

Points worth noting about leadlights being fitted inside double-glazed units.

The majority of leadlights received by us for refurbishment prior to being encased inside double-glazed units are compromised in some way by their years of exposure to weather and abuse. Apart from broken pieces common faults are scratching, “frosting” from chemical action, bowing and out-of-square, deteriorated sealing compound between glass and lead, excessive dirt and mould that is hard to remove, multiple broken joints, decomposing lead and contamination from paint, varnish and God knows what else. Many of these leadlights were not very well-made to start with; for example, glass that does not fit under the lead but relies on cement to disguise this fact.

Scratches: We frequently find the glass is scratched right around the perimeter by careless sanding of the woodwork. The lightest touch with sandpaper will mark the glass forever. It is also common to see swirl scratching by orbital sanders. No glass is scratched during our work; it was already there. Clients do not tend to notice anything wrong with their leadlights as they are often quite dirty due to being high up and difficult to clean. After the job is done it is human nature to minutely examine them and conclude all marks are fresh, while expecting the leadlights to have a brand new appearance.

“Frosting”: It is very common to see a milky discolouration beside the lead. This may be only 2 or 3 millimetres or maybe up to 10 mm wide (I have seen it 50mm wide!). It is caused by moisture leaching calcium out of the cement mix forming a chemical that attacks the glass leaving the frosted appearance. There is nothing that will remove this. The frosting is sometimes far worse on the inside due to excessive condensation. The glass tends to stay damp, promoting this chemical action, while the outside will at least get dried by the wind. Sometimes there will be a light dullness over the entire outside glass surface. This is caused by acid rain – yes, we have it here. The principal offender is hydrofluoric acid and is particularly bad around Ravensbourne, emanating from the fertiliser works.

Border lead: The border lead is almost always rotten as the linseed oil in putty attacks lead over time, forming a white compound called lead oxide while making the lead thin, brittle and impossible to solder. Usually this border lead was 13mm wide but is replaced with 10mm lead to try and reduce the amount of wood that has to be removed from the sash to accommodate the DGU. We can guarantee the leadlight was not square but has to be squared up to facilitate routing the frame and manufacturing the DGU. Due to the narrower lead and the reshaping there will often be a small sliver of glass that is no longer covered by the border lead and becomes visible between the lead and the frosting as it has not been affected by the calcium etching the glass.

Bowing: Leadlights go out of shape, the worst offenders being the diamond quarry type. Every straight lead becomes a potential hinge and in this style of leadlight all leads become hinges so it bows all over. It may be convex at one end and concave at the other. Bowed leadlights will not fit inside double-glazed units so must be flattened. Brute force is seldom successful. They must be persuaded with heat, weight and water and, if this fails, partially or completely dismantled. There is an obvious potential to break glass.

Out of shape: As the house ages, wood warps and twists, piles sink and window and door openings are altered. The once-square wooden frame gradually goes out of shape and the leadlight obligingly changes its shape to suit. Squaring the leadlight can involve cutting or grinding glass protrusions once the border lead is removed as the border glass edges are never even.

Cement: The cement mixture that is forced between the glass and lead giving the leadlight its strength and water-tightness should not actually be Portland cement, but often is. About 5% of it is OK but many studios used (some still do) straight cement and it is this excessive concentration of cement that leads to the opaque contamination around the leads. It also makes it extremely difficult to dismantle the window for repair and frequently further pieces get broken in the process. Putty was often used as a cement, but brings its own problems. Old age dries it out and it becomes brittle. Pieces of it frequently fall out leading to a weak, leaking leadlight. Where we see the putty is obviously missing we will add our sealing mixture to those places while sealing the new border lead. We use compressed air to test for weak areas but really the only way to be sure of fixing this problem is to re-lead the window. It is our experience that very few wish to do that. The correct cement mixture is mainly whiting, some Plaster of Paris, boiled linseed oil with a little cement and black oxide powder and turps.

Heat: The leadlights inside the double-glazed units will get hotter than before due to the glasshouse effect. This is only a problem when the cement is compromised as the heat can help to dislodge brittle cement. This problem is relatively rare.

Cleaning: We spend considerable time trying to get the leadlights as clean as possible and it is certainly not straightforward. It is not a matter of a quick spray with window cleaner and a wipe down. We often have to use paint stripper, razor blades, steel wool and small wire brushes. It is particularly difficult to remove contamination from around lead joins and from the textured glass surfaces. As cleaning progresses the leadlight is checked frequently against electric light and sunlight. It is then blackened with stove polish, for cosmetic reasons, and then huffed and wiped down once more and finished with compressed air. The double-glazing worker checks the windows against fluorescent light and gives them another burst with compressed air.

Conclusion: The reader may now appreciate this is not a simple process. We are satisfied that when the leadlights leave our premises they are the best they can be, but they are not new. It is important to keep that in mind.