Installation, cleaning and maintenance guidelines

for Pilkington IGP products

Pilkington IGP Sp. z o.o., located in Poland, Sandomierz, ul. Portowa 24, manufactures single float glass, laminated glass and toughened glass products, as well as insulating glass units under the brand name Pilkington **Insulight™**. Our goal is to provide customers with products of guaranteed quality, giving the users satisfaction during many years of use.

To maintain confidence in the quality of our insulating glass units, we provide these basic guidelines regarding installation, use and cleaning of our products, as well as some information about physical effects that may occur in insulating glass units. Such effects are not faults giving grounds for complaints on the quality of the supplied products.

Please, note that this document is designed only to provide you with some basic information and guidelines on our products. Further information can be found in our brochures on the specific types of Pilkington products, applicable standards and professional publications dedicated to glass products for building industry and final products in which glass is installed, e.g. windows, building façades, etc.

Please do not hesitate to contact our sales representatives and advisors who can provide further information.

A. General rules of glass installation

Glass should be installed using mechanical means designed for glass handling and transportation, appropriate for the dimensions and weight of glass, in order to ensure safety for personnel and environment. Use the installation techniques conforming to the glass handling equipment instructions and guidelines for the specific façade system.

To prevent the appearance of difficult to clean traces on the glass surface, remove during installation all labels and stickers placed on the glass surface.

During installation, ensure that there is no direct contact between glass and metal elements, in order to limit the risk of possible mechanical damage to the glass.

During installation, use, cleaning and maintenance, the glass should not be exposed to any chemical substances aggressive to glass, and mechanical activities such as scratching or striking. Such actions may damage the glass or reduce the performance of the insulating glass unit.

The construction market offers many types of silicone sealants. Some sealants may contain large amounts of unknown solvents or plasticisers that release during the curing process and aggressively react with the compound used for external sealing of the insulating glass unit.

There have been cases where these agents have caused an insulating glass unit seal to degrade completely within a few days, causing failure of the hermetic seal. Therefore, choose bonds and sealants with great care, and use only those guaranteed by the manufacturer for use in contact with insulating glass units. The general rule, which should be taken into account, is that sealing and/or filling compounds used during glass installation should be applied in such a way that they do not get in contact with the insulating glass units sealant.

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All materials used for glazing such as: profiles, sealants, filling compounds, gaskets, setting blocks, pads and other not specified materials and products released during bonding or curing process or during product life time which may have direct contact or may influence the glass edge, and so should be compatible with the materials used in insulating glass unit or single glass pane production, i.e. must not affect the performance and durability of the glazing.

The installation technique should ensure uniform distribution of pressure on the entire circumference of the glazing. During installation and use, the glazing should not be exposed to twisting stresses, and the deflection of the supporting profiles should not be higher than 1/200 of side's length or 8 mm.

The installation technique must ensure permanent coverage of the entire edge strip around insulating glass units in a way that ensures protection of the insulating glass unit sealing compound from direct sunlight. This condition does not apply where it was agreed at the glass ordering stage that the sealants used in the insulating glass unit production will have permanent resistance to UV radiation (silicone compounds).

The installation technique must ensure effective ventilation and water drainage from the product edge to exclude long-term contact of water or water vapour with the materials used to seal the insulating glass unit.

The glass weight should be transferred on the fixing structure by means of two rigid supporting elements. The elements used for fixing, supporting or depressing the glass must be located at least 50 mm from the glass corner.

B. Use of glass products

Unless otherwise agreed, it is assumed by default that all transparent glazing products (single glass panes and insulating glass units) will be used in vertical position and in conditions that ensure full, natural transfer of light and solar heat through the glass. In such conditions, the naturally developing temperature differences between parts of glass exposed to sun and those in shade do not lead to thermal glass breakage. Please note however, that some items inside a room, directly on the window or close behind can permanently alter heat transfer across the glazing. Their presence causes local accumulation of solar heat at certain areas, which may cause glass thermal breakage. The items that may cause such effects include opaque films, posters placed on the inside of the window, hot items located close to the glass (lamps, displays, kettles, heaters, ventilators etc.), furniture and display cabinets blocking heat transfer, roller blinds, and suspended ceilings.

The use of glass in glazed floors and stairs – due to specific use of such type of glass, please note the following:

a) Resistance of glass with anti-slip enamel to mechanical damage, such as scratches or dirt, is limited. In contact with materials of similar or higher hardness, glass surface may be easily scratched or damaged in other way. Glass floors and stairs panels are particularly exposed to such damages. To keep them aesthetically sound for a long time, the traces of sand, dust and other hard elements on glass surface should be eliminated. This, in turn, will minimize the risk of scratches resulting from multiple pressures of shoes to the glass surface.

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b) Anti-slip effect of specific enamel applied on glass is preserved providing that glass surface is dry and clean. This effect declines when glass surface is wet and damp; when it is covered with a layer of loose grains e.g. sand or with paste, oil or other liquid. In such cases, the risk of collapse and injury is very high (similarly as in the case of typical float glass).

C. Glass cleaning

The glass should be cleaned using agents that do not cause damage to the glass surface. Mechanical cleaning of the glass surface should be avoided if there are traces of sand, dust, plaster or other fine particles. In such situations, these traces should first be removed using a water spray and subsequently the glass surface should be wiped.

Always, during cleaning of glass special care is necessary. Direct contact between glass surface and another hard body could brings to risk of mechanical scratches.

Common best practice is to clean windows with bulk of water and with rubber wipe.

We strong don't recommended steel blades or steel scrapers to cleaning glass surface, special to toughened glasses.

A characteristic of toughened glass is the same hardness as simple annealed glass and high surface compressive stresses level, provides higher strength of toughened glass.

Simply scratch of toughened glass looks much bigger, compare to annealed glass, due presence of surface stresses which makes small shells along edge of scratch.

Other disadvantage is not ideally flat glass surface after toughening process and at time to time small, not visible glass particles bonded to glass surface.

Looking on above, is very risky to use steel blades, scrapers to clear surface of glass, special toughened glass.

Scratches done by careless using of steel blades in first moment are fine, not very visible. After few hours makes wider, much more visible, due growing of shells along scratch.

If the above described operations are ineffective, you may use weak acid (acetic acid) or solvent (e.g. denatured alcohol). Please note however, that those fluids must not come in contact with other elements, such as painted frames. Also remember, that organic solvent based cleaning agents must not get in contact with the silvered side of mirrors.

In the case of texture or sand blasted glass it may be appropriate to use nylon brushes to remove dirt accumulated in the uneven parts of the surface. Never use any glazing or anti-adhesion agents on such glass surfaces. They may permanently remain in the pores of such glass surfaces.

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D. Effects that may accompany the standard use of glass

1. Condensation on external and/or internal surface of glass

External condensation occurs usually in the morning when humid and slightly heated air contacts surfaces of relatively low temperature, such as facades or cars etc. The air cools down on the cold glass surface and passes into saturation state which can be observed as external condensation on the glass surface.

The main reason of the fact that the temperature of the external glass surface is relatively low (which may result in external condensation) is the improved thermal insulation of modern insulating glass units (translated into low heat flux density U value). This allows little heat loss from the room to the ambient air and consequently the temperature of external surface of glass is almost the same as the ambient temperature.

The mechanism of condensation on internal surface of glass is similar. In times of high humidity in the room (e.g. due to problems with ventilation in the kitchen or bathroom), the heat loss through the window combined with insufficient heating of the room results in cooling down of internal surface of glass and the excess of water vapour in the air in the room condensates on glass.

Possible appearance of this phenomenon cannot be eliminated. The temporary appearance of condensation on the outside surface in no way means that the unit is defective or has bad quality. This should be considered as a proof of the high thermal insulation of modern insulating glass units.

2. Light interference phenomenon

The phenomenon of light interference, also called BREWSTER fringes, may be observed as slightly visible multicolour spots, stripes or rings, located in different areas of the insulating glass unit surface. In sunlight these areas have colours changing from light red to light blue. When the phenomenon occurs, it is visible only periodically, at certain observation angles. It quickly disappears with changes of temperature or atmospheric pressure.

The appearance of light interference phenomenon cannot be considered as a defect, as it results from the very principles of the insulating glass unit construction. The float method almost exclusively used in modern glass manufacturing processes results in glass of constant, repeatable thickness, almost completely free from optical faults. This, combined with the nearly perfect parallelism of glass panes in the insulating glass unit manufactured on modern production lines, may lead to overlapping of two or more light waves in one particular space on the glass surface which results in light interference phenomenon.

3. Surface deflection of insulating glass units

An insulating glass unit contains a specific amount of gas between the glass panes, usually air, argon or krypton. Gas filling is influenced by the ambient air conditions during manufacturing process. If the installed insulating glass units are in different ambient conditions (temperature and/or atmospheric pressure) this can create unavoidable differences between the pressure within the insulating glass unit and the ambient air.

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Such pressure differences create forces on the glass panes, which result in slight surface deflection. For example, on a hot summer's day, the temperature of the insulating glass unit increases up to 30°C and more, the gas contained within the unit warms up and builds higher pressure. This increase in pressure from the middle part of glass to glass panes creates force that pushes the glass panes slightly outwards. During the winter season there may be the opposite effect that causes concavity of the glass panes due to the lower temperature of the gas contained within the insulating glass unit.

4. Anisotropy in toughened glass

The effect of anisotropy occurs in toughened glass i.e. glass that has been thermally treated to achieve higher mechanical strength. A glass pane produced in this way contains adjacent areas of very different stress levels, causing differences in the paths of light refracting within the glass. As a result, and only under certain viewing angles, darker spots or stripes can be observed. If viewing angle is changed, this phenomenon will disappear.

5. Deviation in shade and colour of glass

The observed colour and shade of glass as well as coatings deposited on its surface depend upon glass thickness, composition, manufacturing process, type and thickness of any surface applied coatings. Colour and level of light reflection in glass can differ significantly dependent on the viewing angle. Both glass manufacturers and coatings producers use their best efforts to ensure as close as possible repeatability of the process parameters, and as a result the obtained colour and shade of the glass and coatings. Nevertheless, each of those processes has certain limits of repeatability within which there is some space for slight differences of the observed shade and colour. For this reason it is recommended to purchase glazing material for entire façade in a single order.

6. Vacuum cup traces

Sometimes, when glass surface is steamy, visible traces of vacuum cups, labels, fingers or palms may be observed. This effect cannot be considered a product fault, as it is temporary and visible only on steamy glass. In normal use and on dry glass, these traces are not visible.

7. Glass breakage

Glass is a brittle material which cannot be plastically reshaped. Beyond its strength threshold it breaks immediately. Glass breakage may be caused by mechanical and/or thermal stresses acting on the glass at the level greater than permissible for the specific glass product. If a glass product is delivered to the customer intact, and the breakage occurred during installation or use – then the reasons for that should be sought among the conditions that acted on the glass at the moment of breakage. Current glass manufacturing technologies mean that internal glass stresses are at a low, controlled level. Additionally, the possible defects resulting from improper internal stresses would become apparent at the operations carried out in the insulating glass unit manufacturing process. When the glass application may involve causing stresses in the glass, it is recommended to carry out strength calculations beforehand to correctly choose the type and thickness of the glass.

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8. Decorative elements installed inside insulating glass units

Decorative elements such as muntin bar (named also as Georgian bar, Sprossen), may be permanently mounted inside an insulating glass unit. It is recommended to choose the muntin thickness in relation to the spacer bar frame thickness so the difference between these dimensions is at least 3.5 mm. Such thickness difference allows to prevent the muntins to touch the glass, therefore ensures reduced possibility of frost penetration at the muntins.

To reduce the unpleasant effect of "ringing" muntins (when the muntin strikes the glass due to building vibrations or movement of window sash), transparent spacer pads are normally used, so called "bumpons". The number and location of bumpons depends on the number and length of muntins, which is decided on by the manufacturer. Please note that temperature rise due to heavy sun exposure may cause elongation of the muntins resulting in slight deformation of their shape.

9. Single glass and insulating glass units storage guidelines

Single glass panes and insulating glass units should be stored in roofed, dry, well ventilated areas, protected from direct sunlight and atmospheric precipitations.

Construction of stands should ensure even support of the glass on stand crossbars. The glass must not be in direct contact with metal elements or other hard materials. The bottom crossbars of the stand that support the glass should create the right angle with the stand vertical supports. The stand construction should ensure tilting of the glass by ca. 5-7° from vertical position. Any elements that remain in direct contact with glass should be covered with cushioning material, e.g. rubber, wood – to reduce the risk of glass damage.

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