

INFORM

INFORMATION FOR HISTORIC BUILDING OWNERS

Gilding Techniques, Care and Maintenance



Introduction:

Gilding is the application of thin layers of metal, most commonly gold, onto a surface. It is often to be found as decoration for picture frames and furniture, but architectural gilding can also be found on detailing in the decoration of rooms, or on external details such as heraldry and inscription panels. Historically, the process has been used since ancient Egyptian times. However, it was during the period of Victorian opulence that Scotland saw gilding become more prominent as a widely used internal and external decorative feature. The high cost of gilding meant that its use projected a show of wealth by an individual or corporate body designed to impress. As a result it is often found in high quality private and public buildings. Despite this status, many fine examples are under threat due to a lack of care or poor, ill informed, attempts at maintenance. This INFORM aims to provide a brief introduction to gilding, its proper care and conservation.

Applications of gilding:

Gilding has seen many internal and external applications in Scottish architecture. It has been employed in a variety of fashions. It was applied to a wide range of materials (known as substrates) as they form the base onto which the gilding will adhere. This includes wood, metal, stone, plaster and papier mache.

Various applications of gilding



Identification of gilding

Gilding is easily differentiated from cheaper decorative alternatives, such as gold paint. Gilding appears as a solid surface whereas paint will appear more granular, streaky and dull in appearance by comparison. Whilst gold leaf does not tarnish, paint oxidises and consequently becomes a green-brown colour on ageing. This makes gold leaf relatively easy to identify. True gilding retains its characteristic metallic sheen long after paint has lost its original shine. If there is doubt over whether or not gilding is present, the situation should be treated with caution until a professional opinion can be obtained.

Gilding Techniques:

Two main techniques are used when applying gilding to architectural decoration: - oil gilding and water gilding.

Oil Gilding:

This method can be used to apply gilding to most internal and external building surfaces. The first step is to prepare the surface onto which the gilding is to be applied. This is done with paint or gesso. Gesso is made by mixing chalk or gypsum with liquid glue known as size. This is covered in a thin layer of gold size which is left until it is nearly dry and ready to accept the gold leaf. Finally, a protective coating can be added.



Water Gilding:

This process requires greater preparation of the surface onto which the gilding is to be applied but, compared to oil gilding, a superior finish can be produced. Before water gilding is applied a number of coats of gesso need to be built up on the substrate to produce a smooth surface. This is followed by several coats of bole. Bole is coloured clay mixed with size. The surface is then wetted with a mixture of water and metholated spirits and the gold leaf applied instantly. As the water soaks into the gesso it draws the gold firmly onto the surface. The gilded layers are then polished using agate (a form of hard quartz like stone) burnishers. Judging when the surface can be burnished is critical. If the correct degree of dryness has not been achieved the leaf can be easily damaged. The burnished gilded layers can, if required, be toned down using oil based varnishes and pigments.



Materials used in gilding:

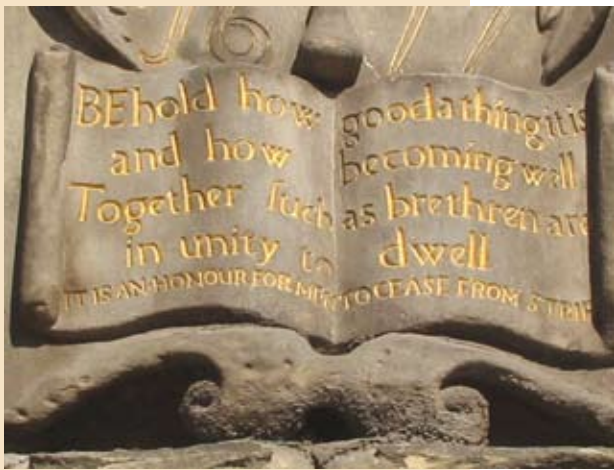
Despite variations in technique of application, the same basic materials of leaf and size are integral to all methods. As with all elements of traditional buildings, an understanding of the materials used is conducive to their proper care. With gilding the following should be noted:

- **Leaf:** Very thin sheets of metal (around 1/250,000th of an inch thick) are used and are supplied on a backing paper in “books”. The most common type of leaf is gold although other metals, such as silver or platinum, can be used. Gold can also be alloyed with other metals to provide different tints and shades. In common with all gold, leaf can come in varying degrees of purity ranging from 12-24 carats. The purity of the leaf can alter the appearance of the finished gilding.
- **Size:** In oil gilding a liquid glue known as gold size is applied to the substrate. This forms an adhesive that acts as the binder between the metal leaf and the prepared surface. This size is most commonly made of heated linseed oil although, in the past, other materials such as rabbit skin glue were used. In water gilding size is mixed with water to help provide the necessary composition to aid adhesion between leaf and substrate.
- **Gesso:** In order to provide the surface to receive the gold leaf a fine plaster-like material has to be applied to the substrate. This layer of gesso is made by mixing chalk or gypsum with size. Warm liquid gesso is applied in several layers and, when dry, is sanded to a smooth finish to create the necessary surface.
- **Bole:** Bole is applied over the gesso layer. In water gilding techniques bole is used beneath the leaf to create a very fine, hard

surface. This allows the gold to be polished (burnished) to a bright sheen. In some cases the colour of the bole can influence the appearance of the finished work.

- **Surface coating:** After gilding has been applied it is sometimes coated for aesthetic reasons or protection. Silver gilding is always coated with varnish to prevent it becoming tarnished. The surface coating can take the form of lacquer, clear glaze, or toned varnish, depending upon the desired level of protection or required appearance. It should be maintained thereafter because removing it exposes the leaf and alters the appearance.
- **Tools:** A variety of specialist tools are used in the gilding process. A gilder's pad and knife are required to cut the leaf into the desired size and shape for the job. A flat brush is used to transfer the leaf from the pad onto the substrate, and these come in a variety of sizes. Other brushes are used to smooth the gilding into position, and to remove excess leaf. A variety of other tools are employed in the application and preparation of gesso, bole and finishing.

Gilded stonework picking out lettering



Threats to Gilding:

Whilst gilding has been known to last for over 3000 years, the biggest threat it faces is from inappropriate cleaning and unnecessary intervention by those without adequate knowledge and training. The application of water during cleaning of water gilded surfaces causes considerable damage as the water dissolves the size that binds the gold leaf to the substrate. The use of cleaning solvents can have an equally disastrous effect. They dissolve the size used in oil gilding and remove the surface finishes (such as lacquer or varnish) resulting in the loss of colour and unprotected work.

As gilding is fragile it should not be cleaned excessively. Only the occasional careful light dusting is necessary. Wherever possible excessive heat and light should be avoided. Care should also be taken with the positioning of lights and heating installations near gilded surfaces to avoid localised areas of damage being created.

Heat and humidity can also lead to deterioration of the gesso layer and the substrate onto which the gilding is applied. This can result in cracking and loss of surfaces. Pests such as woodworm can cause damage in wooden substrates. In damp areas moulds can cause discoloration and loss.

Care and Maintenance:

Any maintenance or specialist conservation work on gilding should be kept to a minimum and, ideally, be carried out by a professional conservator. Before any work is undertaken it is important to properly identify as much as possible about the substrate, method of application and type of leaf. All surface finishes should also be fully understood before an appropriate approach to the work can be established. The aim should be to maintain the original surface as far as possible. This should include any glazing or varnish as these layers protect the leaf and are integral to the appearance of the finish. Where practical to do so, the same original materials and techniques should be used when maintaining or repairing gilded work.

Where the deterioration of the prepared surface is the cause of damage, the application of size or similar glue based material can stabilise flaking gesso or bole. If the protective surface coating has been worn away to expose the leaf this should be replaced to prevent further wear.



Internal gilded decoration © RCAHMS



External gilded decoration

If missing patches of gilding need to be replaced this can be achieved without having to re-gild the whole surface. Replacement leaf can be applied and then toned down to blend in with the original finish. This approach is preferable and more economic than renewing the whole surface.

Whilst gilding itself can last almost indefinitely, a major problem can arise through the deterioration of some substrate materials. This is particularly problematic with exterior gilding on iron railings as gilding can flake off along with rust. Where gilding has been applied to stonework there can also be problems when masonry decay occurs. Water ingress is one of the biggest culprits. Where

this occurs and the loss of either external or internal architectural gilding is evident, action to halt the flow of moisture contributing to the deterioration of the substrate will be necessary before re-applying the gilding.



Deteriorated external gilding



Perhaps the worst cause of unnecessary damage is the application of gold paint on top of gilding. As gold paint oxidises and discolours; a chemical process which cannot be reversed occurs. Widely used as an alternative to proper conservation, it can have disastrous results. The cost of removing the paint and replacing the gilded surface frequently proves prohibitive resulting in the loss of the original effect for ever. Where the original was gilded the subsequent application of gold paint should be avoided.

Due to the cost and difficulties in carrying out appropriate repair to gilding, it is always advisable to seek advice from a suitably qualified professional with an appropriate knowledge of the techniques that were originally used.



Gold paint oxidising and losing its shine

Further Information and Contacts

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ICON The Institute of Conservation, www.icon.org.uk

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Article by Kevin Howell at <http://www.buildingconservation.com/articles/gilding/gilding.htm>



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Published by Technical Conservation, Research and Education Group, January 2007

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