

EVIDENCE FOR ENAMELLING

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(see CfA report 1/2002 for full version)

A strip of opaque red glass was found in a pit dated to the mid-late 1st century AD. Analysis showed it had a composition typical of bright 'sealing-wax' red Roman enamels. It is evidence that enamelling was probably practised at Heybridge in the 1st century. The types of objects decorated in this way are not known; one of the four hairpins with inlaid heads (Cool type 21) from the site contained glass of this type.

Context 3676, the fill of early Roman pit 3580 located on the settlement edge (Area W) is dated to the mid-late 1st century (Period 3). The fill contained a variety of finds including a strip of opaque red glass (SF173). This was 21mm long and had a rectangular cross-section 12 x 3mm; it had been cut or broken at both ends from a longer piece of glass. The surface had slight striations along its length, suggesting it had been drawn down from a larger-sectioned block of molten glass (see Fig 1).



Figure 1. The strip of red glass showing the surface striations (scale is in mm)

A small piece of glass was removed from one corner of the strip, set in resin, ground and polished to obtain a flat surface, and examined in a scanning electron microscope (SEM). An energy-dispersive X-ray spectrometer attached to the SEM was used to analyse the composition of the glass.

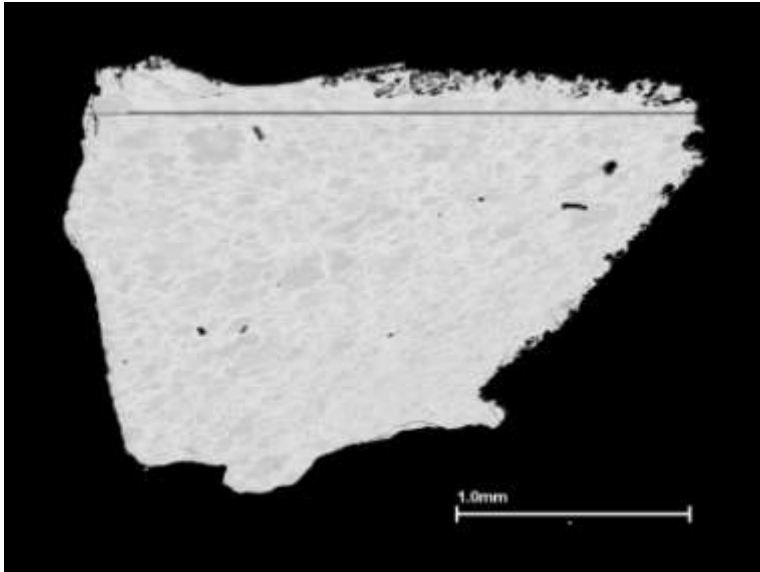


Figure 2. backscattered electron image of the sample of red glass removed for analysis

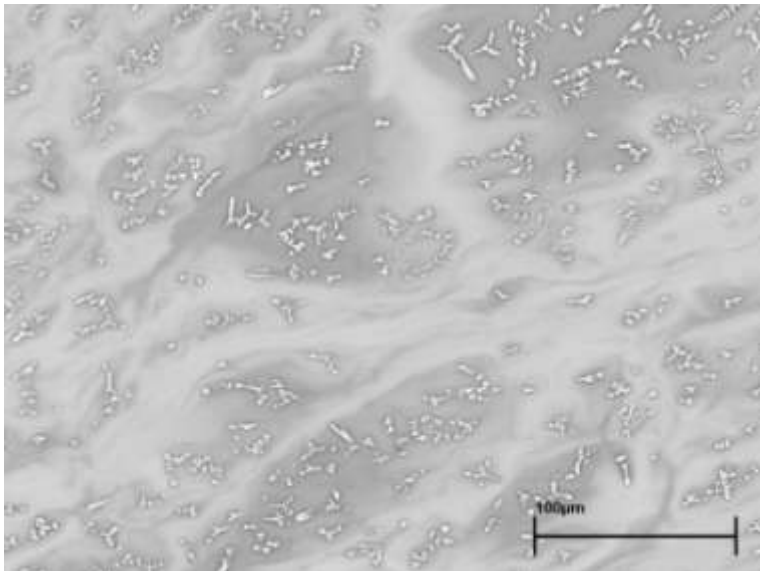


Figure 3. Backscattered electron image showing small cuprite crystals (white) in a matrix of inhomogeneous lead-rich glass (light and dark grey)

To the naked eye the glass looks homogeneous but the backscattered electron image (Fig 2) shows that there are small-scale variations in composition, with lighter shades of grey indicating areas where the average atomic number is heavier. The structure of the glass can be seen more clearly at higher magnification (Fig 3). Knowing the composition of the glass (Table 1) helps in the interpretation of its features. The small bright areas are crystals of cuprite (copper oxide) that have grown in a dendritic form in the glass melt as it cooled. These crystals give the glass its red colour, and also its opacity.