

GGF Guidelines

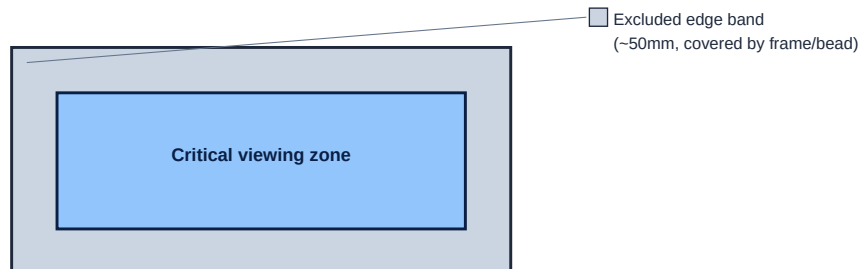
Glazing quality, tolerances, optical standards and best practice — the guidance CSU units are inspected and specified to

About This Guidance

The Glass and Glazing Federation (GGF) publishes widely-used technical guidance for the UK flat glass and glazing industry, covering visual quality, dimensional tolerances, optical characteristics and safe glazing practice. CSU inspects and specifies to this guidance and the British Standards referenced throughout our datasheets — this guide summarises what it covers and why it matters when assessing a sealed unit.

Visual Quality — How Glass Should Be Inspected

Trade guidance sets out a consistent way to inspect glass so that a mark or blemish is judged fairly, not under conditions that would make any glass look faulty. Standard glass is inspected from no closer than 2 metres; toughened, laminated or coated glass — where the extra surface or interlayer makes minor marks slightly more visible — is inspected from no closer than 3 metres. In both cases, view the glass straight on (90° to the surface), plus a check from 45° to the left and right, in natural daylight, not direct sunlight, with the glass clean and dry.



A perimeter band of roughly 50mm around every pane is excluded from assessment, since it's normally covered by the frame or bead once installed — only the central zone counts.

A mark that isn't visible under these conditions — at the correct distance, angle and light, outside the excluded edge band — is within the standard, not a defect.

Acceptable vs Not Acceptable

Feature	Within Standard	Needs Assessment
Bubbles / seeds	Small, isolated air bubbles or blisters not clustered together	Large, clustered, or clearly visible in the central zone at the standard distance
Fine scratches	Not readily visible at the standard inspection distance and angle	Clearly visible at the inspection distance, deep, or detectable by fingernail

Feature	Within Standard	Needs Assessment
Minor blemishes / marks	Not visible in the central zone at the standard distance	Clearly visible in the central zone under standard inspection conditions
Spacer bar	Very minor cosmetic variation with no effect on the seal or performance	Visible misalignment, debonding, or any sign of moisture or gas ingress at the spacer

Batch & Tint Variation

Glass is manufactured in production batches — separate melts of base glass, separate coating runs — and a very slight tint or colour variation between batches is a normal characteristic of the process, more noticeable side-by-side than in a single unit viewed alone. It's the most common source of a quality query on larger projects with multiple openings. Where units will sit side-by-side or across the same elevation and a consistent appearance matters, order them together in the same production run rather than as separate top-up orders — tell us at the time of order if batch-matching across an elevation is important to you.

Optical Phenomena That Are Not Defects

Some visual effects are an inherent property of high-quality glass, certain manufacturing processes, or multi-pane construction itself — not a sign of a fault. Recognising these saves a lot of back-and-forth on site.

Phenomenon	What You See	Why It Happens	Why It's Not a Defect
Brewster's fringes	Faint rainbow-coloured bands, usually seen looking obliquely at bright light with a dark background behind	Interference between light reflecting off two near-parallel glass surfaces	An optical effect that appears on any high-quality parallel glazing; the fringes shift if the glass is gently pressed
Newton's rings	Concentric ring patterns at a single point	Interference where two glass surfaces are extremely close or lightly touching	Purely optical — not a result of the manufacturing process
Anisotropy / leopard spots	Patchy, iridescent patches — most visible through polarised sunglasses or in certain reflections	Inherent stress pattern created by the toughening (heat-treatment) process	An accepted characteristic of all toughened glass, recognised by every major glass standard
Roller wave	A slight wave in reflections, most visible at a low viewing angle	The rollers that support the glass while it passes through the toughening furnace	A normal visual characteristic of toughening; does not affect strength or performance
External condensation	Dew or misting on the outside face, typically on cold mornings	The Low-E coating reflecting room heat back inside, so the outer glass surface tracks outdoor temperature	A sign the coating is working — see our Condensation Guide (TG-002) for full detail
Multiple reflection images	Faint duplicate "ghost" reflections of a bright light source, most noticeable at night	Every glass surface in a DGU or TGU reflects slightly; more surfaces means more faint images, more visible with Low-E coatings	An optical property of multi-pane glazing, not a fault in any one pane
Colour banding in coatings	A very slight colour variation across a coated pane at certain angles	Normal variation in the coating deposition process	Doesn't affect performance; most visible at oblique angles or under certain sky conditions

Phenomenon	What You See	Why It Happens	Why It's Not a Defect
Wavy heritage-glass reflections	Gentle waviness or distortion in reflections	A deliberate design characteristic reproducing traditional drawn glass	The intended look of our Heritage/Slim-Fit range (DS-007) — not a flaw
Minor optical distortion	A gentle waviness in reflections or in the transmitted view, more apparent in large panes and in dark or high-contrast reflections	An inherent characteristic of the float glass manufacturing process — floating molten glass on a bed of molten tin creates minute thickness variation across large areas	A recognised characteristic of float glass generally, not a fault in an individual pane — see Roller Wave above for the toughened-specific version

Toughened Glass — Specific Characteristics

- **Bow / warp:** a slight bow or warp across the pane is an inherent, standard-tolerance characteristic of the heat-treatment (toughening) process, not a manufacturing fault — ask us for the specific tolerance figure for your specification.
- **Fragmentation:** toughened glass is designed to break into small, blunt, granular pieces rather than sharp shards — this is the safety property that makes it "safety glass", not a sign of poor quality, and its fragmentation behaviour is defined by EN 12150.
- **Spontaneous breakage:** very rarely, a toughened pane can break with no external cause, sometimes months or years after installation. This is a recognised characteristic of the toughening process itself — an extremely small nickel sulphide inclusion in the raw glass, invisible to the eye, can slowly change state and trigger a break. It's a genuine industry-wide rarity rather than a sign of a manufacturing defect, and not specific to any one supplier or batch.
- **Where breakage containment matters most** — overhead glazing, balustrades, some door applications — laminated glass (GT-004) is often the better choice, since its interlayer holds the pane together even if it cracks. See our Toughened (GT-003) and Laminated (GT-004) guides for the full comparison.

Edge Quality

Glass edges are given a small ground bevel (an "arris") to remove sharpness during manufacture — a normal finishing process, not a repair. Minor edge shells or chips that fall within the frame-covered zone are within standard tolerance: they sit under the bead or frame rebate, are never visible once glazed, and have no structural effect. Edge quality matters most on toughened glass, where any edge damage acts as a stress concentration point and can initiate a break — which is why edge finishing is inspected closely before toughening takes place, not after. Laminated glass (GT-004) can show a faint haze or slight tint band at an exposed, uncovered edge on thicker builds — a normal optical characteristic of the interlayer, not a fault — which is another reason laminated units are best specified with the edge protected under a frame or bead rather than left exposed.

Patterned & Obscure Glass — Pattern Alignment

Patterned and obscure glass (see our Patterned Glass guide, GT-010) has a directional texture. The standard convention is to glaze it running vertically unless a different orientation is specified at order — tell us if your project needs the pattern run horizontally or to a particular orientation. Where several panes are glazed together on the same elevation, the pattern direction and match should be agreed before we cut, since a slight variation in pattern position between individual panes is a normal characteristic of the pattern-rolling process, not a defect. The textured face is fitted to the inside of the sealed unit cavity as standard.

Sightline & Spacer Component Visibility

Looking closely at the spacer bar from within the standard inspection distance, two things are entirely normal and not a fault: fine desiccant granules visible through the small perforations on the inward face of the spacer — this is how the desiccant absorbs moisture from the sealed cavity, so the perforations are a functional part of the design, not a flaw — and the spacer's corner keys or joints being visible at close range, where the spacer bar is mitred or joined at each corner.

Dimensional Tolerances

- **Overall unit thickness:** a small standard manufacturing tolerance applies, consistent across the trade — ask us for the specific figure for your specification.
- **Width and height:** always ordered as Width x Height in millimetres; allow the standard fitting tolerance for your frame's rebate depth — see our Measuring Guide (TG-014) and How to Measure (TG-006).
- **Spacer sightline:** should run straight and parallel to the unit edge; very minor bow within normal tolerance is not a defect.
- **Georgian bars:** bars are not rigidly fixed within the cavity, so they aren't stressed by thermal movement — a gentle rattle or slight movement when the unit is tapped is normal, not a fault.
- **Stepped / offset units:** the step dimension carries the same standard tolerance as the overall unit size — see DS-005 (Stepped/Offset) for configuration detail.

Condensation & Thermal Stress — Quick Reference

Both are covered in full in their own guides — summarised here since they come up in the same quality conversations. **Condensation:** between the panes always means seal failure and the unit should be replaced; on the outside face on a cold morning is normal and a sign the Low-E coating is working; on the room-side face is ordinary indoor humidity meeting a cold surface. Full diagnosis table in our Condensation Guide (TG-002).

Thermal stress: caused by uneven heating across a pane — partial shading, dark blinds or films fitted close behind the glass, and proximity to radiators are the main risk factors; toughened glass tolerates a far greater temperature differential than annealed and is the usual mitigation. Full guidance in our Thermal Stress Guide (TG-005).

Safety Glazing — Critical Locations

BS 6262-4 guidance sets out where safety glazing (toughened or laminated) is required based on proximity to floor level and doors:

Location	Critical Zone (Above Floor Level)
Glazing in a door	0 to 1500mm
Side panels within 300mm of a door edge	0 to 1500mm
Low-level glazing not adjacent to a door	0 to 800mm

See our Toughened (GT-003) and Laminated (GT-004) glass guides for safety glass options.

Installation Good Practice

- **Packers and setting blocks:** position near the bottom corners, clear of any drainage or weep holes in the frame sill — packers must never block drainage.
- **Edge cover:** keep adequate cover between the glass edge and the frame or bead, to the frame manufacturer's specification.
- **Sealants:** use products compatible with the spacer and secondary seal — avoid solvent-based or non-neutral-cure sealants making direct contact with the secondary seal, which can attack it over time.
- **Bead access:** full frame-specific bead removal and measuring technique is covered in our Measuring Guide (TG-014).

Handling, Storage & Site Care

Store units vertically on A-frames, under cover, with edge protection during transport and no glass-to-glass contact. For cleaning, standard glass cleaner and a soft cloth is correct for most CSU glass — never use abrasive pads, razor blades or scrapers on a coated face (Low-E, solar control), which can permanently damage the coating. See our Cleaning & Maintenance Guide (TG-013) for product-specific care.

- **Protective labels:** remove manufacturer and installation labels promptly after fitting — left in place under sun or heat, the adhesive can bake onto the glass and become difficult to remove.
- **Plaster, render and mortar splash:** protect glass from wet trades wherever possible — these materials are alkaline and can etch the glass surface if left to dry on it; wash off promptly with clean water if any contact occurs.
- **Welding and grinding work nearby:** hot metal splatter embeds into the glass surface on contact and cannot be repaired — screen or remove glazing before any welding or grinding takes place nearby.
- **Protective tape:** never apply tape directly to a coated face (Low-E, solar control) — removing it can lift the coating.

Raising a Quality Assessment

If you want us to look at a specific mark or concern, a few things make the assessment quick and accurate: a photo taken from the standard inspection distance (2m for standard glass, 3m for toughened, laminated or coated glass) in natural daylight, showing the mark in the context of the whole pane; a close-up photo with something for scale next to the mark, such as a coin or tape measure; the unit reference printed on the spacer bar; and your order reference. We'll assess what you send against the guidance set out in this sheet.

How to Order

Contact our sales team: 020 8574 9342 | 07305 993794 | sales@csultd.co.uk | csultd.co.uk — quotes returned within 2 business hours (Mon-Fri, 8am-5pm).