

METALS (NON-FERROUS)

GLOSSARY

Copper alloy: metal alloy principally of copper with one or more non-ferrous metals. Bronze (tin) and brass (zinc) are types of copper alloy.

Galvanic (bimetallic) corrosion: electro-chemical process where one metal corrodes preferentially when in contact with another.

Non-ferrous: metals, including alloys, that do not contain iron in appreciable amounts. In archaeological collections, commonly copper, lead, silver, gold and zinc.

STORAGE

Ideally, non-ferrous metals should be x-rayed before storage.

- ◆ Vapours released by wood can damage all metals, some more than others. Lead is particularly susceptible to corrosion due to acetic acid in woods such as oak. Silver and copper objects, metal embroidery threads, sequins and silver photographic images tarnish as a result of sulphur gases, released by wool.
- ◆ Store copper alloys in well-sealed containers as they are susceptible to corrosion by ammonia, acids, strong alkalis, chlorides, and sulphide gases.
- ◆ Store small metal objects in bags and boxes (polyethylene or polypropylene). Silica gel should be used to reduce humidity inside a box or bag.
- ◆ Store fragile or complex objects (e.g. Roman brooches) in crystal boxes with sculpted Plastazote support. Tyvek layers can help with lifting a fragile item in and out of its support.



Silver finger ring © Bristol Culture

- ◆ Large non-ferrous objects will probably need bespoke packing. Be aware that large, thin-walled or lead objects may be at risk of slumping without support.

LABELLING AND MARKING

Most non-ferrous metals can be given surface marking.

- ◆ Undertake a documentation check to ensure that the information is correct before remains are marked.
- ◆ Ensure that marking is clear and legible.
- ◆ Use a layer of Paraloid B72, then ink, then a layer of Paraloid B72 to seal.
- ◆ Label bags or boxes or use archive labels attached with cotton tape or archival string for severely corroded objects.

ENVIRONMENTAL DATA

- ◆ Temperature: 10–25°C.
- ◆ Humidity: 35–55%.
- ◆ Illuminance: 300 lux maximum.
- ◆ UV Radiation: 0–10 microwatts per lumen ideal. 75 microwatts per lumen maximum.

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INDICATORS OF DECAY

- ◆ **Silver:** splitting, cracking, tarnishing.
- ◆ **Copper alloys:** light green, powdery deposits (known as 'bronze disease').
- ◆ **Lead:** white powdery deposits.

WHERE YOU WILL COME ACROSS NON-FERROUS METALS

- ◆ In archaeological objects of all periods.
- ◆ In archaeological excavation archives.
- ◆ In architectural features.

HANDLING

- ◆ Use nitrile gloves.
- ◆ Highly polished metals are particularly sensitive to the oils and salts in skin.
- ◆ Be aware that many pure metals and some alloys are soft and can be easily scratched or dented. Remove jewellery before handling (and beware of dangling ID passes.).
- ◆ Wear an appropriate facemask if powdery corrosion products are present.



Anglo Saxon saucer brooches © Museums Worcestershire



Lead baling seal © Bristol Culture

LOOK OUT FOR

- ◆ Objects that have been made with multiple metals (alloys) or have metal inlays are composite objects and can be susceptible to galvanic corrosion.
- ◆ Be aware that metal corrosion products can preserve or mineralise materials such as textiles or wood. Handle with care as these can be fragile and ephemeral.

HEALTH AND SAFETY

- ◆ Corrosion products can be toxic, in particular those present on lead, silver and copper alloys.
- ◆ Conservation lacquers and coatings (e.g. Inctalac) can contain Benzotriazole (BTA), a potential carcinogen.
- ◆ Use nitrile gloves and wear facemasks when needed.

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SOURCES OF FURTHER INFORMATION

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