Practical Solutions for Quilt Care and Display
Museum Textile Services: New England's Premier Textile Conservation Studio

Your family christening gown. The signature quilt on display at a local history museum. A flag carried into battle during the Civil War. Each of these textiles tells a story about our personal and collective past. And each story brings meaning to our present.

Founded in 1999, Museum Textile Services is one of just a handful of independent conservation studios that specialize in preserving textiles that are under the care of private individuals, cultural heritage institutions, and government agencies.

Museum Textile Services is a trusted resource for education and information on the conservation, storage, exhibition, and care of textiles of personal and cultural significance.

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Museum Textile Services, LLC
P.O. Box 5004
Andover, MA 01810
(978) 474-9200

www.museumtextiles.com
Museum Textile Services Resources

Whether you are curious about a career in conservation, you work in an allied museum field, or you are a practicing textile conservator, we have the answers to your questions. Our resources page will link you to our own MTS Handouts, online publications, and articles of interest.

TEXTILE CONSERVATION BASICS

TEXTILE STABILIZATION

TEXTILE STORAGE

DISPLAYING HISTORIC CLOTHING

DISPLAYING FLAT TEXTILES

MUSEUM PESTS

DISASTER RESPONSE

ADVANCED TOPICS

IPSC RESOURCES

www.museumtextiles.com
Crazy for Crazy Quilts

An influx of crazy quilts helped to keep Museum Textile Services warm over the recent holiday season. Crazy quilts consist of irregularly shaped patches of many different fibers and woven or knitted structures that are pieced together like a jigsaw puzzle. Many makers cut patches from worn-out garments. The pieces were frequently sewn together into squares before the completed sections were sewn together. Many crazy quilts have rich color and borders and pleated cotton backing fabric. They came to fashion during the aesthetic period of the late 19th century and continued into the early 20th century.

Educational Opportunities

Camille Myers Breeze, Director, is an internationally known textile conservation educator and author. A central mission of Museum Textile Services is to educate museum professionals, scholars, students, and the public on issues related to textiles conservation and museum studies. Upcoming lectures and workshops include:

Practical Solutions: Quilt Care and Display
February 10, 2017
2:30 pm EST

Connecting to Collections free webinar

Do you have quilts in your collection and are you at a loss about what to do with them? You are not alone. Quilts are among the most abundant textiles found in our collections. Their large size, complexity, popularity, and history of use can pose a number of challenges to their custodians. This webinar will review the fundamentals of quilt care and display, including assessment, surface cleaning, stabilization, storage, and display. Along the way, we will dispel common myths, such as the necessity to hang quilts, and expose the truth about rotting and stains. Participants can then walk through the solutions presented. C2C webinars are free but require registration.

Textile Stabilization Using Sheer Overlays
June 5-7, 2017
Tuition and materials $1150

The Campbell Center for Historic Preservation Studies
Mount Carroll, Illinois

Conservatives employ three main types of shear overlay to stabilize deteriorated textiles: net, silk sheer, and synthetic sheer. Each material has its pros and cons including cost, availability, invisibility, ease of use, and archival stability. The benefit of any shear overlay is that it provides immediate stabilization as well as preventative protection. Participants will learn how to use all three of these shear materials and, more importantly, how to determine which material is best for a given situation. You may register.

Conserving and Displaying Quilts
March 1-2, 2017
Tuition and materials $850

Museum Textile Services, Andover, Massachusetts

Quilts are among the most popular textiles displayed in museums and craft exhibits. Contemporary quilters have played a major role in the renaissance of textile arts seen around the world. Quilt Preservation is a hands-on class aimed at quilters and museum personnel with sewing experience who want to learn basic skills for condition reporting, cleaning, stabilizing, and safely displaying both historic and contemporary quilts. Students can bring one quilt for conservation treatment. This course is offered through the International Preservation Studies Center (formerly known as the Campbell Center for Historic Preservation Studies) and will take place at Museum Textile Services in Andover, Massachusetts. To register or for more information, click here.

Displaying Historic Textiles
June 8-10, 2017
Tuition and materials $1050

International Preservation Studies Center
Mount Carroll, Illinois

Temporary display of flat textiles, such as quilts, flags, embroidery, and lace, is a challenge faced every season by museum staff. Learning what technique is best for each textile is essential to safe and attractive exhibition of these often fragile and large items. This three-day workshop will begin with choosing textiles that are good candidates for display. Basic documentation and surface cleaning will then be taught. Attendees will learn how to fold, hang, and mount textiles in ways that are not harmful to the textiles.
Contact us
Museum Textile Services is open to the public by appointment only. Please contact us to discuss your project or to schedule a complimentary introductory consultation. You may call, email, or use the form below.

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museumtextiles(at)gmail(dot)com

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What is a Quilt?
noun  A quilt is a textile constructed of two or more layers of fabric connected by stitching.
A quilt may be large or small.
A quilt may be large or small.
Made by hand or by machine.
Made by hand or by machine.
Made of many pieces or few.
Made of many pieces or few.
Some quilts have a lot of thick batting, and some quilts have none.
Some quilts have a lot of thick batting, and some quilts have none.
A quilt can be assembled by piecing,
By appliqué,
Or by a combination of both.
Some quilts are the chosen medium for artists.
And some quilts are now seen as works of art.
Some quilts contain an intricate network of stitches.
Some employ thread ties to connect their layers.
And some quilts are only connected at the binding.
Some quilts are quilts in technique only.
And some things we call quilts are not at all.
Many conservation techniques will also apply to coverlets, counterpanes, and other bed spreads.
Documentation

- Donation records
- Catalog entry
- Photographs
- Genealogy
- Textile history
- Technology
- Date range
# Documentation

## Condition Report

### Museum Textile Services

#### Accession #: MT32# 1043

#### Description: Feather pillow with crazy quilt cover

#### Date range: 1880-1900

#### Collection: MTS Study Collection

#### Donor: Jean Myers, grandmother of Camillo Myers Thrace

#### Location: Quilt Box 2

### Materials

- Silk, silk velvet, silk embroidery floss, cotton, cotton-silk blend, feather pillow with cotton fabric over cotton ticking

### Dimensions in inches

<table>
<thead>
<tr>
<th></th>
<th>Height</th>
<th>Width</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>11 1/8</td>
<td>16</td>
</tr>
</tbody>
</table>

### Condition (1-4, 1 being Poor and 4 being Very Good)

<table>
<thead>
<tr>
<th>Overall</th>
<th>Soil</th>
<th>Stains</th>
<th>Losses</th>
<th>Fading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>Cover: 3 Pillow: 1</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

### Check all that apply:

- Evidence of Insect Infestation
- Mold/ Mildew
- Previous Repairs
- Unstable Dyes
- Label

### Condition details

Shattered silk is present on one of the patches, and undirectional loss can be found in several places. There are failing seams on the cover and as well as on the inner pillow. Creasing is present on one of the patches, and there are several areas of loss due to abrasion. Other damage includes frayed patch edges, and holes of various sizes throughout. Staining is invisible on the inner pillowcase. There is evidence of past insect activity, including accretion and holes. There is also another accretion of unknown origin on the lower layer of the cover.

### Photographs

- Overall recto
- Overall verso
### Textile Condition Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abrasion</td>
<td>Wearing away of the surface from scraping, rubbing, grinding or friction</td>
</tr>
<tr>
<td>Accretion</td>
<td>Deposit of extraneous material on the surface, such as mud or fly speck</td>
</tr>
<tr>
<td>Crease</td>
<td>Tightly pressed fold often causing threads to weaken and break</td>
</tr>
<tr>
<td>Crocking</td>
<td>Rubbing off of color resulting in loss of dyestuff but not loss of fiber</td>
</tr>
<tr>
<td>Cut/Tear</td>
<td>Clean break in the fabric</td>
</tr>
<tr>
<td>Deterioration</td>
<td>A general term for a weakened state caused by age, use, or environmental conditions</td>
</tr>
<tr>
<td>Discoloration</td>
<td>General change in the color of an area from the prevailing tone</td>
</tr>
<tr>
<td>Embrittlement</td>
<td>Decline in pliability and suppleness to the degree that damage may be imminent</td>
</tr>
<tr>
<td>Fading</td>
<td>Discoloration seen as change of color, often caused by light exposure</td>
</tr>
<tr>
<td>Fold</td>
<td>Pleat resulting from one part doubled or laid over another</td>
</tr>
<tr>
<td>Fraying</td>
<td>Raveled or worn spot indicated by the separation of threads, often found on edges</td>
</tr>
<tr>
<td>Hole</td>
<td>Area of missing fibers from both the warp and the weft</td>
</tr>
<tr>
<td>Insect damage</td>
<td>Holes, surface loss (grazing), or deposits (frass, silky fiber) caused by insects</td>
</tr>
<tr>
<td>Loss</td>
<td>General term for an area missing fibers</td>
</tr>
<tr>
<td>Mold/Mildew</td>
<td>Microbial activity, often seen as stains or surface growth, exacerbated by humidity</td>
</tr>
<tr>
<td>Oxidation</td>
<td>Chemical alteration caused by the presence of corroded iron in or adjacent to fiber</td>
</tr>
<tr>
<td>Particulates</td>
<td>Dust and other soil particles that accumulate on and within fibers</td>
</tr>
<tr>
<td>Shattered</td>
<td>Description for chemically treated silk that exhibits losses</td>
</tr>
<tr>
<td>Soot</td>
<td>General term for a dark and oily deposit caused by air pollution or fire</td>
</tr>
<tr>
<td>Stain</td>
<td>Soiled or discolored spot</td>
</tr>
<tr>
<td>Stiffness</td>
<td>Loss of flexibility and suppleness of fibers causing a resistance to bending</td>
</tr>
<tr>
<td>Undirectional</td>
<td>Failure and loss of warp or weft, leaving behind more of one element than the other</td>
</tr>
<tr>
<td>Weak seam</td>
<td>Looseness in the attachment of two adjoining pieces of fabric</td>
</tr>
</tbody>
</table>

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Treatment Scope

What are your goals for the quilt?

• Study collection
• Research
• Exhibition
• Loan
Treatment Scope

What are your goals for the quilt?

- Study collection
- Research
- Exhibition
- Loan

- Clean
- Rehouse
- Stabilize
- Display

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Surface Clean

Museum Textile Services

Vacuuming Textiles:

- You do not need an expensive vacuum to safely clean historic textiles. Any vacuum with suction control and a low setting can be used, such as a household Miele canister vacuum.

- It is no longer standard practice to vacuum historic textiles through a screen, as contact with the screen can cause damage and the holes in the screen will likely not be large enough to allow for the pick-up of larger pollutants.

- Use your best judgment when deciding whether or not to vacuum your textile. If it is extremely fragile, it is best to avoid damage and consult a conservator.

- The most cautious approach to vacuuming a textile is to use a soft paint brush to brush soil off the textile surface towards the vacuum.

- A micro-suction attachment kit provides precise control for vacuuming textiles with only moderate fragility. They can be purchased on the internet for as little as $10, and come with a small hose, several micro-attachments, and an adapter to connect the hose with your vacuum.

- A small circular micro-attachment with bristles is good for vacuuming stable textiles that need a little abrasion to remove embedded soil. A small flat or round micro attachment is used on textiles whose abrasion is not necessary.

- For stable textiles such as upholstered furniture, tapestries, and carpets, a full sized bristled vacuum attachment can often be used. We recommend covering it with net, (as shown on right) to avoid having the textile pulled in to the attachment during cleaning. It is OK if some of the bristles poke through the net.

- If your textile cannot support the abrasion of the upholstery attachment, you can use the flat vacuum attachment with or without net. Our flat attachment has holes drilled in it to further reduce suction, as well as tape along the bottom on the contact areas to reduce friction and abrasion against the textile.

- When vacuuming the textile, be sure to consider its needs. On less stable textiles, be careful not to slide your vacuum attachment across the textiles surface, instead being sure to lift the attachment off the surface and replace it on the next area to be vacuumed.

- Go about your vacuuming in an organized manner. Sometimes it is hard to tell visually which areas have been vacuumed and which have not. To avoid confusion and stressing the textile by vacuuming it too much, use a visual aid such as a pin to keep track of where you have been.

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Surface Clean
Surface Clean

Do not wash quilts without proper training!
Surface Clean

Resources: Textile Conservation Basics

MTS Handouts
- Sample Condition Report
- Blank Condition Report
- Textile Condition Terms
- Definitions of Conservation Terminology
- Vacuuming Textiles
- Professional Organizations for Textile Conservators

Online Resources
- A variety of resources are on the AIC website
- NPS Museum Handbook, Part I, Appendix K
- Conserve-o-grams, everyone's favorite conservation leaflets
- An Illustrated Guide to the Care of Costume and Textile Collections (MGC)
- NEDCC's Preservation Leaflets
- Getty Conservation Institute publications available for free
- Resources from ICP
- Regional Alliance for Preservation bibliographies
- CCI notes are available individually or in a binder
- Museum Handbook from the National Park Service
- AASLH technical leaflets
- Low-cost technical inserts from Illinois Heritage Association

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Stabilize
Stabilize

An overlay is a sheer material placed on the object surface, with the goal of changing the appearance and/or protecting the object.
Stabilize

- Silk sheers, including crepeline
- Net (nylon, silk, cotton)
- Polyester sheers, including Tetex/Stabiltex
Stabilize

Pros of nylon net:

– Very good transparency
– Very good drape
– Does not unravel
– Comes in endless colors
– Easily dyed
– Available in wide widths
– $2/yard

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Cons of nylon net:

- Moderate sheen
- Stretches more in one direction
- Can be abrasive
- Susceptible to light damage
Stabilize
Stabilize

Conservation Netting

Conservation netting is done to temporarily stabilize areas of weakness, to secure damage with a minimum of intervention, and to prolong the display and/or study life of a textile.

- Nylon net has several advantages over other sheer overlay fabrics such as silk crepe de chine, polyester sheer, and even cotton and silk net. It is often less visible than these alternatives. Net edges do not fray when cut. It is also commercially available in numerous colors and costs around $1.99 per yard, compared to $5.00 to $6.00 per yard.

- Before you begin, purchase a selection of net and thread colors. A straight or curved needle, pins, and good scissors are necessary. Make sure the work space is clean, large enough for the project, and well lit. To avoid unnecessary handling of the textile, keep it flat on the table and stitch from the top.

Netting Quilts and Other Flat Textiles

- Cut a piece of net larger than the area. If your cut the net to shape before sewing it may turn out to be too small by the time you finish. Pin the net so that it lies flat and is not too tight. Thread the needle with a single thread and knot the thread leaving a 2-inch tail to be cut off later. Take the first stitch, preferably in a corner. Pull the thread gently to avoid pulling the knot through.

- Stitch in the “ditch” placing the stitches ¼ inch apart. Take small back stitches—they only need to travel from one cell of the net to the next. Sew around the area you are netting until you arrive at the starting place. Finish by knotting to the tail, placing the knot flush to the fabric.

- Trim the tails to 1 ½ inches, thread them to the needle and bury them between the quilt layers. If you are adding on a new thread, tie the two ends together and then bury them once finished. If you are not netting in a circle, take an extra stitch at the beginning and end and then bury the tails.

- The net may need internal stitching to help it do its job. Follow another seam, or a pattern in the design, for best results. You can also stitch in any spaces or holes to avoid the textile entirely.

- Trim the net leaving ½ inch maximum. You only need to leave one row of net cells beyond where you sewed. Check the stitches to see if you missed the net or cut too close. Fix any mistakes: if the net is not sewn down everywhere, you either cut the net too close or you took a stitch without traveling to the next cell of the net. Go over the areas that you missed. If the net is not lying flat, it may have shifted while you were stitching, back the stitches out and re-stitch. If the stitches are very visible, try making them smaller or choose another thread color.

Stitching in the ditch

Burying the thread tails

Trim the net carefully

Net wrapped around a cuff

Stitches inside a hem

Netting Historic Clothing

Historic clothing has additional applications for conservation netting. Hems, collars, waist bands, ribbons, and clothing fasteners are often damaged and require a flexible, invisible stabilization treatment. Shattered linings can be netted to protect the deteriorated fabric.

- For cuffs, hems, and waist bands, wrap the net around and pin it so the net is tight. The net can be longer on the inside than on the outside.

- Stitch along a seam or a design line that is straight and stable. If there is no seam, place your stitches equidistant from the edge (this may require a ruler).

- Make the first stitch from the inside out, leaving a knot with a 2-inch tail on the inside. Stitch by passing the needle from 1 net to 1 back taking back stitches. Make sure the longer floats are on the back or the inside of the textile.

- If you are stitching around a cuff or collar, finish by tying the thread off to the tail you left and then bury the tails. If you are using more than one piece of net, overlap them by ¼ inch.

- Historic clothing requires a great deal of handling in order to access the interior surfaces. Always be sure to work with clean hands and handle the item with care to avoid additional damage. Cover the work table with a sheet or tissue so that you can move the table cover around as opposed to moving the item.

- When netting over hooks and eyes or other fasteners, complete the netting and then cut a small hole for each fastener. You may also need to add a new thread loop if the original one has broken.

- Ribbons, ruffles, and other trims frequently require netting for additional stabilization. It is sometimes beneficial to separate ribbons from clothing for safe stabilization. A large piece of net can be taped to a dark board and the ribbon pinned to the net. After stitching, the excess net can be trimmed and the ribbon reattached to the garment.

Temporary Netting

Temporary netting is used to support a weak area during a short-term procedure such as wet- and dry-cleaning, exhibition, or moving. It offers extra strength and also serves as a visual reminder of fragility.

Because it is meant to be removed, temporary netting can be done with a very visible color of net and thread. Stitches can be large and spaced apart. The area of weakness itself is often avoided; the technique relies on the strength of surrounding areas and of the net to provide support.

Y. W. 2011


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Stabilize

Resources: Textile Stabilization

MTS Handouts

- Fabrics Used for Stabilization
- Conservation Stitching Guide
- Conservation Netting
- Hot Cutting and Using Polyester Sheer Overlays
- Sample Sheer Overlay Score Card
- Blank Sheer Overlay Score Card
- Sheer Overlay Supplier List

Online Resources

- Treatment of Textiles - Stabilization with Non-adhesive Methods (AIC Wiki)
Exhibit

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Exhibit

Forms of display

• Case deck
• Board / Slant board
• Frame/Shadow box
• Slat / pole
Exhibit

Methods of attachment

• Passive
• Pinned
• Stitched
• Pressure
• Magnetic

www.museumtextiles.com
Exhibit

Making and Attaching a Velcro Header

- Velcro is used to hang textiles that are stable enough to be suspended under their own weight. The loop side is always attached to the textile and the hook side is always attached to a header. Velcro should be sewn directly to a textile and must be machine stitched to a strip of fabric or cotton twill tape.
- Measure the width of the top edge of your textile. Cut the Velcro and strip of fabric or twill tape a bit longer than the width of the textile. This will allow for take-up as the Velcro is sewn to the textile.
- With a sewing machine, stitch the Velcro 1/2 inch from the top of the twill tape. If you are using a strip of fabric, sew the Velcro about 1 inch from the top. Stitch only at the very edges of the Velcro where there is no nap.
- Lay the textile flat on a table with the back of the top edge accessible. Place the Velcro header across the textile along its true horizontal axis. This is often not parallel to the top edge. Pin the Velcro header to the textile in several places across its length.
- Choose a thread such as Betton & Craft for heavy textiles and a medium-weight cotton thread for lighter textiles. The color should blend with the front of the textile and the needle hole perfectly. Often a single color such as beige or brown will blend across the whole textile. The best needle for this is a size 26 or 24 tapestry needle, which will push the textile aside and not rip it as you are stitching.
- The Velcro header is attached to the back top edge of the textile in two lines of stitching that correspond to the machine stitches that hold the Velcro to the fabric. Use these machine-stitch holes makes an otherwise very tough material easier to stitch through.
- Knot the end of your thread. Starting at the center, come up through the back of the Velcro header in a hole left by the sewing machine, leaving the knot at the back. Take a running stitch approximately 6 inch long and stitch straight through the Velcro header to the front of the textile. Flip the top of the textile back, and make sure your needle is not piercing any threads before making the stitch. Every three stitches knot your thread at the back.
- Take a small stitch (approximately 1/8 inch) on the front of the textile that blends with the direction of the thread. Come all the way through the Velcro header to the back. Check that your stitch is lying neatly on the front before moving on. Often you can use your stitching to get a natural feature of the textile such as a seam or color change, which will provide camouflage. Avoid areas of weakness.
- Continue in a running stitch from the center to the edge. Return to the center and stitch outward to the opposite edge. When finished, start at the second row of stitching at the center and work out to each edge. Trim the sides of the Velcro header to 1/8 inch shorter than the width of the textile. Stitch the edges down.
- Hang the textile from a Velcro slot and adjust as necessary to allow it to hang flat.

Hanging a Textile Using a Velcro Slat

- Decide how far down from the ceiling you want your textile to hang, e.g. 36 inches down. Remember that the holes in your slot will line up with the bottom edge of the textile. If the slot is too high, the textile will not hang. When the slot is installed, otherwise the screws will show.
- Hold the slot up to the wall at the desired location and place a pencil dot in the center of the hole. These dots correspond to where you will place your screws in the wall. If you have lower side to side, you may be able to line the screws up with studs in your wall. Otherwise, you’ll want to use drywall anchors. If you have older walls, you may want to hire a professional.
- Double-check that the slot is parallel to the ceiling before proceeding. If you don’t, you may want to parallel the slot to the floor instead.
- Using a drill, make a pilot hole at each of the dots that you’ve drawn. Using a drill or screwdriver, sink the drywall anchors into your pilot holes until they are flush with the wall.
- Holding your slot up to the wall, insert a screw through the first hole in the slot and drive it into the coordinating drywall anchor. Install the remaining screws in the same manner.
- Hanging the textile on the slot is best done with two or more people. Lay the textile out on a clean surface with the Velcro header parallel to the wall. Using arms to cradle it, lift the textile up and begin to marry one edge of the Velcro to the other. Try not to let the textile down until all of the Velcro is connected.
- Adjust the textile side to side, and up and down, so that the fabric isn’t flapping. Sometimes a textile will hang better if the corners are raised a bit. It may also hang better if it is pulled outward gently. Once you are happy with the position, press gently along the whole length of the Velcro to ensure it is fully married.
- When taking a textile down from a Velcro slot, slide your hand between the two layers of Velcro and gently separate them. Never pull on the textile. Cradle the textile in your arms and place it on a clean surface.
- Store all textiles in using archival storage materials. For more information, see http://www.museumtextiles.com/uploads/7/6/2/1/76210082/clothing_and_textile_storage_guidelines.pdf.


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Exhibit

Resources: Displaying Flat Textiles

MTS Handouts

- Textile Display Supplies
- Hanging Large Textiles
- Frame or Shadowbox Installation
- Making and Attaching a Velcro Header
- Hanging a Textile Using a Velcro Slat
- Installing a Slat onto a Wall
- How to Make Your Own Steel Velcro Slat
- Making Wood Velcro Slats

Online Resources

- Is your Textile Suitable for Framing?—Minneapolis Historical Society
- Framing Textiles—Minneapolis Historical Society
- Textile Mounting—Minneapolis Historical Society
- An Alternative to Velcro? by Gwen Spicer (WAAC)
- Evaluating Magnetic Primers for Mounting Textiles on Rigid Backboards with Rare Earth Magnets by Katheryn Ette et al.

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Rehouse

- Flat
- Boxed
- Rolled

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Rehouse

- Size
- Institutional policy
- Resources
- Condition
Rehouse

Wrapping Materials

- Acid-free, Unbuffered tissue
- Cotton fabric
- Polyester batting
- Tyvek / polyethylene sheeting
Rehouse

Boxed Storage

- Acid-free cardboard
- Polypropylene
- Use older boxes for wool and silk
- Acid-free, unbuffered tissue
Rehouse

Rolled Storage

- Acid-free tube
- Polyethylene/ Marvelseal/Mylar
- Acid-free, unbuffered tissue
- Tyvek / cotton
Rehouse

• Work together in a clean environment with ample space
Rehouse

• Plan for the chosen storage container
Rehouse

• Pad folds with tissue snakes.
Rehouse

• Interleave when appropriate.
Rehouse

• Line box with tissue or muslin. Label box.
Rehouse

Quilt Storage and Handling

- Quilts and other multilayered textiles should be folded, not rolled, to prevent wrinkling and compression of the many layers. A 18 x 36 x 6 inch acid-free textile-storage box can hold two average quilts or one large quilt.

- Find a clean area large enough to accommodate your quilt when it is laid flat, such as a bed, a large table, or a sheet on the floor.

- Place the quilt face down so that when you are finished folding it you will be looking at the front.

- Fold the quilt a minimum number of times in order to make it fit into the acid-free storage box. Hold the box next to the quilt to gauge how many times you will need to fold it in each direction.

- Use “snakes,” or rolled up pieces of acid-free tissue, to pad all folds. Interleaving all folds of a quilt with tissue is only necessary if the quilt is very fragile or has surface embellishments.

- Lay two well-tape ties width-ways across the box. Line the box with tissue. Place the folded quilt into the box. Cover the quilt with tissue. Tie the ties so that the tissue is being held in place but not so tightly as to dent the quilt.

- If you have more than one box, label each with a photo of the quilt/s it contains to avoid unnecessary unfolding.

- Always store textiles on the main floors of your house, never in an attic or basement. Ideal locations are on a closet shelf or under a bed. Make sure the box is safe from pets and accidental mishandling.

- Once a year open the box and check for signs of insects or damage.

- If you are going to use your quilt periodically, keep these instructions so that you can easily store it again.

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Choosing the Best Storage Materials

A wide array of textile storage materials is available online and in catalogs from your favorite archival supply companies. Knowing which wrapping or box to use can be daunting given the plethora of choices available today. This handout will help steer you toward the proper materials, which in turn will help you find the best value for your money. For general storage information, please refer to the Clothing and textiles Storage Guidelines available in the Resources section of our website.

It used to be that knowing what material a textile is made of was vital to choosing the best storage materials. At MTS we believe that it is best instead to use the same pleasurable materials to archive all of your items. This can prevent accidental mis-matching, reduce supply storage area, and lower your overall costs.

Wrapping materials
- The material immediately adjacent to your textile is called the "wrapping." The most common and economical wrapping material is acid-free un-buffered tissue paper. Buffered tissue paper is easily confused with un-buffered tissue and should be avoided, as it is not safe for use with textiles such as wool and silk. Other specialty tissue papers, such as Japanese tissue and Photo-Tex tissue, are more expensive but may be considered for special situations. Museum professionals may also use washed unbleached cotton fabric, sheeting, archival polyester padding, Rhodoid®/Velar®, or specialty wrappings such as Remay®, Tyvek®, and Hotpack®.

- A layer of tissue should be used to separate multiple items in a single storage box. It can also be scrunched into a "snack" to pad out folds and support shoulders and sleeves. A large piece of tissue should be placed first in every storage box and folded over the top of the contents before the lid is put on. This box lining will help keep your items in place as the box is carried and allows you to lift all the contents out more easily.

Materials for bottled storage
- The same choices are available for archival storage tubes. Polypropylene tubes can be purchased, which are very strong and will not re-acidify. They are generally heavier and harder to cut yourself, so you may have to pay for custom lengths or additional shipping. A wider variety of acid-free cardboard tubes are available in all diameters, lengths and colors. In some cases, non-archival tubes are used for textile storage after they have been covered with a barrier material, such as Tyvek®, Marvalon®, or Mellinex® (MuMax®). Although these tubes can be low cost or free, the price of the barrier material and additional preparation can be considerable.

- A wrapping, such as archival tissue paper, must be used both at the beginning and the end of the rolling process to ensure that the textile is protected. The outer wrapping is more often used for textile storage such as washed unbleached cotton fabric, or a barrier material such as Tyvek®, Marvalon® or Mellinex® (MuMax®). The choice of outer wrapping may be determined by bow and where the rolled textiles are stored, how frequently they are accessed, and whether a see-through cover is preferred. For a detailed handout on Bottling Textiles, see the Resources section of our website.
Resources: Textile Storage

MTS Handouts

- Clothing and Textile Storage Guidelines
- Choosing Storage Materials
- Quilt Storage and Handling
- Rolling Textiles
- How to Archive Your Wedding Gown
- Template for an Archival Drawer Liner

Online Resources

- Storage of Textiles (AIC Wiki)
- NPS Museum Handbook, Part I, Appendix K
- An Illustrated Guide to the Care of Costume and Textile Collections (MGC)
- Labeling Textiles-Minnesota Historical Society

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Questions
Identifying and Mitigating Insect Infestations

Museum and household textiles are susceptible to damage from several kinds of insect pests. This handout will address how to identify and mitigate damage from three of the most common insect pests impacting textiles in the United States: silverfish, carpet beetles, and clothes moths.

- Most insect infestations occur in dark and moist areas where plentiful food is available and there is little disturbance. Ideal places include closets, trunks, boxes, plastic bags, suitcases, cupboards, and beneath carpets. You may know you have an infestation because you see the insects or their larvae, but just as often you see only piles of fiber, droppings (trass), webbing, and holes in your textiles.

- Insect activity is often seasonal. As spring approaches, dormant eggs hatch, larvae grow and then pupate, and mature adults emerge days or weeks later capable of mating and creating more eggs. Open doors and windows also allow new insects to inhabit the home.

- Insects choose which textiles to infest based on what the material is. Most textiles fall into one of three categories. Protein fibers are made from animal products and include wool, silk, feather, fur, and leather. Cellulosic fibers come from plants and include cotton, linen, hemp, jute, and paper. Synthetic fibers are mostly man-made polymers, including rayon, a man-made cellulose fiber.

- If you believe you have an insect infestation, contact a conservator immediately. Do not use pesticides, such as bug spray, moth balls, or boric acid because they are potentially harmful to pets, people, and your textiles. You may carefully vacuum the affected textiles and surrounding areas to remove insects, larvae, and eggs only if you are certain you can do so without damaging fragile fabrics. Quarantine affected items in zip-top or garbage bags and bring to a conservator.

- A conservator will assess the infestation to determine how to isolate and treat affected items. Sometimes dry or wet cleaning will eliminate an infestation, but not all textiles can be safely cleaned. Conservators may choose to use insect gas chambers, high- or low-temperature treatments, or non-toxic chemicals to safely kill insects. The best treatment choice is the one that causes the least damage to the textile and to people.

- Treatment of an insect infestation often involves treating the area in which textiles are stored. A conservator may make a site visit to determine the extent of the problem and mitigate conditions that led to the infestation. Storage materials are frequently upgraded, monitoring traps are set and checked, and conditions such as high relative humidity, soiling, and egress from the outdoors are corrected.

- After de-infestation of your items and storage areas, most insects can be controlled with careful monitoring, proper storage, and diligent housekeeping. Clothing and craft materials, such as yarn and fleeces, are especially vulnerable and should be stored in clear polypropylene bins or bags.
Advanced Topics

The Dirty Dozen of Museum Pests

1. Webbing Clothes Moth
2. Case-making Clothes Moth
3. Vereal Carpet Beetle
4. Black Carpet Beetle
5. Hide Beetle & Larder Beetle
6. Warehouse / Cabinet Beetle
7. Cigarette & Drugstore Beetle
8. Silverfish and Firebrat
9. Psecids or Booklouse
10. Powderpost Beetle
11. Cockroaches
12. House Mouse

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Advanced Topics

Museum Textile Services

Safe Fumigation of Textiles Affected by Mold & Mildew

Museum and household textiles are all susceptible to damage from mold & mildew. This handout will address how to identify an outbreak, to treat a textile to remove and kill mold & mildew, and to prevent the problem from spreading to the rest of your collection.

- Mold & mildew are two forms of fungal growth commonly found in household and museum environments. Mildew is usually grey or white, whereas mold can range in color from black to red to blue. Mold & mildew often leave permanent stains on paper and fabrics but may be removable from hard surfaces. Like all fungi, mold & mildew reproduce by means of spores, which are tiny particles that are everywhere around us.

- Mold & mildew require high levels of moisture and favor areas with low air circulation, such as attics, basements, backs of closets, and enclosed containers. Mold & mildew outbreaks are also very common following disaster events, such as hurricanes, floods, and fires. You may know you have an outbreak because you see a spotty pattern, which is sometimes fuzzy, or you smell a distinctive musty odor.

- Specific conditions cause mold & mildew to bloom. In 90% relative humidity (RH) and 90°F, it only takes three days for mold & mildew spores to flourish and bloom. As the humidity and temperature decrease, the time it takes for mold & mildew to bloom increases, so at 80% RH and 85°F, it takes three weeks. At 70% RH and 70°F, it may take up to three months for an outbreak to be apparent. Many mold & mildew problems become apparent in collections in late summer after moderate moisture levels and stagnant air have gone unnoticed for several weeks. Mitigating the conditions that encourage mold & mildew growth are as important as removing the mold & mildew bloom from your textiles for preventing future outbreaks.

- If you believe you have a mold or mildew outbreak, do not use alcohol or bleach on your textiles because they can cause irreparable damage. Allow wet items to completely dry in an area of good air flow, such as a garage. You can vacuum minor mold/mildew residue from dry textiles with a

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high-efficiency vacuum only if you are certain you can do so without causing damage (see Vacuuming Textiles). Vacuum in an area with good ventilation, preferably outside, to prevent spreading or inhaling the mold & mildew spores. Thoroughly clean and air out the affected area, and do not store items there again unless you improve the environmental conditions that led to mold & mildew.

- An alternative to bringing your items to a conservator is to treat your objects in a hom-made fumigation chamber made of commonly available products. The chemical chlorine dioxide is sold in marine stores and online, and when used carefully, will kill mold spores and inhibit future outbreaks. We prefer the Star Britex® Mold/Mildew Odor Control Fast Release System, which costs about $15. The directions are easy to follow and treatment is quick.

- First choose a safe place to fumigate, such as a garage, a trailer, or a barn (a cold location is preferable to a hot location). You do not want to breathe the vapors before, during, or after fumigation. Choose a box for your chamber that is large enough to hold your items, leaving at least a foot of head space. Place the box on a large sheet of 4-mil or thicker plastic, with enough plastic to completely enclose the box. Stack the affected objects carefully in the box. Follow the directions on the Star Britex® package, moistening the sponge and returning it to the plastic container before unwrapping and positioning the white chemical packet in the slot on the sponge.

- Place the release system in the box at least a foot away from your textiles. We often tape the plastic container to the inside top of the box, or to a separate piece of board draped over the box. Wrap the box with the plastic sheet and tape all edges to seal well. The directions say to fumigate for 4–6 hours but no longer than 24 hours. We generally fumigate during the week and then leave the chamber open overnight to air out before handling the textiles. When you remove the Star Britex® package from the chamber, immediately discard it in a sealed container, preferably outside.

- Once the mold & mildew is no longer active, you can safely vacuum the residue left behind by a moderate to severe outbreak. Gloves and facemasks should be worn when handling or vacuuming objects with a moderate or severe mold & mildew issue. Dispose of the vacuum bag after cleaning up, and wipe down or wash out the vacuum attachment and tubes. If you are unsure what to do or your mold & mildew are moderate to severe, contact a conservator for assistance.

- After mold & mildew have been removed from your textiles and storage areas, monitor the temperature and relative humidity using a household thermostat with humidity sensor. Proper air conditioning, dehumidification and ventilation are often sufficient to control mold & mildew.

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