

QUALITY CRITERIA FOR INSTALLED INSULATING GLASS UNITS (IGUs)



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Example toughened stamp.



This observation guide has been produced to help answer many of the common questions which arise once glazing has been installed.

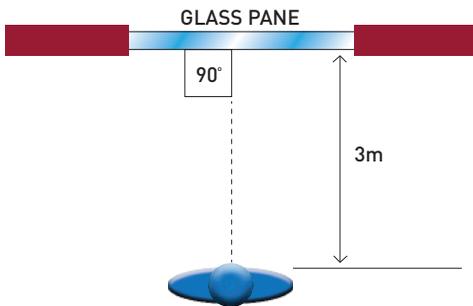
All GLASSOLUTIONS products are manufactured to the very highest quality standards – most notably BS EN 1279. However, the inherent material properties of glass, and the many different processes it goes through to deliver the final performance characteristics, can sometimes affect the appearance of the installed product.

There is no specified criteria for observation of IGUs within the European Standard (BS EN 1279). That's why we have created this simple observation guide based on the British product standards and the Glass and Glazing Federation (GGF) observation guidelines (freely available from www.ggf.org.uk).

Here we explain the most common scenarios – why you may notice certain things and when you should contact your supplier/installer.

Conduct a visual inspection

Look at the glass in a vertical plane and at right angles (90°) to the glass surface from the room side. Stand, where possible, 3m away from the unit to be inspected. Do this in natural daylight – but not in direct sunlight – and when the glass is completely dry.



In a visual observation you look through the glass, not at it. Any defects should be identified within 20 seconds. If the defect is not visible at the specified distance, or it takes longer than the time limit to identify, it is regarded as neither obtrusive nor visually disturbing.

Magnifying devices and strong light sources are not permitted during the observation. All defects must **first** be identified at a distance of 3m and not within a closer range.

Safety glass marking

Individual panes of glass certified as safety products will each carry the appropriate mark relevant to the product. GLASSOLUTIONS do not guarantee that these marks will all be in the same corner of the unit or that they will align through the unit.

Cavity debris

If you see any excessive extraneous/foreign material loose within the cavity area, this is classified as a fault. This includes desiccant leaked from the spacer bar, insects, Lucite or swarf from bar cutting.

Reflections

Due to the number of panes involved in the construction of an IGU multiple reflections may be visible. This effect will increase in triple glazed units. This is not a fault.

Distortion

The hermetically sealed cavity between the glasses has a fixed volume of air/gas due to the temperature and barometric conditions at the time of sealing. After installation, changes in external temperature and barometric pressure will result in expansion or contraction of the air/gas within the cavity resulting in deflection of the unit panes which is visible as distortion in the reflected image. This distortion indicates the unit is sealed correctly and is not indicative of a fault.

Georgian and Duplex bars

Georgian and Duplex bars can sometimes deflect out of line, appear to be discoloured or rattle against the glass – none of which are classed as faults.

When the temperature returns to normal, the bars will revert to their original position

Any apparent discolouration of the bars is normally due to the use of a coated glass.

As for bars rattling against the glass, this should only be noticeable under specific weather conditions where the unit is subject to external vibration – i.e. strong gusts of wind.

Duplex bars and Georgian bar inserts will be manufactured with a positional tolerance of +/-2mm.



Leaded units

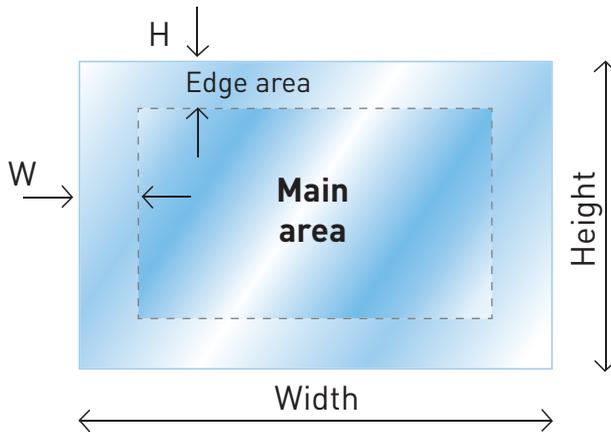
The lead on leaded units will oxidise (white powder) over time – this is perfectly natural and the temporary blemishes will eventually disappear as the patination process continues. The powder can safely be wiped off from time to time until the natural patination process is complete.

Spot faults

These include bubbles (gaseous inclusions), stones and “seeds”; and are evaluated by identifying the quantity and size of the inclusions. Limits as per the chart below;

Dimension of nuclei of spot faults in mm	Area of pane less than 5m ²
Less than 0.5mm	No limitation
Between 0.5 and 1mm	1
Larger than 1mm	Not allowed

Definition of observation areas



$H = 5\%$ of Height or 50mm whichever is the greater
 $W = 5\%$ of Width or 50mm whichever is the greater

Punctual defect

Spots and pinholes in the glass coatings must be measured and counted. Limits as per the chart below;

Dimension of punctual defect - spots/pinholes	Main area & edge area*
Less than 2mm	No limitation
Between 2mm and 3mm	Allowed if not more than 1 per m ²
More than 3mm	Not allowed

Linear/extended faults

Uniformity defects and stains e.g. scuff marks, heavy scratches, lines, deposits, impressions, etc. are allowed as long as they are not visually disturbing.

Scratches

A variety of linear score marks, whose visibility depends on their length:

Dimension of scratch	Main area	Edge area
More than 75mm	Not allowed	Allowed as long as they are separated by more than 50mm
75mm or less	Allowed as long as local density is not visually disturbing	

Colour matching

Glazing technology is continually evolving, therefore new units installed alongside existing units may not exactly match. This is not a fault.

Spacerbar positioning

GLASSOLUTIONS normal units have an average spacerbar face to unit edge of 10.5mm +/- 1.5mm.

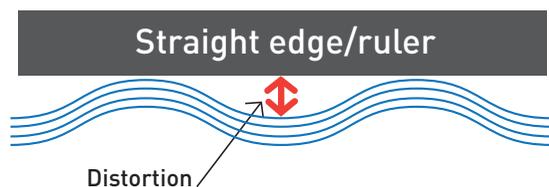
Roller pluck/pickup (toughened glass only)

The toughening process involves heated glass being in contact with rollers in the furnace, this may result in small imprints in the glass surface. This may be more pronounced in thicker glasses.

Roller wave (toughened glass only)

The toughening furnace rollers may also cause a slight unevenness in the glass surface.

Glass Type	Maximum Distortion Value
Float Glass to BS EN 572-2	0.3mm per 300mm
Others	0.5mm per 300mm



Thermal fracture

Thermal stress breaks occur when there is a temperature variance in the body of the glass.

The risk of thermal fracture is increased in installations with deep partial shadow, back-up (e.g. posters, furniture against the glass), blinds, applied films, heaters or air conditioners directed onto the glass.

Haze

Under certain lighting conditions and viewing angles some coatings or laminated products may exhibit a phenomenon known as haze (a cloudy/dusty appearance). This is not a fault.

Condensation

Internal

Condensation forming on the glass surface facing the room is due to warm, moist air trapped in the building. This indicates a problem with the building itself suggesting that increased air ventilation is required – the condensation on the glass is a symptom not a fault.

Inside the cavity

Condensation inside the cavity indicates the IGU seal has broken down; this is a failure of the IGU.

External

Condensation forming on the outdoor face is a positive indicator of the thermal efficiency of the glazing. This is not an IGU fault.

Condensation patterning

Patterns forming in condensation/moisture on the glass face is known as 'condensation patterning' and does not represent a fault. It is caused by microscopic deposits of silicone on the glass face which break down over time.

Where a new unit is installed next to an old unit, the surface of the glass will not have aged and condensation/moisture may form differently on the newer glass.

For further advice and information on condensation see the Glass and Glazing Federation leaflet available from www.ggf.org.uk

Cleaning best practice

- Use mild, non-abrasive glass cleaner, uniformly apply the solution to surfaces by spraying or with a clean brush, grit-free cloth or grit-free sponge.
- Using a circular motion and light to medium pressure, wipe the cleaning solution on the glass. Rinse the glass immediately with generous amounts of clean water making sure to remove all the cleaning solution.
- Use a clean lint-free cloth or a squeegee to dry the glass surface.
- Care should be taken to ensure that no metal parts of the cleaning equipment, e.g. blades, make contact with the glass surface and that no abrasive particles are trapped between the glass and cleaning materials.
- If residues are still present on the glass the steps above should be repeated.
- Abrasive cleaners, powder based cleaners, scouring pads or other harsh materials should not be used to clean the glass or frame surrounds.