangement of layers of this partition guarantee that it is not endangered with internal condensation (condensation of water vapour at lowered temperature), especially increasing in subsequent years, which may lead to increasing moisture of some layers and as a result to fungi growth and biological degradation.

TEMPERATURE COEFFICIENT

WINS systems provide a 10% increase in **f_{Rsi}** value 10% above the requirements of building regulations which amounts to **0.8**.

The temperature coefficient **f** is an indicator of the lowest temperature of internal surface **f_{Rsi}** of a specific joint. It is in fact a dimensionless temperature describing the internal surface temperature independent of the exact boundary conditions, with a value from 0 to 1 (the closer the value to 1 the better the joint is protected). The construction elements must ensure that the risk of local mould and surface condensation on the internal surface of the joint is eliminated.

THERMAL INSULATION

WINS systems provide excellent thermal insulation of the joint, eliminating linear thermal bridges along the frame to reveal joint. The heat conduction coefficient values for insulating foams used in WINS systems meet the requirements of energy-saving materials **λ ≤ 0.036W/mK**.

The lambda value is an indicator of how energy-efficient a material can be. The lower the value, the better the joint is insulated by the specific material. However, it should be remembered that it is the joint between the frame and the reveal that constitutes a classic linear thermal bridge.

The minimum requirement for the reveal to frame joint, i.e. the 3D correction factor in the joint **ψ is 0.15 W/mK**. Linear thermal bridges such as reveal to frame joints constitute an important part of the total heat loss in a building. Their impact on heat loss from the interior to the exterior is usually non-negligible, and with poorly executed details it can be very relevant. Condensation of water vapour and mould often occur on the internal surface of thermal bridges, especially in case of increased humidity in the room. That is why it is so important to properly insulate the joint between the reveal and the frame.

ACOUSTIC INSULATION

WINS systems provide acoustic insulation of the joint of **62 dB**.

Acoustic insulation requirements relate to the entire external structure of the building, including all the elements installed in it. The acoustic insulation coefficient **R_{w,res}** of the external part of the building (external wall + windows) is determined. When planning wall joints, care must be taken to ensure the greatest possible noise reduction. For a well insulated and sealed joint, the **R_{s,w}** value should be ≥ **45 dB** for a 20 mm joint.



Air tightness



Resistance to extreme weather conditions



Water vapour diffusion



Temperature coefficient



Thermal insulation



Acoustic insulation

FACTORS THAT HAVE THEIR IMPACT ON THE WINDOWS DURING OPERATION

Within the meaning of the provisions of Regulation (EU) No. 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC (OJ L 88, 4.4.2011) and of the Act of 16 April 2004 on construction products (Journal of Laws 2019, item 266), windows and balcony doors are construction products. This means that their properties affect the performance of construction works in relation to the basic requirements specified in Article 5 (1) of the Construction Law (Journal of Laws 2019, item 1186) concerning construction works, such as:

- ▶ fire safety.
- ▶ health, safety and environmental sustainability.
- ▶ safety of use and availability of facilities.
- ▶ noise protection.
- ▶ energy savings and thermal insulation.
- ▶ sustainable use of natural resources.

From the moment a window is incorporated into the structural wall reveal, the joint between the frame and the reveal, as well as the insulation and sealing systems used, are subject to variable forces from loads caused by a number of external and internal factors, such as: weather conditions, dead weight of the window structure, movements of the building, operation, burglary attempts, impacts, noise, fire, interior atmosphere.

As a rule, each phenomenon and each factor affecting the window will also affect the insulation and sealing of the joint between the window and the reveal. The sole variable elements will be the values of the forces from the individual loads, depending on:

- ▶ location of the building and the site category,
- ▶ exposure of the window to the influence of particular phenomena and factors,
- ▶ location of the window structure in relation to the cardinal directions,
- ▶ position of the window in the reveal of the construction wall,
- ▶ type and structure of the reveal,
- ▶ window structure dimensions,
- ▶ materials used for window structure production,
- ▶ functional properties of window structure,
- ▶ the destination of the facility - for residential or commercial use.

fig. 1 Factors affecting windows and sealing of joints between the window and the reveal



CONDITIONS AND REQUIREMENTS FOR THE INSTALLATION OF WINDOWS AND BALCONY DOORS

Windows and balcony doors shall be integrated into external walls in such a way that they can be safely operated and used by the end user and fulfil their functions:

- ▶ separating the interior of the building from the outdoor conditions,
- ▶ transferring loads acting on the window to the building walls.

Windows and balcony doors will perform their function only if they are installed correctly. Erroneous installation negatively affects strength, tightness, durability and operational reliability of the joint and of the entire window. The execution of an incorrect joint affects the thermal and acoustic insulation properties of the entire window. For proper installation, it is necessary that the window is properly located in the wall, mechanically fastened, sealed and insulated.

The method of installation, location of the windows, sealing and insulation of the frame in the joint should be specified in the installation design, both for windows/balcony doors in a new building and for their replacement in an existing building.

The methods and rules contained in the installation instructions refer to the standard installation of windows/balcony doors, without taking into account additional, upgraded requirements, e.g. in terms of burglary resistance (classes RC1, RC2), acoustic requirements, installation in non-standard window apertures. In case of such requirements, appropriate arrangements should be introduced and consulted with the manufacturer or distributor of joinery elements and the representative of the installation company.

CONDITIONS NECESSARY TO COMMENCE WORKS

The installation of windows and balcony doors should take place after completion of most wet works (plasters, flooring). This applies to all types of windows, i.e. aluminium windows (especially with anode coatings), wooden windows and on PVC profiles.

The installation of the windows before the completion of wet works is possible with appropriate thermal and humidity conditions inside the building. In case of wooden windows, they should not be allowed to get wet as a result of increased relative humidity inside the building (condensation of water vapour on window elements). It is necessary to control air humidity and to ensure systematic and adequate ventilation of the rooms. In walls with external thermal insulation, windows and balcony doors should be built in before the insulation is executed.

In historic buildings the replacement of windows should be agreed with appropriate maintenance service.

Requirements for the connection of windows and balcony doors to the building.

Connections of frames to reveals should meet the following requirements:

- ▶ air and rainwater tightness,
- ▶ tightness to water vapour penetration from the interior,
- ▶ thermal insulation level similar to that of a window,
- ▶ thermal insulation level similar to that of a window,
- ▶ UV resistance,
- ▶ durability and operational reliability,
- ▶ safety of use,
- ▶ aesthetical values and hygiene.

Before beginning the windows installation in new buildings, it is necessary to check:

- ▶ dimensions of window apertures and to compare them with the window dimensions given in the technical documentation,
- ▶ reveal type (with/without the jamb),
- ▶ horizontal and vertical plane of the wall,
- ▶ the finishing of window frames, in case the windows are installed after plastering,
- ▶ external and internal window sills setting levels.

Before replacing windows in existing buildings, it is necessary to:

- ▶ specify the type of external wall of the building (full, three-layer with central insulation, two-layer with external insulation),
- ▶ specify the reveal type (with/without the jamb),
- ▶ measure the actual window opening and determine the dimensions of the new window taking into account the installation clearance on the perimeter of the window,
- ▶ execute cut-outs in order to be able to precisely measure the dimensions of the window opening,
- ▶ determine the technical condition of the wall and the necessity to perform repairs of reveals, jambs and thresholds,
- ▶ agree with the customer the replacement of the external and internal windowsills,
- ▶ clean the hole from any possible dust and debris.

ACCEPTANCE OF WINDOWS AND BALCONY DOORS BEFORE INSTALLATION

Before installing windows and balcony doors, it is necessary to check::

- ▶ compliance of windows with the technical documentation in terms of material and construction solution as well as the quality of execution,
- ▶ compliance of windows with the technical documentation of the building or with the order,
- ▶ documents of marketing and use authorisation (declaration of conformity with the product standard, certificate of conformity; declaration of performance; declaration of unitary use, if any).

The Contractor shall have at his disposal all the documentation confirming acceptance of products/materials for installation of windows. The documentation shall include:

- ▶ certificates (if required by the customer - investor),
- ▶ declarations of performance (construction products covered by harmonised standards),
- ▶ EC/EU declarations of conformity (products covered by Technical Approvals),
- ▶ national declaration of conformity (document currently not in force),
- ▶ national declaration of performance (mark ,B' for AT or KOT),
- ▶ technical sheets (where applicable).

The contractor should be provided with the information from the manufacturers of the products/materials about their shelf life. If no technical specification is attached to the investor's agreement with the contractor, the type of windows to be installed, the method of installation and acceptance conditions should be specified in the description in the documentation, e.g. with a reference to the following:

- ▶ The guide „Windows and exit doors. Requirements, classification and scope of application” (ITB Guidelines 480/2012)
- ▶ Technical conditions for the Execution and Acceptance of Construction Work, Part B: Finishing work, Notebook 6: „Installation of windows and balcony doors”, ITB 2016
- ▶ ‚Guidelines for the installation of windows and exit doors in new and renovated buildings’, IFT 2018
- ▶ „Sealing and insulation standard for joints between the reveal and the frame” Designed and developed by Selena FM

When performing the sealing, it is necessary to take into account the chemical compatibility of the materials coming into contact with each other - therefore, only the use of system solutions gives rise to a guarantee of the quality of the seal.

SEALING AND INSULATION PLANES IN JOINTS BETWEEN THE WINDOW AND THE REVEAL

Due to the factors and phenomena affecting the joint between the window and the reveal, insulations and sealing within the joint, three planes of window and balcony door installation can be distinguished, and thus three interdependent insulation and sealing areas, presented in the model in figure 2.

The features of the presented model of insulation and sealing are adapted to the weather conditions, phenomena and factors affecting joint between the reveal and the frame typical for Europe, as well as environments with a standard climate.

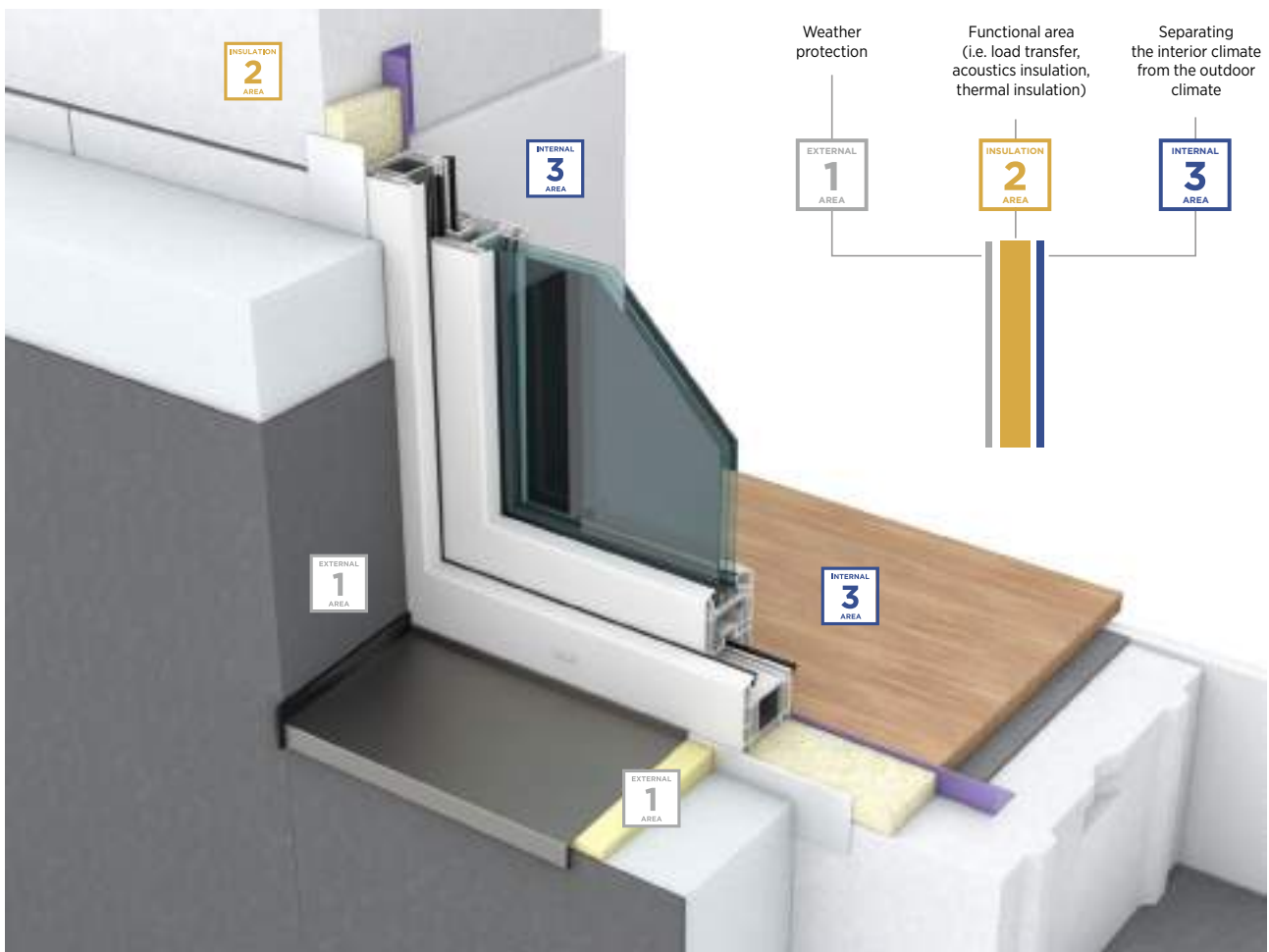


fig. 2 Plains scheme of the joint - installation areas

EXTERNAL SEALING

Area 1 – external sealing – is responsible for protecting the joint between the frame and the reveal against external factors and weather conditions. The fundamental function of the sealing in this area is to protect the joint against rainwater and, above all, against the ingress of rainwater into the building. The rainwater that penetrates into the joint should be controlled and discharged outside. The sealing materials used for sealing in area 1 should also allow the moisture which may have penetrated into the functional insulation area to be discharged outside.

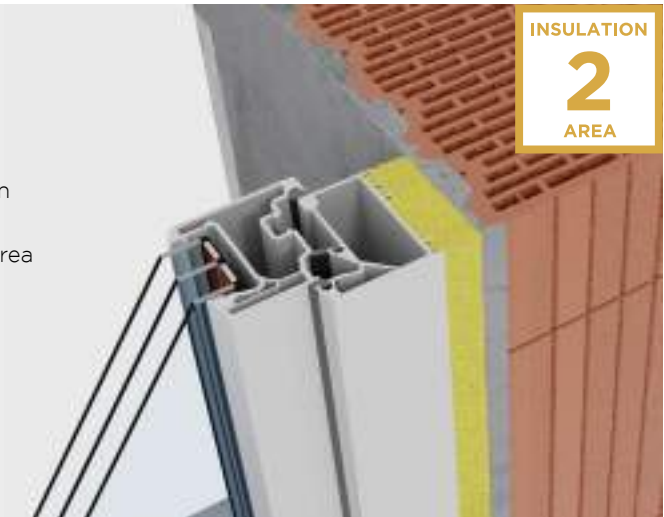
EXTERNAL
1
AREA



FUNCTIONAL INSULATION AREA

Area 2 – functional insulation area – is responsible for the required level of thermal and acoustic insulation of the joint between the frame and the reveal. The functional properties of the functional insulation area should be ensured in a permanent manner within an economically justified period.

INSULATION
2
AREA



INTERNAL SEALING

Area 3 – internal sealing – the actual and ultimate barrier separating the internal environment from the external environment. The sealing in this area should prevent uncontrolled air infiltration through the joint between the frame and the reveal. Elimination or significant reduction of uncontrolled air flow minimises the risk of draughts, condensation of vapour within the joints and reduces heat loss through the joint. A correct sealing in the internal area should form a continuous surface over the entire surface of the joint, which should not be interrupted.

INTERNAL
3
AREA



In accordance with the requirements of Polish technical and construction regulations, the surface temperature of the internal sealing should have a temperature coefficient f_{Rsi} of not less than 0.72 - the value recommended by the Selena Standard is 0.8.

INSTALLATION STEP BY STEP

1 CLEANING THE SUBSTRATE

Clean the surface from loose and unbound elements of the construction material with a wire brush.



2 DUSTING THE SUBSTRATE

Dust the surface with a vacuum cleaner. The substrate should be clean, free of grease, dust, compact and free of loose elements and any substances that might impair the adhesion of PU foam and other products included in the system. It is recommended to dust the surface using a vacuum cleaner.



3 RESURFACING THE REVEAL

Significant defects of the reveal should be filled in with appropriate mortars, such as Tytan Mastic 3-30. after the surface has been primed with: Multigrunt S1 primer.



4 INSTALLATION OF THE WINDOW FRAME TO THE REVEAL

Fix the window frame mechanically to the reveal in accordance with the design guidelines, guidelines of the window manufacturer or RAL technical guidelines. If there is no default window film, the frames should be protected against possible contamination with painting tape Tytan 14-days tape.



5 WETTING THE WORKING SURFACE

Wet the working surface with water (only at temperature > 0 °C) using a suitable sprayer (the surface should be moistened but not soaking wet).



6 PREPARATION FOR WINS FOAM APPLICATION

Gap filling with the foam from WINS Fast or WINS Flex. The recommended can temperature is room temperature. Wear gloves and safety glasses. Shake the can vigorously before use (for about 30 seconds). Remove the protective cap and screw the foam can to the gun adapter. It is recommended to use Tytan Professional Gun Pro Grafit or Tytan Professional Gun Pro Control guns.

7 FILLING THE FISSURE WITH WINS FOAM

During application the can must always be in the „valve down” position. Always apply the foam from the bottom up, filling the fissure with fresh foam always in 100% of the section. This will permit to obtain an even surface of the entire perimeter of the fissure (from the inside and outside), after cutting off the hardened foam, for application of subsequent layers of the system. Fill the fissures gradually in layers of about 4 cm deep each. A suitable knife with a sharp blade should be used for hardened WINS Flex or WINS Fast foam. A blade that is too blunt can result in poor cutting precision, local tearing of the PU foam structure and the impossibility of achieving the desired even surface. Any stains caused by fresh foam should be removed using a dedicated Tytan cleaner.



8 WETTING THE FOAM

Immediately after application moisten the foam surface with water mist (only at temperature > 0°C).



9 REMOVAL OF EXCESS FOAM

When the WINS Fast or WINS Flex foam has completely cured, cut off the excess foam with a sharp knife evenly to the frame surface.



FULL CURE
(+23°C / 50% RH)

WINS Flex foam

1.5 h

WINS Fast foam

1.5 h

10 APPLICATION OF THE LIQUID FOIL IN AREA 3

Apply Internal Liquid Foil from WINS system inside the building, minimum thickness 2 mm (while wet). Wet liquid foil in blue. The internal coating should be applied over the entire surface of the PU foam and should overlap at least 3 mm on the surface of the joinery frame and at least 5 mm on the reveal surface. The temperature of the substrate and the environment should be in the range from +5°C to +30°C. For the application of internal liquid foil, a dedicated Tytan silicone applicator or an appropriate brush should be used. During the application of internal liquid foil in a bucket after opening the product should be stirred thoroughly. For the application of internal liquid foil available in 600 ml sausage packs, a suitable manual or electric caulk gun must be used (e.g. Tytan CG SA613 or CG CA601).



The full curing time depends on the ambient conditions (temperature and relative humidity) and the thickness of the applied layer of the liquid foil. When fully cured, the coating changes colour to dark graphite blue.

AMBIENT TEMPERATURE	CURING TIME RECOMMENDED THICKNESS 2 MM
+5°C	> 5 h
+23°C	≈ 2.5 h
+30°C	≈ 2 h

Only a properly executed three-layer joint seal eliminates uncontrolled heat loss from the building, protects the frame from biological degradation and the reveal from humidity and fungi, and constitutes a sound barrier, protecting the inside of the building from the outside noise.

11 APPLICATION OF THE LIQUID FOIL IN AREA 1

Apply the external liquid foil from the outside. The white foil should be applied in one layer about 1 mm thick while wet. The temperature of the substrate and the environment should be in the range from +5°C to +30°C. The internal coating should be applied over the entire surface of the PU foam and should overlap at least 3 mm on the surface of the joinery frame and at least 5 mm on the reveal surface. For the application of external liquid foil, a dedicated Tytan silicone applicator or an appropriate brush should be used. During the application of external liquid foil in a bucket after opening the product should be stirred thoroughly. For the application of external liquid foil available in 600 ml sausage packs, a suitable manual or electric caulk gun must be used (e.g. Tytan CG SA613 or CG CA601).



The full curing time depends on the ambient conditions (temperature and relative humidity) and the thickness of the applied layer of external liquid foil. After the application of external liquid foil, the tools used should be washed with warm water.

AMBIENT TEMPERATURE	CURING TIME RECOMMENDED THICKNESS 1 MM
+5°C	≈ 5 h
+23°C	≈ 1 h
+30°C	< 1 h

ACCEPTANCE OF INSTALLATION WORKS

ACCEPTANCE OF CONSTRUCTION WORKS BEFORE THE INSTALLATION

The installation of windows should take place after completion of most wet works (plaster, flooring). In double-layer walls with external insulation, the windows should be installed before the thermal insulation is completed.

Before beginning the windows installation, it is necessary to check:

- ▶ dimensions of window apertures,
- ▶ reveal type (with/without the jamb),
- ▶ vertical and horizontal plain of the walls,
- ▶ finishing of the reveals,
- ▶ external and internal window sills setting levels.

ACCEPTANCE BEFORE THE INSTALLATION

Before installing the windows, it is necessary to control:

- ▶ compliance with the system documentation or individual technical documentation in terms of materials, construction and execution,
- ▶ compliance with the contract, design, technical documentation of the building,
- ▶ product acceptance certificates.

ACCEPTANCE AFTER THE INSTALLATION

After the installation of the windows, it is necessary to control the correctness of:

- ▶ frame sill support,
- ▶ mechanical window fastenings around the entire perimeter (the spaces between mechanical fasteners),
- ▶ thermal insulation of the fissure between the window frame and the reveal around the entire perimeter (including under the frame sill),
- ▶ sealing of the external and internal joints of the insulation fissure (between the window and the reveal),
- ▶ execution of balcony door thresholds,
- ▶ external and internal window sills embedment.



WINS INSULATING AND SEALING SYSTEM - MATERIALS CHOICE

The insulation and sealing system WINS for the joints between the frame and the reveal is a set of materials intended to provide insulation and sealing within properly designed expansion joints (joints), ensuring that thermal transmittance, acoustic insulation, rainwater resistance and air-tightness of the joint are at least at the minimum level required by national technical and building regulations, unless other higher requirements are specified in the building permit design or in the contract as for the desired and expected performance level.

Based on the experience and the results of laboratory and field tests, we present several proven insulation and sealing systems based on materials produced and supplied by Selena FM, designed for professional execution of insulations and sealing, the use of which in accordance with the recommendations and guidelines of this guide allows to obtain a result consistent with the Selena quality standards based on the requirements of the Regulation of the Minister of Infrastructure of 12 April 2002 on technical conditions to be met by buildings and their location (Journal of Laws 2019, item 1065).



WINDOW INSULATION AND SEALING STANDARD BASED ON LIQUID FOILS



WINS systems are innovative three-layer systems for insulation and sealing of frame to reveal joints. Systems regulate the water vapour flow in the joint and eliminate uncontrolled air infiltration, which increases the energy and acoustic efficiency of the joint. WINS systems consist of integrated products which, when used as a system, provide a frame to reveal joint meeting the Selena **Sealing and insulation standard for joints between the reveal and the frame.**

- ▶ High resistance to extreme weather conditions
- ▶ Tightness
- ▶ Extremely high UV resistance - 10 years
- ▶ Ease of application
- ▶ Time-saving installation and sealing of the joint
- ▶ No special substrate preparation or priming of the reveal
- ▶ Versatility - does not depend on the joint width
- ▶ High passive fire protection
- ▶ Energy efficiency
- ▶ Does not emit any harmful substances during installation and use of the building
- ▶ Reliability of the solution - minimising the possibility of execution errors during installation, insulation and sealing, as well as during further construction work

PARAMETERS OF A PROPERLY INSULATED JOINT BY SELENA

THE FEATURE OF THE WINDOW - REVEAL JOINT	REFERENCE DOCUMENT	CLASS/LEVEL/VALUE
Resistance to rainwater penetration	EN 1027	pressure 1200 Pa
Resistance to rainwater penetration	EN 12208	class E1200
Air permeability	EN 1026	pressure 600 Pa
Air permeability	EN 12207	class 4
Air permeability	EN 12207	$Q_L \leq 0.46 \text{ m}^3/\text{hm}$
Air permeability	EN 1026	$a \leq 0.1 [\text{m}^3/\text{hm}(\text{daPa})^{2/3}]$
Temperature coefficient value f_{Rsi}	EN 13788	≥ 0.80
Linear thermal transmittance	EN ISO 14683	$\leq 0.15 \text{ W/mK}$



FOR NEW AND DEMANDING INSTALLATIONS

RECOMMENDED USES

Insulation and sealing of joinery, joinery for large apertures and window sets in new buildings:

- ▶ Single-layer walls
- ▶ Double-layer walls (ETICS)
- ▶ Framed walls
- ▶ Three-layer walls without a jamb

POSSIBLE USES

Insulation and sealing of joinery in existing buildings



FOR THE FASTEST RENOVATION ON THE MARKET

RECOMMENDED USES

Installation and sealing of joinery in existing buildings:

- ▶ Single-layer walls
- ▶ Double-layer walls (ETICS)
- ▶ Framed walls
- ▶ Three-layer walls without a jamb

POSSIBLE USES

Installation and sealing of joinery in new buildings



FOR FAST REPLACEMENT AND RENOVATION, INCLUDING IN HISTORIC BUILDINGS

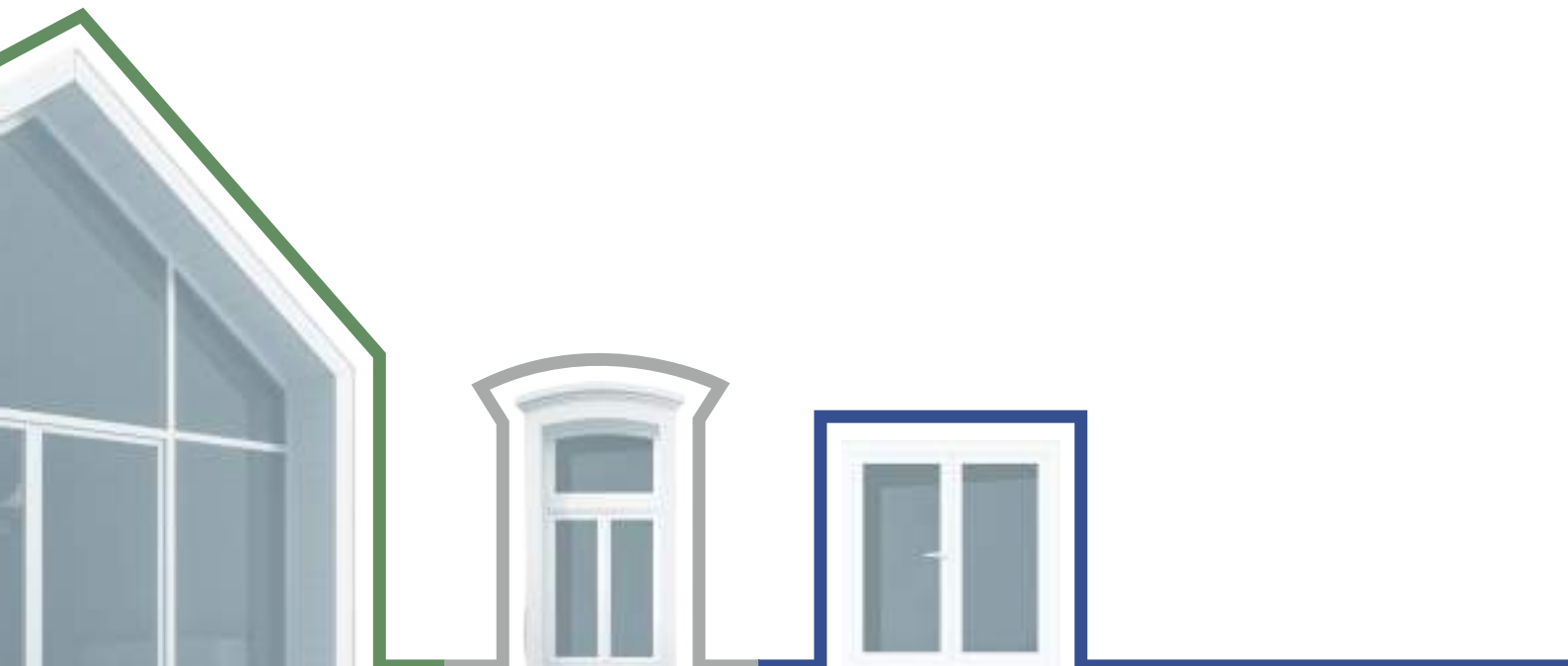
RECOMMENDED USES

Installation and sealing of joinery in existing buildings and on historical sites:

- ▶ Three-layers walls with a jamb

POSSIBLE USES

Insulation and sealing of joinery in new buildings in case of clinker façade wall with a jamb





- ▶ Highly flexible
- ▶ High thermal insulation
 $\lambda \leq 0.035 \text{ W/mK}$
- ▶ Protects even the largest joinery components joints from unsealing
- ▶ Perfectly transmits all the vibrations of the building
- ▶ It remains airtight even under extreme load conditions on the window (rain, vibrations, etc.)
- ▶ Does not deform the frame
- ▶ Excellent thermal and humidity-related performance of the joint:
 $Sd_{\text{internal}} \geq 30 \text{ m}, Sd_{\text{external}} \leq 2 \text{ m}$
- ▶ Excellent resistance to rainwater penetration - class E1200 (1200 Pa)
- ▶ Excellent air tightness - class 4 (600 Pa)
- ▶ Temperature coefficient
 $f_{R_{Si}} \geq 0.8$ (no possibility of humidity or mould formation in the joint)



- ▶ Ultra fast application
- 4x faster than standard three-layer systems
- ▶ Excellent for window repairs and replacement
- ▶ Does not deform the frames
- ▶ Excellent thermal and humidity-related performance of the joint:
 $Sd_{\text{internal}} \geq 30 \text{ m}, Sd_{\text{external}} \leq 2 \text{ m}$
- ▶ Excellent resistance to rainwater penetration - class E1200 (1200 Pa)
- ▶ Excellent air tightness - class 4 (600 Pa)
- ▶ Temperature coefficient
 $f_{R_{Si}} \geq 0.8$ (no possibility of humidity or mould formation in the joint)



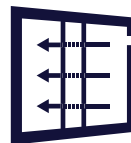
- ▶ Perfect where the facade needs to remain intact
- ▶ Perfect for historic buildings
- ▶ Recommended for walls with clinker facade with the jamb
- ▶ Does not deform the frames
- ▶ Excellent resistance to rainwater penetration - class E1200 (1200 Pa)
- ▶ Excellent air tightness - class 4 (600 Pa)
- ▶ Temperature coefficient
 $f_{R_{Si}} \geq 0.8$ (no possibility of humidity or mould formation in the joint)



Air tightness



Resistance to extreme weather conditions



Water vapour diffusion



UV resistance



Thermal and acoustic insulation



Suppressed vibrations in window gaps



Protection against mould and fungal



Indoor air quality



1. EXTERNAL LIQUID FOIL
2. FLEX FOAM
3. INTERNAL LIQUID FOIL

HIGHLY FLEXIBLE



1. EXTERNAL LIQUID FOIL
2. FAST FOAM
3. INTERNAL LIQUID FOIL

4X FASTER INSTALLATION

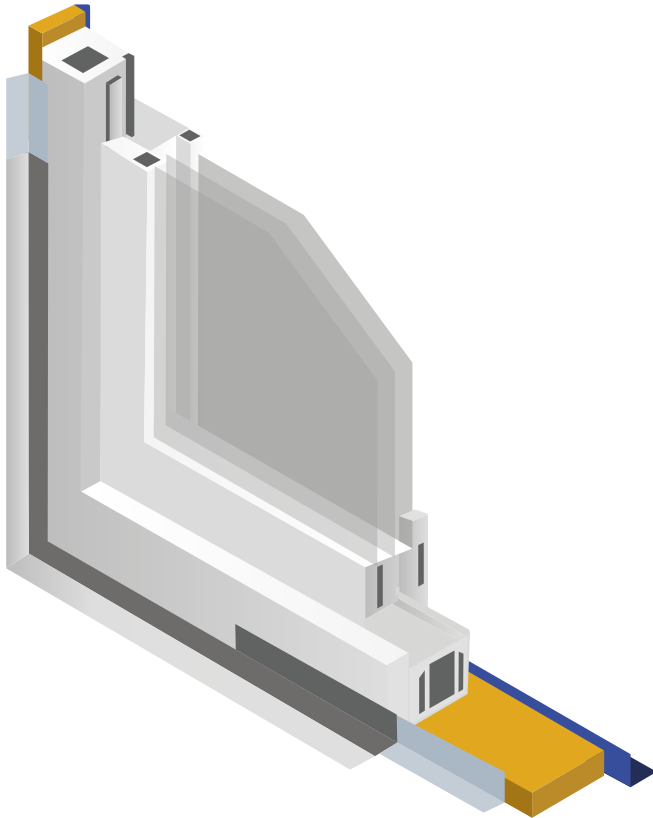


1. FIX TAPE
2. FAST FOAM
3. INTERNAL LIQUID FOIL

WITHOUT FACADE'S INTACT



The set consists of two foam packets, one bucket of external foil and one bucket of internal foil. The yield depends on the size of the window and the width of the gap, for the calculation a typical window 1.5x1.5, width of the joint: 2 cm, depth of the gap: 8 cm was assumed.



RECOMMENDED USES:

Insulation and sealing of joinery, joinery for large apertures and window sets in new buildings:

- ▶ single-layer walls,
- ▶ double-layer walls (ETICS),
- ▶ framed walls,
- ▶ three-layer walls without a jamb.

POSSIBLE USES:

Insulation and sealing of joinery in existing buildings.

INNOVATION FOR NEW AND DEMANDING INSTALLATIONS

WINS Flex is a highly flexible, highly weather-resistant three-layer window installation system that does not require special preparation of the substrate. Protects even the largest windows from deformation. Perfectly transmits all the vibrations of the building and retains its tightness even under heavy loads.

MAIN CHARACTERISTICS OF THE SYSTEM:

- ▶ resistant to extreme weather conditions,
- ▶ highly flexible
- ▶ precise application and guarantee of long-term tightness,
- ▶ 10 years of UV resistance
- ▶ high thermal insulation
 $\lambda \leq 0.035 \text{ W/mK}$
- ▶ passive fire protection, fire class B2
- ▶ perfect transmission of all the vibrations of the building
- ▶ ultra-tightness even under extreme load conditions on the window (hurricanes with a speed of up to 160 km/h)
- ▶ protects even the largest windows from deformation
- ▶ excellent thermal and humidity-related performance of the joint:
 $Sd_{\text{internal}} \geq 30 \text{ m}$, $Sd_{\text{external}} \leq 2 \text{ m}$
- ▶ excellent resistance to rainwater penetration - class E1200
- ▶ excellent air tightness - class 4
- ▶ temperature coefficient $f_{\text{Rsi}} \geq 0.8$
(no possibility of humidity or mould formation in the joint)

Correctly designed and executed sealing of the joint between the window and the frame made according to the described and presented variant of the sealing system using materials produced or supplied by Selena is characterized by the level/class/value of:

THE FEATURE OF THE WINDOW - REVEAL JOINT	REFERENCE DOCUMENT	CLASS/LEVEL/VALUE
Resistance to rainwater penetration	EN 1027	pressure 1200 Pa
Resistance to rainwater penetration	EN 12208	class E1200
Air permeability	EN 1026	pressure 600 Pa
Air permeability	EN 12207	class 4
Air permeability	EN 12207	$Q_L \leq 0.46 \text{ m}^3/\text{hm}$
Air permeability	EN 1026	$a \leq 0.1 \text{ [m}^3/\text{hm}(\text{daPa})^{2/3}]$
Temperature coefficient value f_{Rsi}	EN 13788	≥ 0.80
Linear thermal transmittance	EN ISO 14683	$\leq 0.15 \text{ W/mK}$

WINS FLEX PRODUCTS



INTERNAL
LIQUID FOIL



FLEX
FOAM



EXTERNAL
LIQUID FOIL



VAPOUR-PERMEABLE EXTERNAL LIQUID FOIL

WINS External Liquid Foil is a single-component compound. Creates a very flexible film with a creamy texture based on pure acrylic polymers in a water-based emulsion that forms a flexible, waterproof and durable film. It is chemically neutral and adheres to most construction materials. It creates a performant and vapour-permeable coating. Due to its flexibility, it is suitable for sealing various fissure sizes, including narrow fissures where small joint movements may occur. It is reinforced with polymer fibres.



INDEX N.	10045215	10045171
TYPE OF UNIT PACKAGING	sausage	bucket
VOLUME	600 ml	2400 ml
NET WEIGHT	850 g	3400 g
GROSS WEIGHT	855 g	3600 g
N. OF PCS IN COLLECTIVE PACKAGING	12 pcs/box	-
NUMBER OF UNITS PER PALLET	600	100

Colour	white
Width of the expansion joint	min. 10 mm, max. 30 mm
Recommended substrate temperature for application	min. +5°C, max. +70°C
Recommended air temperature for application	min. +5°C max. +30°C
Temperature of use after curing	from -30°C to +80°C
Minimum coating layer thickness	1 mm
Maximum coating layer thickness	3 mm
Curing time in temperature min. +5°C, 50% RH	1 mm / 5 h
Curing time in temperature min. +23°C, 50% RH	1 mm / 60 minutes
Curing time in temperature max. 30°C, 50% RH2	1 mm / 50 minutes
Equivalent diffusion resistance factor Sd	2 m
Longitudinal tensile strength	1.31 MPa, ISO 527-1 2012
Relative elongation at break - longitudinal	720%, ISO 527-1 2012
UV rays resistance	10 years
Yield sausage, 600 ml, for gap thickness 20 mm	20 rm*
Yield bucket, 2400 ml, for gap thickness 20 mm	80 rm*
Storage temperature	from +5°C to +30°C
Cleaning method	the fresh material is removed with water and the cured one - mechanically

* the exact yield of the product depends on the quality and evenness of the substrate, the thickness of the applied layer and the way the joinery is anchored

TYTAN PROFESSIONAL FLEX FOAM

WINS Flex Foam with great thermal insulation level.
 All year round. Resistant to mould and fungus formation.
 Able to compensate for structural displacements.
 Compatible and adhesive to substrates made of aluminium,
 PVC, wood, silicates, concrete, cellular concrete, ceramic hollow
 bricks, brick, plaster, etc. A full description of the properties
 and conditions of use is available in the product data sheet.

INDEX N.	10045190
TYPE OF UNIT PACKAGING	can
VOLUME	750 ml
N. OF PCS IN COLLECTIVE PACKAGING	12 pcs/box
NUMBER OF UNITS PER PALLET	720



Thermal conductivity coefficient λ	0.035 W/mK
Acoustic insulation	≤ 62 dB
Width of the expansion joint	min. 10 mm, max. 30 mm
Recommended substrate temperature for application	min. -10°C, max. +35°C
Recommended air temperature for application	min. -10°C, max. +35°C
Can temperature for application	min. +5°C, max. +30°C
Cutting time +23°C, 50% RH	30 minutes*
Full cure +23 °C, 50% RH	1.5 h
Yield (free foaming)	up to 48 l
Yield (in gap)	up to 39 l
Foam volume increase (postexpansion)	40% - 80%
Flammability class	B2
Sustainability and hazardous substances	does not contain CFC, HCFC, does not emit TVOC, MDI, ammonia, formaldehyde, does not affect the ozone layer

* result for foam bead 6 cm wide, 3 cm high

INTERNAL LOW VAPOUR-PERMEABILITY LIQUID FOIL

WINS Internal Liquid Foil for windows is a single-component compound. It is chemically neutral and adheres to most construction materials. Creates a hard, flexible, low vapour-permeability membrane. Due to its flexibility, it is suitable for sealing various fissure sizes, including narrow fissures where small joint movements may occur. It is reinforced with polymer fibres.



INDEX N.	10045214	10045170
TYPE OF UNIT PACKAGING	sausage	bucket
VOLUME	600 ml	2400 ml
NET WEIGHT	770 g	3050 g
GROSS WEIGHT	775 g	3250 g
N. OF PCS IN COLLECTIVE PACKAGING	12 pcs/box	-
NUMBER OF UNITS PER PALLET	600	100

Colour	dark grey, anthracite
Width of the expansion joint	min. 10 mm, max. 30 mm
Recommended substrate temperature for application	min. +5°C, max. +70°C
Recommended air temperature for application	min. +5°C, max. +30°C
Temperature of use after curing	from -30°C to +80°C
Minimum coating layer thickness	2 mm
Maximum coating layer thickness	3 mm
Curing time in temperature min. +5°C, 50% RH	2 mm / 5 h
Curing time in temperature min. +23°C, 50% RH	2 mm / 2.45 h
Curing time in temperature max. 30°C, 50% RH2	2 mm / 2.10 h
Equivalent diffusion resistance factor Sd	30 m
Longitudinal tensile strength	1.04 MPa, ISO 527-1 2012
Relative elongation at break - longitudinal	140%, ISO 527-1 2012
Yield sausage, 600 ml, for gap thickness 20 mm	10 rm*
Yield bucket, 2400 ml, for gap thickness 20 mm)	40 rm*
Storage temperature	+5°C to +30°C
Cleaning method	the fresh material is removed with water and the cured one - mechanically

* the exact yield of the product depends on the quality and evenness of the substrate, the thickness of the applied layer and the way the joinery is anchored

INNOVATION 2021 FOR NEW AND DEMANDING INSTALLATIONS



INTEGRATED 3-LAYER WINDOW SEALING AND INSULATION SYSTEM

Resistant to extreme
weather conditions

Precise application
and guarantee of long-term tightness

10 years
of UV resistance

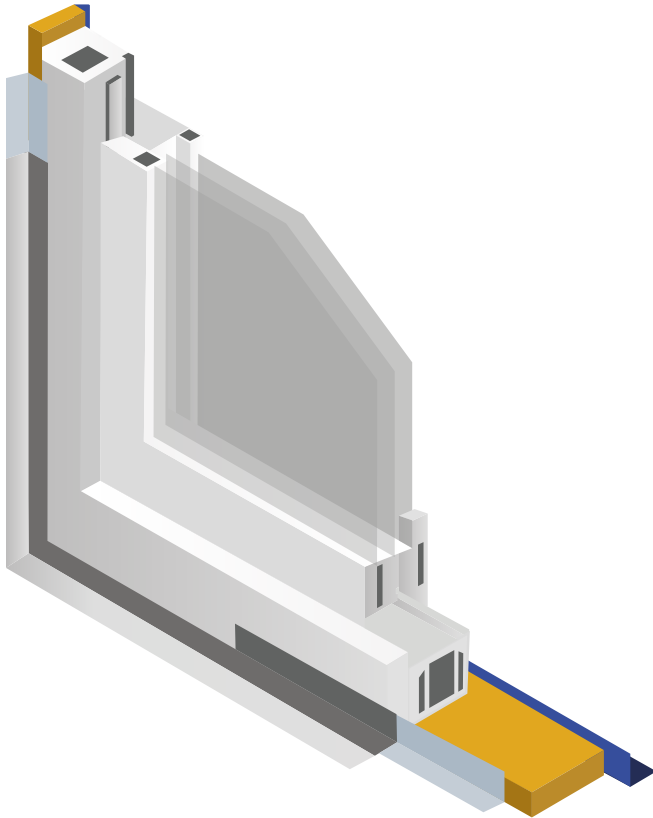


WINS - NEW WINDOWS INSULATION STANDARD
BASED ON LIQUID FOILS

CERTIFIED BY:



www.wins.tytan.pl



INNOVATION FOR THE FASTEST RENOVATION ON THE MARKET

WINS Fast is a very fast and easy to install three-layer window sealing system, which does not require special preparation of the substrate. Universal, independent of the width of the joint. Excellent for window repairs and replacement. It provides a weatherproof sealing and acoustic insulation. Perfect where the speed of installation is relevant.

MAIN CHARACTERISTICS OF THE SYSTEM:

- ▶ 4x faster installation than in case of traditional textile foils,
- ▶ precise application and guarantee of long-term tightness,
- ▶ 10 years of UV resistance,
- ▶ easy and reliable to apply, no need of special substrate preparation or priming of the reveal, independent of the width of the joint,
- ▶ excellent for window repairs and replacement,
- ▶ does not deform the frames,
- ▶ ultra-tightness even under extreme load conditions on the window (hurricanes with a speed of up to 160 km/h)
- ▶ excellent thermal and humidity-related performance of the joint: $Sd_{internal} \geq 30 \text{ m}$, $Sd_{external} \leq 2 \text{ m}$,
- ▶ excellent resistance to rainwater penetration - class E1200,
- ▶ excellent air tightness - class 4,
- ▶ temperature coefficient $f_{Rsi} \geq 0.8$ (no possibility of humidity or mould formation in the joint).

RECOMMENDED USES:

Installation and sealing of joinery in existing buildings:

- ▶ single-layer walls,
- ▶ double-layer walls (ETICS),
- ▶ framed walls,
- ▶ three-layer walls without a jamb.

POSSIBLE USES:

Installation and sealing of joinery in new buildings.

Correctly designed and executed sealing of the joint between the window and the frame made according to the described and presented variant of the sealing system using materials produced or supplied by Selena is characterized by the level/class/value of:

THE FEATURE OF THE WINDOW - REVEAL JOINT	REFERENCE DOCUMENT	CLASS/LEVEL/VALUE
Resistance to rainwater penetration	EN 1027	pressure 1200 Pa
Resistance to rainwater penetration	EN 12208	class E1200
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Air permeability	EN 12207	class 4
Air permeability	EN 12207	$Q_L \leq 0.46 \text{ m}^3/\text{hm}$
Air permeability	EN 1026	$a \leq 0.1 \text{ [m}^3/\text{hm}(\text{daPa})^{2/3}]$
Temperature coefficient value f_{Rsi}	EN 13788	≥ 0.80
Linear thermal transmittance	EN ISO 14683	$\leq 0.15 \text{ W/mK}$

WINS FAST PRODUCTS



VAPOUR-PERMEABLE EXTERNAL LIQUID FOIL

WINS External Liquid Foil is a single-component compound. Creates a very flexible film with a creamy texture based on pure acrylic polymers in a water-based emulsion that forms a flexible, waterproof and durable film. It is chemically neutral and adheres to most construction materials. It creates a performant and vapour-permeable coating. Due to its flexibility, it is suitable for sealing various fissure sizes, including narrow fissures where small joint movements may occur. It is reinforced with polymer fibres.



INDEX N.	10045215	10045171
TYPE OF UNIT PACKAGING	sausage	bucket
VOLUME	600 ml	2400 ml
NET WEIGHT	850 g	3400 g
GROSS WEIGHT	855 g	3600 g
N. OF PCS IN COLLECTIVE PACKAGING	12 pcs/box	-
NUMBER OF UNITS PER PALLET	600	100

Colour	white
Width of the expansion joint	min. 10 mm, max. 30 mm,
Recommended substrate temperature for application	min. +5°C, max. +70°C
Recommended air temperature for application	min. +5°C, max. +30°C
Temperature of use after curing	from -30°C to +80°C
Minimum coating layer thickness	1 mm
Maximum coating layer thickness	3 mm
Curing time in temperature min. +5°C, 50% RH	1 mm / 5 h
Curing time in temperature min. +23°C, 50% RH	1 mm / 60 min
Curing time in temperature max. 30°C, 50% RH2	1 mm / 50 min
Equivalent diffusion resistance factor Sd	2 m
Longitudinal tensile strength	1.31 MPa, ISO 527-1 2012
Relative elongation at break - longitudinal	720%, ISO 527-1 2012
UV rays resistance	10 years
Yield sausage, 600 ml, for gap thickness 20 mm	20 rm*
Yield bucket, 2400 ml, for gap thickness 20 mm	80 rm*
Storage temperature	+5°C to +30°C
Cleaning method	the fresh material is removed with water and the cured one - mechanically

* the exact yield of the product depends on the quality and evenness of the substrate, the thickness of the applied layer and the way the joinery is anchored

TYTAN PROFESSIONAL FAST FOAM

WINS Fast Foam with very good thermal insulation, extremely short curing time, reduced post expansion and high yield. All year round. Resistant to mould and fungus formation. Able to compensate for structural displacements. Compatible and adhesive to substrates made of aluminium, PVC, wood, silicates, concrete, cellular concrete, ceramic hollow bricks, brick, plaster, etc.

INDEX N.	10045189
TYPE OF UNIT PACKAGING	can
VOLUME	860 ml
N. OF PCS IN COLLECTIVE PACKAGING	12 pcs/box
NUMBER OF UNITS PER PALLET	720



Thermal conductivity coefficient λ	0.036 W/mK
Acoustic insulation	≤ 62 dB
Width of the expansion joint	min. 10 mm, max. 30,mm
Recommended substrate temperature for application	min. +5°C, max. +30°C
Recommended air temperature for application	min. +5°C, max. +30°C
Can temperature for application	min. +5°C, max. +30°C
Cutting time +23°C, 50% RH	≤ 10 minutes*
Full cure +23°C, 50% RH	1.5 h
Yield (free foaming)	70 l
Yield (in gap)	up to 45 l
Foam volume increase (postexpansion)	30% - 50%
Flammability class	B3
Sustainability and hazardous substances	does not contain CFC, HCFC, does not emit TVOC, MDI, ammonia, formaldehyde, does not affect the ozone layer

* result for foam bead 6 cm wide, 3 cm high

INTERNAL LOW VAPOUR-PERMEABILITY LIQUID FOIL

WINS Internal Liquid Foil for windows is a single-component compound. It is chemically neutral and adheres to most construction materials. Creates a hard, flexible, low vapour-permeability membrane. Due to its flexibility, it is suitable for sealing various fissure sizes, including narrow fissures where small joint movements may occur. It is reinforced with polymer fibres.



INDEX N.	10045214	10045170
TYPE OF UNIT PACKAGING	sausage	bucket
VOLUME	600 ml	2400 ml
NET WEIGHT	770 g	3050 g
GROSS WEIGHT	775 g	3250 g
N. OF PCS IN COLLECTIVE PACKAGING	12 pcs/box	-
NUMBER OF UNITS PER PALLET	600	100

Colour	dark grey, anthracite
Width of the expansion joint	min. 10 mm; max. 30 mm
Recommended substrate temperature for application	min. +5°C, max. +70°C
Recommended air temperature for application	min. +5°C, max. +30°C
Temperature of use after curing	from -30°C to +80°C
Minimum coating layer thickness	2 mm
Maximum coating layer thickness	3 mm
Curing time in temperature min. +5°C, 50% RH	2 mm / 5 h
Curing time in temperature min. +23°C, 50% RH	2 mm / 2.45 h
Curing time in temperature max. 30°C, 50% RH2	2 mm / 2.10 h
Equivalent diffusion resistance factor Sd	30 m
Longitudinal tensile strength	1.04 MPa, ISO 527-1 2012
Relative elongation at break - longitudinal	140%, ISO 527-1 2012
Yield sausage 600 ml (for gap thickness 20 mm)	10 rm*
Yield bucket 2400 ml (for gap thickness 20 mm)	40 rm*
Storage temperature	+5°C to +30°C
Cleaning method	the fresh material is removed with water and the cured one - mechanically

* the exact yield of the product depends on the quality and evenness of the substrate, the thickness of the applied layer and the way the joinery is anchored

INNOVATION 2021 FOR THE FASTEST RENOVATION ON THE MARKET



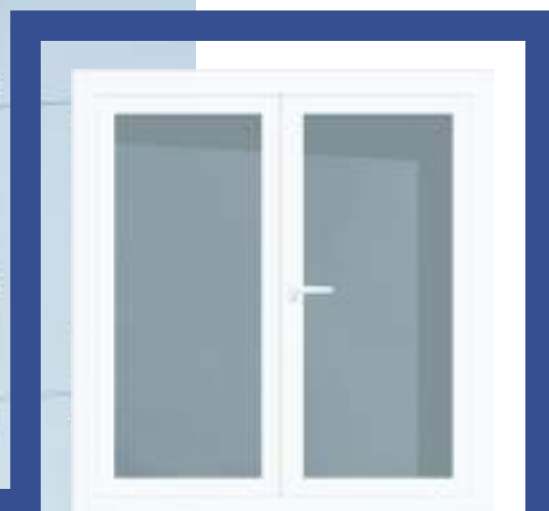
INTEGRATED 3-LAYER WINDOW SEALING AND INSULATION SYSTEM



4x faster installation
than in case of traditional textile foils

**Precise application
and guarantee of long-term tightness**

**10 years
of UV resistance**

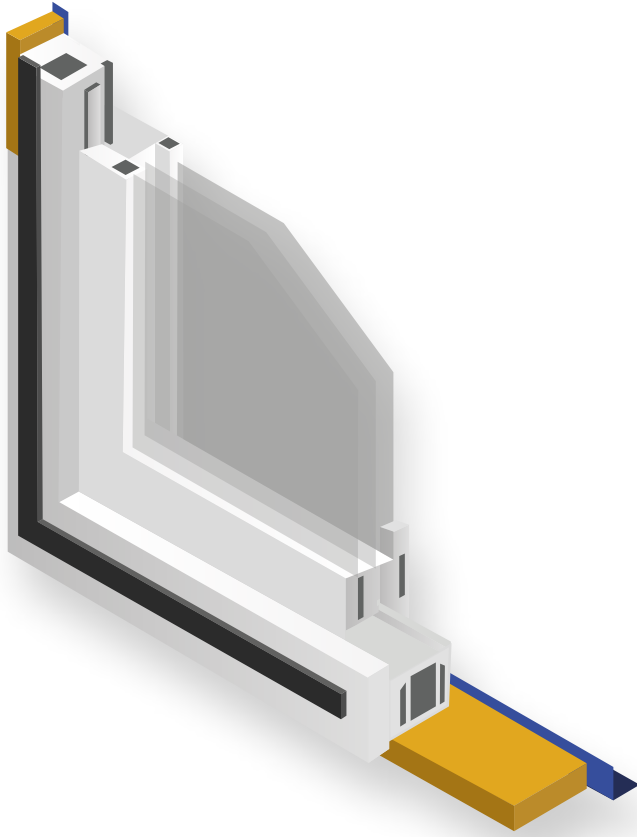


**WINS - NEW WINDOWS INSULATION STANDARD
BASED ON LIQUID FOILS**

CERTIFIED BY:



www.wins.tytan.pl



RECOMMENDED USES:

Insulation and sealing of joinery in existing buildings and on historical sites:

- ▶ three-layers walls with a jamb.

POSSIBLE USES:

Insulation and sealing of joinery in new buildings in case of clinker façade wall with a jamb.

INNOVATION FOR FAST REPLACEMENT AND RENOVATION

WINS Fix is a quick and easy to install three-layer sealing system for windows in walls with the jamb that permits to maintain the external layer of the facade intact. It provides a weatherproof sealing and acoustic insulation.

MAIN CHARACTERISTICS OF THE SYSTEM:

- ▶ 2x faster installation without damaging the facade,
- ▶ precise application and guarantee of long-term tightness,
- ▶ 10 years of UV resistance,
- ▶ perfect where the facade needs to remain intact,
- ▶ perfect for historic buildings,
- ▶ recommended for walls with clinker facade with the jamb,
- ▶ does not deform the frames,
- ▶ ultra-tightness even under extreme load conditions on the window (hurricanes with a speed of up to 160 km/h)
- ▶ excellent resistance to rainwater penetration - class E1200,
- ▶ excellent air tightness - class 4,
- ▶ temperature coefficient $f_{Rsj} \geq 0.8$ (no possibility of humidity or mould formation in the joint).

Correctly designed and executed sealing of the joint between the window and the frame made according to the described and presented variant of the sealing system using materials produced or supplied by Selena is characterized by the level/class/value of:

THE FEATURE OF THE WINDOW - REVEAL JOINT	REFERENCE DOCUMENT	CLASS/LEVEL/VALUE
Resistance to rainwater penetration	EN 1027	pressure 1200 Pa
Resistance to rainwater penetration	EN 12208	class E1200
Air permeability	EN 1026	pressure 600 Pa
Air permeability	EN 12207	class 4
Air permeability	EN 12207	$Q_L \leq 0.46 \text{ m}^3/\text{hm}$
Air permeability	EN 1026	$a \leq 0.1 \text{ [m}^3/\text{hm}(\text{daPa})^{2/3}]$
Temperature coefficient value f_{Rsi}	EN 13788	≥ 0.80
Linear thermal transmittance	EN ISO 14683	$\leq 0.15 \text{ W/mK}$

WINS FIX PRODUCTS



FIX TAPE



FAST FOAM



EXTERNAL LIQUID FOIL



EXTERNAL EXPANSION TAPE

According to DIN 18542 BG1 a sealing WINS Fix tape for external, direct weather protection is a sealing tape consisting of impregnated foam. It is used to pre-seal joints exposed to weather conditions. It acts as thermal and acoustic insulation.



INDEX N.	10045087; 10045088; 10045089
IDENTIFICATION	15/3-7, 15/7-12, 20/10-18
TAPE THICKNESS / GAP DEPTH	15 mm, 20 mm
JOINT WIDTH	3 - 18 mm
TYPE OF UNIT PACKAGING	roll
VOLUME	10 m
BOX	320 rm

Base	flexible polyurethane foam
Impregnation primer	fire retardant acrylic compound
Air tightness	$a < 1.0 \text{ m}^3 / [\text{h} \cdot \text{m}^2 \cdot (\text{daPa})^n]$
Resistance to driving rain	BG1 $\geq 600 \text{ Pa}$
Resistance to temperature changes	from -20°C to $+80^\circ\text{C}$
Fire class	B1
Equivalent diffusion resistance factor Sd	$< 0.5 \text{ m}$
Acoustic insulation	$R_{\text{ST,wmax}} = 59 \text{ dB}$
Thermal conductivity coefficient λ	0.046 W/mK

TYTAN PROFESSIONAL FAST FOAM

WINS Fast Foam with very good thermal insulation, extremely short curing time, reduced post expansion and high yield. All year round. Resistant to mould and fungus formation. Able to compensate for structural displacements. Compatible and adhesive to substrates made of aluminium, PVC, wood, silicates, concrete, cellular concrete, ceramic hollow bricks, brick, plaster, etc.

INDEX N.	10045189
TYPE OF UNIT PACKAGING	can
VOLUME	860 ml
N. OF PCS IN COLLECTIVE PACKAGING	12 pcs/box
NUMBER OF UNITS PER PALLET	720



Thermal conductivity coefficient λ	0.036 W/mK
Acoustic insulation	≤ 62 dB
Width of the expansion joint	min. 10 mm, max. 30 mm
Recommended substrate temperature for application	min. +5°C, max. +30°C
Recommended air temperature for application	min. +5°C, max. +30°C
Can temperature for application	min +5°C, max. +30°C
Cutting time (+23°C / 50% RH)	≤ 10 minutes*
Full cure (+23°C / 50% RH)	1,5 h
Yield (free foaming)	70 l
Yield (in gap)	up to 45 l
Foam volume increase (postexpansion)	30% - 50%
Flammability class	B3
Sustainability and hazardous substances	does not contain CFC, HCFC, does not emit TVOC, MDI, ammonia, formaldehyde, does not affect the ozone layer

* result for foam bead 6 cm wide, 3 cm high

VAPOUR-PERMEABLE EXTERNAL LIQUID FOIL

WINS Internal Liquid Foil for windows is a single-component compound. It is chemically neutral and adheres to most construction materials. Creates a hard, flexible, low vapour-permeability membrane. Due to its flexibility, it is suitable for sealing various fissure sizes, including narrow fissures where small joint movements may occur. It is reinforced with polymer fibres.



INDEX N.	10045214	10045170
TYPE OF UNIT PACKAGING	sausage	bucket
VOLUME	600 ml	2400 ml
NET WEIGHT	770 g	3050 g
GROSS WEIGHT	775 g	3250 g
N. OF PCS IN COLLECTIVE PACKAGING	12 pcs/box	-
NUMBER OF UNITS PER PALLET	600	100

Colour	dark grey, anthracite
Width of the expansion joint	min. 10 mm, max. 30 mm
Recommended substrate temperature for application	min. +5°C, max. +70°C
Recommended air temperature for application	min. +5°C, max. +30°C
Temperature of use after curing	from -30°C to +80°C
Minimum coating layer thickness	2 mm
Maximum coating layer thickness	3 mm
Curing time in temperature min. +5°C, 50% RH	2 mm / 5 h
Curing time in temperature min. +23°C, 50% RH	2 mm / 2.45 h
Curing time in temperature max. 30°C, 50% RH2	2 mm / 2.10 h
Equivalent diffusion resistance factor Sd	30 m
Longitudinal tensile strength	1.04 MPa, ISO 527-1 2012
Relative elongation at break - longitudinal	140 %, ISO 527-1 2012
Yield sausage 600 ml, for gap thickness 20 mm	10 rm*
Yield bucket, 2400 ml, for gap thickness 20 mm	40 rm*
Storage temperature	+5°C to +30°C
Cleaning method	the fresh material is removed with water and the cured one - mechanically

* the exact yield of the product depends on the quality and evenness of the substrate, the thickness of the applied layer and the way the joinery is anchored

INNOVATION 2021 FOR FAST REPLACEMENT AND RENOVATION



INTEGRATED 3-LAYER WINDOW SEALING AND INSULATION SYSTEM



2x faster installation
without damaging the facade

Precise application
and guarantee of long-term tightness



WINS - NEW WINDOWS INSULATION STANDARD
BASED ON LIQUID FOILS

CERTIFIED BY:



www.wins.tytan.pl

SUPPLEMENTARY MATERIALS SELENA FOR PREPARATION OF STRUCTURAL WALL REVEALS PRIOR TO THE INSTALLATION OF WINDOWS AND BALCONY DOORS AND FOR INSULATION AND SEALING OF FRAME TO REVEAL JOINTS

FAST EFFECT ACRYLIC SEALANT

It is a flexible and universal sealant designed to fill cracks, scratches and fissures in walls and ceilings. Due to its innovative formula, it can be painted as early as 10 minutes after application. It is odourless and chemically neutral. It adheres perfectly to porous surfaces such as concrete, plaster, brick, wood, plasterboard. It can be used both indoors and outdoors.

All parameters given are based on laboratory tests and trials in accordance with the manufacturer's internal standards and strongly depend on the curing conditions of the product (packaging, ambient and substrate temperature, quality of equipment used and skills of the person applying the product).



INDEX N.	10041716
TYPE OF UNIT PACKAGING	cartridge
VOLUME	280 ml
NET WEIGHT	0.446 kg
GROSS WEIGHT	0.486 kg
N. OF PCS IN COLLECTIVE PACKAGING	12
NUMBER OF UNITS PER PALLET	1440

Colour	white
Texture	thick paste
Curing time	1 mm / 24 h*
Temperature resistance (after curing)	from -20°C to +80°C
Application temperature	from +5°C to +40°C
Open time	5 - 10 minutes*
Meets the requirements for traffic (ISO 9047)	7.5%

* measured at 23°C and 50% RH. Lower temperature and humidity as well as greater joint thickness increase the curing time

NEUTRAL CONSTRUCTION SILICONE

It is a universal sealing compound that creates a flexible, non-shrinking, waterproof and long-lasting joint. It is basically odourless. It is resistant to UV rays and temperature changes. It has good adhesion to both porous and non-porous surfaces such as concrete, brick, wood, glass, tiling, steel, aluminium, enamel, laminated and lacquered surfaces as well as plastics. Does not cause corrosion of metals and concrete.

All parameters given are based on laboratory tests and trials in accordance with the manufacturer's internal standards and strongly depend on the curing conditions of the product (packaging, ambient and substrate temperature, quality of equipment used and skills of the person applying the product).



INDEX	10041698	10041697	10041696	10041695	10041694	10022225	10022226
VOLUME	280 ml	280 ml	280 ml	280 ml	280 ml	600 ml	600 ml
COLOUR	transparent	black	white	grey	brown	transparent	white
PACKAGING	cartridge	cartridge	cartridge	cartridge	cartridge	foil	foil
PCS IN A COLLECTIVE PACKAGING	12	12	12	12	12	12	12
PCS ON A PALLET	1440	1440	1440	1440	1440	384	384

Colour	transparent, white, gray, black, brown
Texture	thick paste
Curing time	3 mm / 24 h*
Hardness Shore A (ISO 868)	18 ± 102
Temperature resistance (after curing)	from -40°C to +120°C
Application temperature	from +5°C to +40°C
Elongation at break (ISO 8339)	> 150%
Module at 100% elongation (ISO 7389)	0.30 ± 4 MPa
Open time	5-15 minutes*

* measured at 23°C and 50% RH, lower temperature and humidity as well as greater joint thickness increase the curing time

FOAM CLEANER

Multifunctional agent for removing uncured foam and polyurethane adhesives.

INDEX N.	10004617
TYPE OF UNIT PACKAGING	can
VOLUME	500 ml
NET WEIGHT	375 g
GROSS WEIGHT	480 g
N. OF PCS IN COLLECTIVE PACKAGING	6 pieces
NUMBER OF UNITS PER PALLET	750



Colour	colourless liquid
Composition	acetone, isopropyl, alcohol, ethyl acetate
Propulsive gas	propane, butane, isobutane

CURED FOAM CLEANER

Professional cured PU foam removal agent. A professional cleaning product with very high effectiveness. Removes cured polyurethane foam. Perfect for cleaning most types of surfaces: PVC, wood, stone, tiles, concrete, epoxy, steel, upholstery, clothing, work clothes, hands, etc. Very fast, doesn't interfere with the surface structure.

INDEX N.	10036192
TYPE OF UNIT PACKAGING	bottle
VOLUME	100 ml
N. OF PCS IN COLLECTIVE PACKAGING	12
NUMBER OF UNITS PER PALLET	6000



Colour	transparent
Use	removal of cured polyurethane foam from most types of surfaces used in construction

PROFESSIONAL POLYURETHANE FOAM GUN TYTAN PROFESSIONAL PRO GRAFIT

Professional gun for application of polyurethane foams. Due to the use of Teflon-coated construction elements, the gun is highly resistant to dirt.



INDEX N.	10022047
TYPE OF UNIT PACKAGING	carton box
NET WEIGHT	0.308 kg
GROSS WEIGHT	0.435 kg
N. OF PCS IN COLLECTIVE PACKAGING	20 pieces
NUMBER OF UNITS PER PALLET	480

PROFESSIONAL POLYURETHANE FOAM GUN GUN PRO CONTROL



INDEX N.	10024718
TYPE OF UNIT PACKAGING	carton box
NET WEIGHT	0.42 kg
GROSS WEIGHT	0.56 kg
N. OF PCS IN COLLECTIVE PACKAGING	40
NUMBER OF UNITS PER PALLET	480

TYTAN CG SA613 MECHANICAL MANUAL DISPENSER FOR APPLICATION OF COMPOUNDS IN FOIL (SAUSAGE 600 ML)



INDEX N.	10023269
TYPE OF UNIT PACKAGING	0.95 kg
NET WEIGHT	0.95 kg
GROSS WEIGHT	1.2 kg
N. OF PCS IN COLLECTIVE PACKAGING	12 pieces
NUMBER OF UNITS PER PALLET	288 pieces

TYTAN TOOL CASE



INDEX N.	10044893
TYPE OF UNIT PACKAGING	plastic suitcase, dimensions 48x10x37 cm
NET WEIGHT	1150 g
GROSS WEIGHT (GUN WITH THE SUITCASE)	2220 g
N. OF PCS IN COLLECTIVE PACKAGING	5 pieces
COLLECTIVE PACKAGE DIMENSIONS	50x50x40 cm
NUMBER OF UNITS PER PALLET	60 pieces

SILICONE SPATULA



INDEX N.	10041888
TYPE OF UNIT PACKAGING	carton box
N. OF PCS IN COLLECTIVE PACKAGING	25 pieces

14-DAYS COLOURED PAINTING TAPE TYTAN (30 MM X 50 RUNNING METRES)



INDEX N.	10022571
TYPE OF UNIT PACKAGING	carton box
N. OF PCS IN COLLECTIVE PACKAGING	36 pieces

ACCEPTANCE PROTOCOL

ACCEPTANCE PROTOCOL				
ACCEPTANCE OF CONSTRUCTION WORKS BEFORE THE INSTALLATION				
1.	Wall system			
		single-layer with plaster		
		ETICS		
		wooden frame		
		multi-layer		
			fissure insulation	
			facing brick	
			light casing	
			ventilated	
2.	Wall material			
3.	Position in the reveal	levelled		
		external		
		internal		
4.	Internal air humidity			
5.	External air humidity			
6.	Installation temperature			
7.	Clearance dimensions of window apertures			
		height		
		width		
8.	Reveal type			
		with jamb		
		without jamb		
9.	Finishing of the window reveals			
		unplastered reveal		
		description of the reveal condition		
		plastered reveal		
10.	Level of external windowsills			
11.	Level of internal windowsills			
12.	Possible fixing from each side			
13.	Planned fasteners			

CONSTRUCTION WORKS ACCEPTANCE BEFORE THE WINDOW INSTALLATION

14.	Documents of marketing and use authorisation (DoP; AT, etc.)			
		external sealing		
		PU foam		
		internal sealing		

CONSTRUCTION WORKS ACCEPTANCE AFTER THE WINDOW INSTALLATION

15.	Frame sill support			
16.	Thermal insulation of the fissure between the window frame and the reveal around the entire perimeter (including under the frame sill)			
17.	External sealing on the internal joints of the fissure between the window and the reveal			
18.	Internal windowsill fitting			
19.	Internal windowsill fitting			
20.	The deviation from vertical and horizontal plane for elements long up to 3000 mm should not exceed 1.5 mm/m			
21.	The difference in length between the diagonals of the frame and the sash should not exceed 2 mm (for lengths up to 2 m) and 3 mm (for lengths above 2 m)			
22.	The opening and closing of the sashes should be possible without any obstacles			
23.	The sash shouldn't open/close under its own weight			
24.	The closed sash should evenly adhere to the frame, ensuring tightness			
25.	Candle test	tight		
		untight		

SUMMARY



Air permeability according to EN 12207
Joint class 4 - resistance for pressure 600 Pa



Rainwater resistance according to EN 12208
Joint class 9A - resistance for pressure 600 Pa



Acoustic insulation EN ISO 10140
 $R_w \geq 62$ dB



Thermal insulation EN
 $\psi \leq 0.15$



Elimination of the possibility of condensation and mould formation
EN ISO 13788 $f_{Rsi} = 0.8$



Diffusional tightness EN 12572
 $Sd_{internal} = 30$ m
 $Sd_{external} < 2$ m



Sustainability M1
Does not contain CFC, HCFC, does not emit TVOC, MDI, ammonia, formaldehyde; does not affect the ozone layer.



High yield:
1 set is enough for as many as 6 windows.

CERTIFICATES



QUICK INSTALLATION GUIDE



1. Clean the installation surface.



5. Moisten the foam surface with water.



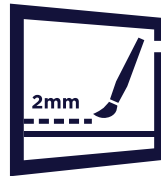
2. Shake the PU foam container before use.



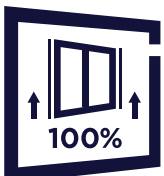
6. Cut off excess foam.



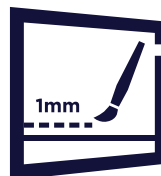
3. Before applying the foam, moisten the substrate.



7. Apply internal foil.



4. Fill the fissure from the bottom up.



8. Apply external foil.



FORM FOR NOTIFICATION OF CONSTRUCTION PROJECT

for 20-year guarantee

1. FULL NAME OF CONSTRUCTION PROJECT

BUILDING TYPE:

- | | |
|--|--|
| <input type="checkbox"/> Single family | <input type="checkbox"/> Public |
| <input type="checkbox"/> Multi-family | <input type="checkbox"/> Obiekt przemysłowy |
| <input type="checkbox"/> Office | <input type="checkbox"/> Other (please indicate) |

2. LOCATION

3. CONTRACTOR DETAILS

Company _____

NIP - Tax Identification Number _____

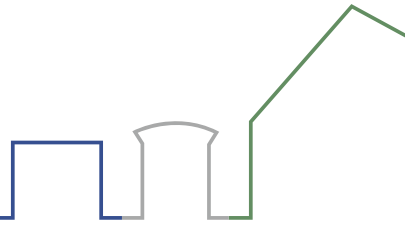
Address _____

Phone number _____ E-mail _____

Data of the reporting person

Name and surname _____

Phone number _____



4. STATEMENT OF TRAINING RECEIVED

The installation works contractor hereby declares that each member of the installation team delegated to carry out the works has been trained by a Selena representative and is authorised for the installation of WINS System, which means that he has the theoretical and practical knowledge necessary to insulate and seal the joint between the reveal and the frame according to the Selena Standards with use of the 3-layer WINS system, in a complete and correct manner. At the same time, the installation works contractor certifies that at least one member of the installation team delegated to carry out the works has WINS system certification n. _____

The installation works contractor undertakes to comply with all technological guidelines of the WINS system contained in technical sheets, Wins Standards, Installation guide.

- Oświadczam, że zapoznałem się z regulaminem certyfikacji budynków w systemach WINS w celu objęcia ich 20-letnią gwarancją szczelności.
- Wyrażam zgodę na przetwarzanie moich danych osobowych na potrzeby skutecznego zarejestrowania i objęcia wyżej wskazanej inwestycji 20-letnią gwarancją szczelności ościeżnic z ościeżkami w systemach WINS.

Date and Contractor's signature

WYPEŁNIA DORADCA TECHNICZNY SELENA FM

LISTA KONTROLNA ZASTOSOWANYCH MATERIAŁÓW:

- | | |
|--|---|
| <input type="checkbox"/> WINS Internal Liquid Foil | <input type="checkbox"/> Mechanical dispenser |
| <input type="checkbox"/> WINS External Liquid Foil | <input type="checkbox"/> Electric dispenser |
| <input type="checkbox"/> WINS Flex Foam | <input type="checkbox"/> Silicone spatula |
| <input type="checkbox"/> WINS Fast Foam | <input type="checkbox"/> Primer |
| <input type="checkbox"/> Foam gun _____ | |

COMMENTS AND RESERVATIONS

DATE OF VISIT OF SELENA REPRESENTATIVE
TO THE CONSTRUCTION SITE

THE FORM DRAWN UP BY
(LEGIBLE NAME AND SURNAME)



Selena FM S.A.
2-4 Strzegomska street,
53-611 Wrocław, Poland

tel.: +48 71 783 82 90
fax: +48 71 783 82 91

e-mail: office@selena.com
www.selena.com



INVESTMENT CLOSURE PROTOCOL

and providing a 20-year tightness warranty

INFORMATION ABOUT THE CONTRACTOR

Company _____ NIP _____

Adress _____

Phone contact _____ E-mail _____

Data of the reporting person

Name and surname _____

Phone number _____

INVESTMENT INFORMATION

Construction name _____

Location / investment adress _____

Date of works commencement _____ Date of works completion _____

BUILDING TYPE

Single family

Office

Other (please indicate)

Multi-family

Public



Type of reveal of base surface

Type of frame (material)

The width of the gap between the reveal and the frame

Reveal width (depth)

METEOROLOGICAL DATA DURING SEALING WORK

Air temperature

Construction base temperature

ATMOSPHERIC CONDITIONS DURING SEALING WORK

Sunny

Partly cloudy

Cloudy

Drizzle

Rain

ISOLATION AND SEALING SYSTEM

WINS Flex

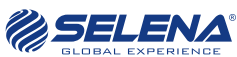
WINS Fast

WINS Fix

ADDITIONAL INFORMATION

_____ date and place

_____ signature

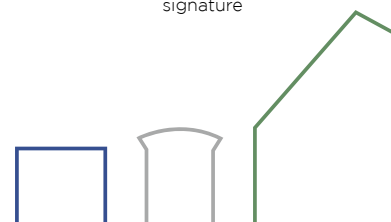


Selena FM S.A.

2-4 Strzegomska street,
53-611 Wrocław, Poland

tel.: +48 71 783 82 90
fax: +48 71 783 82 91

e-mail: office@selena.com
www.selena.com



INSTRUCTIONS FOR SEALING AND INSULATION OF THE FRAME TO REVEAL JOINT IN WINS SYSTEMS

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