

PLASTIC 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; 18001 – 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, hinges will not be affected by corrosion,
- ✓ natural external climate will not cause irreparable surface defects,
- ✓ there will be no cracks in frame because of weight of the frame, there will be no cracks in the frame because of inappropriate quality of the material or overweight (which is guaranteed under the proper installation and proper indoor climate, by ensuring ventilation and indoor relative humidity is less than 60 %),
- ✓ surface will not peel, coating will not fissure,
- ✓ sash gaskets 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.

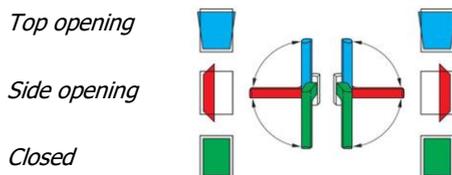
The warranty terms are:

- ✓ sash frame and jamb frame - 5 years
- ✓ glass unit - 5 years
- ✓ sash gaskets - 5 years
- ✓ front and terrace door fittings - 2 years
- ✓ window fittings - 5 years
- ✓ sash and frame surface and colour - 5 years

Note: The warranty is granted for plastic windows and plastic 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

The main window and balcony door opening positions:



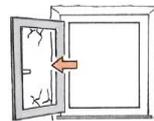
Danger of injury compressing parts of the body between the sash and frame!
When closing a window or door, you cannot insert hands between a sash and a frame.



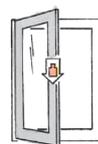
Danger of injury and material damage!
Permanent damage might be done when external objects are placed between a sash and a frame.



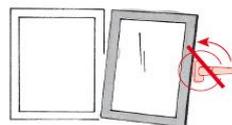
Danger of injury because of the wind impact!
When the wind blows or there might be a draft, close the window.



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 overloading the sash!
Sash can not load any extra weight.



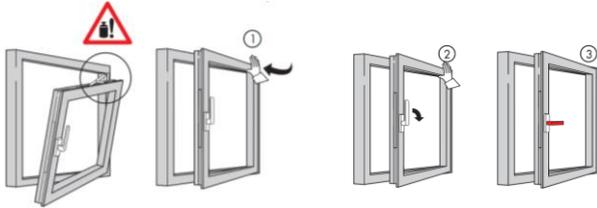
Danger of injury and material damage by improperly swirling the handle!
Do not change the handle position when the window or door is open. Do not try to open the window or door when handle is not completely screwed.



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

Evaluation of plastic products

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.

IMPORTANT: When checking the properties, the visual image of the surface to be inspected shall be evaluated for a period not exceeding 15 seconds. Generally, inspections of external surfaces shall be carried out at a distance of at least 5 meters and inspections of internal surfaces shall be carried out at a distance of at least 3 meters. Features are considered noticeable when they are visible under the specified inspection conditions. Pre-marking of features is not allowed. The external surfaces should be inspected in the scattered daylight, the internal surfaces should be inspected under normal scattered lighting, with each viewing angle perpendicular to the surface (deviation from the vertical not more than $\pm 30^\circ$). In the event of a dispute, the assessment of the vertical angle is decisive. The assessment must be carried out with appropriate removal of traces of use (climatic events, dirt deposits and consequences of cleaning).*

* - 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

Legend of signs and numerical values:

Level of requirements (see Figure 1 / Figure 2):

- 1 - Strict requirement area (visible after closing the window when the planned installation is completed)
- 2 - Standard requirement area (visible after opening the window when the planned installation is completed)

Areas of non - stringent requirements or not subject to requirements (not visible after planned installation)

Designation: + feature is acceptable

+ / - feature is acceptable conditionally

- feature is not acceptable

- / - feature is not applicable or not valid

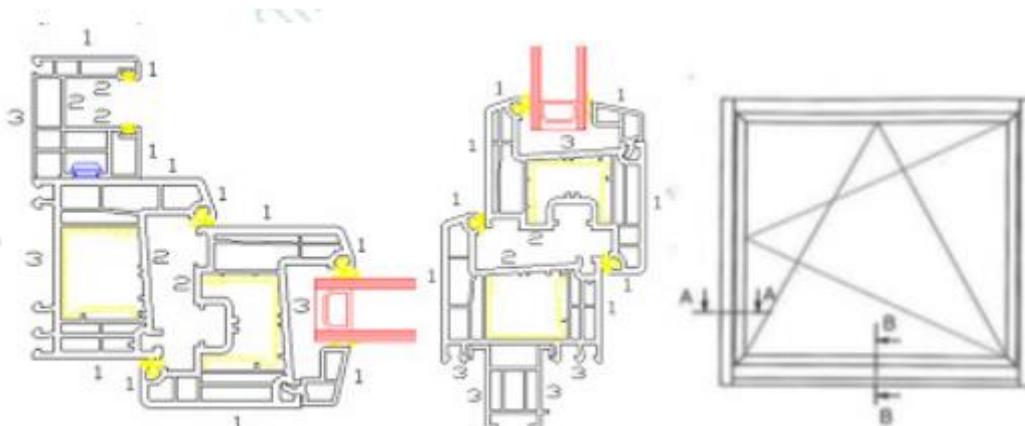


Figure 1 Plastic windows with blind guide and lower connecting profile

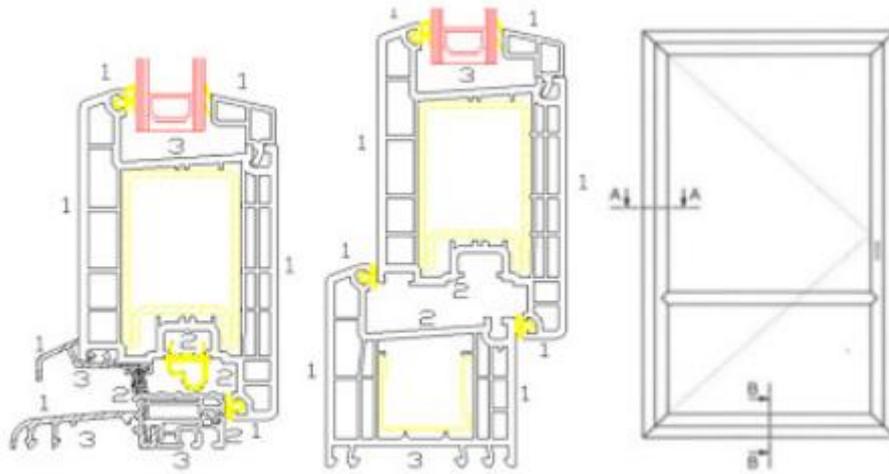


Figure 2 Plastic windows and doors with filling

Assessment criteria, features and levels		MINIMUM REQUIREMENTS			
		Plastic surfaces	Coating		
			With paint	With film	
1	Craters (paint coating), blisters, cavities	1	+ / - If this is not clearly noticeable, keep the observation distances according to point 2	+ / - $\varnothing < 0.5$ mm: X $\varnothing \geq 0.5$ mm: max. 10 pcs. For one m or m ²	+ / - $\varnothing < 0.5$ mm: X $\varnothing \geq 0.5$ mm: max. 10 pcs. For one m or m ²
		2	+	+	+
		3	+	+	+
2	Inserts (e.g., fibre)	1	+ / - If this is not clearly noticeable, keep the observation distances according to point 2	+ / - $\varnothing < 0.5$ mm: X $\varnothing \geq 0.5$ mm: max. 5 pcs. For one m or m ²	- / -
		2	+	+ / - $\varnothing < 0.5$ mm: X $\varnothing \geq 0.5$ mm: max. 10 pcs. For one m or m ²	- / -
		3	+	+	+
3	Cracking, peeling	1	- / -	-	-
		2	- / -	-	-
		3	- / -	+	+
4	Colour runoff	1	- / -	-	- / -
		2	- / -	+ / - If this is not clearly noticeable, keep the observation distances according to point 2	- / -
		3	- / -	X	- / -
5	Orange peel surface	1	- / -	+ / - Rough texture with a layer thickness > 50 μ m due to design or ordering requirements. Fine structure is allowed!	- / -
		2	- / -	+	- / -
		3	- / -	+	- / -
6	Gloss differences ¹⁾	1	+ / - If this is not clearly noticeable, keep the observation distances according to point 2	+ / - If this is not clearly noticeable, keep the observation distances according to point 2	+ / - If this is not clearly noticeable, keep the observation distances according to point 2
		2	+	+	+
		3	+	+	+
7	Colour non-compliances ¹⁾ - on the surface	1	+ / - If this is not clearly noticeable, keep the observation distances according to point 2	+ / - If this is not clearly noticeable, keep the observation distances according to point 2	+ / - If this is not clearly noticeable, keep the observation distances according to point 2
		2	+	+	+
	- on treated surfaces,	1	+	+	+
		2	+	+	+

	e.g., welded seams	3		
8	Unevenness of semi-finished products	1	+ / - If this is not clearly noticeable, keep the observation distances according to point 2	
		2	+	
		3		
9	Features related to production and use (e.g., bending irregularities, mechanical joints, grinding marks, deflections, bumps, scratches, imprints)	1	+ / - If this is not clearly noticeable, keep the observation distances according to point 2	
		2		
		3	+	

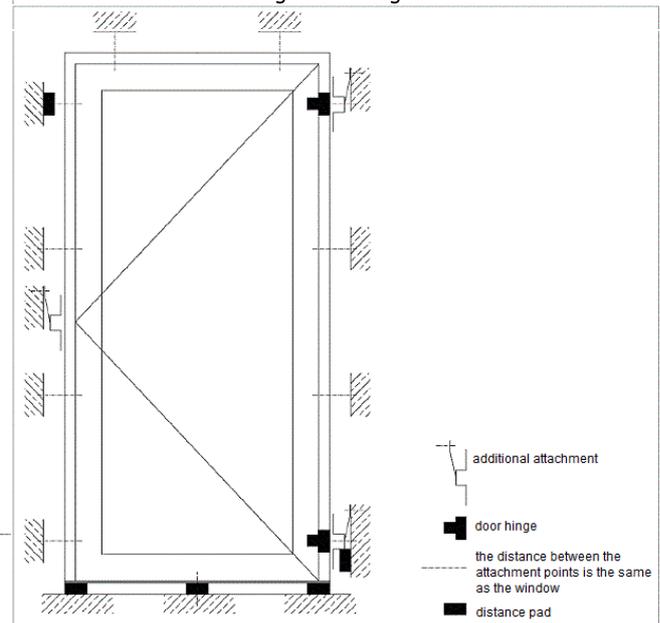
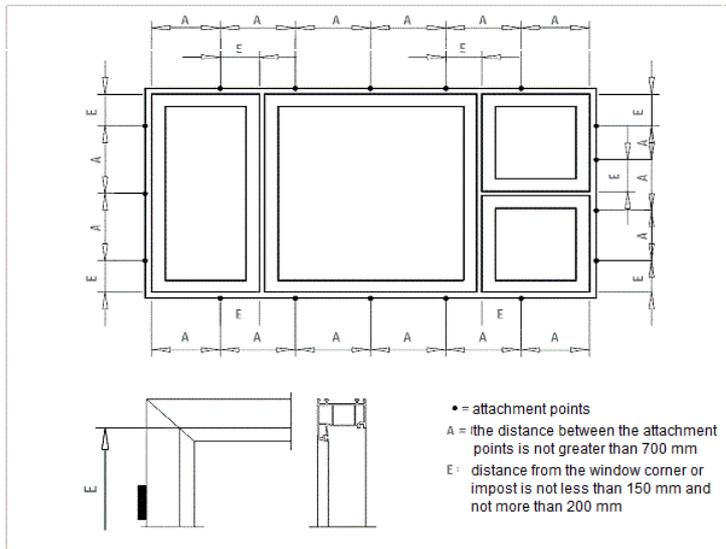
1) When replacing or repairing the product and/or its individual elements or parts, differences in gloss and colour between existing and available and newly installed elements are possible due to climatic conditions and should not be considered as defects.

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.

The window installation diagram. Source: Building Regulations ST 2491109.01:2008

The door installation diagram. Source: Building Regulations ST 2491109.01:2008. We observe that blocks marked in black in the figure should be left after mounting and sealing.



Plastic surface maintenance

Do not use aggressive cleaning products on the surface of the window, do not use aggressive adhesive tapes.

- ✓ Protecting film that protects the plastic profiles, must be removed from the surface of the product after installation works. **IMPORTANT:** If the protective film on the surface of the product is left for more than three months, there is the potential for surface damage.
- ✓ At least several times a year clean the surface from dust and dirt. Use a water-soaked (or water with baking soda) sponge or cloth (do not use household cleaners that can damage the surface, glass or fittings). The profiles are susceptible to cement, chlorine, aggressive cleaners. Profiles can not be processed with rubbing alcohol, organic solvents - acetone, ethyl acetate, alcohol, chlorine or similar hydrocarbon fluids.
- ✓ During the construction or repair work (plastering, luting, painting), it is necessary to cover the surface of the product with the protective film 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 7 days, other manufacturer – 3 days, because longer storage can lead

to accumulation of moisture between the window and the protective film, the film could stick too strong and this can damage the surface.

- ✓ We warn that unremovable surface irregularities may appear, if the plaster mixture gets on plastic surfaces. Product damage, occurred during construction works is a non-warranty.

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.

Glass unit maintenance

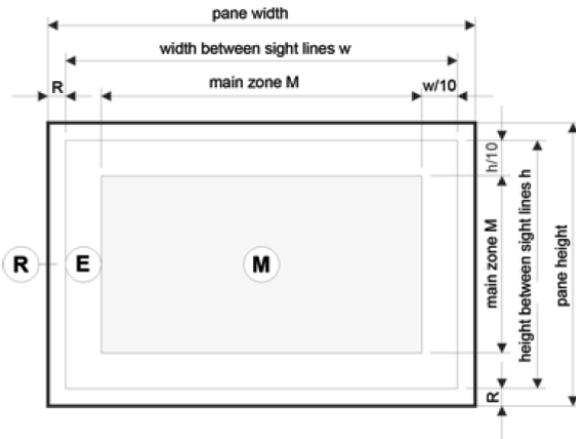
1. CHECKING

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.

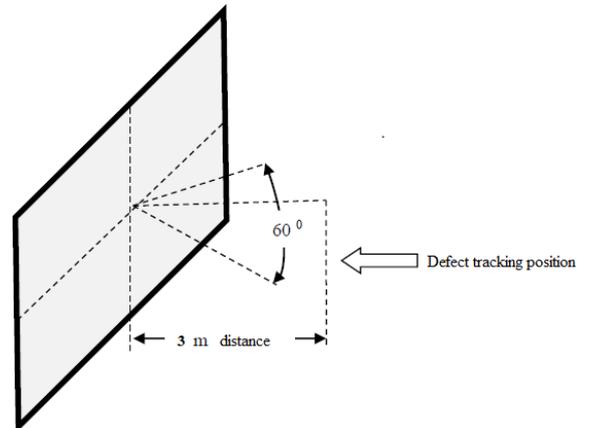
The inspection of glass products, in accordance with the table in Chapter 2, must be carried out at a distance of approximately 3 meters from the viewing surface at a certain viewing angle, which corresponds to the generally accepted use of the premises. Verification takes place under diffused daylight (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.

Notes:

- 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:
 - Cutting and connecting in corners. In this way, all types of frames can be prepared;
 - Fitted with special equipment and connected in straight sections;

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.

Laminated Glass:

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.

Tempered glass:

1. The local wavelength on the glass surface shall not exceed 0.3 mm in each 300 mm section

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.

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 BODIES

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!

- ✓ Do not apply protective film on the glass.

- ✓ Avoid the high temperature difference that impacts the glass unit. Greater than 36°C temperature difference increases the probability of breakage.
- ✓ 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).
- ✓ 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.
- ✓ External and internal blinds distance from the glass unit shall not be less than 2 cm.
- ✓ 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 or adhesive		These need to be wetted with a solvent soaked pad until they dissolve. Suitable solvents are acetone, isopropyl alcohol, 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 of 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 Netoié 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
<u>Sidolin</u>
<u>Brand names of Sidolin cleaners from Henkel:</u>
~ 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)
Product code: SF THO 03
- Premier Exterior Cleaner (Red)
Product code: SO24
- Premier Interior Cleaner
Product code: SF THO 02
[1 part cleaner to 20 parts water]
- Acidic Glass Cleaner 584 / 585
UVTek Professional Glass Cleaner
Wilko Window Cleaner
<u>Würth Cleaners</u>
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:-
Winzer Würth Industrial Ltd, Catteshall Lane, Godalming, Surrey, GU7 1NP
Tel; 01483 412800 Fax; 01483 412805
E-mail; sales@winzerwurth.co.uk
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

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, acetoxy 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.

- ✓ 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. Clean fittings, also directing rails of sliding/folding doors from dust and other dirt regularly.
- ✓ 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.

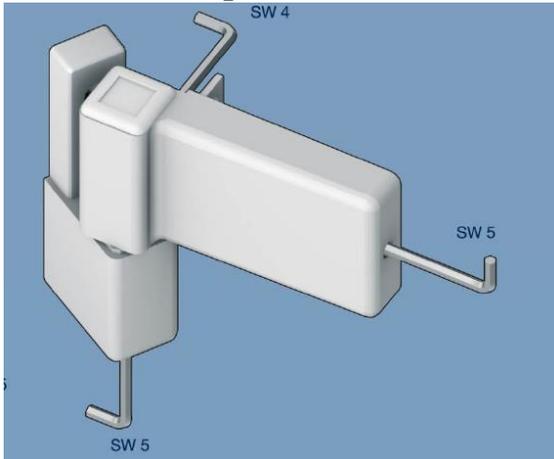
Note! These operations can be performed only by specialized companies:

- ✓ change the hardware part,
- ✓ remove or insert sashes,
- ✓ adjust the hardware, especially in the lower hinges or scissors,
- ✓ replace the glass unit.



Door adjustment

Scut-Duis hinges Brillan and Garant



SW 4 key rotation:

is performed the pressing (or pressure reduction) of door sash to the door frame (or pressure reduction).

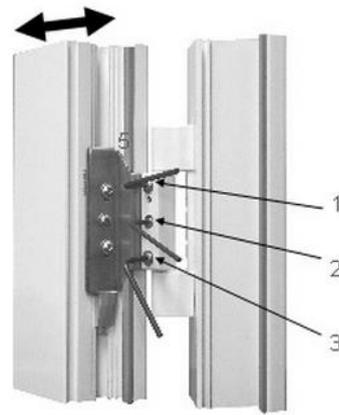
SW 5 key rotation:

is performed the pressing: door sash closer to hinges of to lock side.

SW 5 (below) key rotation:

is performed door sash height adjustment when the sash can be raised or lowered down.

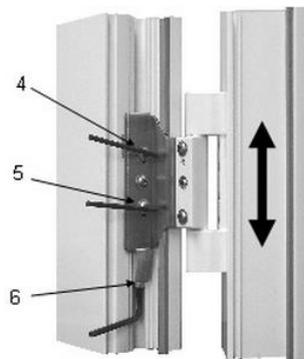
Scut-Duis hinges Ronda



1 position key rotation necessary to loosen the screw, but not fully remove it.

2 position key rotation is performed the pressing: door sash closer to hinges of to lock side.

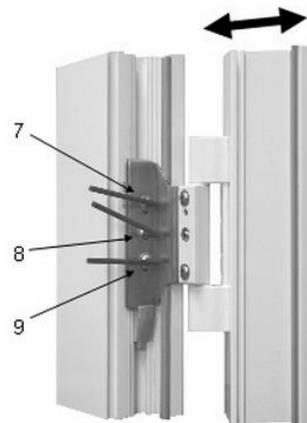
3 position key rotation necessary to loosen the screw, but not fully remove it.



4 position key rotation necessary to loosen the screw, but not fully remove it.

5 position key rotation necessary to loosen the screw, but not fully remove it.

6 position key rotation is performed door sash height adjustment when the sash can be raised or lowered down.



7 position key rotation necessary to loosen the screw, but not fully remove it.

8 position key rotation is performed the pressing (or pressure reduction) of door sash to the door frame (or pressure reduction).

9 position key rotation necessary to loosen the screw, but not fully remove it.

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.
- ✓ Water drainage holes must be cleaned of trash and dirt, so that the entering water could escape outside, otherwise the water can run inside.

How to properly ventilate the premises?

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 %. Especially during the cold season humidity in the room air condenses on the glass units and this could lead to mold on the walls.
- ✓ **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.
 - 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.