

## REPLACING WIRE TIES IN SITU

Soldering new copper ties in the vertical is not one of the most enjoyable jobs. It is tempting to reuse old brittle wires and it is not unheard of to find that wires have been broken or cut away and not replaced.

I have just finished a job involving replacement of more than 1000 tie-wires. The project involved changing 120 iron saddlebars and 80 T-bars – all of which were iron and rusting away and making a mess of the stonework.

Using a soldering iron for this work has always been slow and problematical for me, and I felt the need to find a better method. This involved the use of a gas micro torch as follows:

- 1 Brush away all dirt and grime lodged behind the old bar (a potential fire hazard).
- 2 Cut new wires and tin the middle 10 mm.
- 3 Bend these to a hairpin shape.
- 4 Bend the old wires so that they are perpendicular to the glazing.
- 5 Direct the fine gas flame onto the old wires, at least 20 mm out from the solder joint – whilst holding the wire with pliers.
- 6 After a few seconds the old wire should fall away.
- 7 A slot should be left in the old solder blob where the wire had been. (The key to success is reusing the old solder blob.)
- 8 Rub a little tallow into the slot.
- 9 Take the replacement wire. Hold the ends with pliers and press the tinned part onto the slot. (I have cut a notch in an old pair for better grip).
- 10 Play the micro flame onto the new wire – not less than 20

mm out from the solder joint – at the same time pressing the tinned wire onto it.

11 The heat will transmit through the wire and the solder blob will soften and cover the wire. Withdraw the flame immediately but continue to hold the wire for a few seconds more.

At first the solder blob might fall away – which defeats the whole object. But with practice this method will result in a good strong attachment of the wire.

It is essential to keep the direction of the flame away from the glass – otherwise heat cracks will occur – with that sickening ‘ping’. Plenty of practice on old, disposable panels is strongly advised, until the process is perfected and the work can be done without risk to the glass.

Sometimes, instead of melting off the old wires, you can sometimes simply pull them away with pliers. However, this will often tear the lead – so it is usually better to melt the ties off.

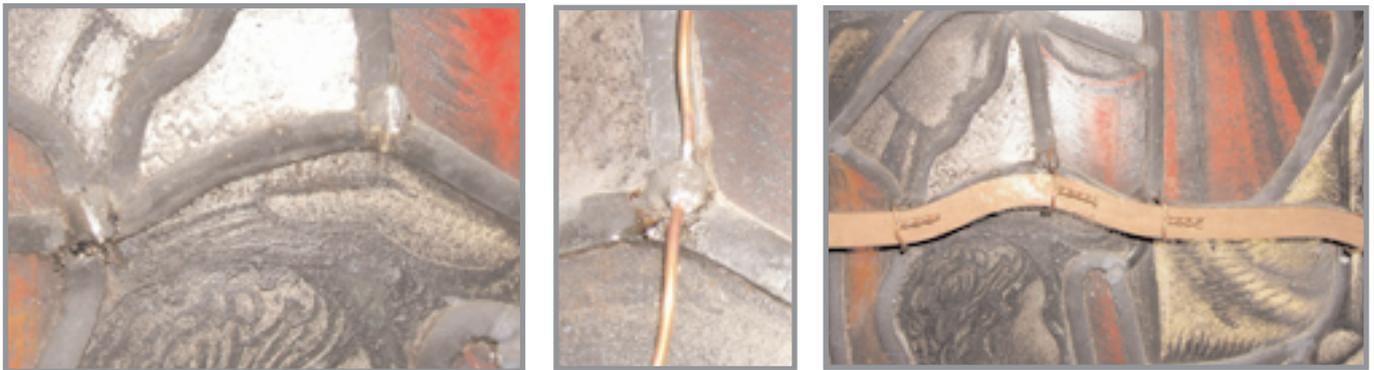
As a live flame is employed sensible fire precautions must be taken – a handy extinguisher for instance!

Notification must be given to the church/DAC, architect and insurance office that a ‘hot process’ is to be used and they will be interested in the precautions to be used.

For your own and the customer’s satisfaction, photographs should be taken before and after the work – particularly if there are already cracks in the areas of work.

It is sometimes possible to reuse the ties wires by annealing the ends ‘in situ’. To do this you need to direct the micro flame onto the ends until they are cherry-red and then quench them with a wet tissue. This softens the wire, which can then, hopefully, be reused.

*Keith Hill – email: keith@glassconservation.com*



*Left: Slots in solder blobs.*

*Centre: New wire.*

*Right: Finished / with bronze bar.*