

## **Guidelines for the Preservation of Flags and Banners**

Artifacts have unique preservation and conservation needs based upon their past history, the materials used in their construction and the purpose of their preservation – research or display. As the organic materials age, they become more sensitive to adverse environments. These guidelines provide basic, general information on care and storage. Specific questions should be addressed to trained professionals who can evaluate the individual artifact and its needs. The basic premise of conservation is that any intervention should be reversible, non-harmful and not interfere with the research and aesthetic value of the artifact. Cleaning procedures are non-reversible and should be undertaken with extreme caution and only when necessary. Damage should be prevented as much as possible by controlling the known agents of deterioration: exposure to elevated temperatures, shifts in relative humidity, light radiation, and pollution. Careful choice of exhibition materials will extend the display lifetime of an artifact. Artifacts should be examined regularly to detect changes early, and while still treatable.

### **General Care**

- All organic materials are damaged by exposure to light, air, high temperatures, elevated levels of moisture, chemical pollutants, and abrasives such as soil particles.
- Limit exposure to all sources of light
- maintain a stable temperature and relative humidity level around the textile
- avoid exposure to chemical pollutants
- limit manipulation and handling of the textile
- lightly vacuum off dust and airborne particles

**LIGHT:** With flags that have seen outdoor use, the fibers are already damaged from exposure to sunlight; extra care needs to be taken to insure no further damage is done. It is recommended that textiles not be displayed in direct sunlight such as might come through a window or skylight. Interior walls where light levels can be controlled are preferred locations. Display lighting needs careful consideration as well. Ultraviolet radiation and infrared radiation are found in many lighting systems. These regions of the light spectrum do not enhance the viewing of an artifact but do damage organic materials.

Incandescent and halogen light sources generate heat (infrared) and could be potential fire hazards as well. Fluorescent and halogen light sources are a source of ultraviolet light radiation which is thought to be the most damaging kind of light energy. These lights must be filtered to remove the ultraviolet light component. If you light the flag unevenly, you will create uneven levels of damage. If you light the top more than the bottom, you will weaken the very area which supports the weight of the rest of the textile. For fragile textile artifacts on permanent display, the light levels must be kept low. The guideline is no more than 5 footcandle exposure if displayed 3 months or less a year. If the artifact is permanently displayed, the amount of light exposure can be limited by covering the artifact with a light shield for part of the time; using timers and dimmers to limit the length of exposure. Ideally the textile should only be exposed to light when it is necessary to see it. For silk artifacts, the light exposure should be even lower as silk is very easily damaged by light.

**AIR:** The presence of oxygen is necessary for many chemical deterioration processes to continue. If it is possible to frame and glaze the flag, contact with the oxygen in the air will be limited. For long term storage of flags, they should be containerized to limit contact with oxygen. However, certain textiles such as woolen fabrics will continue to degrade even in the absence of oxygen if exposed to light. Inert atmosphere storage will not permit high light levels to be used.

**TEMPERATURE:** Most chemical reactions occur at a faster rate with higher temperatures. While it is not often possible to lower the temperature of textiles on display, when in storage the textiles should be kept in a cool environment rather than attic storage. Textiles should not be displayed near sources of localized heat such as lights, motors, fireplaces, over heating vents or in direct sunlight. High temperatures may also desiccate fibers causing them to become brittle and break when handled.

**RELATIVE HUMIDITY:** Different types of fibers react differently to moisture. In many flags, there are multiple fibers used. Exposure to moisture can cause stresses which will damage the fibers. The presence of water can speed some deterioration reactions. Storage at relative humidity levels above 65% can lead to mold growth. While mold is a more common problem for cellulosic materials such as cotton and linen, it can also grow on soils and greases found on wool. Bacteria can also become a problem in moist environments. When displaying a textile on a wall, whether framed or in the open, you must

make sure a moist micro-climate is not created behind the textile. To prevent moisture buildup behind a textile, place a spacer between the wall and the textile or frame. Because outside walls often have a high moisture content, textiles should not be displayed on them. Textiles should not be stored in damp places such as basements.

**CHEMICAL POLLUTANTS:** Urban pollution sources such as car exhaust can be very damaging. The chemicals can combine with atmospheric water to create acids which will damage all textiles, fibers, and dyes. The oily component of the exhaust can act to embed airborne soils into the fibers. The deterioration of these oils can also create chemicals which may be damaging. Textiles should not be displayed by open windows in urban environments. Where urban pollution is not as great a problem, airborne soils may still enter the display space through open windows. Soils on your hands can also transfer to the textile with handling. You should always wash your hands before handling textiles, or wear gloves if this is not possible.

**ABRASIVES:** Abrasive materials can be damaging in a number of ways. Firstly, they can cause mechanical damage as they move against the fiber surface, much like sandpaper. They may also contain chemically active ingredients which can promote deterioration. They can also support biological activity such as mold growth. Textiles should not be displayed over air ventilation ducts or by windows and doors to prevent deposition of air-borne particulates.

**MAINTENANCE:** Good housekeeping procedures will prevent damage or at least halt it before serious damage is done.

- Inspect textiles in storage at least every six months
- Vacuum off loose debris before it becomes embedded
- Clean textiles before placing them in storage if needed
- Once a year, refold textiles
- Avoid stacking textiles on top of each other

**INSPECTION:** Look for changes in the textiles. Are there new stains or general discoloration? Are there new breaks or losses? Are the fibers of the textiles shedding or powdering? Are there signs of insect infestation – are there cocoons, or webbing? Is there frass (insect excrement), grainy soils, chewed fibers? Are there smears and stains? Are there new, small holes, especially along outside edges or fold lines? If you find changes in your textile, you should have it examined by a conservator to determine what has caused the changes and what should be done to prevent further damage.

**HANDLING:** Textiles should not be moved unsupported. A layer of clean fabric, or a stiff board can be used to transport textiles from one location to another. When separating the layers of a folded textile, carefully lift one corner and fold back so you can make sure the layers haven't become entangled in areas of loss or breaks in the yarns. Ideally a separating layer should be placed between the fabric layers. Acid free tissue paper is a good choice because of its smooth surface.

**VACUUMING:** If a textile is in sound condition, very few breaks or losses, no shedding of fibers, no loose paint or embellishments, it can be vacuumed. Remove debris by vacuuming the textile surface with as low a suction as you can create. The objective is to remove only the loose material, not anything adhered to the fibers. Start by cutting a small piece of window screening, nylon or fiberglass, to size. For small textiles, 2' x 2' is large enough. Tape or bind the edges to keep them from snagging the textile. Place the screen on top of the textile. Hold it in contact with the textile. Vacuum the textile top to bottom and side to side. Lift screen and move to another area and repeat. If the suction on the vacuum cleaner is not adjustable, hold the tool above the surface of the textile by placing your finger between the textile and the tool. Upholstery brushes work well if you use care not to contact the textile. Do not use crevice tools as they will concentrate the suction.

**CLEANING:** It is not recommended that you try cleaning textiles other than by vacuuming. Flags and banners are usually composed of more than one material. Each material reacts differently to water, detergents and solvents. They must all be tested for any reaction before cleaning. Often the cleaning method chosen must be a compromise to avoid damage to any one component. Cleaning should be done by trained professionals. Stains and soiling more than six months old may not be removable. Overall cleaning of a textile might make a stain more visible.

**REFOLDING TEXTILES:** Textiles in sound condition can be folded for storage. Wool, linen, and unglazed cotton are usually the best candidates for folded storage. Folding stiff textiles such as glazed cottons or silks may cause stresses which eventually will become breaks along the fold lines. If possible, textiles should be folded along seam lines. All folds should be padded out with acid-free tissue or stockinet tubing stuffed with inert materials such as polyester batting to keep the folds from crushing under their own weight. Open folded

textiles every six months to inspect them for damage or changes. When refolding textiles, you should fold in a new area to avoid stressing the same area.

**STACKING TEXTILES:** Wool is more resistant to fold and crease damage than silk. If you need to stack the textiles for storage and you cannot create shelves or supports, place the heavy wool on the bottom and the lighter, more fragile silk on top. Separate the textiles using acid-free tissue or washed muslin which can be used to lift the textile.

## **Display**

**MATERIALS:** Avoid acidic materials such as wood, or acidic paper products in direct contact with the artifact. Paper products such as mats, dust seals and support boards have a limited lifetime for use. They should be changed at least every 10 years, and may need to be changed more frequently if the textile is displayed in a more polluted, urban environment. Napped fabrics such as velvet or unwaled corduroy will provide "tooth" to prevent the slipping of the textile while on display. The fabric should be used against the grain to provide this friction effect. This technique should not be used on heavily damaged or brittle fabrics. Any dyed fabric should be tested for water solubility before using to prevent dye bleed if case of humidity build-up or water leak.

**GLAZING:** If possible, displayed textiles should be "glazed". Both glass and plexiglass materials will provide some protection from the damage caused by ultraviolet light radiation. Plexiglass is normally a lighter material which may be an advantage for large textiles. It will not shatter should the hanging support fail. Glass can shatter, cutting and permanently damaging the textile. However, plastic materials will melt or burn in a fire causing irreparable damage to the textile. Glazing the textile will also limit the amount of soiling from airborne particulates. Glazing materials in direct contact with the textile can cause damage because of a moisture build-up within the framing enclosure, a "micro-clime" which can be very different from the ambient conditions in the room.

**METHOD OF ATTACHMENT:** Textiles need to be supported while displayed. Very large textiles can be lined with a new support fabric to provide stability. However, open display can cause other problems as noted above. If the textile is framed, it can be "pressure mounted" so that no stitching or adhesive is required. A padded support is created, the textile is placed on the support and the weight of the glass/plexiglass prevents the movement of the textile when framed. Alternatively, if the textile is sound, it can be stitched to a support cloth and the support cloth can be attached to a stretcher frame for display. The choice of method is dependent on the condition of the artifact.

**DISPLAY ANGLE:** Angling the framed textile even slightly will reduce the stress on the artifact. At a 23 degree elevation off the horizontal the textile can become self-supporting so no additional support or attachment is necessary. Even canting the frame off vertical by 10

degrees will significantly reduce the hanging stresses. The frame can be made thicker at the bottom to create a slight angle. Air should be allowed to flow behind framed/glazed textiles to prevent moisture build up and adverse micro-climates surrounding the textile.

## **The Star-Spangled Banner**

### **By Francis Scott Key**

O! say can you see, by the dawn's early light,  
What so proudly we hail'd at the twilight's last gleaming,  
Whose broad stripes and bright stars through the perilous fight  
O'er the ramparts we watch'd were so gallantly streaming?  
And the Rockets' red glare, the Bombs bursting in air,  
Gave proof through the night that our flag was still there,  
O say does that star-spangled Banner yet wave  
O'er the Land of the free and the home of the brave?

On the shore dimly seen through the mists of the deep  
Where the foe's haughty host in dread silence reposes,  
What is that which the breeze, o'er the towering steep,  
As it fitfully blows, half conceals, half discloses?  
Now it catches the gleam of the morning's first beam,  
In full glory reflected now shines in the stream,  
'Tis the star-spangled banner – O! long may it wave  
O'er the Land of the free and the home of the brave!

And where is that band who so vauntingly swore  
That the havoc of war and the battle's confusion  
A home and a Country should leave us no more?  
Their blood has wash'd out their foul footsteps' pollution.  
No refuge could save the hireling and slave  
From the terror of flight or the gloom of the grave,  
And the star-spangled banner in triumph doth wave  
O'er the land of the free and the home of the brave.

O! thus be it ever when freemen shall stand  
Between their lov'd home and the war's desolation,  
Blest with vict'ry and peace may the Heav'n rescued land  
Praise the power that hath made and preserv'd us a nation!  
Then conquer we must, when our cause it is just,  
And this be our motto - "In God is our trust,"  
And the star-spangled Banner in triumph shall wave  
O'er the Land of the free and the home of the brave.

*For more information about the Star-Spangled Banner, visit  
[www.americanhistory.si.edu/starspangledbanner](http://www.americanhistory.si.edu/starspangledbanner)*



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