



**PILKINGTON**  
NSG Group Flat Glass Business

**Performance Standards of Glass Products Manufactured by Pilkington IGP**

<b>Item #</b>	<b>Item</b>	<b>Standard term</b>	<b>Deviations from standard terms, of which Pilkington IGP should be notified at the stage of request for quotation and/or product ordering.</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1.	Intended application	Use in buildings and construction works.	Other applications e.g. elevator glazing, ships, home appliances – determine other product requirements (e.g. marking, quality, standards).
2.	Intended location	Depends on unit construction, its size and intended use; in general it is not recommended to use insulating glass units on height exceeding 650 m above sea level.	Use of glass units at higher altitudes than the location of its production site increases the risk of breakage or loss of gas-tightness – each case requires analysis of thickness selection and glass panel dimensions.
3.	Transportation	Road transport up to 1000 m above sea level; sea transport; no air transport allowed.	
4.	Glass unit orientation	<u>Vertical</u> – as fixed, turn or tilt windows; without elements permanently diverting heat flow across the glass panels e.g. shutters, films, adhesive decorations for glass, suspended ceilings, furniture, structural components covering a part of the glass area.	Inclined position (skylights, canopies, conservatories, glass floors) requires an individual selection of glass panels for loads; presence of elements causing diversion of heat transfer across the glass panels may require the use of toughened or thermally strengthened glass.
5.	Glass fixing techniques	All edges mechanically fixed along the entire length; glass unit edges covered with an external glazing bar to the depth of 12-30 mm.	Other mounting techniques (two edge support, point fixing, structural bonds, glass corners, fixed with clamping bars thinner than 12 mm, glass edges covered with bars wider than 30 mm) require the use of silicone in insulating glass units, mechanical strength calculation, individual glass specification.



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6.	Insulating glass unit construction	<p><u>external glass pane</u>: clear glass, tinted glass, with Pilkington <b>Activ™</b> coating on surface #1, with solar control coating on surface #2; laminated glass and toughened glass, toughened glass with HST, thermally strengthened glass with those coatings; textured glass, fire-resistant glass</p> <p><u>internal glass pane</u>: clear glass, with low-emissivity coating (Low-E type, Pilkington <b>K Glass™</b>, Pilkington <b>Optitherm™</b>) on surface #3, laminated glass and toughened glass, toughened glass with HST, thermally strengthened glass with those coatings; textured glass, fire-resistant glass</p> <p><u>middle glass pane</u> (for triple glazed units): clear glass</p>	The use of other glass types than specified as external, middle or internal glass panes of insulating glass unit – is a non-standard solution and requires a consultation regarding their appropriate specification, regarding suitability and period of warranty.
7.	Product warranty	<p>Pilkington IGP Sp. z o.o. provides standard warranty for insulating glass units tightness: 5 years for rectangular units and 2 years for other shapes, based on conditions covered in “Standard warranty general conditions for insulating glass units”.</p> <p><u>Warranty is not provided for</u>: glass sheets or cut to size glass panes with or without coating, texture glass, toughened glass, enamelled glass, screen-printed glass, silicone coated glass, laminated glass, fire-protection glass, as their declared parameters should not deteriorate with time, except for the features that accompany normal use of a glass product.</p>	Providing longer warranty for insulating glass units tightness or for insulating glass units other than specified in the “Standard warranty general conditions for insulating glass units” requires an agreement before placing an order. “Standard warranty general conditions for insulating glass units manufactured by Pilkington IGP Sp. z o.o.” are available on website <a href="http://www.pilkington.pl">www.pilkington.pl</a>
8.	Sealing compounds in insulating glass units	Butyl + polyurethane, polysulphide or <i>other</i>	the <i>other</i> is two-component silicone – see point 5 ”Non-standard fixing method”



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9.	Glass unit dimensions	<i>Production capability</i> - according to the Dimension limit table, and production line limitations. Dimensions limits included in the table are of exemplary nature and maximum sizes may be smaller/bigger depending on unit construction and its intended use. <i>Pilkington IGP takes no responsibility for correct unit construction, size, thickness and glass type specification for place and conditions of intended use.</i>	Manufacture of insulating glass units and toughened glass panels in dimensions smaller than 250 x 350 mm or with an edge aspect ratio higher than 8:1 requires an agreement before placing the order.
10.	Nominal distance from unit spacer bar to glass edge	Distance < 13 mm	For units for non standard applications (see p. 5) bigger thickness of sealing compound might be required. In such case spacer bar will have to be located further from the glass edge which results in decreased vision glass are.
11.	Insulating glass units gas filling	Argon or krypton – the choice depends on expected U-value; filling level: 90% (+10/-5); gas mixtures are not used.	SF <sub>6</sub> gas is not used; depending on a shape and construction, some insulating glass units are filled with gas through holes drilled in the spacer frame. Hole and plug are visible to end users.
12.	Type of spacer bar	<i>Wood and PVC framework:</i> silver aluminium spacers or <i>other Aluminium or steel façade framework:</i> steel galvanized spacers or <i>other Structural glazing:</i> black aluminium spacers	<i>Others such as:</i> warm TGI type spacers, warm spacers made of stainless steel, aluminium or steel spacers painted with specified colours
13.	Spacer bar overprint text	Pilkington IGP, Department number, production date, order number and item number.	additional information can be printed on the spacer bar, as agreed with the customer
14.	Quantity and location of spacer bar joints	We do not guarantee only one spacer bar joint on the unit perimeter. Additional spacer bar joints may be located on various glass sides.	Special requirements for quantity and location of spacer bar joints require an individual agreement before placing the order.
15.	Spacer bar overprint colour	Black	.....
16.	External glass pane coating edge deletion (edge deletion width)	<i>Yes</i> (10 mm) – glass with Pilkington <b>Suncool™</b> coatings, (including laminated versions) <i>No</i> – glass panes with coatings: Pilkington <b>Activ™</b> , Pilkington <b>Eclipse Advantage™</b> , Antelio, Stopsol	Depending on the fixing method chosen by the customer, larger edge stripping width of the soft coating is necessary in the case of corner glass panels and structurally bonded glazing.
17.	Internal glass pane coating edge deletion (edge deletion width)	<i>Yes</i> – (10 mm) – glass with coatings: Pilkington <b>Optitherm™</b> , Planibel Top N, Low-E <i>no</i> - Pilkington <b>K Glass™</b>	



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18.	Decorative elements inside the insulating glass unit: muntins/ Georgian bars	Type, placement – according to the customer’s drawing. At the muntin bar intersections small transparent silicone elements are fixed (bumpers) to reduce risk of vibration and knocking of the muntins. When using muntins, the spacer bar width must be minimum 12 mm to prevent the risk of frost penetration through the insulating glass unit.	When a single segment of the muntin is longer than 0.7 m, transparent silicone bumpers are glued at a half of its length. For the Vienna type muntin of 11.5 mm width, the spacer bar width must be at least 15 mm. For muntin with teflon veneer (eg. “Renolit” type) are fixed without silicone elements (bumpers); units with this type of muntin are more at risk of vibration and knocking.
19.	Equal dimensions of both glass panes in an insulating glass unit (presence of a step)	Both glass panes are the same – no step	Manufacture of insulating glass units where one of the glass panes is larger than the other (at one or more sides) – is possible, but requires detailed information at time of order. As standard, such insulating glass units are made with silicone sealing of 6 mm thickness.
20.	Insulating glass units with stepped edge	According to the insulating glass unit application and settlements with the customer; the step can be opacified black with silicone or left clear	
21.	Marking location of the bottom of insulating glass unit edge when installed on a façade	Yes – for insulating glass units with one of the dimensions > 2.5 m	The insulating glass unit should be installed in a window frame so it is laid on supports on the edge with a marking label.
22.	Edge working	<i>Mechanically arrised edges</i> – toughened glass <i>manually arrised edges</i> – bottom edge of a cut to size laminated glass with one of the dimensions > 2.5 m	Other method of the edge work and the number of edge worked edges – requires agreement at time of quotation and/or order.
23.	Dimension tolerances	According to the “Quality evaluation criteria for Glass products manufactured by Pilkington IGP Sp. z o.o.” available on website <a href="http://www.pilkington.pl">www.pilkington.pl</a>	Higher quality requirements need individual agreement before placing the order.
24.	Flatness tolerances		
25.	Visual examination		
26.	Scope of tests of insulating glass units and declared parameters	According to PN-EN 1279-5 standard requirements	Other tests, other performance declaration methods or other scope of declared performance – require agreement at the time of quotation and/or order.
27.	Intended use of enamel or silicone coated glass (spandrel panels, partition walls, component of an insulating glass unit)	<i>Façade cladding</i> : single glass panel or insulating glass unit with enamel coating on position 2, 3 or 4; silicone coating on position 2 (single glass panels) or on position 4 (insulating glass units); opaque background directly behind the glass panel, no contact of the coating with other materials.	The use of the enamel or silicone coated glass panels to allow partial visibility requires individual specification.



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28.	Enamel/silicone coated spandrels – colours	Basic colours on clear float glass – see Pilkington glass samples.	Other colours of coating and/or other types of glass as a background – requires customer confirmation of reference samples.
29.	Toughening direction	no standard	Depending on dimensions, direction of toughening along height or width can be agreed
30.	Enamel or silicon coating direction	no standard	In normal conditions no differences resulting from coating directions are observed.
31.	Additional thermal treatment (HST) for toughened glass	This service is available for all toughened glass products. Performing the HST test depends on a customer order.	The HST test is recommended to minimize theoretically possible spontaneous breaking of toughened glass caused by nickel sulphide inclusions in a glass substance.
32.	Techniques used for drawings and description of construction of the ordered insulating glass units	<i>View from the outside of the building</i> – refers to insulating glass unit drawings, insulating glass unit construction descriptions	
33.	Location of a label on an insulating glass unit	Usually on the external glass pane, except for the glass with Pilkington <b>Activ™</b> coating and some solar control glass units.	When installing insulating glass units, follow a direction on the label: “install this side to the outside of the building” or “install this side to the inside of the building”.
34.	Location of solar control coating	On position # 2, facing unit cavity.	We do not recommend the use of reflective coatings on position #1. This does not refer to the Pilkington <b>Activ™</b> glass.
35.	Location of markings on laminated glass, toughened glass, enamel and silicone coated glass, fire-resistant glass	In any of insulating glass corners; corner; no other settlements are made.	Uniform location of marking label in a corner specified by a customer requires an agreement before placing the order.
36.	Packaging	Metal racks, can be off-loaded by forklift	In case of glass of very large dimensions or weight, agreement on the unloading techniques is required.
37.	Type of vehicle	As agreed with a customer; it can be a vehicle with an integrated crane.	
38.	Packaging, storage, installation, use/maintenance	According to Pilkington IGP Instructions and Guidelines available on website <a href="http://www.pilkington.pl">www.pilkington.pl</a>	

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