



# Textiles

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## 3.1

### Introduction

The textile collection of GSA is primarily made up of contemporary works commissioned or purchased through the Art in Architecture Program from the 1970s to the present. Though the pieces vary widely in materials, size, types of display methods, display environment, and storage facilities, they will all benefit from the following maintenance procedures.

Preventive conservation procedures help to ensure a well-maintained and stable collection. A large and important part of the care procedure is observation and maintenance on a regular annual schedule. The procedures, however seemingly simple or routine, can go a long way toward maintaining a stable collection, whether on display or in storage, and hopefully mitigate the need for a full conservation treatment.

The accompanying Textile Maintenance Questionnaire 3.10 and GSA Art Inspection Form should be used together each time the textiles are examined. They should be filed and studied to observe condition or environmental changes. If changes occur, notify a textile conservator. (Note—artwork in GSA’s Fine Arts Collection is inspected biennially.)

## 3.2

### Nature of textile materials

Textiles are a complex and varied medium. The artworks are often fragile, multimedia pieces that incorporate mixed fibers and structural techniques to create two- or three-dimensional works. The manufacturing of a fiber into a textile has five components: (1) the fiber, whose material may come from many sources, ranging from plant-based materials such as cotton, linen, hemp, and jute; animal-based materials such as silk, wool, fur, leather, and feathers; and manmade fibers such as rayon, nylon, polyester, and acrylic; (2) the yarn, whose structure is made by spinning or twisting the fibers together; (3) the fabric construction, which is either woven, twisted, looped, knotted, or a combination; (4) the finish, with processes such as desizing, mercerization, shearing, heat setting, or bleaching; and (5) the color, which may be dyed, printed, or painted.

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**Left:** During conservation: Note conservator securing hanging fibers to protect them during vacuuming.

**Right:** During conservation: note conservator reinforcing the attachment of fibers to the top of the textile.



### 3.3

#### Maintenance and care requirements

The aim of cyclic maintenance is to provide stability and long-term care for the collection. Its procedures include watching for changes and monitoring the textile, its display environment, and the storage area; keeping the textile and its environment clean; recording and maintaining annual condition reports; and notifying a textile conservator with any changes. The changes may at times seem small, irrelevant, or not important or crucial to the condition of the artwork, but textiles are fragile artworks. Their sensitivity to environment, their installation, and their material strength are important to understand and to look at for their preservation. Seemingly ordinary tasks can provide needed maintenance.

### 3.4

#### Environment

The environment within which an artwork is displayed or stored plays a vital role in its condition. Textiles contain physical and chemical properties that cause them to deteriorate rapidly if exposed to fluctuations in temperature and humidity, if there is too much light, or if there are pollutants and particulates in the air such as dirt, dust, industrial and automobile pollution, food, off-gassing of materials and/or pests. Contact with skin can also be harmful. Salts and oils transfer to fibers and after a period of time can cause discoloration and weakening; therefore, a stable, well-monitored environment is required for the safety of the artwork.

Textiles, both on permanent display and in storage, should be examined on a regular schedule once a year.

#### Light

All textiles are sensitive to light, both invisible ultraviolet (UV) and visible radiation. Light causes a general weakening of fibers and structural deterioration, along with irreversible color fading. Once fading has occurred and is noticed, it is too late. The damage to the textile has been done and cannot be reversed. Even a white or colorless material that absorbs little visible radiation will absorb invisible UV causing damage. All organic material is at risk under light. The term “organic material” includes all things originating in animals or plants, i.e., cotton, linen, wool, silk, leather, feathers, etc., and because of similarities in chemical structure, also includes almost all synthetic dyes and plastics.

It is recommended for museums and collections that the light level be 50 lux. Though this level may not be practical for public buildings, it is important to keep the levels down as much as possible where textiles are displayed. The environment can be modified to lower the light level. Filters can be applied to windows to absorb daylight radiation. They are available as a self-adhesive film applied directly to the window, or as shutters, curtains, or sunblinds that allow light to filter in while filtering out UV. Fluorescent lights that also emit significant amounts of UV can be fitted with UV absorbing sleeves.

Light damage is cumulative, therefore, preventive measures should be taken to ensure appropriate light levels.

**Watch for:**

- Unnecessarily high light levels.
- Incandescent, tungsten, or fluorescent lights left on when the area is not in use and during the evening.
- Lights emitting heat near the textile.
- Direct daylight on the textile or continual indirect daylight.
- Perceptible color fading within the last six months.
- Blinds, curtains, or shutters that can be drawn to filter out the light.

If the light quantity seems to be a potential problem, it is recommended that a Blue Wool standard fading card be placed by the textile to estimate the amount of fading. These can be purchased through University Products, Holyoke, MA.

**Humidity**

The primary humidity scale in a display or storage area is the scale of relative humidity (RH). The RH is a measure of the percentage of moisture saturation in the air. A high RH is more damaging than a high temperature. Air at 50 percent RH, at whatever temperature, holds half the water it can. As long as the RH remains constant, natural materials that contain moisture such as textiles, paper, or wood, will neither appreciably expand nor contract. The absorption of moisture makes fibers swell and distort, and they may also change shape. When the moisture is removed from the air, the fibers become dry and less flexible. In damp conditions, the probability of fungal growth such as mold is high. This expansion and contraction causes the textile to become distorted and weakened. Therefore, it is imperative that there be as little RH change as possible, or at most, a slow gradual or seasonal increase and decrease. The humidity level should be kept between 50 and 65 percent.

In high-traffic public buildings where windows and doors are often open, it may be difficult to control the RH, even if the building is equipped with an HVAC system. If the RH becomes too high or too low, it may be necessary to install a humidifier or a dehumidifier within the display or storage area. This will require monitoring under the supervision of a textile conservator.

RH is measured by a sling wet-and-dry bulb hygrometer, dial hygrometers, or a recording thermohydrograph, all of which need calibration by someone who is familiar with the equipment. Also available is an electronic hygrometer that can self-calibrate. The most practical, though the least accurate (but will give a good indication), is the humidity-indicating card. Humidity recording devices are available through University Products, Holyoke, MA.

**Watch for:**

- Any dampness on the textile, display wall, or storage area.
- A damp or very dry environment.

If the environment is excessively dry or humid, notify a textile conservator to install a humidifier or dehumidifier, and instruct responsible personnel in its use.

**Air pollutants and particulates**

There are two types of air pollutants: particulate and gaseous. Particulate matter, (i.e., dust and dirt) can attract moisture, insect pests, and acidic pollutant gases. It can also cause abrasion to fibers; therefore, it is important to remove this particulate matter to keep the textile and its surrounding environment clean. Gaseous air pollutants (i.e., from sulfur dioxide and ozone) are quite harmful but are hard to handle and remove without HVAC air-filtering systems. Stand-alone filtering units are available for small, contained areas but must be monitored and have their air filters changed frequently.

**Watch for:**

- Drafts from doors, windows, or air ducts.
- Dust, dirt, or food on the textile and in the environment.
- Open doors and windows. (If open, close them.)

The area around the textile should be kept clean and free of dust and dirt throughout the year.

## 3.5 Vacuuming

Annual vacuuming and dusting is a crucial part of the maintenance procedures. Dust and dirt can attract insect pests, moisture, and acidic pollution, and can be abrasive to the textile. Vacuuming must be done under the supervision of a textile conservator, either by a conservation technician or trained and supervised GSA personnel.

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**Left and Right:** During conservation: Note the conservators vacuuming textiles.





### Equipment

- Vacuum cleaner: small, lightweight, variable suction, portable, over-the-shoulder cleaner, with flexible extension hose. This will allow both hands to be free and keep the cleaner away from the textile. This vacuum should be dedicated to cleaning textiles only.
- Nylon screening, with the sharp edges of the screening bound with tape: The screening is used to prevent the textile from being sucked into the nozzle of the vacuum cleaner, and it holds down any loose threads and protects fringes.
- Netting to secure over hose nozzle with tie or rubber band for vertically displayed textiles.
- Soft natural-bristle brush.

### Vacuumping Procedure

**Do not attempt to vacuum without instruction by a textile conservator.**

1. If the textile is displayed vertically, cover the hose nozzle with the netting. If the textile is flat, place the screening on top.
2. Adjust the suction so that particles of debris lift from the surface without lifting the textile.
3. Work in the direction of the warp and weft, or pile.
4. Work on a small area at a time, methodically covering the area.
5. Glide the attachment lightly over the surface without pressing down or rubbing.
6. If needed, use a soft, natural-bristle brush to dislodge particles into the suction.
7. Watch for fragility, separations, beads, embroidery.
8. When finished, clean the screening, netting, and brush by washing thoroughly.

## 3.6 Pests

Insect pests are attracted to an environment for food, moisture, and temperature. Infestations often start with pests coming in through open windows and doors and on the bottoms of shoes. They lay eggs directly on the textile or dust, dirt, and debris in the area. Though there are a wide variety of pests, most of the destruction to textile materials is caused by carpet beetles and clothes moths.

Many of the beetle and moth pests are small, and their eggs and young larvae may be difficult to see. Visual inspection of the textile, environment, and storage area is necessary. If any active infestation is found, notify a conservator immediately.

### Watch for:

- Live insects, silk webbing, casts skins of larvae.
- Clothes moths: Small, dull, gray-fawn moths that scuttle rather than fly. They hide in dark areas and lay batches of eggs on wool, silk, feathers, and skins. The larvae spin silk webbing, or spin a cocoon leaving a trail of “grazed” textile and frass.
- Carpet beetles: Damage is recognized by holes and “grazed” areas, which are irregular but clean cut. They have active, hairy torpedo-shaped larvae, lacking the silk webbing and mess of the moth

larvae damage. It is best to inspect for carpet beetles in June. Look on the textile, including in any folds or creases, and on the reverse side.

- In storage areas, look in the boxes and in dark or damp areas. Inspect the textiles carefully, especially material at risk such as wool, animal skins, feathers etc.

Any material found to show signs of active infestation must be isolated from other textiles on display or in storage.

If infestation is suspected, install sticky traps near the textile, display area and storage. A conservator should be consulted to identify the pest and determine appropriate treatment.

### 3.7 Handling

Textiles should be handled as little as possible. If handling is required:

- Clean white gloves should be worn to protect the textile.
- Never pick up an unsupported textile. Always use a board or rigid support to carry it horizontally on acid-free board, if available.
- To turn a textile over, sandwich it between two boards, then turn the boards over, and remove the top board to view the other side.
- If handling a large textile, roll it onto a large tube with textile face down, keeping the edges of the textile in alignment.
- To remove a large hanging textile from a vertical wall display, roll the textile onto a large tube starting at the bottom of the textile with the front side rolling out. Continue rolling up to the top keeping the edges in alignment. This will take at least two people and two ladders, one on either side of the textile.

### 3.8 Display

There are many display methods for textiles, depending on the size, material, and location of display. A textile maybe attached to a mount first and then the mount is attached to a wall. Or a textile may be hanging by Velcro from a sleeve or pole, or it may be in a sealed, environmentally sound display case.

#### **Whatever the display method:**

- Is the textile secure in its mounting or case, with no sagging, separations, splitting, or distortion?
- Are the hanging devices secure?
- Is the weight of the textile evenly distributed over the hanging device?
- Is the textile protected from pedestrian traffic, touching, or possible abrasion?
- Is the textile in a protected environment, away from drafts, open windows, and doors?
- Is the lighting appropriate? No daylight or excessive interior lighting. Turn off lights when area is not in use.
- Is the temperature and relative humidity at appropriate levels?



## 3.9 Storage

The specifications below are of a general nature. Handling and storage of works of art in GSA's Fine Arts Collection should be coordinated through the Fine Arts Program. The Fine Arts Program maintains the Fine Arts Storage Facility and coordinates professional art transport for the collection.

Textile storage should be located in a dark, clean, dry space that is well ventilated, away from water pipes, and has a constant relative humidity. It is best to have storage furniture of metal rather than wood. Storage areas can be a breeding ground for pests, so the area must be kept clean.

A textile conservator should train personnel on procedures in rolling textiles onto tubes and packing into boxes. He or she should also check storage furniture to ensure that it can properly accommodate boxed, rolled, or framed storage.

### Equipment

- Acid-free storage boxes of various sizes.
- Acid-free paper for lining boxes or drawers, for padding out textiles in boxes, and for rolling around tubes.
- Rolling tubes, various lengths and dimensions.
- Unsized, washed muslin.
- Archival labels and tags.
- Wide cotton twill tape to attach tags.

### Procedures:

1. Keep storage areas clean, dry, and free of dust and dirt.
2. Examine storage areas and textile boxes thoroughly once a year for dampness, pests, and mold. Pay particular attention to dark corners in the storage area and to folds in textiles.
3. It is best to store textiles flat, as single layers in boxes or drawers lined with acid-free tissue paper. If a textile is too large for a box in a flat position and cannot be rolled, it can be accorded into a box padded with acid-free tissue paper. Make sure there are no sharp folds or creases.
4. Interleave each layer of textile with acid-free tissue.
5. Do not overfill boxes as textiles crush very easily.
6. Cover all rollers with acid-free tissue before use. The larger the dimensions of the object, the greater the diameter of the tube needs to be.
7. Roll textiles firmly, right side out in the direction of the warp threads, interleaving with acid-free tissue paper, and keeping the edges in alignment.
8. Never roll a textile right side in or it will crush.
9. Wrap the rolled textile in clean muslin sheeting to keep out dust and light. Leave enough muslin at the ends to secure ties.
10. Tie ends with twill tape. Do not tie on the textile and never use rope or string that can cut into the textile.

## 3.10 Appendices

### Appendix 1: Textile Maintenance Questionnaire

This form accompanies GSA Textile Cyclic Maintenance Instructions.  
Fill out this questionnaire together with the GSA Art Inspection Form.

ID #	Artist:
Title:	Dimensions:
Materials:	
Building #:	Building Name:
Address:	
Sub-Location:	
Type of Artwork:	

Please answer questions and make notations. Notify textile conservator with any changes.

#### **Environment**

##### **Light:** what to look for

1. Are the light levels kept as low as possible?  
\_\_\_\_\_
2. Are the incandescent, tungsten, or fluorescent lights turned off when the area is not in use and during the evening?  
\_\_\_\_\_
3. Are lights emitting heat near the textile? Look especially for tungsten lights.  
\_\_\_\_\_
4. Is there direct daylight on the textile, or is the room lit with continual indirect daylight?  
\_\_\_\_\_
5. Has there been any perceptible color fading within the last six months?  
\_\_\_\_\_
6. Are there blinds, curtains, or shutters that can be drawn to filter out the light?  
\_\_\_\_\_

##### **Humidity:** what to look for

1. Is there any dampness on the textile, display wall, or storage area?  
\_\_\_\_\_
2. Is the environment damp or very dry?  
\_\_\_\_\_
3. If environment is excessively dry or humid, has a textile conservator been notified to perform RH level monitoring?  
\_\_\_\_\_
4. If necessary, has a humidifier or dehumidifier been installed?  
\_\_\_\_\_

##### **Air pollutants and particulates:** what to look for

1. Is it drafty from doors, windows, or air ducts?  
\_\_\_\_\_
2. Is there dust, dirt, food on the textile and in the environment?  
\_\_\_\_\_
3. Are doors and windows kept closed as much as possible?  
\_\_\_\_\_
4. Is the area around the textile clean and free of dust and dirt throughout the year?  
\_\_\_\_\_

This form can be enlarged  
by photocopying it at 130%  
to fit on letter size paper.

### Continued: Textile maintenance questionnaire

#### **Pests:** what to look for

1. Are there live insects, pellets of frass, silk webbing, cast skins of larvae?  
\_\_\_\_\_
2. Are there any clothes moths? (Clothes moths are small, dull, gray-fawn moths that scuttle rather than fly. They hide in dark areas and lay batches of eggs on wool, silk, feathers, skins. The larvae spin silk webbing or a cocoon leaving a trail of grazed textile and frass.)  
\_\_\_\_\_
3. Are there any carpet beetles? It is best to inspect for carpet beetles in June. (They have active, hairy torpedo-shaped larvae. Look for holes and "grazed" areas that are irregular but clean cut, lacking the silk webbing and mess of the moth larvae damage.)  
\_\_\_\_\_
4. Have the folds, creases and the reverse side of the textile been inspected?  
\_\_\_\_\_
5. Have dark and damp areas of storage and the interior of boxes been inspected carefully, especially material at risk such as wool, animal skins, feathers etc.?  
\_\_\_\_\_
6. Has any material found to show signs of active infestation been isolated from other textiles on display or in storage?  
\_\_\_\_\_
7. If infestation is suspected, have sticky traps been installed near the textile, display area, and in storage?  
\_\_\_\_\_

#### **Display**

Whatever the display method:

1. Is the textile secure in its mounting or case, with no sagging, separations, splitting or distortions?  
\_\_\_\_\_
2. Are the hanging devices secure?  
\_\_\_\_\_
3. Is the weight of the textile evenly distributed over the hanging device?  
\_\_\_\_\_
4. Is the textile protected from pedestrian traffic, touching, or possible abrasion?  
\_\_\_\_\_
5. Is the textile in a protected environment, away from drafts, open windows and doors?  
\_\_\_\_\_
6. Is the lighting appropriate—no daylight, or excessive interior lighting? (Turn off lights when area is not in use.)  
\_\_\_\_\_
7. Is the temperature and relative humidity at appropriate levels?  
\_\_\_\_\_

## Appendix 2: Vacuuming procedure

**Do not attempt to vacuum without instruction by a textile conservator.**

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1. If the textile is displayed vertically, cover the hose nozzle with the netting. If the textile is flat, place the screening on top.
  2. Adjust the suction so that particles of debris lift from the surface without lifting the textile.
  3. Work in the direction of the warp and weft, or pile.
  4. Work on a small area at a time, methodically covering the area.
  5. Glide the attachment lightly over the surface without pressing down or rubbing.
  6. If needed, use a soft, natural bristle brush to dislodge particles into the suction.
  7. Watch for fragility, separations, beads, and embroidery.
  8. When finished, clean the screening, netting, and brush by washing thoroughly.
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## Appendix 3: Handling procedure

**If handling is required:**

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1. Wear clean white gloves to protect the textile.
  2. Never pick up an unsupported textile. Always use an acid-free board if possible or a rigid support to carry it horizontally.
  3. To turn a textile over, sandwich it between two boards, then turn the boards over, and remove the top board to view the other side.
  4. If handling a large textile, roll it onto a large tube with the textile face down, keeping the edges of the textile in alignment.
  5. To remove a large hanging textile from a vertical wall display, roll the textile onto a large tube starting at the bottom of the textile with the front side rolling out. Continue rolling up to the top, keeping the edges in alignment. This will take at least two people and two ladders, one on either side of the textile.
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## Appendix 4: Storage Guidelines

**The specifications below are of a general nature. Handling and storage of works of art in GSA's Fine Arts Collection should be coordinated through the Fine Arts Program. The Fine Arts Program maintains the Fine Arts Storage Facility and coordinates professional art transport for the collection.**

**Procedures to be carried out under the supervision of a textile conservator.**

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1. Keep storage areas clean, dry, and free of dirt and dust.
  2. Examine storage areas and inside the textile boxes thoroughly once a year for dampness, pests and mold. Pay particular attention to dark corners in the storage area and to folds in textiles.
  3. It is best to store textiles flat, as single layers in boxes or drawers lined with acid-free tissue paper. If a textile is too large for a box in a flat position and cannot be rolled, it can be accorded into a box padded out with acid-free tissue paper. Make sure there are no sharp folds or creases.
  4. Interleave each layer of textile with acid-free tissue.
  5. Do not overfill boxes as textiles crush very easily.
  6. Cover all rollers with acid-free tissue before use. The larger the dimensions of the object, the greater the diameter of the tube needs to be.
  7. Roll textiles firmly, right side out in the direction of the warp threads, interleaving with acid-free tissue paper and keeping the edges in alignment.
  8. Never roll a textile right side in or it will crush.
  9. Wrap the rolled textile in clean muslin sheeting to keep out dust and light. Leave enough at ends to secure ties.
  10. Tie ends with twill tape. Do not tie on the textile and never use rope or string that can cut into the textile.
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