

## Surface coatings and decorative scheme

### E.1.1822 Inner Coffin Box

#### General comments

The entire surface of the inner coffin appears to be covered with a uniform pale yellow layer. This coffin also appears to be in better condition than the outer coffin, seeming to be structurally sound with some paint losses. The composition is much more detailed and finely wrought than that of the outer coffin. The general palette of the decoration is restricted to blues, greens and reds, with blacks used to paint in final details before varnishing. Red paint was used to draw in the figures and hieroglyphs. The blues and greens on this object are built up proud of the surface, often into very three-dimensional figures. The lid is covered in a thick final yellow-tinted organic coating or varnish, which is applied across the entire outer surface, unlike the selective application seen on the outer coffin.

No XRF analysis was carried out on the inside of the coffin, as the awkward angle required of the instrumentation would have put the coffin and equipment at risk.

NB this report does not separate out analysis for the inner and exterior of the inner coffin box. This is because they do not differ significantly in their appearance or apparent material use.

#### Preparation Layer

The outside of the inner coffin box is covered in a white preparation layer that extends over the entire surface of the object (as seen in cross sections IB 1, 2, 3, 4, 5, 6). This layer is crystalline and thickly applied, and appears to have been applied in one layer (as opposed to the double ground layer visible on the outer coffin box and on the inner coffin lid). It is consistent in appearance with calcite. IL06 does suggest two layers, but no other cross sections do.

#### Yellow

A thin yellow paint layer is seen on top of the white ground in the cross sections from the robes: in a sample from the red outline (IB04) and the yellow colour of the robe itself (X IB05). This pigment has been identified as orpiment from cross section and XRF analysis (S40). XRF analysis found significant amounts of arsenic present across the exterior surface of the inner coffin base, suggesting that the whole of the exterior of the coffin was painted with orpiment prior to the application of other colours.

The interior of the inner coffin also indicated similar layer structures, including a yellow wash under a thick yellow organic coating. The flesh of the main figure was found to be painted with a layer of yellow directly onto the white ground layer (X, IB03). The yellow paint is thin but opaque and brightly coloured. There is a thin, discoloured and degraded organic coating on top of this. It is likely that the yellow paint layer continues under the other colours in the same way that it does on the exterior. There is no evidence that the varnish layer contains orpiment.

The yellow degraded organic coating that covers the surface of the inner coffin box was applied after the paint layers. This layer is consistent in texture, UV fluorescence and colour (yellow) with an aged natural resin varnish, which probably contributes towards the yellow appearance of the passages. It is possible that this layer is the main cause of the overall yellow colour of the coffin, as the orpiment may have partially degraded to colourless  $\text{As}_2\text{O}_3$ , arsenolite, a common deterioration product. This is

suggested by some of the cross sections, which show the pigment's characteristic sparkle and particle shape, but lighter colour than expected for an orpiment layer. If this is the case, the degradation of the natural resin varnish is the main cause of the inner coffin box's yellow colour.

The application of yellow tint to the entirety of the inner coffin box (and lid) is dramatically different to that of the outer coffin, which was only selectively coloured yellow – the yellow was messily applied to the illustrated portions of the outside of the outer coffin, leaving areas of background an undecorated, unvarnished white.

### Red Drawing

The decorative and figurative elements were drawn onto the coffin surface using a red earth pigment. This red drawing occurred after the application of the preparation and yellow wash layers, but before the application of any other paints. A cross section taken from a visible compositional red line (from one of the figures with a striped robe, IB04) shows the red lying on top of the orpiment layer. Areas painted in with green or blue clearly show the red sketching sitting below the coloured paint.

The red pigment used for the Gods' skin and the linear decorative elements has been identified as red earth (PLM IB09 (this identification is supported by significant iron levels identified with XRF (S32, 37, 41)), the same pigment as was used for the sketching of the decoration. These areas were probably painted in at the same time as the sketching occurred.

### Other colours

Green has been used in the hieroglyphs, the skin of certain figures and other smaller decorative elements of the exterior of the coffin, overlying the red outlining. This pigment has been identified as Egyptian green (PLM IB8). The sample had a number of glassy inclusions, possibly part of the manufacturing process. A green dispersion sample was taken from the green lower central boat in the interior of the inner coffin base (PLM IB08) – this was also found to be Egyptian green. The paint was found to be the same composition as the paler green from the outside of the inner coffin (PLM IB07), although its final appearance is much more vivid. XRF results show that there are low levels of tin and lead in the Egyptian green, alongside the expected copper. These materials may have come from the copper source used to make the pigment.

Egyptian blue has been identified across the coffin using VIL photography. This has been used on the hieroglyphs, linear horizontal and vertical dividing lines across the exterior, the wigs of figures and other smaller decorative elements. The blue areas of the inner coffin were painted in thick, three-dimensional figures. Pooling of the pigment suggests that the paint was applied while the coffin was flat on its base. These thick layers are vividly coloured and solid on the surface, but once damaged reveal a friable, highly unstable and underbound bulk. Taking cross sections was therefore challenging, but a sample was taken from a blue wig (IB06), which revealed the use of Egyptian blue. Like areas of the outer coffin, a thin, faint orange-red layer was observed underlying the blue. Similar areas of discolouration have been observed on Nespawershefy's outer coffin and mummy board.

Black paint was used to add details to the faces and finer features to the characters. This was applied last, thinly and fluidly over other paint colours, before the final organic coating was applied. XRF analysis (S 44, 45) shows no significant levels of manganese, suggesting this is carbon black.

Cross section samples

IB01	X	White background (outside PRS)
IB04	X	Red line from robe (outside, PLS)
IB05	X	White from robe (outside, PLS)
IB06	X	Blue from wig (outside, PRS)

PLM samples

IB07	PLM	Green from jackal's arm (outside, PRS)
IB09	PLM	Red from neck (outside)

Cross section samples

IB02	X	White background (inside)
IB03	X	White in flesh (inside, main figure)

PLM samples

IB08	PLM	Green from inside boat (inside)
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All samples for the inner coffin (E.1.1822) were taken in October 2014 by Nelly von Aderkas