BARROWMORE
MODEL RAILWAY GROUP

"Modelling to a high standard amongst friends"

Workshop Notes: Flush-Glazing

The glazing on most r-t-r rolling stock models has always been second-rate at best - recent introductions show some improvement, but there are still many 4mm scale models on the market that leave a lot to be desired. Perhaps the biggest fault is that the 'glass' is usually recessed below the side by far too much – indeed, on most modern steel-panelled stock the windows are only just below the plane of the side panelling, rather than the scale two or three inches seen on some models. The next drawback which must be mentioned is the gap around the periphery of the window. And the last grumble I have is the uniformity of the recessing of windows in opening and non-opening lights.

An improvement can sometimes be made by using the replacement vacuum-formed windows marketed for a lot of models by South Eastern Models – you can find this 'flush glaze' advertised in magazines, and it is listed in Mainly Trains catalogues [1]. There is still a small gap between window and body, but it can be disguised cosmetically. A more unsightly defect is the slight uneven surface caused by the thin-ness of the plastic causing slight buckling.

Luckily, the way in which the bodies of r-t-r models are moulded suggests an alternative. To facilitate removal of the plastic body moulding from its metal mould, there has to be a built-in chamfer on the outside of any apertures (see sketch diagram);

Enlarged diagrammatic section through body at window aperture

And the glazing is normally applied from inside the vehicle body. So, if you abandon the r-t-r glazing and fit the replacements from outside the model, it is then possible to tailor individual pieces of transparent plastic exactly to fit the apertures. But not a quick job, it must be admitted!

The raw material used is important: it must have at least two qualities. The first and most important one is that it must be easily workable with simple hand-tools – and it must be said that this immediately rules out glass. Then it must not be affected by the sorts of solvents commonly used by modellers – and this rules out transparent polystyrene (Slater's 'plastiglaze', etc.).

In a lot of ways, the most 'friendly' material is acrylic ('Perspex' is a well-known brand); but it does have drawbacks – it is expensive, and difficult to find in the sorts of thicknesses and quantities that modellers require. It is also relatively brittle. But it does file nicely!

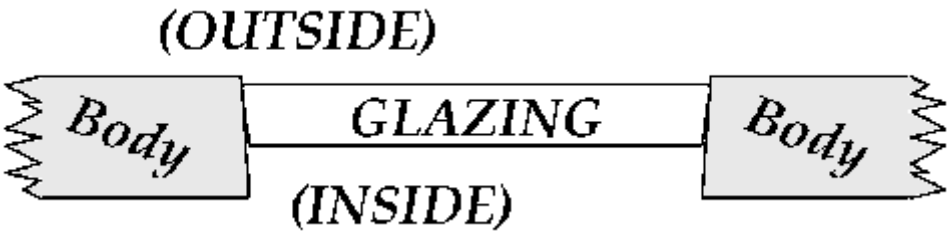
Which brings me to my favoured glazing material. Twenty years ago or so, I was talking to a professional sign-maker who also happened to be a P4 modeller and a member of the group that runs “Adavoyle Junction”, and asked him if he knew of a source of thin Perspex. He told me that instead of Perspex he mostly used a transparent grade of a polycarbonate plastic with the trade name “Lexan”. And he gave me several square feet of it, in several thicknesses from 0.020” up (some, I suspect, of other manufacturers), from his bin of ‘off-cuts’! So I experimented with it, and discovered that if you made the window a press-fit in the opening, then the ‘glass’ did not need any other fixing. As insurance, I brush Plastic Weld around the periphery of the window: I think it very slightly softens the paint that is there, and so reinforces the joint when it dries. But do remember to finish painting before adding the glazing.

Lexan is the trade name for a highly durable polycarbonate resin thermoplastic, discovered in 1953 by a General Electric Company chemist. It now has many uses in industry, from aircraft canopies and bus shelters to CDs. It is also marketed in sheet form (both clear and coloured) – and here the drawback for modellers, is that a ‘sheet’ is 8ft x 4ft (or 3m x 2m): so a sheet would last even a large model club for decades. So, as I (accidentally) did, you have to find a friendly industrial user and buy a piece from his scrap bin. A small commercial sign-maker is the sort of firm to try. Lexan sheet itself is made in thicknesses from 0.75mm (0.030in) up to 12mm (½in). There are several other similar brands on the market: e.g. Makrolon and Tuffak, but what thicknesses these are made in, I haven’t investigated. You will very likely find that

Lexan which has come out of a scrap box is scratched to some extent (unless it is of a scratch-resistant grade); in practice, this is irrelevant: blemishes become invisible after even a light coat of weathering.

How to go about making windows:

Start with something simple, like a Lima B.R. Mk.1 GUV – no small lights, and none with complex shaped corners; and a few tips: add ½mm or so to all your measurements of apertures to allow for filing, etc. Cut more blanks than you think you will need: the reject rate is far higher initially than you expect. Make the largest windows first – any wastage from these can be cut down for the next smaller size. Remember to file a taper on the edges, so that the blank will fit securely into the aperture: see the next diagram:-



With some model manufacturers it is safe to assume that seemingly identical window apertures are actually the same size, but not with all – so check! One minor defect of polycarbonate is that it tends to develop ‘whiskers’ along filed edges; they can be avoided to some extent by using second-cut (or finer grade) files, by filing along the axis of the blank, and finally by using your thumb-nail drawn along the edge, as a scraper. These methods should work – if there are some left, you have to use fine wet-and-dry abrasive paper. Light finger pressure should be all that is needed to position the window if the fit is correct.

Practice makes perfect!

[1] Mainly Trains, Unit C, South Road Workshops, South Road, Watchet, Somerset TA20 0HF; tel. 01684 634543. http://www.mainlytrains.com