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Freezing guidelines for controlling insect infestation

This summary is a general guide for freezing objects such as textiles, paper and wood to destroy insect pests.

If the object does not belong to your organisation - permission from owner/lender to treat objects by freezing must be obtained before they are treated.

Where there is concern about the fragility of an object, advice should be sought from a conservator about the suitability of freezing. Another method such as anoxia (low oxygen treatment) may be more appropriate for sensitive objects.

Freezer temperatures and exposures needed

-18°C to -20°C for 14 days exposure
-30°C for 3 days exposure

- It can take at least 24 hours for the centre of dense objects, such as rolled textiles, to reach the target temperature. It is advisable to place a temperature sensor in the centre of very dense objects to ensure that target temperatures have been reached.

Procedure

- Document the objects to be processed?
- Measure the freezer, have the right materials ready i.e. acid-free tissue, plastic sheeting, tape dispenser for polyethylene tape, scissors etc.
- Make sure you have plenty of working space when wrapping the objects.
- Objects should first be wrapped in acid free tissue.
- When wrapping, cut the acid-free tissue paper and plastic sheeting roughly to size required first.

- As a precaution, wrap any metal components on textiles in extra acid-free tissue to prevent condensation forming and staining occurring.
- The object should then be wrapped in plastic sheeting, removing excess air where possible.
- Use gripper bags (zip-locked bags) for smaller sensitive objects.
- If the object is fragile or of an awkward shape, then it can be placed in a tray or an archive box which can then be wrapped in plastic sheeting.
- If treating an infested item, do not clean it before freezing. Bag it up for freezing and clean after treatment. This will help to avoid spreading insect eggs, larvae etc.
- Seal the bag with tape (double tape if necessary) or a tie to ensure that no air or moisture is allowed to enter the wrapped object.
- Label bags with:
 1. the object's description
 2. accession number (if applicable)
 3. date it went into the freezer
 4. date it was taken out
 5. name of person responsible for the object
 6. what it is infested with (if known).
- Place the object carefully in the freezer.
- Do not pack objects too tightly and ensure there is an air space around the sides of the freezer. Baskets can be used.
- Place a wood or foam spacer on the floor of the freezer before loading to ensure that there is an air space under objects to allow the cold air to circulate.

If using a chest freezer, attach a document sheet on the freezer lid so that colleagues know not to add any other items during the treatment and also not to turn off the freezer during the treatment period. Lock the freezer if this is possible.

- Expose objects for the appropriate time (see above).
- Once the treatment has been completed you can turn off the freezer unit (with contents inside) and allow to return to room temperature before emptying. However, please do not do this if the lid has been opened during the treatment cycle as this could cause condensation to form around the edges of the freezer.

- Remove objects carefully as many materials will be very brittle at low temperatures.
- Once removed, place objects on racking or an appropriate surface and allow them to recover to room temperature for at least 24 hours before they are unwrapped.
- Very dense objects should be left for at least 48 hours before unwrapping.
- When conservation-approved materials are used, objects may be left wrapped for short periods if there is a risk of them becoming re-infested (speak to a conservator, if in doubt).
- After removal and unwrapping, the objects should be cleaned to remove dead insects and signs of infestation such as frass and webbing.
- The treatment of each object must be documented according to organisation guidelines.

NOTE.

- If a -30°C freezer is used, then staff must use freezer gloves and avoid contact with surfaces to prevent freezer burn.
- If freezers are running continuously, objects can be placed immediately. If they are switched on for each treatment, they should be operating for 24 hours before objects are introduced.
- Auto-defrost freezers should not be used.

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