

Textiles

Found in such items as quilts, clothing, and bags

Identification and General Information

Although today many textiles are made of synthetic fibers, until recently they were made of animal and plant fibers. Protein fibers, like wool and silk, and cellulose fibers, like cotton and linen, are commonly found in older textiles. Methods of construction include spinning and weaving, plaiting or braiding strips, and felting through shocking woolen fibers with heat and cold and then agitating the unspun fibers repeatedly. Both hand and machine methods of production are used. Textiles are commonly made into blankets, clothing, and bags as well as many other items. Decorations can include dyeing, surface painting, embroidery, appliqué, and beads. The variety of materials, production techniques, and decorations often results in a composite item.

Basic Care and Storage

In general, textiles are extremely vulnerable to deterioration. The very things that make them pleasant to wear and use close to our bodies, such as flexibility, softness, bright colors, and decorations, also make them fragile. Wear, heat, moisture, and light are the main causes of textile deterioration.

Textiles do not support themselves; they are constantly flexing and folding. Flexing and folding of any fiber, whether wool, cotton, or linen, will result in breakage at some point. Breaks of this type are most evident along sharp knife-edge creases where the textile separates with a clean fracture. Abrasions, a type of wear commonly found in the knees of pants, will also result

in an area of loss. Repetitive handling will further weaken fragile abraded areas.

Extreme heat is dangerous for textiles. It dries out the naturally existing moisture in fibers that gives flexibility, leaving textiles brittle and fragile. Heat also causes discoloration through the aging of starches and the formation of acidic by-products. For example, white cotton items often turn yellow and brown, sometimes looking like they have been toasted under a broiler. Finally, heat can also cause dyes to bleed faster in a humid environment. This type of damage is not easily reversed.

Textiles readily absorb both high humidity and water, which can cause extensive damage. Types of water damage include tide lines, dye bleeds, shrinkage, distortion, and mold growth. Tide lines form when a textile becomes wet enough to move acidic by-products and dirt by a wicking action through the fibers. A tide line often appears as a wavy, dark, sharp dirt line. Once one has occurred, it is not easily removed. Dye bleeding and fabric shrinking and distortion are also difficult to reverse on all textiles. Finally, humid environments can accelerate and promote mold growth, resulting in serious staining and discoloration. If left unchecked, mold will digest textile fibers as well as other organic embellishments, resulting in discolored, embrittled, and fragile items.

Light accelerates the fading of both vegetable and chemical dyes, as well as other colorants like paints. Light also promotes the embrittlement and weakening of textiles, especially silk. It is important to understand that while the fading of dyes or other colorants may slow with time, actual deterioration of textiles accelerates the longer they are exposed to light. Over time, even if you see no visible change, it is occurring on a molecular level.

When using textiles for display, a common rule of thumb is to expose them to light for no more than four months at a time every four years at the light levels suggested in *Display*.

Special Pest Concerns

Insects and rodents can decimate any group of textiles. Carpet beetles and clothes moths feed on protein fibers like silk and wool, including sheep, goat, and camel hair, while silverfish feed on cellulose fibers like cotton and linen. Even more damaging is the use of precious textiles by mice, rats, and squirrels as bedding. Constant inspection and routine cleaning are the best ways to prevent infestation, along with implementation of an integrated pest management program.

Routine Handling

You should remove any jewelry you are wearing. You do not want to snag a ring or watch on a textile, causing a tear or detaching surface decorations like beads . Be sure to wash your hands because textiles can absorb the oils, dirt, and lotions on the surface of your skin. Check the measurements of the textiles. Do you have a big enough space prepared on which to work? Do you need a second set of hands to help you move large or fragile items? Make sure your work surface is clean. Clear off debris, and wipe the work surface with a clean cloth before you lay out the textile.

Once the textile is laid out, be sure to examine it all over. Look for areas of weakness or loss as you unroll or unfold it. Check for active infestation. You can never be too vigilant when monitoring textiles for insects. Finally, check for areas of dirt, accretions, or stains, as these can indicate areas of damage.

Display Issues

When displaying textiles, standardize the size and color of the mounts. In this way, mounts can be reused within cases, saving dollars and time on future mount preparation.

If possible, always place textiles in cases. If cases are not available, and items need to be in the open, maintain a weekly surface-cleaning schedule. It is important to clean regularly so dirt and dust do not accumulate. Try not to place items directly under or near heating or cooling vents, which may generate dust.

Slanted boards or mounts are frequently used for the display of many different types of textiles. For example, beaded garments or fragile blankets too heavy to hang can be placed on slanted mounts. This method of presentation allows you to place an item out for viewing without securing it to the board with tacks or staples or by sewing.

The slanted mount is a board that rests on an incline at no more than 35 degrees. Slanted mounts can be easily made with acid-free double-walled corrugated board. Place thermal-bonded polyester padding on top of the board and wrap a show cover of de-sized washed cotton fabric over it. This creates a soft supportive platform for an item to rest on. The show cover fabric can be neatly secured to the back of the board with 3M #415 double-coated transparent tape or white glue. Another option is to fold the material in half and sew up the side with machine stitching. An easy way to measure the right width is to lay the board on top of the material and draw lines, which you will sew through, down the side of the material. Now turn the fabric inside out so that the seam allowance is on the inside. You can then slide the board inside, turn the remaining edges in, and sew up the bottom by hand. Large slanted mount boards will need to be sturdy and may require the extra support of a wooden stretcher frame. Using a wooden stretcher frame will also enable you to secure the fabric show cover to the reverse of the board with staples.

Velcro hook-and-loop strip heading bands are another technique used to display large flat textiles, like rugs and quilts, by hanging. Note that only items with strong weave structures that will not pull or stretch out of shape during hanging may be displayed in this manner. If the item

is woven loosely, has unsupported areas of loss, or heavy embellishments like beading, then a slanted mount may be more appropriate.

To make a Velcro strip heading band, machine stitch a 2-inch-wide strip of loop Velcro to a strip of cotton canvas 3 inches wide. The strip should extend the entire length of the piece to which it will be sewn, without any breaks. Position the Velcro approximately 3/8 to 1/2 inch from the top of the cotton canvas. Machine stitch the Velcro to the canvas on the top, and herringbone stitch the bottom as well as down the middle. Next, position the prepared Velcro along the top edge of the textile and pin it in place. Hand-stitch the canvas to the textile with herringbone stitching. Take care to match the thread with the item so that the stitching will not show on the front of the textile. Place half of the herringbone stitching within the edge of the Velcro. This will help to support the item by joining it and the Velcro closely to one another. Finally, staple the matching strip of hook Velcro to a sealed wooden slat. The wooden slat can be sealed with a waterborne polyurethane that has been allowed to dry for four weeks. Once you secure the slat to the wall, roll up the prepared item with the loop Velcro edge exposed. Position the textile, and gently push the Velcro loop strip against the slat-mounted Velcro hook strip to create a secure bond. You can adjust the Velcro strip up and down to improve the flat hanging of the textile.

Garments on display can be presented on the storage hangers described below under hanging storage. Three-dimensional mounts, such as mannequins, often carved from sheets of Dow 220 Ethafoam, can also be used for display. Mannequins, considered ideal for museum exhibition, are often expensive to buy new and difficult to fabricate. An industrious person may be able to find older mannequins free, or for a small fee, from department stores no longer using them. These can then be retrofitted by museums for historic garments.

There are several methods of adapting older mannequins for display. One is described here. Conservators often remove the breasts from commercially manufactured mannequins by sawing them off, and modify the stomach, hips, and chest areas to conform to the garment. The stomach, or any other area, of a secondhand mannequin can be expanded by stretching two pairs of queen-sized nylon panty hose over the bottom and top of the mannequin. Take the first pair of panty hose and dress the lower half of the mannequin. Fit the head and neck through a slit cut in the crotch of the other panty hose. Pull the waist over the head, and extend it down over the chest to meet the first pair of panty hose in the middle. Once the second pair of pantyhose is on the mannequin, sew a twill tape strip or binding edge along the neckline to prevent the panty hose from running and losing structural stability. Extend the waistband down over the chest to meet the first pair at the middle. If necessary, remove the excess panty hose legs by cutting them off. Another option is to feed the arms through the leg holes of the top pair, further securing the panty hose in place at the shoulders, trimming them to rest under the sleeve and out of sight. You can now stuff clean thermal-bonded polyester batting around the torso where the two waistbands meet, expanding midriff, chest, and hips as needed. When the final shape is complete, sew the two waistbands together to seal them. Finally, go back and adjust the twill tape at the neckline so that it is not visible. Though these methods may seem crude, they are used by many professional museums.

Hand-carved Ethafoam museum mannequins are another option, but the materials are sometimes difficult to obtain as well as to carve. You can order this foam from a conservation supply catalog. If you do decide to use Ethafoam, contact a conservator to help design and guide the construction of mannequin mounts that will fit your needs.

Mounts and Supports

Storing textiles with mounts and supports is necessary for their preservation because textiles do not support themselves. The goal of all mounts and supports is to prevent any further distortion or physical damage. Flat, boxed, hanging, and rolled mounts and supports are commonly used to store textiles.

Flat Mounts

A flat mount acts like a supportive inflexible tray for an item on display or in storage. Flat mounts serve two purposes: to support a textile when it is in storage, and to provide support to facilitate moving an item without undue flexing and handling. Textiles can be stored on this type of mount if when lying flat, they are not distorted. Flat mounts are commonly stored within a box or drawer or on a shelf covered with unbuffered acid-free tissue or a muslin fabric.

Use acid-free corrugated board for flat mounts. If an item is heavy, it may be necessary to use a thicker board that will not flex. Another material for support is Coroplast, a polypropylene and polyethylene corrugated board. Coroplast is used by sign makers and may be available locally. However, if acid-free board or Coroplast is not available, then corrugated cardboard with a barrier of Marvelseal or polyester film is another option.

If the textile needs to be folded, line all folds with soft rolls of crumpled acid-free tissue. Line sleeves, pants, and the sides of dresses with tissue when storing flat. This additional support prevents folds from turning into stiff, hard creases that will eventually break or split. You can make a soft roll of crumpled tissue by loosely rolling a length over itself like a tube. A soft roll of crumpled tissue does not need to be perfectly smooth, just supportive for the fold or sleeve.

When placing smaller textiles on a flat mount, keep in mind the following: the opening

and closing of drawers will cause smaller textiles to slide and shift. This is especially problematic if you have several small items on one board. To prevent movement, secure smaller items with white cotton twill tape ties anchored through slits in the board. Another option is to line the board with fabric that has enough surface texture to hold an item in place. Suitable fabrics for this are washed and undyed cotton muslin or washed white cotton flannel. Do not use fabric softeners or bleach when washing fabric for use next to an item, and try to use as little soap as possible so that no residue will be left on the fabric. You can secure this fabric to the board with small tabs of 3M #415 double-sided tape laid near the perimeter of the board.

Finally, when planning the size of a flat mount, be sure to leave room for a handling edge around all four sides of the board. You need to allow easy access without touching the textile.

Boxed Storage

A box with a lid is good way to protect textiles on open shelves. Stacking one or two boxes on top of one another will give you more shelf space. Using acid-free materials for boxes is best. However, if acid-free boxes are not available, line corrugated board boxes with a barrier material such as polyester film or Marvelseal. Wrap items in unbuffered acid-free tissue before placing them in the lined acidic boxes. Smaller items can be safely stowed in custom-made trays of acid-free board to fit within the box, preventing shifting or crushing. You can make these trays yourself or purchase them from conservation suppliers. Larger textiles and garments can be folded to fit within a box, freeing valuable shelf space. When folding items, keep the following procedures in mind:

Folded Storage for Flat Textiles in Boxes

- Lay the textile out on a flat surface, and examine it for former fold lines. If a flat textile, like a rug or blanket, has been folded in quarters, fold it in thirds to prevent damage.
- Line all folds with rolls of crumpled unbuffered acid-free tissue. Then fold the item over the rolls. Insert your hand into the folded textile to reposition the tissue rolls if necessary. Make these rolls of crumpled unbuffered acid-free tissue as described above under flat mounts.

Folded Storage for Garments in Boxes

- Lay the garment flat, and fill sculpted areas, like the arms, legs, and chest, with crumpled unbuffered acid-free tissue to create a soft, flat pillow. If you are storing a dress or skirt, line folds with soft rolls of crumpled acid-free tissue to prevent creasing.
- If the garment needs to be folded in half or thirds, line each fold with rolls of crumpled acid-free tissue.

Hanging Storage

Garments that are strong and show no weaknesses are candidates for hanging storage. Be sure to carefully inspect the shoulders for weakness since they carry the weight. Never hang heavily decorated garments, those with weak shoulders, those that are fragile overall, or knitted ones.

Plastic molded hangers can be easily padded to properly support hanging garments.

Purchase plastic molded hangers with curves at the shoulders. Pad the hanger with one or more

layers of thermal-bonded polyester batting so that the item rests on the hanger and does not slide off. Cover the padded hanger with washed cotton knit fabric, and sew closed by hand. When finished, the hanger should easily fit within the garment, supporting the shoulders without distorting or stressing them.

If molded hangers are not available, you can use wire ones if they are clean and in good shape. The benefit of a wire hanger is that it can be bent to accommodate small items if necessary. Nevertheless, you must make sure that the hanging hook is strong enough to carry the weight of the garment and will not bend over time under stress. Be sure to examine the hanger for rust. If any type of corrosion is found, discard it. After examining the wire hanger for rust and hanging strength, cover it with two or more layers of thermal-bonded batting. Once the batting is wrapped around the hanger, to create support for the shoulders, cover it with washed cotton knit fabric. Sew the fabric closed by hand to secure the batting inside the hanger. When completed, the hanger should resemble a semi-flat pillow with a hanging hook.

Once a garment is hung for storage, protect it from dust, dirt, and abrasion with a muslin cotton dustcover. The dustcovers should fit easily over the garments and not squeeze them in any way. White or off-white cotton or Bemberg rayon fabrics are good for dustcovers because they will show dirt and dust accumulation. Checking for dust accumulation is especially important if garments are stored in an open area. Bemberg rayon is a fabric commonly used to line clothing. Its slippery surface allows a dustcover made from it to glide on and off a garment without abrading the surface.

Rolled Storage

Rolling a flat textile around a strong tube is a good way to store a large item without creating

fold lines. Rolled storage is good for large flat textiles like rugs and blankets. Do not roll items that are heavily decorated with embellishments such as beads or shells. Rolling these items will create creases and distortion of the textile as well as place stress on the threading used to secure these embellishments to the textile. Instead, fold heavily decorated items with supportive rolls of crumpled acid-free tissue. When rolling a large textile, try to use a tube with at least a 6-inch diameter. Also, make sure that the tube is longer than the textile. Allowing the textile to hang over the edge of the tube once it is rolled will promote distortion, ripping, and areas of loss. If you do not have access to acid-free tubes, you can substitute a regular 6-inch-wide Sono tube, the kind of tube used on cement footings, providing you cover the tube with a barrier such as Marvelseal or polyester film. This is especially important with Sono tubes because of their oily surface. Finally, cover the tube by rolling on a length of washed muslin or acid-free paper.

Once the tube is prepared, leave a small length of the cover paper or muslin unrolled. Next, place the top edge of the textile on the paper. Align the edge so that the textile is centered and square with the tube. Slowly roll the tube over the textile. Take care to roll the textile onto the tube evenly so that neither side telescopes out. If telescoping occurs, take the time to adjust the tube and start over. After rolling, cover the textile with washed muslin or acid-free paper. Once the textile is rolled, store it on support cradles so it will be suspended from the roll. The rolled textile should never rest upon a shelf or the floor.

This same method of storage can be used for smaller items on thinner cardboard tubes like those used in fabric stores. Sometimes these tubes are available free from fabric and carpet stores.

Cleaning and Minor Repairs

If done with care, surface cleaning can usually be successful. Before surface cleaning, be sure to examine the textile thoroughly for such problems as loose beads, open seams, splits, or areas of loss within the fabric. If there are any loose pieces or bits of the textile, bag them and document their original location with photographs, diagrams, or even photocopies, if this will not harm the item. This documentation will help you return those loose pieces to their original position. If the pieces cannot be returned to the textile, they can be stored in a file with the item.

You can surface clean with a low-suction vacuum cleaner. Vacuum cleaners can be fitted with micro-suction attachments found in fabric and computer stores. When placing the soft brush of the nozzle on the textile, do not drag it back and forth across the surface. Rather, tap the head on the textile in a systematic row-by-row manner. Do the same thing on the back of the textile. By methodically moving across the textile, you can be assured of equal cleaning throughout. If the textile is exceedingly fragile, or the suction of the vacuum is very strong, vacuum through a nonabrasive piece of fiberglass window screen, the cut edges of which have been bound with cotton fabric and a seam binding.

A second method of surface cleaning is to use a vulcanized rubber dry cleaning sponge. These sponges were originally used to clean soot in homes after fires and are good for removing greasy, sooty, particulate dirt from surfaces. This sponge will help to remove any buildup of greasy dirt from previous use and handling. First, cut a piece of the sponge to fit comfortably within your hand. Gently place the sponge on the textile, and make a swooping motion with light pressure. As soon as the sponge is black with dirt, cut it off and shave it down to reveal a clean portion underneath. A soot sponge is not appropriate for a fragile textile or embellishments with fragile threading.

Conservators consider washing an item to be an intrusive and irreversible act. Washing can damage historic items in many ways. Impure water can leave deposits that will become visible at a later date. For instance, water heavy with iron or copper can cause rust spots to appear later or a green overcast. Textiles can shrink or lose their sizing when washed, changing their appearance and feel. Items not properly supported while wet or drying can distort or rip. Dye bleeding is a real threat when washing items that have dyes that are not fast. Contact a conservator for advice if you feel an item needs more aggressive cleaning like washing.