



## Mechanical Surface Cleaning of Textiles

### Introduction

This Note describes methods and considerations for mechanical surface cleaning of museum textiles in routine situations. Mechanical surface cleaning refers to the removal of loosely bound particulate soils by mechanical means, such as brushing or vacuuming. Although these techniques are routinely carried out in the home, they must be modified for museum textiles. For example, in a domestic situation the goal is to remove as much dirt as quickly as possible. However, in a museum setting the goal is to remove only the dirt that is disfiguring and potentially damaging the textile, without causing further damage.

N.B. The issues involved in removing soot and mould are beyond the scope of the Note, and are not dealt with here. For more information, see CCI Notes 13/15 *Mould Growth on Textiles* and Technical Bulletin 26 *Mould Prevention and Collection Recovery: Guidelines for Heritage Collections*.

### Why Surface Clean?

Textiles tend to trap dust and dirt due to their texture and porous nature. If left in place, this dust and dirt is disfiguring and can give the impression that the collection is not being cared for properly. Dust and dirt can also damage textiles physically or chemically. For example, gritty particles (especially crystalline materials) have sharp edges that abrade and cut fibres when the textile is moved or manipulated. Dust and other solid particles attract and absorb materials from the atmosphere (acidic or alkaline agents as well as oxidizing or reducing agents) that, with moisture, can initiate harmful chemical reactions.

### Limitations

Mechanical surface cleaning is effective for removing loose dust and surface dirt, but it will not get rid of stains or soils that are bound to the fibres with fats, oils, or grease. Removal of these stains requires washing or dry cleaning — both of which are major interventions that should be carried out only in consultation with a professional textile conservator and following approved conservation methods (see CCI Notes 13/7 *Washing Non-coloured Textiles* and 13/13 *Commercial Dry Cleaning of Museum Textiles*). The size of the soil particles is also a factor in determining the effectiveness of mechanical surface cleaning. Extremely small, finely divided particles are more difficult to remove than larger ones; some are so small that they cannot be removed.

### What to Surface Clean

Before cleaning a textile, it is essential to determine the nature of the soil and if it is important to the artifact. For example, battlefield mud on a military uniform may provide documentary evidence about how the textile was used, and should be retained. In contrast, dust that has accumulated due to poor storage conditions has no significance and should be removed. When in doubt, seek curatorial advice.

The textile's condition must also be assessed. Textiles in good condition are unlikely to be damaged by occasional mechanical surface cleaning with a protective screen and low suction. However, textiles that are extremely fragile and fragmented or have powdering fibres should not be cleaned. Similarly, textiles with numerous broken threads and loose decorative elements such as beads, sequins, or feathers are not good candidates for mechanical surface cleaning. In these cases, consult a professional textile conservator.



## When to Surface Clean

Mechanical surface cleaning may be required in the following situations:

- before a newly acquired artifact is integrated into the collection
- in preparation for exhibition or loan
- upon returning an exhibited artifact to storage
- as part of a treatment for insect pests (see CCI Notes 3/3 *Controlling Insect Pests with Low Temperature*)

Mechanical surface cleaning is also the first step when washing a textile (see CCI Notes 13/7 *Washing Non-coloured Textiles*).

The need for (and frequency of) mechanical surface cleaning is influenced by the nature and condition of the textile as well as the storage and display conditions. For example, a robust carpet displayed on the floor of a historic house museum may require, and be able to withstand, more frequent mechanical surface cleaning than a delicate textile displayed vertically in a display case.

Mechanical surface cleaning should not be carried out routinely unless justified, and should not be relied upon to correct problems caused by inappropriate display, storage, or housekeeping. Proper procedures, including protection from dust, can significantly reduce the need for mechanical surface cleaning (see CCI Notes 13/2 *Flat Storage for Textiles*, 13/3 *Rolled Storage for Textiles*, and 13/5 *Hanging Storage for Costumes*).

Finally, when making the decision to surface clean a textile, the potential damage due to the dust and dirt that are present must always be balanced against the damage that could be caused by the cleaning procedure.

## Equipment

### Vacuum cleaner

High-efficiency particulate air (HEPA) vacuum cleaners,<sup>1</sup> which are available from some conservation supply firms, safety supply houses, and department stores, are the preferred choice for cleaning museum textiles. If a HEPA vacuum cleaner is not available, an ordinary domestic canister vacuum cleaner can be used with the exhaust directed to an outside window or a fume hood. Upright vacuum cleaners and power heads with beater bars are never appropriate.

Regardless of the type of vacuum cleaner used, reduce the suction power when cleaning museum textiles. Some vacuum cleaners have a speed control accessory for this purpose. Alternatively, an inexpensive speed controller can be purchased from a power tool supplier. Air-bleed mechanisms in the handle can also be used. Suction can be further reduced by drilling holes in

the plastic tube or wand, and leaving some or all of these holes open.

If the vacuum cleaner is used for multiple purposes, keep a set of attachments (labelled “clean”) for use on textiles only. Brush attachments with soft natural bristles are the preferred choice. To prevent anything from being accidentally sucked into the machine, insert a piece of screening or a sheer open fabric between the end of the vacuum hose and the attachment (see Figure 1). Mini attachments may also be useful, and can be used with full-size vacuum cleaners in the same way as regular attachments (see Figure 2). All attachments should be washed regularly.

### Screen

Use plastic screening (nylon or polyethylene, 18–20 mesh) and cut it to a size appropriate to the item being cleaned. It is best to have a couple of sizes of screen, for example 30 cm (approximately 1 ft.) square for smaller textiles and up to 60 cm (approximately 2 ft.) square for larger textiles such as carpets and rugs. Sew cotton tape over the cut edges to prevent them from snagging the textile (see Figure 3); this can be done by hand or machine. All screens should be washed and thoroughly dried before use and regularly thereafter.

### Method

Examine the textile carefully, as described previously. If there are loose elements that would not be adequately protected by the screen, do not vacuum the textile or (at the very least) do not vacuum that portion of the textile.

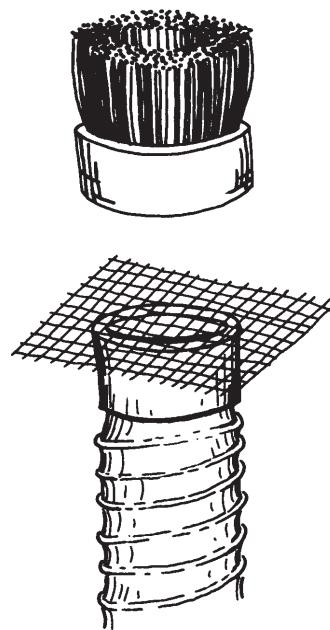


Figure 1. A protective screen over the vacuum cleaner hose.



Figure 2. Mini cleaning tools for the vacuum cleaner.

Having determined that it is safe to proceed, place the textile on a clean flat surface covered with acid-free tissue or prewashed cotton sheeting. Lay the screen over one area and adjust the suction of the vacuum cleaner so that the dirt particles are removed without lifting the textile itself. Gently vacuum following the direction of the warp or weft, or the pile if one is present. Do not press the vacuum nozzle down — suction removes the dirt, not pressure. When the area has been cleaned, lift up the screen and place

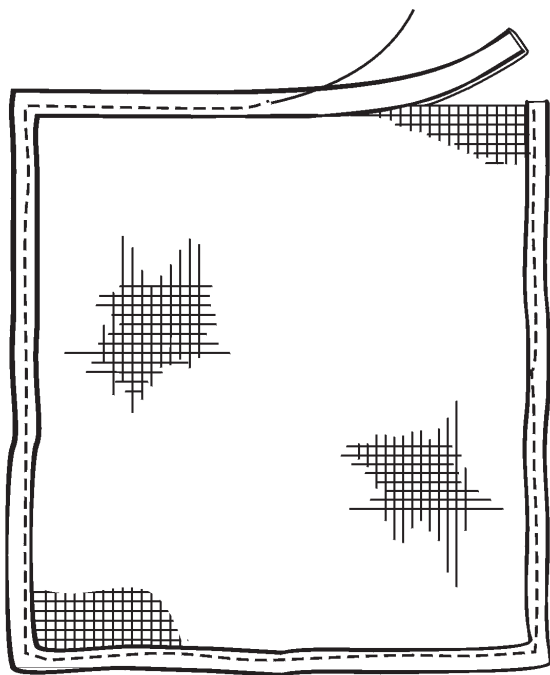


Figure 3. Cotton tape sewn around plastic screen.

it over the next area. Work methodically to clean the entire surface. When finished, turn the textile over and repeat the process on the reverse side. When turning the textile, make sure that the support surface is still clean. If it is not, vacuum or replace it before cleaning the second side.

For three-dimensional textile artifacts, such as hats and shoes, use a clean soft-bristled brush to push dirt toward a vacuum nozzle covered with a sheer fabric. Suitable brushes are available at artist suppliers and cosmetic counters. All brushes should be washed and dried before use and regularly thereafter. Some artifacts are too fragile or delicate for this method. If any part of the artifact becomes dislodged, stop immediately and consult a textile conservator.

In some cases, it may be more efficient to remove lint and other particles by picking them up with tweezers. When carefully done, this is less harmful than repeated applications of suction.

For flat textiles with thick pile or rows of knots, vacuuming may be more effective if the artifacts are placed over a narrow roll or tube. This provides access to deeper areas of the pile, where dirt may be lodged. Be sure to cover fringes with a screen.

## Bibliography

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## Endnote

1. All vacuum cleaners blow out or exhaust the air they suck in. What is contained in the exhausted air is determined by the filtering capabilities of the machine. Ordinary vacuum cleaners filter only the larger particles and blow the smaller ones back into the room. In contrast, a vacuum cleaner with a HEPA filter can remove 99.97% of particles down to 0.3  $\mu\text{m}$  in size.

by the staff of the CCI Textile Lab

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