

Freezing guidelines for controlling an insect pest infestation

This is a general guide for freezing small items, such as textiles, paper and wood, to eliminate insect pests. If the object does not belong to you, permission from the owner or lender to treat by this method should be acquired before any treatment takes place.

If you are concerned about the delicacy of an item, advice should be sought about the suitability of freezing. Another method such as anoxia (low oxygen treatment) may be more appropriate for sensitive objects. You should either seek advice from a conservator or a good pest control company will be able to help with general public enquiries.

Freezer temperatures and exposures needed are:

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

IMPORTANT - PLEASE NOTE:

If a -30°C freezer is used, then you must use freezer gloves and avoid contact with the surfaces to prevent freezer burn.

In the case of freezing large items, for example rolled up carpets, it can take at least 24 hours for the centre of the dense objects to reach the target temperature. To ensure this is achieved, it is advisable to place a temperature sensor in the centre of the objects to ensure that the temperatures have been reached.

Procedure for wrapping items:

- 1) When treating infested items, do not clean before freezing. Bag items up for freezing and clean after treatment. This will help to avoid further spread of any insect eggs or larvae.
- 2) Measure the section of the freezer you are using. Ensure the items can be placed without them touching the sides.
- 3) Make sure you have plenty of working space when wrapping up the items.
- 4) Have the right materials ready to hand, for example plastic self-sealing bags or plastic sheeting, tape dispenser for polyethylene tape, acid-free tissue, scissors.
- 5) Items should always be wrapped in acid free tissue before placing in plastic bags or sheeting.
- 6) When wrapping, cut the acid-free tissue paper and plastic sheeting roughly to the size required first.
- 7) As a precaution wrap any metal components on textiles, (buttons, zips, buckles on belts), in extra acid-free tissue to prevent condensation from forming and any staining occurring as a result.
- 8) The object should either be placed in the plastic self-sealed bag or wrapped in plastic sheeting. Remember to remove any excess air if possible.
- 9) Seal the bag with tape, use double tape if necessary, to ensure that no air or moisture is allowed to enter.
- 10) Use gripper bags, (zip-locked bags), for smaller sensitive objects.

11) If the object is fragile or of an awkward shape, it can be placed in a tray or a box which can then be wrapped in plastic sheeting.

Label bags or boxes with:

- 1) the item description
- 2) the accession number (applicable to museums and heritage organisations)
- 3) the date it was put in the freezer
- 4) the date it was taken out
- 5) the name of person responsible for the item (if applicable)
- 6) what the item is infested with (if known).

Freezing instructions:

- 1) Always place items carefully into the freezer. Do not pack them in too tightly and always ensure there is an air space around the sides of the freezer. Baskets can also be used.
- 2) If freezers are running continuously, items can be placed immediately. If they are switched on for carrying out each treatment, they should be operating for 24 hours before any items are placed inside.
- 3) Auto-defrost freezers should not be used.
- 4) If you are using a chest freezer, you can attach a document sheet on the freezer lid so that others know not to add any other items into it during the treatment period and also not to turn off the freezer. You can also place a wood or foam spacer on the floor of the freezer before loading to ensure that there is an air space under items to allow cold air to circulate. Lock the freezer if this is possible.
- 5) Expose the items for the appropriate time (see page 1).
- 6) Once the treatment has been completed, you can turn off the freezer unit (with the items inside) and allow them to return to room temperature before emptying. However, 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.
- 7) Remove the items carefully as many materials can be very brittle at low temperatures.
- 8) Once removed, place the items on racking or an appropriate surface and allow them to recover to room temperature for at least 24 hours before unwrapping. Very dense objects should be left for at least 48 hours.
- 9) When conservation-approved materials are used, items may be left wrapped for short periods if there is a risk of them becoming re-infested (check with a conservator if in doubt).
- 10) After removal and unwrapping, the items should be cleaned to remove the dead insects or larvae and any other signs of infestation such as frass and webbing.
- 11) The treatment of historical items, for example those found in a museum or heritage institution, must be documented according to organisation guidelines.

Guidelines written by Dee Lauder and David Pinniger,
May 2019.