

WOODEN WINDOWS AND DOORS WARRANTY CONDITIONS AND USER INSTRUCTIONS

The manufacturer Sumeda, LLC produces windows and doors in accordance with the contract specification. Product design parameters satisfy the conditions of the CE requirements. Company operates in accordance with 9001; 14001; 45001 – ISO standards. Sumeda, LLC ensures warranty for the produced goods counting from the date goods are delivered to the buyer and invoice is issued indicating the date of fulfilment of the buyer's order. It is agreed and acknowledged between the parties that goods must be maintained following the instructions provided in this document.

Sumeda LLC ensures, that during the warranty period:

- ✓ glass unit will not change internally, weeping will not occur inside the glass unit, dust will not get inside the glass unit,
- ✓ hinges securely grip the window/door sash, sash will not brake due to its weight,
- ✓ natural external climate will not cause irreparable wood surface defects,
- ✓ there will be no cracks in wood because of weight of the frame, there will be no cracks in the frame because of inappropriate quality of the material (which is guaranteed under the proper installation and proper indoor climate, by ensuring ventilation and indoor relative humidity is less than 60 %) and the paint coating will be maintained according to the care instructions provided
- ✓ aluminum water drips will not be deformed due to weather conditions, their paint will not peel.
- ✓ wood surface paint will not peel, coating will not fissure (which is guaranteed if the indoor relative humidity is less than 60 %)
- ✓ sash gasket and silicone seam will remain resilient and will not fissure

Note: warranty is not provided if the contract conditions are not fulfilled, manufacturer's requirements and recommendations for product installation, use and maintenance have not been complied. The responsibility of regulation of windows/doors and reinstallation of the hardware (if there will be the need someday) belongs to the company that installed the windows/doors.

The warranty terms are:

- ✓ sash frame and jamb frame - 5 years
- ✓ glass unit - 5 years
- ✓ aluminum coating, aluminum water drips and dashboards - 5 years
- ✓ sash gasket and silicone seam - 5 years
- ✓ front and terrace door fittings - 2 years
- ✓ window fittings - 5 years
- ✓ paint coating - 5 years with surface treatment or 2 years without surface treatment. It is recommended to repaint wood surface after 5 years (process rules are set at the end of the document). Acrylic paint is the most suitable for windows repainting because it has no adverse interaction with seals or the previous window and door coverings.
- ✓ Every 6 months the surface of oak has to be re-oiled, otherwise the warranty will not cover it (recommended care product for wood oak by „OSMO UV-Schutz-Öl“ 420 Farblos seidenmatt.

Notes:

The warranty is provided for colored surface when the care of wood surface is performed at least once a year on the first 5 years of windows and doors usage and twice a year - on spring and on autumn - on the 6-to-10 year of windows and doors usage and when, if necessary, overcoating for damaged wood areas is made.

Recommended care for wooden frame surface: TEKNOCARE 4250-0 from Teknos. The product is intended for painted wooden windows care: cleaning and preservation. Regular usage of this product provides a window surface durability, updates the color and gives shine. Maintenance facility is available:

LITHUANIA: UAB LitMet, Rietavo g. 7, LT-90161 Plungė | info@litmet.com | +370 448 73009

SWEDEN: Teknos AB, Limmaredsv. 2, P.O.Box 211 SE-514 24 Tranemo | info@teknos.se | Tel. +46 325 619 500

NORWAY: Teknos Norge AS, Industriveien 28, NO-3430 Spikkestad | teknos@teknos.no | Tel. +47 31 29 49 00

DENMARK: Teknos A/S, Industrivej 19, DK-6580 Vamdrup | teknos@teknos.dk | Tel. +45 76 93 94 00

UK: Teknos (UK) Limited, Unit E1, Heath Farm, Banbury Road, Swerford, Oxfordshire ox7 4bn | sales@teknos.co.uk | Tel. +44 1608 683 494

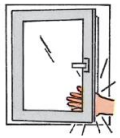
IRELAND: Teknos Ireland Limited, Unit 1, Fortwilliam, Industrial Estate, Dargan Crescent, Belfast bt3 9jp, Northern Ireland, UK | sales.ni@teknos.co.uk | Tel. +44 2890 960670

Warranty applies in the cases when the wooden product surface is maintained as stipulated in the contract and in this document. If any defects appear during the warranty period and the manufacturer agrees with the defects, the manufacturer undertakes to eliminate the indicated defects at its own expense.

To ensure long life of goods it is necessary to properly supervise the wood coating. We observe that the need for maintaining and repainting the surface of wood does not mean that the product is of a poor quality. This is only the standard of wood care.

Note: The warranty is granted for wooden windows and wooden doors but not for additional details, such as shutters or construction, in which the windows or doors are fitted. If repair work is carried out during the warranty period, it is not the basis for extension of the warranty period.

Safe handling instructions



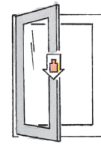
Danger of injury compressing parts of the body between the sash and frame!
When closing a window or door, you cannot insert hands between a sash and a frame.

CMR

Danger of injury and material damage if the sash is pulled over to!
Avoid the window sash pressure to the wall.



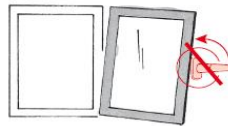
Danger of injury and material damage!
Permanent damage might be done when external objects are placed between a sash and a frame.



Danger of injury and material damage overloading the sash!
Sash can not load any extra weight.



Danger of injury because of the wind impact!
When the wind blows or there might be a draft, close the window.



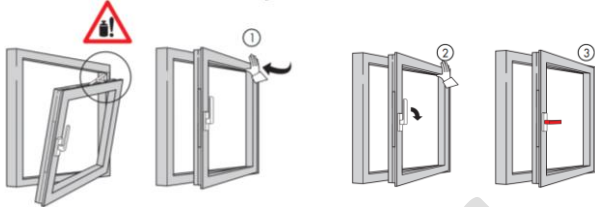
Danger of injury and material damage by improperly swirling the handle!
Do not change the handle position when the window or door is open. Do not try to open the window or door when handle is not completely screwed.



Dropping out risk and danger of injury!
If young children or persons who are unable to assess the risk can gain access to the window, use special security measures such as lock handle.



Dropping out risk and danger of injury while doing pressure to the glass and by breaking the glass!



Inappropriate opening risk!

In order to prevent damage to the window opening mechanism when the windows is improperly opened, close the window as soon as possible following the instructions leftwards.

Operating rules

Information about limitation of function. Windows and doors, that are open, unfixed or in a ventilation position does not perform the following functions: insulation, protection against rain, sound insulation, heat insulation and protection against intrusion. This maintenance and safety instructions shall be applied on all types of windows and doors which are produced by Sumeda, LLC.

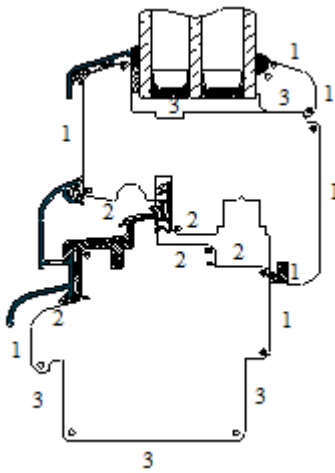
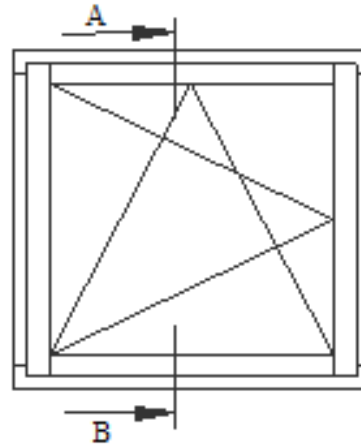
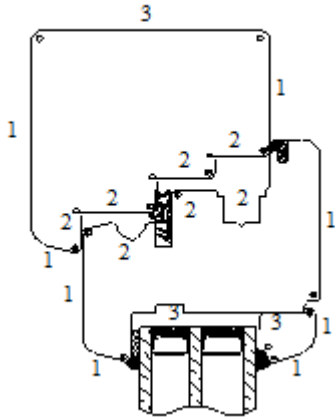
Evaluation of wooden products

IMPORTANT: During the visual assessment of the products, all traces of the use of the product must be removed from the assessment surface (factors influencing the weather conditions - water, snow, mud and other factors influencing the assessment). The overall visual assessment of the product surface is performed from the outside of the product from 5 meters and from the inside of the product from 3 meters. The visual image of the surface is evaluated for a maximum of 15 seconds. Prior to the assessment, the places to be assessed may not be specially marked. Exterior surfaces should be inspected under diffused daylight, and interior surfaces should be inspected under diffused lighting. The visual assessment must be carried out with the surface of the product perpendicular to it, with a maximum deviation of $\pm 30^\circ$ from the perpendicular. In the event of a dispute, the vertical assessment of the angle is decisive. Visual assessment of wood products includes: wood, painting, gaskets, slopes, aluminum profiles, fittings, silicone, glass packages.*

* - According to the recommendations of the Republican Association of Window and Door Manufacturers "Guidelines and Recommendations for Qualitative and Visual Assessment of Windows and Doors and Their Components" according to the Construction Rules ST 2491109.01: 2015 / VV2020 "Installation of Windows, Doors and Their Structures"

Conditions for Visual and Qualitative Assessment

Cross section A B



1 – Surfaces subject to strict requirements

2 - Surfaces subject to strict standard requirements

3 – Surface not subject to requirements or subject to minimum requirements

NOTE: roundings including intersection of surfaces attributed to two different groups shall be subject to the stricter requirements

Wood evaluation

Assessed Property	Assessment Area	Conditions for Visual and Qualitative Assessment,	Requirement	Compliance with the Requirements
Product surface planing, profiling	1	at 3 m distance	The surface of the products (all areas) must be planned or profiled in accordance with the technical drawings of the manufacturer.	No planing or profiling knife impact marks should be visible
	2	at 3 m distance		Planing or profiling knife impact marks may not exceed 2 mm
	3	at 3 m distance		Planing or profiling knife impact marks shall not exceed 40 mm.
Product smoothing marks	1	at 3 m distance	The surface of the products must be smoothed (when this required to keep the wood surface smooth and ensure that no wood hairs remain after painting), with abrasive paper of appropriate grain size.	No transverse or longitudinal smoothing marks shall be visible;
	2	at 3 m distance		Both longitudinal and transverse smoothing marks can be visible;
	3	at 3 m distance		It can be unsmoothed if the work surface does not injure a person during transportation or lifting, and does not interfere with the technological use of the product (i.e., the unsmoothed surface does not interfere with the installation of other structures required for the product (window sills, glass strips, etc.)).
Product wood cracks	1	at 3 m distance	No transverse and longitudinal cracks are acceptable.	No transverse and longitudinal cracks are acceptable.
	2	at 3 m distance		No transverse and longitudinal cracks are acceptable.
	3	at 3 m distance		There may be longitudinal cracks not exceeding 0,5 mm in width and 90 mm in length and not exceeding 10% of the depth of the product. These cracks must be filled with sealing material.
Product wood splitting	1	at 3 m distance	Splitting is only possible in the rabbet area, with the exception of contact surfaces intended for sealing profiles.	≤ 2 mm in the rabbet area up to 20 mm depth.
	2	at 3 m distance		
	3	at 3 m distance		
Serrated joints	1	at 0.5 m distance	Serrated joint shall be free of gaps.	Serrated joint shall be free of gaps as this affects the structural strength of the product;
	2	at 0.5 m distance		
	3	at 0.5 m distance		
Annual ring pattern	1	at 3 m distance	The relief annual rings of the wood can be seen due to the structure of the wood and its properties	The relief annual rings shall not be longer than 0.5 mm and must have no cracks.
	2	at 3 m distance		
	3	at 3 m distance		
Resin leakage	1	at 3 m distance	Wood rich in resins e.g., pine, larch is used for products, thus it is impossible to avoid the leakage of resin.	Small leaks of resin are caused by nature, so they are acceptable and shall not be treated as a defect.
	2	at 3 m distance		
	3	at 3 m distance		
Adhesive residues in seams	1	at 3 m distance	Joints must be cleaned, clean and free of adhesive residue.	Joints must be cleaned, clean and free of adhesive residue.
	2	at 3 m distance		
	3	at 3 m distance		
				Adhesive residues may not protrude by more than 2 mm.

Painting evaluation

Assessed Property	Assessment Area	Conditions for Visual and Qualitative Assessment,	Requirement	Compliance with the Requirements
Painting with a coating colour	1	at 3 m distance	This area must be completely painted with a coating colour evenly, without leaks, in a uniform shade.	The thickness of the paint layer (dry matter) must be at least 100 µ
	2	at 3 m distance	This area must be completely painted with a coating colour evenly, without leaks, in a uniform shade.	The thickness of the paint layer (dry matter) must be at least 100 µ
	3	at 3 m distance	This area must be completely minimally coated with at least one coating layer (not necessarily a final coating layer).	There must be no unpainted places
Painting in transparent (varnish) colour	1	at 3 m distance	This area must be completely painted with a transparent coating, evenly, without leaks, in a uniform shade.	The thickness of the paint layer (dry matter) must be at least 100 µ. Due to the peculiarities of wood patterns (core wood and non-core wood) the shades may differ and this shall not be treated as a defect
	2	at 3 m distance	This area must be completely painted with a transparent coating, evenly, without leaks, in a uniform shade.	The thickness of the paint layer (dry matter) must be at least 100 µ. Due to the peculiarities of wood patterns (core wood and non-core wood) the shades may differ and this shall not be treated as a defect
	3	at 3 m distance	This area must be coated minimally, at least with the first coating layer (varnish).	There must be no unpainted places
Roughness of painted (or otherwise coated) surface of the product	1	Visually, or in contact with the surface of the product	The product must be evenly coated.	Surface of the product must not interfere with cleaning the surface of the product.
	2	Visually, or in contact with the surface of the product	The product must be evenly coated.	Surface of the product must not interfere with cleaning the surface of the product.
	3	Visually, or in contact with the surface of the product	The surface may be rough	When the surface of the product is touched, it must be coated with a coating material and its surface must be such as not to injure a person when touching the product.
Differences in colour and gloss	1	at 3 m distance	Different degrees of gloss are not allowed.	Different degrees of gloss are not allowed.
	2	at 3 m distance	Different degrees of gloss are allowed if they are not visible when the window is closed.	Different degrees of gloss are allowed if they are not visible when the window is closed.
	3			
Shades of hardwood (oak, mahogany, etc.) differences when products are painted in a transparent (varnish) colour	1	at 3 m distance	Since wood is a natural material, when coating such wood with a transparent coating, the shades of vertical and horizontal details may differ.	Differences in shades of hardwood under the transparent coating are not considered a defect;
	2			
	3			

Assessed Property	Assessment Area	Conditions for Visual and Qualitative Assessment,	Requirement	Compliance with the Requirements
Two-colour painting transition line	1	at 3 m distance	The junction of two different shades must be a solid line. The place of colour junction is determined by the structural features of the product or special requirements.	Deviation of the two-colour junction line must not exceed ± 1 mm
	2			
	3			
Product surface imprints	1	at 3 m distance	Imprints are not acceptable	Imprints are not acceptable
	2	at 3 m distance	Imprints are allowed if they are not visible when the window is closed.	Area of acceptable imprints may be ≤ 1 cm ² and depth ≤ 1.5 mm, but the coating of imprints shall be intact and shall not be visible when the window is closed.
	3	at 3 m distance	Imprints are allowed	Area of acceptable imprints may be ≤ 2 cm ² and depth $\leq 1,5$ mm, but the coating of imprints shall be intact and shall not interfere with the technological use of the product (product installation, window sill installation, etc.)
Product surface scratches	1	at 3 m distance	Scratches of surface are not acceptable.	Scratches are only possible not deeper than 0.2 mm and not longer than 10 mm, and the paint layer must be intact. Area of scratches must not exceed 2 cm ²
	2	at 3 m distance	Scratches of surface are not acceptable.	Scratches are only possible not deeper than 0.2 mm and not longer than 10 mm, and the paint layer must be intact. Area of scratches must not exceed 2 cm ²
	3	at 3 m distance	Scratches are acceptable	Scratches are acceptable, but the wood must remain protected.
Wooden product thresholds	1	at 3 m distance	Wooden thresholds must be protected by a coating paint, or other material that protects the threshold from water.	The wooden threshold must be coated with a waterproofing material (oil, varnish, coating paint colour). Because the threshold of the product is physically exposed, abrasion of the coating colour due to physical activity is not considered a defect.
	2			
	3			
Joints for frame, sash, vertical and horizontal parts	1	at 3 m distance	All joints between horizontal and vertical parts must be sealed with an elastic material.	The joints between parts must not have unsealed gaps.
	2			
	3			

Gasket evaluation

Assessed Property	Assessment Area	Conditions for Visual and Qualitative Assessment,	Requirement	Compliance with the Requirements
Inserting gaskets	1	Visually with opened sash;	Gaskets must be placed in the space provided for the gasket, depending on the design of the product.	Gaskets must be held firmly in place. Gaskets must be fully inserted in their place 2
	2			
	3			
Joints of gaskets	1	Visually with opened sash;	Gaskets must be joined without gaps	Gaskets at bends (corners) must be joined neatly (specially cutting the space required for a neat joint) without gaps. When connecting gaskets to each other, the point of connection of the gasket must be at the top of the sash, approximately in the middle (not closer than 50 mm to the intermediate bending point, angle). Gap is not available at the joint.
	2			
	3			
Inserting gaskets depending on the structure	1	Visually with opened sash;	At least one gasket contour in the sash must be placed along the entire perimeter.	At least one gasket contour in the sash must be placed along the entire perimeter.
	2			
	3			
Tightness of gaskets	1	Visually with closed sash	Gasket must completely seal the product around the perimeter.	Gasket must fit snugly around the frame. Bond strength is measured with a simple A4 sheet. If a simple A4 sheet could be inserted between the frame and the gasket, this is considered a defect.
	2			
	3			

Slope evaluation

Assessed Property	Assessment Area	Conditions for Visual and Qualitative Assessment,	Requirement	Compliance with the Requirements
Slope installation	1	at 5 m distance	Slopes must be placed on all horizontal surfaces at the bottom of the product (unless not required by the design of the product)	Slopes must be laid stably and to the end of the product's construction so that water does not enter under the slope. All gaps that allow water to enter under the slope (between the slope and the timber) must be sealed with an elastic material.
	2			
	3			
Shades of slopes	1	at 5 m distance	Slopes (on different horizontal planes) must be of the same shade.	Differences in shades of slopes (on different horizontal planes) are not acceptable.
	2			
	3			
Shades of slopes painted in the same colour as the products	1	at 5 m distance	Slopes painted with the same colour as the products, must have very similar shades. The difference is only possible if the slope is metal and the product is wooden.	The difference in shades cannot be more than one colour tone.
	2			
	3			
Surface of painted or anodized slopes	1	at 5 m distance	Surface of painted or anodized slopes must be covered evenly and on the entire visible surface with the window closed.	Painted or anodized surfaces must be covered with a coating on the entire visible surface. There must be no uncoated surfaces. The protrusions on the visible surface must not exceed 0,5 mm and must not exceed 1 mm ²
	2			
	3			

Painting evaluation

Assessed Property	Assessment Area	Conditions for Visual and Qualitative Assessment,	Requirement	Compliance with the Requirements
Painting of aluminium caps	1	visually at 5 m distance	Aluminium caps must be evenly and completely covered with a coating colour	There must be no unpainted places. The protrusions on the visible surface must not exceed 0,5 mm and must not exceed 1 mm ² when the sash is closed Number of protrusions not more than 1 pcs. Per 1 m ²
	2	when the sash is opened		
	3	visually at 5 m distance		
Shades of aluminium cap painting, mattness	1	visually at 5 m distance	Shades of aluminium cap painting, mattness must be similar	Shades of aluminium cap painting, mattness must be similar
	2	visually at 5 m distance		
	3	visually at 5 m distance		
Joints of aluminium profiles	1	visually at 5 m distance, gap meter	Aluminium profiles must be connected with a rigid connection (depending on the system design).	The gap between the profiles must not exceed 0.3 mm.
	2			
	3			
Overlap of aluminium profiles in planes	1	visually at 5 m distance, gap meter	Aluminium profiles must be connected with a rigid connection and must not separate from each other at the joint point in relation to the planes.	The overlap between the connected profiles in relation to the planes must not exceed 0.5 mm
	2			
	3			
Joining angles of aluminium profiles	1	By hand	The corners of the aluminium must be rounded to prevent injury when taking the product.	Sharp connection angles are not possible.
	2			
	3			
Aluminium decorative dividers on a glass package	1	visually at 5 m distance, gap meter	An aluminium divider at the joint with a perpendicularly passing profile gap is allowed.	The size of the gap depends on the length of the divider. The gap size is calculated as follows: For a 1 meter divider, a gap of 0.5 mm is allowed on one side of the divider's connection to the profile perpendicular to the divider. Divider spacing must be the same in the same product.

Fitting evaluation

Assessed Property	Assessment Area	Conditions for Visual and Qualitative Assessment,	Requirement	Compliance with the Requirements
Fastening of fittings	1	at 3 m distance	All visible and invisible (when the sash is closed) fittings must be fastened with the necessary screws at all fastening points.	All screws must be screwed in the required places (there must be no empty holes). The screws cannot be turned over. The screws must not be screwed at an angle. Closing plates must be attached straight
	2	when the sash is opened		
	3	at 3 m distance		
Coating of the fitting surface	1	at 3 m distance	The surface must be free of scratches and corrosion.	The surface of the fittings must be free of scratches and free of corrosion when the sash is opened.
	2	when the sash is opened		
	3	at 3 m distance		
	2			
	3			

Silicone evaluation

Assessed Property	Assessment Area	Conditions for Visual and Qualitative Assessment,	Requirement	Compliance with the Requirements
Silicone seams to the glass package	1	at 3 m distance	The gap between the glass package and the wood or aluminium must be completely sealed, the seam formed smooth.	The silicone seam must not sit or protrude more than ± 1 mm. Silicone seam cracking is not acceptable. Corner of the silicone seam must be clean.
Application of silicones, sealants in technologically necessary places	1	at 3 m distance	In technologically necessary places, silicone, sealants must be filled evenly	Silicone or sealant residues, unsealed cracks are not acceptable
	2	when the sash is opened	In technologically necessary places, silicone, sealants must be filled evenly	Silicone or sealant residues, unsealed cracks are not acceptable
	3	at 3 m distance	In technologically necessary places, silicone, sealants must be filled evenly	Residues are possible if they do not interfere with the structure.

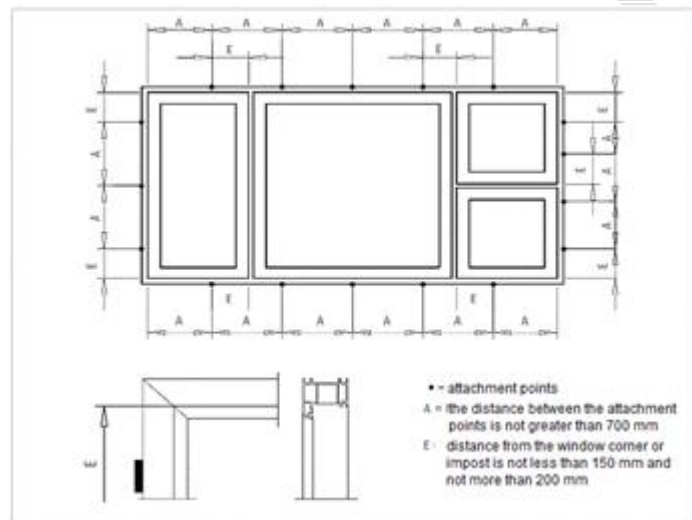
Transportation and installation

Cargo must be carried out in accordance with Convention on the Contract for the International Carriage of Goods by Road (CMR) (Geneva, 19 May 1956). Products must be transported only packed. Production which is not yet installed, must be properly stored. Also need for high quality installation based on Building Regulations. Improper transportation and inadequate storage of the goods before installation may permanently cause damage to the them. Warranty does not cover goods, which were damaged during improper transportation, storage or installation. The basic rules for transportation and installation are: 1) protect the goods from the condensate, which accumulates on the surface, 2) do not store the goods outdoors with a direct impact on the climate, protect from moisture, dirt and mechanical damage, 3) we recommend to remove the protective film from the products in two-week period (storage of packaged products is acceptable only when air flow channels are made under the protective film. Protective film must not come into contact with the product surface). We observe that goods must be installed in accordance with an illustrated charts. Otherwise, the functionality of goods and ease of use guarantee is not provided.

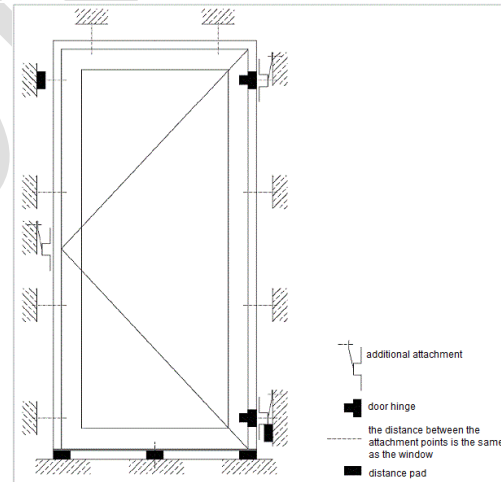
Sequence of window mounting works:

- ✓ Checking the tool kit and the dimensions;
- ✓ Preparing the opening for mounting;
- ✓ Indicating the number and manner of fastening;
- ✓ Placing the bearing and mounting spacers;
- ✓ Placing the product on the spacers;
- ✓ Regulating the products' vertical and horizontal profile by using spirit level and changing the height of the spacers;
- ✓ Fixing the product in the opening;
- ✓ Taking away no longer necessary supportive mounting spacers;
- ✓ Sealing the gaps between the casing and the edges of the opening.

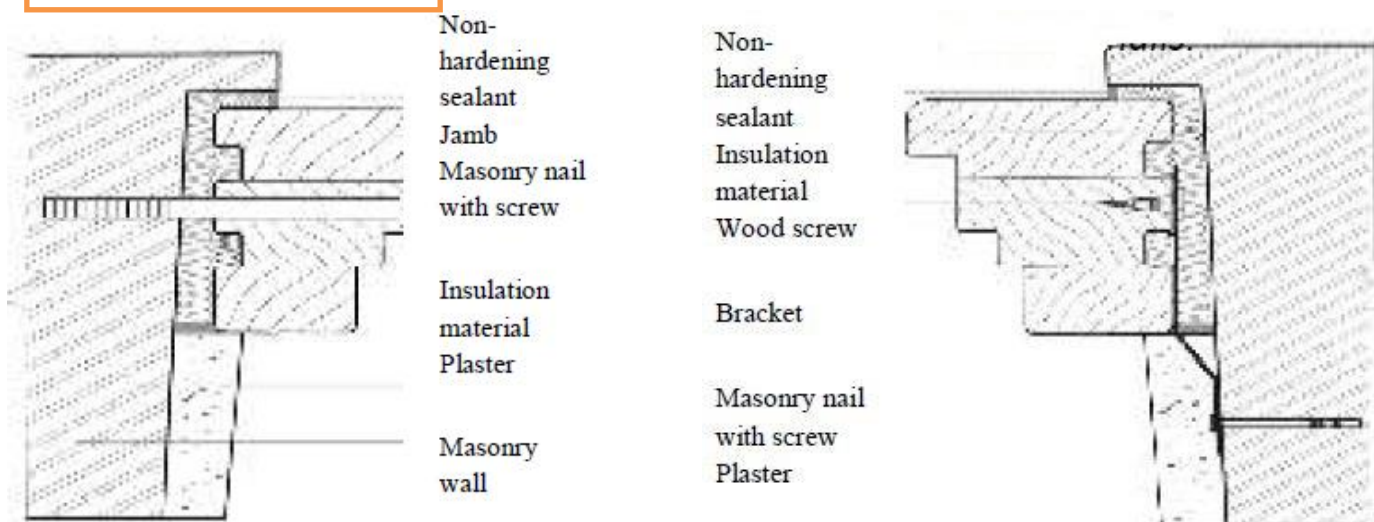
The window installation diagram. Source: Building Regulations ST 2491109.01:2015



The door installation diagram. Source: Building Regulations ST 2491109.01:2015. We observe that blocks marked in black in the figure should be left after mounting and sealing.



Ways of fastening



Mounting with masonry nails and anchors through the wall

Directly through the frame, drill a hole of such a diameter to secure the masonry nails. Recommended masonry nail diameter – 8-10 mm (minimum mounting depth - 30 mm)

Mounting with anchors with a screw or masonry nails

The anchor has to be fastened with the self-tapping screw (min. 3,5 x 35) to the frame. Anchors fastened to the building wall with bolts or bricks (minimum mounting depth - 30 mm)

Fasteners for wood constructions. Source: Building Regulations ST 2491109.01:2015

Sealing

- ✓ The gaps must be sealed so that the frame of the product is not deformed (too much sealing foam may deform the frame), leaving no voids and no gaps between the frame and the wall.
- ✓ Products must be mounted in the zone of wall heat insulation. To prevent water and wet air, the edges of the product must be properly sealed.
- ✓ Edges of the opening must be additionally hydro-insulated from inside and outside, because sealing foam does not protect from humidity.
- ✓ It is necessary to heat-insulate the edges of the opening from the outside, because in case of insufficient insulation the frame of the door or the window may get frozen.
- ✓ The sealant foam on the painted or lacquered surfaces of the product must be cleaned immediately, otherwise the product may be aesthetically damaged.

Wood surface maintenance

Do not use aggressive cleaning products on the surface of the window, do not use aggressive adhesive tapes, in the event of surface damage - cover it as soon as possible with the necessary means.

- ✓ At least several times a year clean the surface from dust and dirt. Use a water-soaked sponge or cloth (do not use household cleaners that can damage the wood, glass or fittings). Failure to do so may result in mold and lichen. The hard dirt can be removed with special wood cleaners. The profiles are susceptible to cement, chlorine, aggressive cleaners.
- ✓ During the construction or repair work (plastering, luting, painting), it is necessary to cover the surface of the product with the protective film (recommended Agro light-colored "breathable" film – in order to insure against the probability of formation of the "greenhouse effect" and as a result – paint rebound or wood resin release, glass thermal breakage. **Note: carefully read the point about glass pane maintenance below.**) and suitable adhesive tape. TESA 4438 and TESA 4838 adhesive tapes protect window coverings from damage. It should be noted that TESA tape must be peeled off within 3 days because longer storage can lead to accumulation of moisture between the window and the protective film and this can damage the wooden/aluminum surface. Also can be used: Scotch 2090-2 (3M) masking tape (blue), PROF masking tape (blue), Scotch (3M) construction tape (black), Tesa 4334, precision masking tape (yellow), Tesa 5258, masking tape for outdoors (blue).
- ✓ We warn that unremovable surface irregularities may appear, if the plaster mixture gets on painted surfaces. Product damage, occurred during construction works is a non-warranty.
- ✓ If the coating of windows or door paints or lacquer over time changes slightly, this is a natural consequence of environmental impact (sun, air, humidity).

Note: after installation of windows, but when the roof is not yet closed or the wall finish is not yet completed, it is necessary to protect the window frames and glass from the outside, because rain water washes building materials, and irreparable damage on the window frame and the glass appears. While construction works are carried out it is necessary to cover the windows with the purpose to protect them.

The main wooden window repainting rules: **1)** Do not paint sealing joints, gaskets, locks, handles, plastic trim, silicone joints to the glass unit, insect nets and other moving parts. **2)** Prepare the surface before painting. The previous coating must be abraded with sandpaper or sanding sponge. Clean the dust with a soft damp cloth. **3)** Do not use abrasive or other cleaner damaging the surface. **4)** Before painting use fats strippers or primers and make sure that they are really dry **5)** Apply paint only on opened window and do not close it until the paint is dry. Ensure that painted surface is not damaged during opening and closing, by contact with other surfaces until paint is completely dry. **6)** Before closing the painted window or door, lubricate the gasket with fats (e.g. cooking oil), so that it would not broaden a piece of surface upon a contact with a new paint coating.

IMPORTANT! Regardless of the surface coating, resin leakage (for e.g. almost all coniferous wood, including Red Meranti) may happen while using resinous timber in window production - the risk is higher with darker coatings. Slight leaks of resin are natural and that is not a defect.

Glass unit maintenance

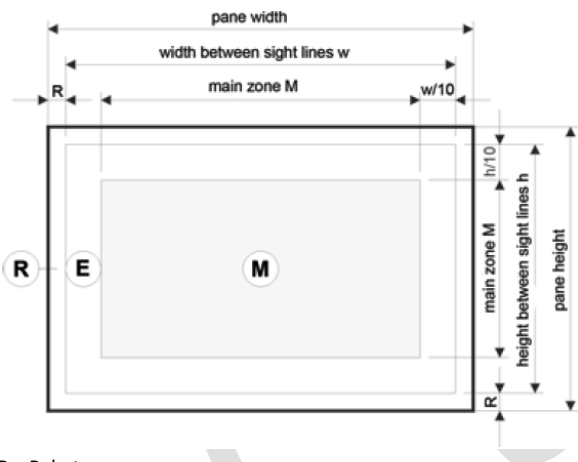
1. CHECKING

The most important thing when checking for defects is the overall view through the glass packet, i.e. looking at the background behind it, not reflections. Possible discrepancies are not specifically described or described.

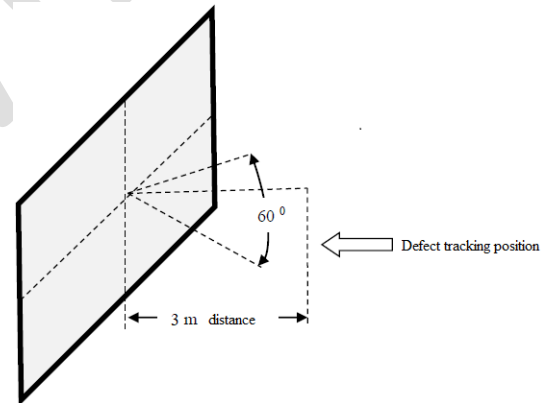
The inspection of glass products must be carried out at a distance of approximately 3 meters from the viewing surface at a certain viewing angle, which corresponds to the generally accepted use of the premises. Verification takes place under diffused daylight (e.g. cloudy sky), without direct sunlight or direct artificial lighting.

2. PARAMETERS

The scheme of the glass unit



The position of the glass defect assessment



- R = Rebate zone
The visually concealed area in the installed state (no limits on discrepancies, with the exception of mechanical damage to the edges)
- E = Edge
Area around edge with width $w/10$ or $h/10$ respectively (less stringent assessment)
- M = Main zone (most stringent assessment)

Verification conditions: when checking defects of the glass unit, the distance between the checker and the glass must be not less than 3 meters. The test must be carried out in the daylight with even cloudiness and without direct sunlight or direct artificial lighting.

Zone	Allowed in one glass:
R	Damages on the outer side and edges of the surface, including grit, which do not affect the strength of the glass and do not exceed the width of the sealant layer.
	Scrape inside without fragments, filled with insulating mass
	Spot and surface compounds and scratches - without restrictions.
E	Inserts, blisters, spots, spots, and so on. defects: where the sheet area is $\leq 1m^2$: not more than 4 units each having a diameter of ≤ 3 mm for sheet area $> 1m^2$: not more than 1 unit with diameter ≤ 3 mm per meter per meter
	Spot sediment between glasses: when the sheet area is $\leq 1m^2$: no more than 4 pcs. diameter ≤ 3 mm each when sheet area $> 1m^2$: no more than 1 pc. diameter ≤ 3 mm per 1 meter per meter
	Precipitation in the form of spots between the glasses: white-gray and translucent - not more than 1 unit with an area of ≤ 3 cm ³
	Scratches: The amount of individual scratch lengths - no more than 90 mm, one scratch length - no more than 30 mm.

	Micro scratches: Not allowed in larger groups
M	Inserts, blisters, spots, spots, and so on. defects: sheet area ≤ 1 m ² : no more than 2 pcs. with a diameter of ≤ 2 mm 1 m ² <sheet area ≤ 2 m ² : no more than 3 pcs. with a diameter of ≤ 2 mm sheet area > 2 m ² : no more than 5 pcs. with a diameter of ≤ 2 mm
	Scratches: The amount of individual scratch lengths - no more than 45 mm, one scratch length - no more than 15 mm.
	Micro scratches: Not allowed in groups.
E+M	The maximum number of defective discrepancies is the same as in zone R. Inserts, jigsaws, dots, spots, etc. with dimensions of 0.5-1.0 mm are available without restrictions, except when they are in groups. "Group" means that at least 4 blisters, dots, spots, or so on. defects are located inside the circle with a diameter of ≤ 20 cm.
<p>Notes:</p> <ul style="list-style-type: none"> • Defects with dimensions ≤ 0.5 mm are not evaluated. The diameter of such defective zone must not exceed 3 mm. • The permissible frame displacement in the two-chamber package is ≤ 2 mm. • In the production of packages, frames are prepared in two ways: <ul style="list-style-type: none"> ➢ Cutting and connecting in corners. In this way, all types of frames can be prepared; ➢ Fitted with special equipment and connected in straight sections; <p>In both cases, the frames may contain 1-2 joints in the double-glazed unit (3-4 in the two-chamber package, respectively), and if the perimeter is ≥ 6 m and the 3 or 4 connection.</p> <p>Laminated Glass:</p> <ol style="list-style-type: none"> 1. For each laminated glass sheet area E and M, 50% more defect numbers in groups are allowed. 2. Laminated glass with liquid resin may have a waviness resulting from the manufacturing process. <p>Tempered glass:</p> <ol style="list-style-type: none"> 1. The local wavelength on the glass surface shall not exceed 0.3 mm in each 300 mm section <p>With a nominal glass thickness of 6 mm to 15 mm, the glass surface curvature, depending on the thickness of the glass, must not exceed 3 mm for every 1000 mm of glass edge length.</p>	

3. PHYSICAL PROPERTIES

The following physical phenomena may occur in glass units: Effect of interference; Double-glazed glass effect; Anisotropy; Condensate formation; Wet glass surfaces. All of these phenomena are typical of glass packs and are not seen as drawbacks.

Glossary:

Effect of interference. In glass packets with float glass, the effect of interference can be seen. This effect occurs in colored zones of higher or lower intensity, which change by clicking on the glass. Optical interference occurs due to the coincidence of light waves at one point. The effect is enhanced by parallel or almost parallel glass surfaces. The effect of interference can be seen in the whole or part of the surface of the glass surface. The phenomenon of interference occurs randomly and cannot be influenced.

The effect of a glass glazing (double glazing). The double-glazed unit has a sealed volume of air or other gas. The state of the gas in the glass unit is determined by the manufacturing site altitude, atmospheric pressure and temperature during production. If the double-glazed unit is installed in another altitude, the atmospheric pressure or air temperature changes during operation; hissing or bending. As a result, distortion of the glass packet may occur. Glass packets may also display reflections of varying intensity. Aspiration can be seen particularly clearly if there is a dark background or coated coatings.

Anisotropy. Anisotropy is a phenomenon characteristic of tempered glass due to internal stresses caused by the hardening process. Anisotropy can reveal dark wheels or bands that vary depending on the viewing angle if the glasses are in polarized light or viewed through polarized glasses. Polarized light is also present in normal daylight. The degree of polarization depends on the weather and the sun. The effect is more pronounced when looking at the glass at an oblique angle or in glass packs mounted at right angles to corner facades.

Condensate formation. Condensate may form on the outer surface of the glass if the glass surface temperature is lower than the ambient air temperature. The formation of condensate on the outer surface of the glass unit is determined by the heat transfer coefficient of the glass unit, the relative humidity of the air, the movement of the air to the glass surface and the temperature of the outdoor and indoor air.

Condensate on the glass surface inside the room usually results from insufficient air movement to the glass surface, for example. Due to low ventilation, too much relative room air humidity, due to curtains, blinds, deep vault, flower pots, unfavorable radiators, and so on. In some cases, condensate may form on the outer surface of the glass from the outside on the glass surface with good thermal insulation, when the relative humidity of the outdoor air is high and the outdoor temperature is higher than the glass surface.

Wet glass surfaces. Due to the roller, fingers, labels, paper texture, vacuum soaps, sealant residues, polishing and other tools, the water adhesion to the glass surface may vary. Different areas of the urine can be clearly seen when the glass is moistened due to dehydration (condensation), rain or washing water.

4. GLAZING RELATED TO INCREASED THERMAL AND / OR DYNAMIC LOADS

Damage to the glass due to increased thermal or dynamic loads is not covered.

Risk factors for thermal fractures:

Films, paints, inner blinds, backed objects. The installation of absorbent films or paints, internal blinds on existing glazing, retaining objects in glass, can cause thermal cracking of the glass. The manufacturer should be consulted before such glazing changes are made.

Floating asphalt. If the asphalt in the glazed areas is poured, the glass will be heated strongly and unevenly on one side. Glass units must be protected by appropriate means. It is recommended to remove the glass packs completely at that time.

Heating and conditioning devices. Heating and conditioning devices should be kept at least 20 cm away from the glazing units. If the inner pane of glass is tempered, the distance can be reduced to 15 cm. The length of the heater should be within the entire width of the glass unit to ensure even glass surface heating. If the heating devices are installed closer than the above distances, the safety shields of the heaters should be used for safety reasons.

5. CHANGES OF COLOR

All materials used in glass production have their own characteristic, raw material color, which is becoming more and more noticeable as glass thickness increases. Glass with special coatings is used for energy saving requirements. Glass with a coating also has a characteristic color. This color may differ due to optical conditions (light transmittance and reflection, glass orientation). Fluctuations in color intensity are possible due to the amount of iron oxide in the glass, the coating process, the coating itself, the thickness of the glass, the place of glass insertion and all this cannot be avoided. When additional glass-coating orders are made, it is not possible to guarantee that the color will be absolutely identical for reasons related to the production technology. This type of color change cannot be treated as a basis for claim.

6. GLASS DECOMPOSITION

Modern production technologies significantly reduce internal glass tension. Usually glass breakage occurs due to external factors and therefore there is no reasonable basis for claim. The warranty applies to the sealing of the glass unit, but not to the heat. Responsibility for breaking usually rests with the person responsible for the glass at the moment of impact. Therefore, we recommend taking appropriate measures to protect the glass packets.

Reinforced and heat-absorbing glass, due to its specific physical properties in the glass package, exposed to mechanical and thermal loads, has a higher risk of impact. Therefore, these guidelines should be followed.

Tinted glass absorbs more solar energy than plain transparent glass. Thermal stress arises due to the following reasons: covered areas or shadows; hot air pockets due to insufficient air circulation.

Under unfavorable conditions, these stresses cause the glass to break down from the edge of the glass. Therefore, the following conditions should be observed, in particular for glazing in direct sunlight: The entire glass surface should be either in the shade or in the sun; Sufficient, uniform ventilation of the inner surface of the glass must be ensured; The absorption of the frame material and the glazing pads must be selected according to the absorption of the glass; There must be freedom allowing the glass to expand and move. Strict attachment must be strictly avoided.

If the listed criteria cannot be met in certain circumstances, the increased risk of tinted glass strokes can be eliminated by the use of toughened glass. In addition, if the frame thickness > 16 mm and the unfavorable aspect ratio, it is recommended to harden the thinner glass of the asymmetric glass unit. Self-decomposition can occur in hardened glass during operation, which is affected by impurities in nickel sulphide. These breakdowns are accidental and independent of the glass packs or glass manufacturer, and therefore cannot be considered glass fracture.

7. DAMAGES OF GLASS SURFACES

Glass surface can be damaged by mechanical, thermal and chemical factors.

Alkaline damage

Alkaline materials, washed from concrete surfaces and exposed to glass or mortar of lime and cement, can settle the glass. Especially during construction, glass surfaces already installed must be protected from such factors. Freshly squeezed and still untreated lime and cement mortar spots can be washed with water, and the resulting glass damage can be eliminated under special conditions only with special cleaning agents. Damaged violations are usually not eliminated.

Welding drops or sparks from grinding and cutting discs

If welding or grinding operations are performed near glazed surfaces, welding drops or hot sanded particles can penetrate the glass and damage the surface. After cleaning their glass from the glass, micro-cracks remain on the surface.

Facade cleaning factors

The facades, especially of brick buildings, are often contaminated during the construction work and polluted. The glass surfaces are then usually cleaned with facade cleaners containing hydrofluoric acid, which can damage the glass surface. This could be avoided by building work, covering the glass with film. Glazing elements should be protected against such violations because they are the responsibility of the construction contractor. Because of the variety of possible glass surface damage, it is impossible to give a comprehensive list of protective measures. On a case-by-case basis, risk assessment and appropriate safeguards should be applied.

8. GLASS CARE AND CLEANING

Care. All building materials, such as window frames, paint, sealing joints or strips, are the subject of a natural aging process. Regular functionality tests are required to maintain the validity of the warranty and extend the lifetime of the double-glazed units. Regular and

appropriate intervals should be used for all maintenance work, such as window frame painting (if the windows are wooden), checking for leaks between the glass and the window frame, inspection of ventilation and steam pressure alignment holes.

- ✓ **Cleaning:** all glass cleaning measures are appropriate for cleaning glass unit. Do not use: abrasive tools, razor, strong alkaline solutions, acid or hydrofluoric solutions.
- ✓ **Protection from scratches:** protect glass unit from welding or grinding work, also from contact with the plaster mixture because while trying to remove them, glass surface scratches are left.
- ✓ **Protection against breakage:** protect glass from sash smashing, do not leave windows opened without supervision, particularly on a windy days (thermal glass unit breakage, breakage due to the pressure difference or mechanical punch is not the warranty case. The warranty applies to glass unit tightness, but not to the breakage).

Important: The warranty does not apply to glass fractures caused by direct mechanical impact, external shocks, accidents, misuse or pressure changes. The warranty applies to the insulation of the glass unit, but not its breakage!

- ✓ In order to avoid different thermal stresses and glass breakage, thermal cracks, do not stick any films on the glass.
- ✓ Avoid the high temperature difference that impacts the glass unit. Greater than 36°C temperature difference increases the probability of breakage.
- ✓ The risk of thermal break increases significantly if plastic or paper screens are installed (from the inside or outside), objects resting on the glass (as an example: mineral wool panels, plasterboard panels, furniture cabinet, bed mattress, etc.).
- ✓ Do not store heating devices next to the glass (distance: not less than 20 cm to the glass, temperature of heating equipment shall not exceed 65°C), avoid direct flow of warm air to the glass.
- ✓ Household appliances distance to the glass shall be not less than 30 cm.
- ✓ Start the heating of the premises little by little, especially during the winter, avoid temperature extremes inside the room, never direct the flow of warm air directly into the glass, do not put the air conditioner near the windows.
- ✓ When installing internal or external blinds, observe the requirement that the distance between the blinds and the glass must be at least 2 cm.
- ✓ Ensure consistent heat maintenance in the room (especially during winter), avoiding sudden temperature rise or fall. The minimum temperature must not be lower than +5°C.
- ✓ Note that tinted glass unit should be illuminated or should be in the shadow by the total area, because differently heated glass will break.
- ✓ Do not place dark objects near the glass. Make sure there are no items which are touching the glass.
- ✓ If there is a fireplace near the window, a protective shield should be placed between it and the window, which prevents the glass unit from becoming hot. Otherwise the window glass unit can explode.
- ✓ **Protection against injury:** if glass unit is damaged, apply thick, sticky tape on the breakage in different directions across it and contact a company which is specialized in glass unit replacement.
- ✓ **Care of Pilkington Activ.** Pilkington Activ glass is coated with a special coating that performs two functions: decomposition and dirt removal. In daylight, this coating reacts with ultraviolet rays to break down organic pollutants. Rainwater, evenly flowing down, rinses the dirt off the glass, thus exploiting the process of photocatalysis. Later, the glass is exposed to water. Glass is hydrophilic, so the surface of the water does not flow with drops but with a smooth stream. Care should be taken to follow all recommended safety procedures associated with the products used to clean the glass. Please note that spraying windows with a hose will only be practical and safe for low-rise buildings. If the water quality is very hard (i.e. greater than 180ppm combined content of calcium carbonate and magnesium carbonate), use a domestic water softener, or a couple of drops of dishwashing detergent per litre, in rinsing water.

Symptom	Cause	Solution
Dusty windows	Dust from roads or building/construction work is mostly inorganic in nature, and so is not destroyed by the Pilkington Activ™ coating.	Wait for natural rainfall or spray with hose.
Dusty window beneath overhang	Deeply recessed windows will not receive any natural rainfall.	The window will be "activated" by daylight, and so organic dirt will be destroyed, but will require hosing to remove any inorganic dirt.
Sand or salt build-up on window	Coastal areas are susceptible to this contamination.	Wait for rainfall or hose with water to remove.
Streaks, particularly in upper part of window	Sometimes streaks are seen after light rainfall following a dry spell, because the amount of water on the window is not sufficient to fully "wet out".	Hose the window with water.
Fingerprints, outline of labels visible		The coating will naturally break down these contaminants. Until this happens you will see irregular sheeting of water.
Fresh paint or sealant splash/over-spray		Immediately remove with a solvent wipe before it sets or cures. Suitable solvents are acetone, isopropyl alcohol, methylated spirits and white spirits. Do not spread solvent mix over clean areas. Follow with detergent wash and water.
Dried paint or sealant, sticky marks		These need to be wetted with a solvent soaked pad until they dissolve. Suitable solvents are acetone, isopropyl alcohol,

or adhesive		methylated spirits and white spirits. Do not let the solvent run over unaffected areas. Keep reapplying the solvent with a fresh area of cloth until all the marks are gone. Do not rub the mark to remove it. Follow with detergent wash and water rinse. The Pilkington Activ™ in the cleaned area will be reactivated after 5-7 days.
Silicone contamination	A drop of silicone has dripped from the gun, or a silicone fingerprint gets onto the glass. (Please note, silicone should not be used as part of the glazing system).	Let the silicone dry and then peel it off the glass. Do not use a knife or any abrasive action to remove it. Clean the contaminated area with methylated spirits, being careful not to spread the solvent over the glass surface. The glass in this area may need ongoing treatment with silicone eaters.
Fresh mortar/cement splash		Remove immediately before it sets with plenty of water and soft sponge to avoid scratching the coating. Dab the splashed area with water. Do not rub and do not drag the material across the surface of the glass.
Dried or cured mortar/cement		The longer the cement/mortar is left on the surface, the more difficult it is to remove. However, light splashes and small areas of 1-2cm diameter that have been on the glass for less than one week can be removed by limescale remover, e.g. Ritec or Viakal. Gently dab the remover onto the affected area without rubbing. Do not let it run off onto areas that were not affected. Leave for a minimum of 30 minutes, maximum 2 hours. Rinse off with water making sure that the loosened material does not get dragged across the surface of the glass and scratch it. After all the material is removed, rinse the glass thoroughly with water. The Pilkington Activ™ in the cleaned area will be reactivated after 5-7 days.
Coating appears to be removed (brownish, blue or clear spots or streaks observed)	Direct mortar or cement splash can attack the coating. Water run-off that contains elements or mortar or cement can also have the same effect.	The coating cannot be rectified if attack by mortar/cement has already occurred. Film protection is required if cement splash is likely.
White streaks running down the window	Rain/water run-off from silicone caulking areas (sealant between window frame and building surrounds) can deposit silicones onto the Pilkington Activ™ surface.	If there is a straightforward pathway for water run-off between the silicone caulking and the Pilkington Activ™ surface, the caulking material used should not be silicone. Alternatives include MS Polymers and polyurethanes.
Milky-white streaks on window	Hosing windows with hard water supply.	Add drops of detergent to water through a fitting to the hose before spraying. Windows can be cleaned with limescale remover following procedures given.
Whitish streaks running down window (particularly conservatory roofs)	Possible run-off from untreated lead flashing.	Try to remove white stain as soon as possible with soft cloth. Do not use abrasives to clean off. Always treat lead flashing prior to installation.
Heavy bird dirt		Heavy bird dirt can take a while to break down. To remove immediately, either hose or use warm soapy water and soft cloth.
Scratches in coating	Scratches can occur through harsh metallic contact.	Scratches cannot be rectified through rouge or any other method.
Slight silvery spots visible	This is the coating actually breaking down dirt on the surface.	The silvery spot is temporary.
Pilkington Activ™ looks different to ordinary clear float glass		Pilkington Activ™ has a cleaner, brighter appearance than ordinary clear glass when the two are viewed side by side.

List of Approved Cleaning Agents

<i>Supplier and brandname</i>
3M Scotch-Weld cleaner spray
Ajax 3-Fach Aktiv
Ajax Antistatic
Ajax Citrofrisch
Ajax Fete Des Fleurs
Ajax Glass Universal Double Action
Ajax Glasrein Zitro-Frisch
Ajax Kristall
Ajax Streak Free Professional Glass Cleaner
Ajax Tip-Top
Ajax Window Cleaner
Bluesky glass cleaner
Bluesky Sky Shield
Bohle Glasreiniger BO 5107800
CIF Window Wipes
Cleani Glass Universal
Cosmofen 10 and 20 (with water rinse)
Decra Clean
Denk Mit Glasreiniger
Domol Glasklar
Elite Force 2000 UPVC Cleaner
Elite Force Extra Strength
Ettore Squeegee Off (concentrate)
Fenosol 510 (For PVC)
Frosch Spiritus Glas-Reiniger
Graffiti Wipes (Ritec International)
Gunge Wipes (Ritec International)
HG glazenwasser, HG le lave vitre des Pros
HG window cleaner, HG Fensterputzer
Innotec Easy Clean
Kent Glas Kleen 40-1 Superkonzentrat
Kent Glas Kleen Netoiie Vitres
Kent Rotanium Soft Surface Cleaner (article No. 83950)
Kent Surface Cleaner (article No: 83926)
Kristall Fenster
Mr Muscle Window Cleaner
Nationwide Glass Cleaner
Nova Window Cleaner

Ritec Glass Cleaner
Sidolin
Brand names of Sidolin cleaners from Henkel:
~ Sidolin 2 Phasen (DE)
~ Sidolin Streifenfrei Aktivschaum (DE)
~ Sidolin Streifenfrei Cristal (DE)
~ Sidolin Streifenfrei Zitrus-Frisch (DE)
~ Instanet Ruiten / Instanet Ruiten Citron (B, NL)
~ Clin Windows / Clin Universal (Austria, Eastern Europe)
~ Bref Vitre / Bref Vitre Citron (F)
~ Bref Multiuso (IT)
~ Tenn Crystales e Superficies / Tenn Multiusos (S)
~ Sonasol Vidros / Sonasol Vidos e Superficies (Pt)
~ Sidolin Christal
~ Sidolin Zitrus
Safeway Vecta Window Cleaner
Spontex Glass Wipes
Spray Clean Glass Universal
Sure Chemicals Ltd
- Premier Exterior Cleaner (Purple)
<i>Product code: SF THO 03</i>
- Premier Exterior Cleaner (Red)
<i>Product code: SO24</i>
- Premier Interior Cleaner
<i>Product code: SF THO 02</i>
[1 part cleaner to 20 parts water]
- Acidic Glass Cleaner 584 / 585
UVTek Professional Glass Cleaner
Wilko Window Cleaner
Würth Cleaners
Active glass cleaner (No. 890.25)
Ready diluted glass cleaner (No. 892.332.840)
Cleaner Type 10 (No. 892.100.10)
Cleaner Type 20 (No. 892.100.11)
Available from:-
<i>Winzer Würth Industrial Ltd, Catteshall Lane, Godalming, Surrey, GU7 1NP</i>
<i>Tel; 01483 412800Fax; 01483 412805</i>
<i>E-mail; sales@winzerwurth.co.uk</i>
Zack Glasreiniger

Decorative window transoms*

Boundaries of decorative window transoms

Decorative profile width, mm	8	18	26	45	Maximum dimensions, mm
8	x	-	-	-	700x700
18	-	x	x	x	1200x700
26	-	x	x	x	1200x700
45	-	x	x	x	1200x1200

- Decorative window transoms of different widths: 18, 26, 45 mm can be joined together.
- Distance separators „Duplex“ are used between the glass and the decorative window transoms to reduce vibration and thermal bridge. Separators „Duplex“ are glued at the intersections of the decorative profiles, their number and distances depending on the number and length of the inserts.
- Distance separators „Duplex“ are not used when the glazing unit frame is narrower than 12mm but 8mm decorative window transoms can be used instead.

Tolerances

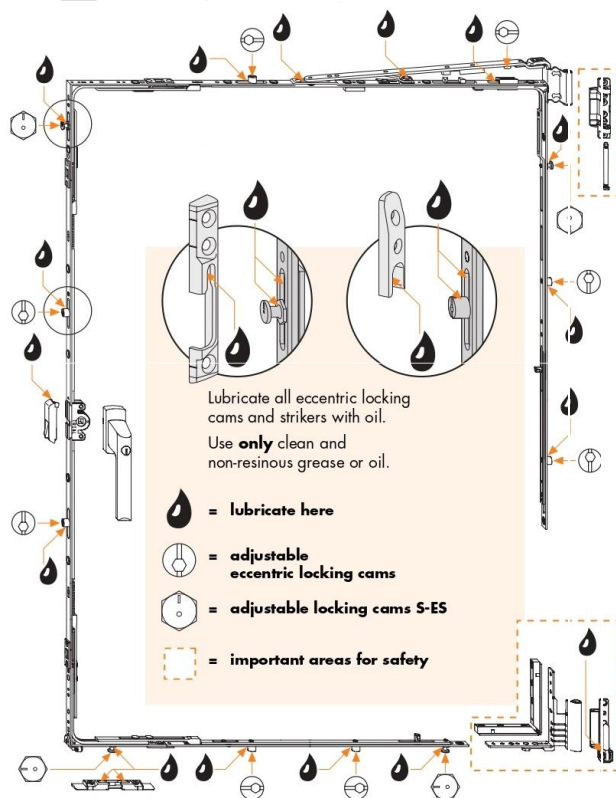
- Due to the manufacturing technology, the remains of materials can be noticeable at the cut of transoms (remnants of sawdust) and slight discoloration. It cannot be completely eliminated.
- Even when using distance separators „Duplex“, the vibration is not always avoided: the risk of the transoms making sounds still remains.

- Tolerance of transoms position in the insulating glass unit: ± 4 mm from the dimensions of the measurements on the drawing
 - Permissible gap between joint and transoms (or double-glazed unit): ≤ 2 mm.
 - Due to sophisticated manufacturing technology of transoms, customer-provided drawings of transoms, dimensions, joints, radius of bending and more can be evaluated individually.
- * according to glass unit manufacturer information

Opening mechanism maintenance for windows and doors

Note! These operations can be performed only by specialized companies:

- ✓ change the hardware part,
 - ✓ remove or insert sashes,
 - ✓ adjust the hardware, especially in the lower hinges or scissors,
 - ✓ replace the glass unit.
- ✓ At least twice a year (autumn and spring), dust, construction residues, debris must be removed from the fittings with a dry cloth, and all moving parts of the bindings and sealing points must be lubricated with machine oil (see diagram).
 - ✓ It is necessary to lubricate all moving hardware parts and closing points with engine oil, at least once a year (see chart).
 - ✓ Check the stability of hardware and handle mounting screws regularly. If it is necessary, tighten or replace them.
- ✓ Use gentle, neutral pH cleaners for fittings cleaning only (non-powder cleaners). Clean fittings, also directing rails of sliding/folding doors from dust and other dirt regularly.
 - ✓ When striking a part of windows or doors, make sure that there are no dust, garbage, or building waste in the fittings, moving parts, otherwise you can break the fittings. In addition, when the fittings are not properly closed, the sash can be deformed or fall out of the window frame.
 - ✓ Protect locks, window fittings and painted surfaces from contact with paint, building filler, plaster mixtures.
 - ✓ Avoid construction waste access to the moving part of the fittings (due to this hardware hangs, it becomes difficult to open and close the window, hardware can break).
 - ✓ Protect opening and closing mechanisms from contact with the paint, while windows are repainted. During the repainting work it is necessary to cover the fittings.
 - ✓ In wintertime, regularly clean mud, snow, ice, sand, etc. from the threshold of an exterior door and running tracks of sliding doors.



Maintenance and adjustment of opening mechanisms

To ensure the perfect functionality and appearance of your windows and fittings for a long time, please note the following points, especially during the construction time:

1. When applying internal or external plaster

Make sure that the fittings are not dirty when applying internal or external plaster!

Gypsum or cement plaster has an alkaline pH and, in combination with moisture, damages the fittings surface, especially galvanized areas, therefore white and eventually red rust may appear. Under humidity conditions, dust created by, for example, sanding drywall panels can also cause corrosion. In addition, there is a risk of deterioration of the lubrication and slippage of the hardware, which can cause premature wear. For these reasons, the windows must be covered during the above mentioned works. Even after careful handling, if the dirt gets on the fittings, it should be rinsed immediately with water without leaving marks, ideally before it gets dry. Do not use any aggressive cleaning agents (eg vinegar or other acidic cleaners). Only cleaners with a neutral pH

should be used and they should be diluted. Never use abrasive scrubs or abrasives solutions.

2. Protection against condensation

Avoid condensation on windows and fittings and ventilate sufficiently!

Lack of ventilation is one of the main causes of damage to windows and buildings. Particularly during construction time, the drying of building materials results in very high humidity, which needs to be removed frequently, purposefully and regularly. Condensation builds up in the sash and inside the room as the air remains unchanged for an extended period of time. Water usually contains CO₂ (carbon dioxide) and minerals, which are in the form of salts. Reacting with zinc, they form a carbonate coating surface that protects galvanized parts from water-borne corrosion. However, the condensate does not contain these salts, therefore carbonate layers do not form. The galvanized parts then react directly with water to form an off-white precipitate called white rust.

Therefore it is necessary to ventilate the room several times a day, ie. y. open all windows for about 15 minutes to change all air. If not possible, install condensation driers. Ensure adequate ventilation even during holidays and festive days. If the construction project is more complex, make a ventilation plan!

3. No acidic sealants

Don't use acidic sealants!

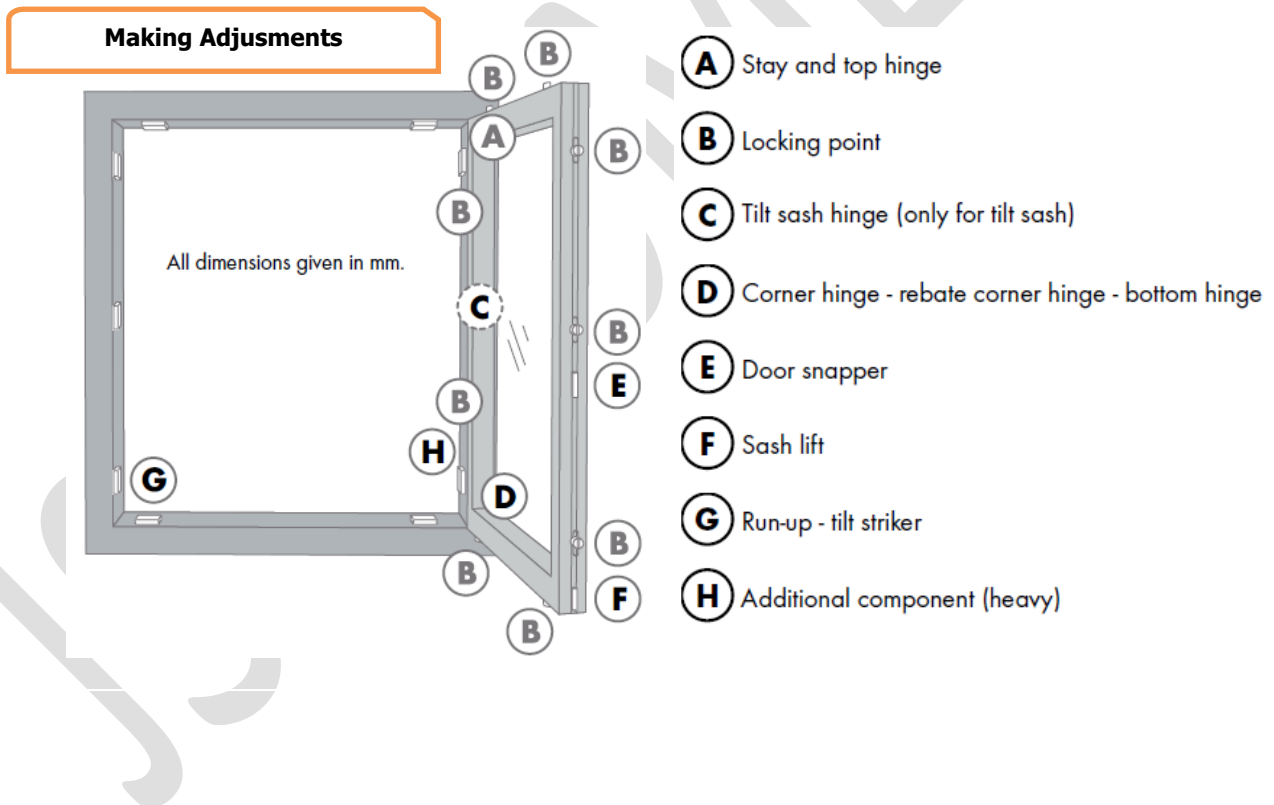
Many silicones, even those specified by the manufacturers as being for windows, are extremely aggressive in heat and humidity conditions. It is important to avoid using acidic products (acetate, acetox or acetic acids). These must be neutral products (benzomide, alkoxide or oxime systems). Acidic products react with air humidity and release acetic acid. It settles on the fittings and acts the zinc layer. In this case, the sealant must not be in direct contact with the hardware.

Essential information is provided on the packaging, for example:

A sealant is **suitable** if: without primer adhering to steel, stainless steel, galvanized steel, aluminum, etc.

Sealant is **not suitable** if: adheres to glass, glazed surfaces and aluminum without primer. No information on use with galvanized steel is provided.

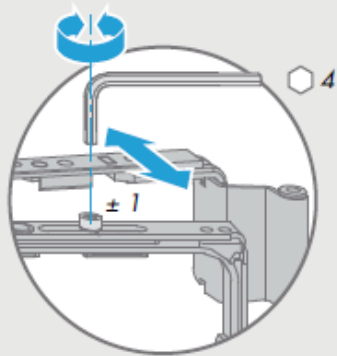
When in doubt, you can simply do a smell test: suitable sealants are in most cases odorless or have a slightly sweet odor, while unsatisfactory sealants have a strong acid or vinegar odor.



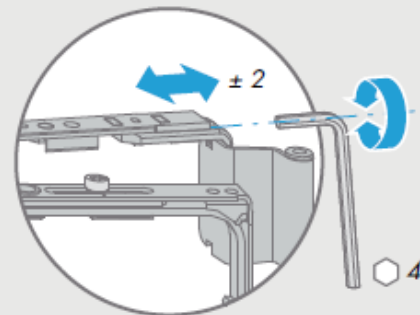
A Stay

TITAN iP, AF

Pressure adjustment



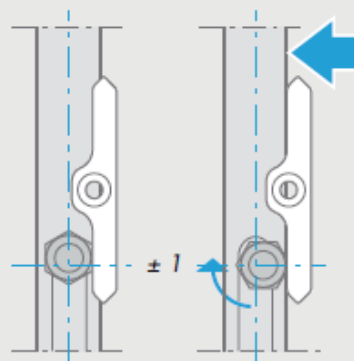
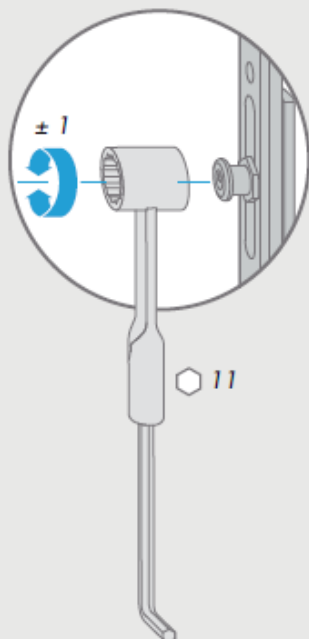
Side adjustment



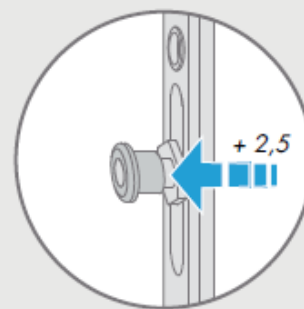
B Locking point

TITAN iP, AF - comfort mushrooms

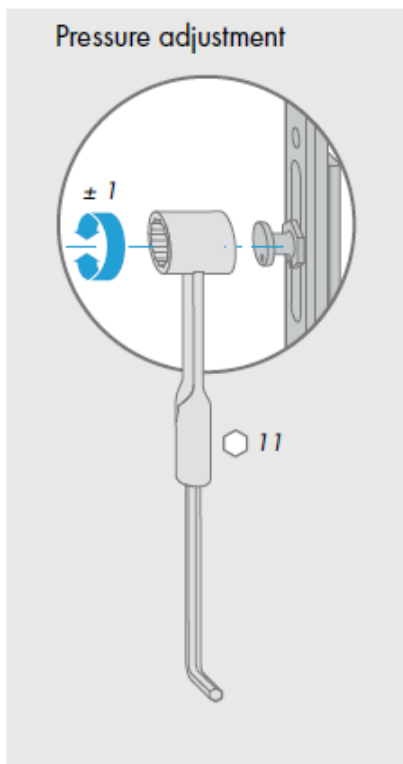
Pressure adjustment



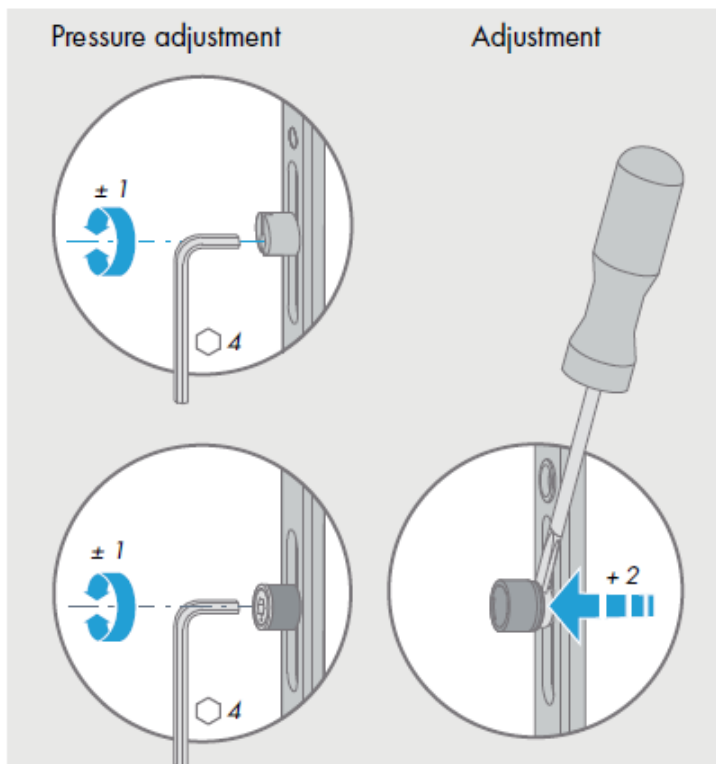
Adjustment



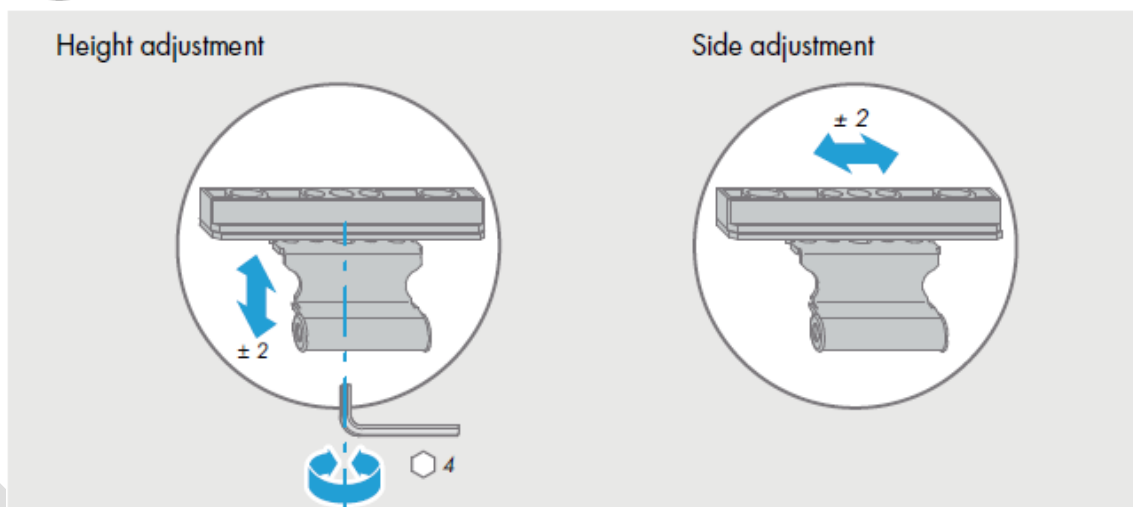
TITAN iP/FAVORIT



TITAN iP/FAVORIT

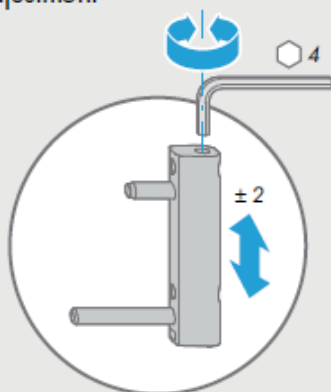


Ⓒ Tilt sash hinge

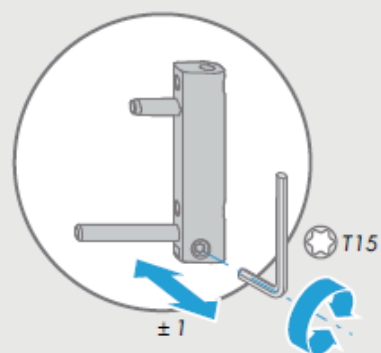


D Corner hinge

Height adjustment

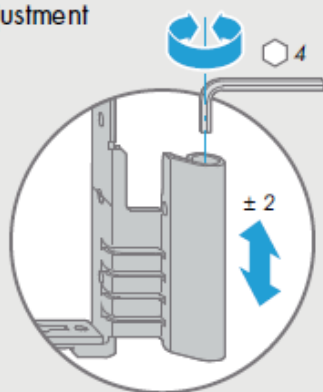


Pressure adjustment

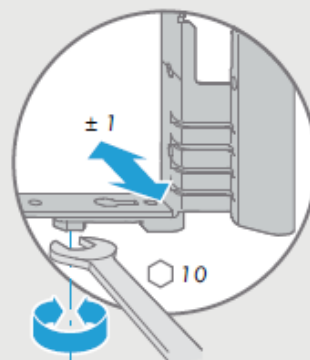


Hinge side Si-line timber

Height adjustment

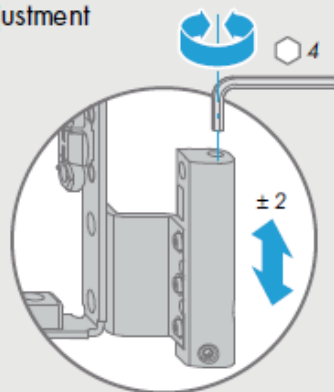


Pressure adjustment

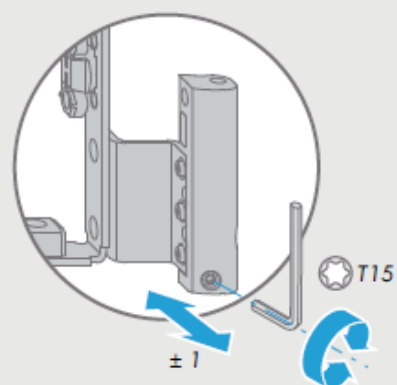


Hinge side TITAN timber

Height adjustment

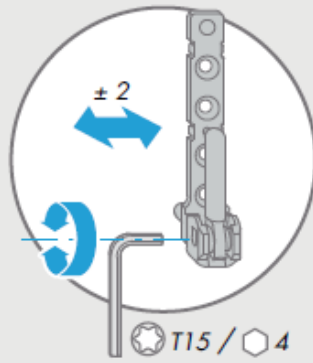


Pressure adjustment



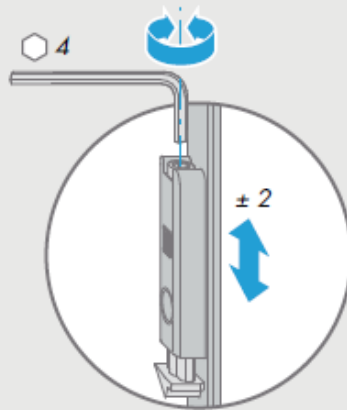
D Bottom hinge

Side adjustment



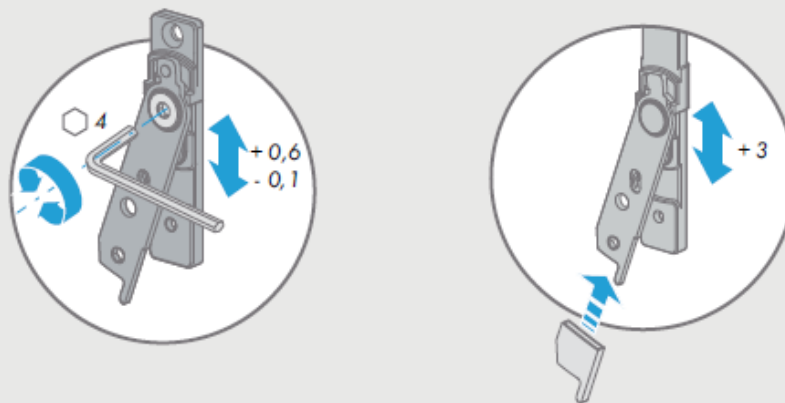
E Snapper

Height adjustment



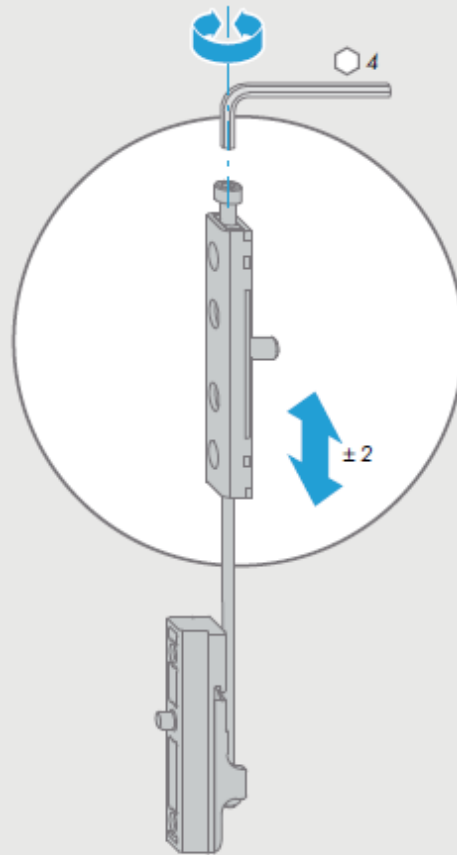
F Sash lift with mishandling device

Height adjustment



H Additional component V-V heavy

Height adjustment



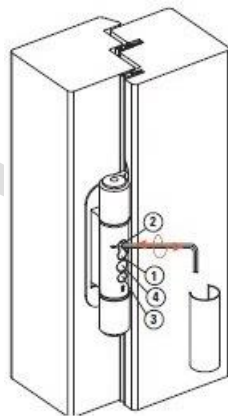
Door hinges adjustment

The adjustment holes are placed on the front of the hinge. These are independent, mechanical adjustments which do not interfere with each other and are made with a 4 mm hex key. Each hinge can be adjusted in 3 dimensions to better distribute the weight on all the hinges. Therefore then can be adjusted in any order.

Horizontal
 ± 3 mm

Height
 $+ 3$ mm / $- 2$ mm

Gasket pressure
 ± 2 mm

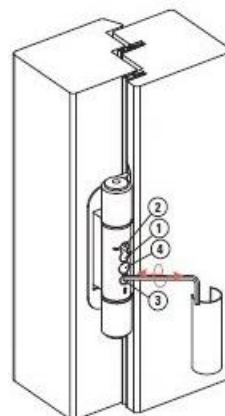


Horizontal adjustment to the left side

1. Loosen screw 1.
2. Tighten screw 2.

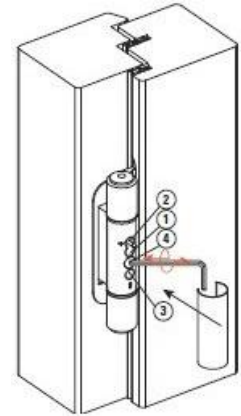
Horizontal adjustment to the right side

1. Loosen screw 2.
2. Tighten screw 1.



Height adjustment

1. Carry out the height adjustment by operating on screw 3.
2. To distribute weight properly, carry out the adjustment first on one hinge and then gently line up the adjustment screws of the other hinges.
3. The adjustment is a self-locking mechanism.



Gasket pressure adjustment

1. Carry out the gasket pressure adjustment by operating on screw 4.
2. The adjustment is a self-locking mechanism.

Cleaning and maintenance of aluminum coated surfaces

It is important to follow the transportation and storage rules set out in this publication, because outdoor storage conditions may cause that among the colored aluminum surfaces and packaging materials will appear humidity, which penetrates the paint, and because of that may appear milky white spots on the surface. Also do not use adhesive tape on the surface.

- ✓ **Do not use scrapers, abrasive papers or similar items to clean the area as this may damage the surface of the powder coating.** Do not use organic solvents, concentrated alcohol, acids, strong alkaline substances, oil compounds. The usage of these substances can cause permanent damage to the product surface.
- ✓ Where it is absolutely necessary, adhesives, silicone rubber, adhesive tape residue, fat, oil and resin substance can be removed from the surface by cleaners made from oil with no aromatic compounds.
- ✓ All surfaces should be cleaned using a soft cloth or sponge, using nothing harsher than natural bristle brushes (cleaning of window sections etc. can be conveniently carried out at the same time as glazing cleaning, at least once every 6 months). **Usual maintenance can be done using water (less than 25°C) with mild detergent (pH 5 to 8).** Detergent on the surface can not be left more than one hour.

Sash gasket and water drainage maintenance

- ✓ Rubber seal in the hinged windows and doors must be lubricated with silicone grease once a year, therefore seal is protected from cracks and it is elastic and does not freeze in winter.
- ✓ When cleaning windows, it is necessary to clean the gaskets. Various debris, construction waste can break or deform.
- ✓ Water drainage holes must be cleaned of trash and dirt, so that the entering water could escape outside, otherwise the water can run inside.

Ventilation and climate control

The premises shall be ventilated each day. If the installation takes place during the winter, immediately after the installation it is necessary to heat and ventilate premises regularly. It is important to maintain proper indoor relative humidity (non-warranty damage when done in not operational space and cases when the indoor relative humidity exceeds 60 %).

- ✓ Condensation begins with an indoor relative humidity being higher than 60 %. Water condensation (clouding) on windows is one of signs that temperature and humidity proportion (microclimate) in your home is improper. Especially during the cold season (because wooden windows are tight) humidity in the room air condenses on the glass units and this could lead to mold on the walls. The condensation effect: peeling paint on doors or windows, deformation of glazing beads. The long-term moisture leads to swelling and deformation of windows and doors and this makes the product less tight, window/door opening and closing becomes difficult. Mold begins to penetrate into the wood, because of this it starts to rot, aesthetic appearance of the window changes. Windows or doors must be operated in rooms where there is no excessive moisture, so that they do not run out, dry or dry. During the winter, do not raise the temperature above 25 °C when high temperatures are outside, otherwise deformations of windows or doors may occur and become leaking.
- ✓ **3-centimeter condensate strip form around the edge of the glass.** It may be due to reason that casing of the glazing unit is aluminium one and just as any other metal, while conducting cold, it cools the glass-pane. Condensate forms up in cooler part of a glass-pane. Because the middle part of the glass-pane remains warmer than glass edge near the casing of the glazing unit, it does not cloud over. Strip of condensate does not mean that window is of improper quality or that it permeates cold inside. It is often recommended to use plastic casings instead of aluminium ones. Plastic holds warmth much better, glass surface near the casing is usually warmer and possibility of clouding is therefore lower. That also assures better thermal properties of a window.
- ✓ **Condensate form inside the window (inside casing and sash).** All opening and closing parts are more or less permeating the air. When warmer and more humid air contacts with cooler air or surfaces, by cooling it emits humidity. Released humidity settles down on the interior side of window casings and sashes. To assure that condensate does not accumulate on the mentioned surfaces of the window and runs outside, condensate drainage holes are made in the aluminium drainage hole. It is important to check if your window condensate drainage holes are not clogged with dirt or litter.
- ✓ **Condensate form on the outer side of the window.** It happens to majority of the outside surfaces when their temperature falls down below outside air dew point. And this in no way means that your windows are of bad quality. As a matter of fact, outside clouding shows that window preserves interior warmth well (warmth does not reach the outside surface of the window).
- ✓ **Condensate between glass-panes inside the glazing unit.** Formation of such condensate shows that sealant of the the glazing unit is damaged. Sealant of the glazing unit holds the gases filling of the unit inside. Most often leakiness of sealant is a defect of glazing unit production Nevertheless, there are cases when sealant is damaged by surplus water quantity inside the window, on the casing, near the glazing unit. It accumulates due to clogged condensate drainage holes. The owner is responsible for this error, as it has been said that condensate drainage cavities must be supervised to prevent overlapping.

- ✓ **To prevent condensation**, heat sources must be installed and constant heating must be ensured. If there is no forced ventilation in rooms or there is no special permanent ventilation in windows, **daily open the Windows for two or three times for at least 5-10 minutes, for the purpose that fresh and dry air could change humid air**. It is extremely important to ventilate bedroom and bathroom. If a simple air vents are installed in your windows, keep in mind that they do not provide adequate ventilation. If there is a possibility, reduce or turn off the heat during the ventilation. It is worth noting that the moist air heating is more expensive than the freshly filled air. It is very important to ensure the functioning of the vertical vent, because next to the continuous ventilation (by opening windows), another important aspect is the removing air by vertical channels on the basis of natural pull principle – convection. These vertical channels are usually installed in toilets, bathrooms and kitchen. Make sure that these ducts are not sealed off.
- ✓ During the construction or repair work (plastering, concrete), be sure to ventilate a lot. In cold, wet period, without the possibility of ventilation, be sure to use special measures to collect moisture.
- ✓ **Intensive ventilation by opening windows is highly important during the first year of operation of the building.** Ducted air conditioning system is not enough for the first season. There are two reasons for this:
 - a. Construction work such as masonry walls, floor concreting, plastering, daubing walls and ceiling are large sources of moisture. After the completion of these works, walls, ceiling and floor construction keep spread the moisture from the inside for some time. Evaporation is particularly intense after heating season beginning. At high relative humidity wooden windows begin to drink the same moisture to the wood.
 - b. It should be noted that not only internal but also external works affect the relative humidity inside the premises. In this case, when a masonry wall units are laid in spring, summer, autumn period, when windows are installed and wall insulation is going to be made only after the winter, the moisture must be measured in order to see how much of it was absorbed during the whole period until the walls were insulated. After the insulation of walls and after the beginning of heating season the walls begin to evaporate the moisture which can no longer go outside. All the moisture enters the premises because of the temperature difference.

Note: Curtains and other window coverings can lead to condensation because they disturb the circulation of warm air between the window surface and heating appliances. In other words, pulled curtains, roller blinds, internal blinds encourages the windows fogging.