

Handling and Packing

Handling

Many artefacts appear to be more solid and robust than they are. A great deal of damage can be caused by inappropriate handling and moving. A little forward planning will vastly reduce the risk of damage to an object.

To handle and move objects safely you need to consider the following questions before touching the object:

- **Why am I handling this object?**
- **Is it really necessary to move the object?**
- **Is it robust enough to withstand handling?** Check the condition of the object to see whether there is a structural weakness or any damage.
- **Can I lift the object?** If it is heavy or large you may need someone to carry it with you or to act as a guide.
- **Do I need moving or lifting equipment, such as a tray, box, trolley or powered equipment?** If moving or lifting equipment is used, follow the manufacturers' guidelines.
- **What are the health and safety risks for people?** Can I move this item without endangering myself or others? If there are risks, how can I minimise them? It might be necessary to warn people along the route or ask them to leave the area.
- **Where is the object going to and how will it get there?** Plan the route to be taken. Make sure that the object will fit through doors and awkward areas and arrange for the doors to be opened. Clear the route of obstructions at all levels. Ensure that there is an area prepared at the receiving end for the object. This should be clean, secure and free from obstructions. It may be helpful to lightly pad the surface with a layer of 'Jiffy' foam or several sheets of acid-free tissue.

Small objects may need a smooth surface to rest on, but larger ones may need padded blocks so that they can be lifted without damage in future. Make sure there is no food, drink or smoking in the areas where the object is being taken from and where it is going to.

- **Does the object have enough support?** If not, find suitable materials to support the object before handling, see Packing section below. You might need to place it in a box or on a tray, padded to fit the object.
- **Does the object move about inside its box?** Check that parts of the object do not rub or knock against each other. They may need to be packed separately. If the object is loose in its box, pack it more securely using suitable packing materials and methods as described in the Packing section below.
- **Should I wear gloves?** Wearing gloves is very important when handling objects. The skin secretes oils and metabolic wastes including various salts and urea, which react aggressively with all materials. These will leave a permanent mark on the object. For example, fingerprints can quickly eat into polished metal. To protect objects, wear either cotton or disposable nitrile or latex gloves every time you handle them. Change the gloves as they get dirty, ensuring that dirt is not transmitted from one object to another.

It is important to choose the right kind of gloves. If the object is dusty or dirty, has a rough surface which could catch on fibres or a very smooth surface which could be slippery, it may be better to wear non-absorbent gloves made of latex or nitrile. If it is clean and dry, it may be preferable to wear cotton gloves.

Wearing gloves also protects you. The object may be coated with harmful substances such as lead-rich pigments or plant alkaloids like curare, or the remains of earlier treatments such as pesticides. Early felts were made with mercury and stuffed animals may have been treated with arsenic. The object may have been stored in the past with items contaminated with dangerous compounds.

- **How do I lift it?** If one person is able to carry the object without aid, place one hand underneath the object, and the other around the side for support and control. It is preferable to carry objects in their boxes where possible. Do not pick up objects by their handles or projections, as they may be loose or break off. Do not be afraid to ask for help. Even small or light objects may need two people to carry them safely.

If more than one person is carrying the object, share the weight and nominate one person to say when to lift and when to put down. If possible, keep the object level and make sure all the parts are supported. Agree in advance which way you will move or turn the object. If moving or lifting equipment is used, make sure the operator understands how to use it and follows the manufacturers' guidelines.

- **Will I need to move it again?** If the item is going to be moved more than once, you may wish to plan for this, providing it with a secure carrying case or support which is more easily lifted and moved.

Some useful tips

- Before handling objects, remove all jewellery that could scratch the surface or become entangled such as necklaces, pendants, bracelets, rings and large watches. Have a secure place to keep these while you are working.
- Remember that the size and complexity of an object can be a greater problem than its weight. For example, a large sign or poster made of card can be very light in weight, but it may be difficult for one person to carry. Damage may be caused by bending or crumpling it during a move if it is caught in a breeze or knocked against a doorway.
- All the parts of an object must be supported.
- Ensure that vision is not impaired when carrying bulky objects. Get somebody to guide you if you cannot see over or around the object.
- Before carrying a framed picture, make sure the picture is securely fastened in the frame. Carry it upright by the sides of the frame or the top and bottom. Do not use the top as a handle to lift it.
- Carry an unframed picture by the stretcher bars at the back. Never touch the painted side or the back of the canvas.
- If the surface of an object is damaged, for example, a painted surface is flaking or loose, do not move the object. Contact a conservator.
- Take care when picking up or setting down ceramics and glass. These materials can have hairline fractures that may cause the object to shatter.
- Carry costume supported across both arms or on a large cloth. If it is on a hanger, hold the hanger in one hand and support the rest of the garment across your other arm, making sure your clothes cannot become entangled. It may help to drape a clean cloth across your arm first.
- Make sure that all the parts of the object and any associated material or labelling are moved to the new location.
- Never carry or lift objects by their handles. These components are often weak and may give way under the weight of the object.

Packing

Museum objects can be damaged by insufficient or inappropriate packing materials. Damage can be physical, for example, rubbing against other objects, or chemical from substances present in the packing materials.

It should be easy to identify the object without removing it from the packing. For example, small items should rest on a nest of tissue paper, not be rolled up in it. All parts of an object should be supported and protected to prevent physical damage. The method of packing and the packing materials selected will depend on factors such as:

- The materials it is made from
- The condition of the object
- The size, shape and weight of the object
- The environment in which it is kept
- How long the object will stay in the packing

General Packing Guidelines

- **Do** assess every object for its own packing requirements. Even similar objects may need different packing.
- **Do** make sure that you can identify an object without unpacking it. Minimise disturbance of the object.
- When putting objects in a box **Do** nest them in packing materials, so that you can easily take them out afterwards.
- **Do** make sure that all parts of the object are well supported.
- **Do** pack fragile objects separately. Pack smaller objects individually, for example in 'Crystal' boxes. Place these small boxes inside a larger box, such as a 'Stewart' polythene box or acid-free card box. Pack the smaller boxes so that they cannot move around within the larger box. Fill any empty spaces with rolled up light packing materials such as acid-free tissue, jiffy foam or bubble wrap. Label each small box and label the outside of the large box with ALL the contents.
- **Do** pack fragile objects separately so that they cannot knock or abrade each other.
- **Do** check on the object regularly. Record the date it was packed and each time it was checked (e.g. on the database or on the outside of the box).
- **Do** hang costume on custom-made padded hangers that fit each individual item. This prevents immediate and long-term damage. Some costume should NOT be hung, as it is too fragile, too heavy, too ornate or made of bias-cut fabric.
- **Do Not** roll up small objects in packing materials. Damage can occur when unrolling, loose parts may be lost and the object can easily be dropped.
- **Do Not** crowd or over-fill a container.
- **Do Not** allow objects to move around in a box due to insufficient packing material.
- **Do Not** reuse packing materials unless you are certain they are clean and show no discolouration.
- If your budget is limited, plan to replace some unsuitable materials each year. Prioritise replacement with the most vulnerable items in the collection being repacked first.

Boxes Protect objects from:

- physical damage
- environmental agents, such as dust, pollution and light
- rapid and extreme fluctuations in temperature and humidity

Suitable boxes are:

- **Acid free card boxes.** These are often used to store objects that do not require a special environment.
- **'Stewart' boxes** (translucent inert polyethylene boxes with lids that seal). These are often used where special environmental conditions need to be maintained to preserve the object (see Microclimates Section below).
- **'Crystal' boxes** (clear, lidded boxes made of a specially formulated polystyrene). These are often used to pack small or fragile objects. These boxes can then be placed inside another box, to keep them together or to maintain special environmental conditions (see Microclimates, below). The smaller boxes are packed in such a way that they cannot move around within the larger box.

Microclimates

Objects may need to be stored in special environmental conditions to prevent further deterioration. If the environment in the store does not meet the requirements of a particular material, it is possible to create and maintain a special environment within a box. This is called a microclimate.

The most common need for a microclimate occurs when storing archaeological metalwork, particularly iron, which requires a very dry environment to prevent the metal from corroding further

To create a microclimate:

- Objects should always be packed in a 'Stewart' box.
- A perforated polythene bag of silica gel is placed inside the 'Stewart' box. The objects should not be in contact with the silica gel. It is very important to use enough silica gel to dry out the volume of air inside the sealed container. As a rough guide, the amount of silica gel required should be about one fifth of the volume of the air being dried. It is better to use too much than too little.
- An RH indicator strip should be placed inside the box, facing outwards so that the RH level can be read without opening up the box.

The boxes must be checked periodically to see when the silica gel needs changing. When it has changed colour it is no longer drying the air. It can be regenerated in an oven at 80 – 100°C and allowed to cool before replacing in the polythene bag. It may need to be kept in a sealed container (e.g. a metal biscuit tin) while it cools.

Packing materials

All packing materials should be acid-free, and chemically inert. Common types of packing materials are:

- **Acid-free tissue and card.** These can be easily cut to size. Acid-free tissue can be made into soft pads and nests to cushion objects. A layer of acid-free tissue should be placed between the object and any other material it touches, such as shelving or polyethylene foam
- **'Jiffy Foam'** – expanded polyethylene sheet available in several thicknesses. The sheets are slightly corrugated and can be cut with scissors.
- **'Plastazote'** – smooth, dense polyethylene foam, available in sheets of various thickness or blocks, and in several colours. White 'Plastazote' is the best to use; black can also be used. It can be difficult to cut cleanly, as the material tends to stretch slightly. Use a very sharp blade such as a scalpel or Stanley knife, following appropriate health and safety procedures.
- **'Ethafoam'** – a coarse, rigid polyethylene foam available in thick sheets. This can be cut with ease using a long blade, such as a bread knife or small hand saw – again please ensure that you are following appropriate health and safety procedures.

All the above materials have been tested for their suitability with museum objects, and have been found to be inert. However, even good packing materials can cause damage if they are not accurately cut to shape or have rough surfaces. Do not allow the packaging to exert pressure on the object.

Materials to avoid include:

- Non acid-free materials, such as newspaper, toilet paper, ordinary tissue paper, cardboard, hardboard and wood as these often contain harmful chemical compounds. Museum objects may deteriorate if left in contact with these materials.
- Hairy or fluffy materials, such as cotton wool. The fibres can easily become attached to the object. They may be difficult to remove and can cause loose parts to detach.
- Materials which can deteriorate to form harmful compounds – such as polyurethane foam, styrofoam, latex foam and pvc (polyvinyl chloride).

It is usually safe to assume that the object will be in the packing materials for longer than was originally planned, so it is worth the extra expense and care to pack well.

Packing method examples

Small, lightweight objects that do not require special conditions

- Use acid-free card boxes.
- Place a layer of soft packing material in the bottom of the box.
- Create a nest for each object from acid-free tissue or Plastazote foam, making sure there is sufficient packing material underneath and around each object.
- Make a soft pad of acid-free tissue or a piece of Jiffy foam to place over the object before closing the box.
- Avoid placing objects in layers. If objects have to be packed in layers, ensure that the objects underneath are robust, and those on top are lightweight. A tray or rigid layer of acid free card between layers will help to spread the weight of the objects above. Remove all the objects from each layer in turn when unpacking the box. Make sure that there is a label inside the box indicating the number of layers present in the box.
- Label the box with all of the contents.

Large or very heavy objects

- When boxing an object is not feasible, large or very heavy objects can be protected by raising them off the floor. Place them on wooden pallets, the bottom shelves of racking or stand them on thick sheets of 'Plastazote' or 'Ethafoam'. The object may need to be raised slightly from the surface on padded blocks, so that you can safely set it down and lift it in future. Large pictures, cannons and stone blocks are frequently stored this way.
- Cover them with dustsheets, made from unbleached cotton, 'Tyvek' (spunbonded polyester cloth) or 'Jiffy' foam. Label the dustsheets and the objects clearly. If the dustsheets need to be secured, use cotton tape. Do not use any type of adhesive tape, as it will eventually fail and the adhesive will migrate onto the objects leaving a permanent stain.
- Tie a label to the dustsheet using cotton tape.

Large flat textiles

- When packing large flat textiles in a box, use the largest size box you can manage to minimise the number of folds. Line the box with acid-free tissue and use loose rolls of acid-free tissue to pad inside the folds. If possible, put each item in a separate box.
- An alternative to boxing is rolling. This prevents items such as large textiles from becoming damaged by creases from folding. Make sure you have enough space to store the rolls and that all the materials are inert.
- Prepare a clean flat area large enough for the textile and the people working on it. Cover an area slightly larger than the textile with acid-free tissue. Lay the textile face down on the tissue.
- Select an acid-free cardboard tube that is wider than the textile and has the biggest diameter you can manage. Wrap it twice in acid-free tissue and place it on the edge of the acid-free tissue which extends from under the textile. Roll the tube slowly and evenly across the textile, using the tissue to hold it onto the tube as it rotates. This will almost invariably require at least two people.
- Cover the tube with an unbleached calico or Tyvek cover tied gently with cotton tape.
- Place a wooden dowel which is strong enough to support the weight of the rolled textile inside the tube, making sure that the ends project either side of the tube. Suspend the dowel horizontally so that the roll hangs free and is not pressing the textile against a wall or projection.
- If this is not possible, the tube can be placed horizontally on pads, on a shelf.
- Label the outside of the roll, including a small picture of the contents if possible.

Costume

- When packing costume in a box, use the largest size box you can manage to minimise the number of folds. Line the box with acid-free tissue and use loose rolls of acid-free tissue to pad inside the folds. If possible, put each item in a separate box.
- When hanging costume, custom-fit each hanger to fit the item by padding it out with polyester wadding and making an unbleached calico slip cover to go over the wadding. Label the hanger so that it is simple to identify the correct hanger for each object if they become separated.
- Cover each item of hung costume with a custom-made Tyvek or unbleached calico 'garment bag'. Great care must be taken in the design of the bag so that the object is not damaged when the bag is put on or taken off.
- If several items are hung on one rail a large sheet of Tyvek can be hung to protect them all.
- Label the outside of the box or bag, preferably with a picture of the garment, so that it is not necessary to open it up to identify the contents.

Labelling and identification

Follow your museum procedures for labelling the packaging. 'Artline 250' and 'Artline 70' permanent markers manufactured by Shachihata, and 'Pigma Micron' archival marker pens made by Sakura are recommended for labelling on boxes, lids and on labels (such as 'Tyvek' labels).

Attach a photograph or drawing of the object to the outside of the box or cover. This will identify the object and prevent any unnecessary handling. It may also be helpful to include the date when the object was packed.

Factsheet 3 prepared by:
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Suppliers

Acid Free Boxes/Tyvek Labels RH Indicator Strips

Conservation Resources (UK) Ltd
Unit 2 Ashville Way
Off Watlington Road
Cowley
Oxford OX4 6TU
Tel: 01865 747755
Fax: 01865 747035
www.conservationresources.com

Acid Free Tissue/Cotton Tape Conservation by Design Ltd

Timecare Works
5 Singer Way
Woburn Road Industrial Estate
Kempstone
Bedfordshire MK42 7AW
Tel: 01234 853555
Fax: 01234 852334
www.conservation-by-design.co.uk

Artline Pens

Local Stationers

Gloves

Local DIY stores and chemists

Gloves/ Pigma Pens/Tyvek

Preservation Equipment Ltd
Vinces Road
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Norfolk IP22 4HQ
Tel: +44 (0)1379 647400
Fax: +44 (0) 1379 650582
www.preservationequipment.co.uk

Jiffy foam

Key Industrial Equipment Ltd
Blackmoor Road
Ebbleke Industrial Estate
Verwood
Dorset BH31 6BR
Tel: 0845 6040660 (local rate)
Tel: 01202 825311 (accounts & catalogues)
www.keyind.co.uk

Plastazote

Beldam Plasmar Ltd
Neachells Lane
Wednesfield
Wolverhampton WV11 3QG
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Silica Gel

GeeJay Chemicals Ltd
16 Gosforth Close
Middlefield Industrial Estate
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Bedfordshire SG19 1RB
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Fax: 01767 692409
www.geejaychemicals.co.uk

Stewart Boxes (small orders)/Crystal Boxes

AZPACK Ltd
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Tyvek

Shiloh Healthcare Ltd
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