

# Product Quality Standards

---

Clayton Glass manage the product quality by means of a Quality Management System to consistently provide products that meet or exceed customer and regulatory requirements.

BS EN 1279-2:2002	Production of Insulated Glass Units
BS EN 1270-3:2002	Gas Retention in Insulated Glass Units
BS EN 12150 & BS EN 12600:2002	Toughened Safety Glass

Clayton Glass Ltd is committed to manufacturing insulating glass units to both industry and regulatory standards and is committed to continuous improvement in quality and service.

This document should be read in conjunction with our Terms and Conditions of Trade. This can be found on our website ([www.claytonglass.co.uk](http://www.claytonglass.co.uk)).

## Inspection Standards

All products are to be inspected using the criteria as described below.

Transparent glass used in the manufacture of insulating glass units, is identical to that used traditionally for single glass, and will therefore have a similar level of quality, indeed the basic glass received from the glass manufacturers often contains 'seeds' and bubbles which are more likely to end up in very large units where cutting around faults is not always possible.

All panes of an insulating glass unit shall be viewed at right angles to the glass from the room side, standing at a distance of not less than 2 metres (toughened, laminate or coated glass), not less than 3 metres), in natural daylight and not in direct sunlight.

There should be no visible moisture on the glass surface. The area to be viewed is the normal vision area with the exception of a 50mm wide band around the perimeter of the unit, known as the edge zone. Insulating glass unit quality shall be judged by looking through the glass and not at it.

# Product Quality Standards

## 1. Permissible glass defects in insulating glass units.

Defect Type	Main Vision Area	Edge zone – visible 50mm perimeter
Hairline Scratches	Permissible, but not in clusters	Permissible, but not in clusters
Scratches	Permissible, a single scratch of 15mm length, sum of all lengths of all scratches must not exceed 15mm	Permissible, a single scratch of 25mm length, sum of all lengths must not exceed 90mm
Spot defects		
< 0.5mm	Permissible	Permissible
< 1.0mm	Permissible, but not in clusters 2 spots per m2	Permissible, but not in clusters
< 2.0mm	max 5 spots	1 spot per 1m length of glass side
> 2.0mm	Not permissible	Not permissible

In the case of obscure and patterned glass the above criteria doesnot apply due to the method of manufacture, imperfections such as seeds and bubbles are deemed to be acceptable.

## 2. Glass Soiling

No dirt visible from a distance of 2 metres is permissible inside the insulating glass unit.

# Product Quality Standards

### 3. Dimensions and thickness tolerances of insulating glass units

Parameter	Permissible Tolerance
Dimensions	+2.0/-1.0mm
Thickness	± 1.0mm (annealed glass) ± 1.5mm (toughened glass, laminated glass, texture glass)
Diagonal Difference	< 2.0mm/m
Glass Pane Offset	< 2.0mm

### 4. Chips, nicks, shells and other edge defects

Glass defects such as edge chips and shells are permissible up to 2mm, whilst a single individual chip can be up to 6mm. Cracks, even minor – are not permissible and these should be reported at glass receipt.

### 5. Glass type

Any deviation from the glass product types specified in the purchase order is considered as a product fault.

### 6. Defects – Georgian bars, leaded units & back to back bar

Decorative elements can be installed inside an insulating glass unit at the buyer's request. The type, colour, geometry of elements are according to the purchase order.

The evaluation method regarding the accuracy and quality of these elements is the same as for the entire insulating glass unit (see sections 1-3).

Georgian bars and back to back spacer should not deviate from parallel by more than 2mm per metre. Lead strip that is applied to decorative leaded units will oxidise for several weeks after installation, eventually the oxidation will stabilise and leave a dark patination on the lead – this oxidation is a neutral phenomenon and is not a defect.

Lead is a comparatively 'soft' metal and small scratches on the surface of the lead do not constitute a defect.

# Product Quality Standards

---

## **7. Spacer bar defects**

The internal surfaces of the spacer bars should be clean. In standard insulating glass units the distance between the spacer bar sight line and the glass edge should not exceed 13mm, and the variation of the distance from the glass edge at one side of the insulating glass unit should not exceed 2mm. Curvature of the spacer particularly at the corner on bent and super-spacer units is a part of the manufacturing process and is acceptable provided that it does not extend beyond the allowed 13mm. No primary seal should protrude beyond the spacer bar and into the vision area.

## **8. Loss of seal tightness – moisture penetration**

This is an insulating glass unit defect which occurs when the internal space between the insulating glass unit panes loses its seal tightness and allows gas and moisture exchange.

A sign of such a fault is visible by permanent or periodic condensation on the internal surfaces of the insulating glass unit panes, or water collecting at the bottom of the insulating glass unit. According to our 'Standard Warranty General Conditions for Insulating Glass Units Manufactured by Clayton Glass Ltd' the manufacturer provides warranty for seal tightness of the delivered insulating glass units.

The standard warranty period for insulating glass unit tightness is 10 years (reduced to 2 years if an edge tape has been applied in manufacturing at the buyers request) for rectangular shape insulating glass units.

The warranty covers only the cases where the seal tightness was lost due to material or workmanship defects of the delivered insulating glass units and if the defects can be attributed to Clayton Glass Ltd.

It should be emphasised that only the water vapour condensation (dew) visible on the internal surfaces of insulating glass unit panes can be considered an insulating glass unit defect. Such dew cannot be removed by wiping the glass panes dry. However, it is quite a common effect that water vapour condenses on the insulating glass unit surfaces towards the inside of the room or outside of the building – this is a natural effect which occurs when air humidity is high and the glass temperature is lower than that of the ambient air. Such dew can be removed by wiping the glass panes dry.

# Product Quality Standards

---

## **9. External Condensation**

The water vapour condensation on the external surfaces of insulating glass units is not considered as an insulating glass unit defect and is not covered by the warranty provided by Clayton Glass Ltd.

## **10. Toughened glass “polarisation” effect**

When thermally toughened glass is reviewed by reflection, the effect of the toughening process may be seen under certain light conditions. The visibility of the surface colouration or patterns does not indicate physical deterioration in the physical performance of the toughened glass, because of the nature of the toughening process, distortion will be accentuated, when the glass is viewed in reflection or incorporated in insulated glass units. Visual double reflection can occur under certain lighting aspect conditions, especially when viewed from an angle.

## **11. Brewster’s Fringes**

The appearance of the optical phenomenon known as Brewster’s Fringes is not a defect of the glass and can occur with any glass of high optical and surface quality. This phenomenon is a result of the high quality now being achieved world-wide by modern methods of glass manufacture. Brewster’s Fringes occur if wavelengths of light meet up with each other when they are exactly 180° out of phase – an example of the phenomenon known to physicists as the interference of light.

The effect is similar to, although usually much smaller than the interference, fringes which can sometimes be seen on toughened glass windscreens. Brewster’s Fringes occur when the surfaces of the glass are flat and the two panes of glass are parallel to each other i.e. when the light transmission properties of the installation are of a very high order. This phenomenon is not a defect of the product, being dependent on the laws of physics and not on the quality of the insulating glass. In fact, it arises because modern glass made by the float process is flat and is therefore free of the distortion inherent in sheet glass.