

# Medieval Scottish window glass

Helen Spencer, MClfA (10647), ScARF Project Manager, Society of Antiquaries of Scotland



*The remains of Elgin Cathedral – the large openings for the windows would once have been full of glass.  
Credit: Helen Spencer*



Unlike in England and Wales, almost no medieval window glass remains in situ in Scottish cathedrals and monasteries. This was due to the extensive damage done to the buildings during the Scottish Reformation in the 1560s. Documentary and archival evidence for medieval glass is also relatively scant, with few references to glass importation or glassmakers. The main evidence for what once would have been resplendent features is what we find in the archaeological record. Medieval window glass does not survive well in the acidic Scottish soils and when it is found it is often very fragile, covered in dark black crusts, and when dried out it can disintegrate if not conserved. As a result, the corpus of medieval window glass is relatively small, although assemblages do survive from some of the great buildings such as Elgin Cathedral, St Andrews Cathedral, Holyrood Abbey and Elcho Nunnery.

While there is some evidence for glass working in the Iron Age and early medieval periods – such as making IA beads at Culduthel and enamels at the monastic site at Portmahomock – these were small-scale, lower-temperature technologies recycling pre-made glass. Glass was not made from its raw materials in Scotland until the post-medieval period and it has been assumed that the window glass used in medieval Scotland was made in France, Germany or England, although there was little direct evidence of this.

Over the past few years, a project has been underway to reassess and scientifically analyse medieval window glass found in Scotland as part of a PhD at Heriot-Watt University. A range of scientific techniques – portable-X-ray Fluorescence, Scanning Electron Microscopy and Laser-Ablated Inductively Coupled Plasma Mass Spectrometry – was used to chemically characterise glass from a range of 13th–16th-century cathedral and monastic sites across Scotland. By determining the composition of the glass, it can be possible to identify when and where the glass was made. The bulk glass composition can show the recipes (for example the type and quantities of flux used to make the glass), minor elements can show the different materials added for example to produce colour, and trace and rare earth elements can, for example, identify particular sand sources used.

The results of the analysis of the Scottish window glass were compared with previous work to characterise window glass made across Europe. This showed that the ‘colourless’ glass from the 13th and early 14th centuries used in Scotland was made predominantly in north-west France/Normandy. This glass was high in potassium and made with wood-based fluxes as well as ashes from ferns and bracken (indicated by higher phosphorus levels), a recipe known to have been used in Normandy. However, by the 15th and into the 16th century, the majority of ‘colourless’ glass imported into Scotland came from



*Four fragments of medieval window glass from St Andrews Cathedral. The red lines show where the glass was cut by the glass maker – the other edges are breaks. Credit: Helen Spencer*



*Glass samples mounted and polished ready for analysis by LA-ICP-MS. Credit: Helen Spencer*

what is now eastern France and Belgium. The recipe used was a high-lime low-alkali type of glass that was not made in Normandy, or England, until later. Indeed, none of the Scottish window glass analysed fitted with glass compositions thought to be made in England.



Glass of a range of colours was also studied. Red, yellow, green and pink glasses were all likely made in Normandy throughout the medieval period. However, blue glasses had a range of compositions and colourants and were made at a number of different locations in Europe. A dark blue glass, for instance, likely came from Rhineland. Two pieces of light blue glass found at sites over 200 miles apart – one from Coldingham Priory and one from Elgin Cathedral – were found to be of almost identical composition. If they had been found in the same window they would have been assumed to have come from the same larger pane of glass, so it is probable that the blue glass used at both sites was made at the same time, in the same glasshouse, and imported to Scotland at the same time.

Further work is planned to study more glass assemblages and also to look more closely at how the trade in glass is linked with other imports and exports to Scotland during the medieval period.



*Two pieces of decorated glass from St Andrews Cathedral. Credit: Helen Spencer*

*Melrose Cathedral – the many windows would once have been full of window glass. Credit: Helen Spencer*

