

QUICK GUIDE TO MATERIALS

FOR STORAGE, DISPLAY
& HANDLING OF
VALUABLE COLLECTIONS



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The tables on the following pages provide a list of materials to use or to avoid when storing or displaying documents and artifacts from your collections. The recommended materials are those you should select first, whenever possible. There are occasions when, due to circumstance or budget, less than ideal archival materials are in use. In those cases, we have provided suggested techniques for mitigating the potential negative impact. We have also noted those materials which pose too great a hazard to your collection and therefore should be removed from and/or never selected for use.



PAPER, BOARDS & PLASTICS FOR STORAGE

The quality of materials used for storage containers is extremely important because most objects will spend a long time in storage. The papers and boards and films used in storage should be permanent and durable, meaning they should be inert and chemically stable. Papers and boards should have long enough fiber to withstand many folds without cracking or tearing. The difference between archival quality materials and acidic and unstable materials is not usually visible and many companies misrepresent their products. To make sure you are buying materials that will be safe for your collection, buy products that have passed the Photo Activity Test (P.A.T.) or purchase them from a reputable supplier of archival quality products.

WHITE PAPER

Purpose(s): Printer, photocopy paper, labels, interleaving

Safety Factors: RESERVATIONS. Most commercially available papers are either acidic or are filled with so much buffering agent that there's little fiber strength. Acidic papers cause objects in contact with them to discolor and deteriorate, and will speed the deterioration of metals and other objects.

Substitution(s): RECOMMENDED. Permanent and durable paper from reputable archival product suppliers; may have a watermark which identifies them.

Mitigating Actions: None. Unless identified with a watermark, acidic paper may look just like a permanent durable paper; avoid mistakes by stocking only archival quality papers.



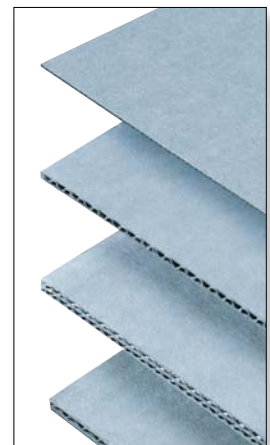
CORRUGATED BOARD, CARDBOARD

Purpose(s): Storage boxes, mount material

Safety Factors: RESERVATIONS. Most commonly available corrugated board contains significant amounts of lignin that deteriorates and produces acids which will damage objects.

Substitution(s): RECOMMENDED. Acid-free, lignin-free corrugated board (cardboard) is available from reputable suppliers of archival products.

Mitigating Actions: None. Eliminate acidic corrugated board from your collection; it may still be appropriate for shipping cartons if objects are not stored in them for long periods.



BARRIER BOARD, BOX BOARD, PAPER BOARD

Purpose(s): Storage boxes, Pamphlet Binders

Safety Factors: RECOMMENDED. Archival quality board is available from reputable archival suppliers in buffered (with an alkaline reserve) or unbuffered; often made into storage boxes with metal edges.

Substitution(s): Use buffered board with an alkaline reserve for storing cellulose-based materials; neutral (unbuffered) board as storage for protein-based objects (silk, wool, natural history specimens, etc.).

Mitigating Actions: When using buffered board (with an alkaline reserve) to store protein based objects, provide a barrier of neutral, archival-quality material between the buffered board and the object.



FOLDER STOCK

Purpose(s): File Folders, stiffeners, indexing tabs, book repair

Safety Factors: RESERVATIONS. Many commercially available folders are acidic and will speed deterioration of stored items.

Substitution(s): RECOMMENDED Acid-free, lignin-free file folders and folder stock available through reputable archival suppliers.

Mitigating Actions: Replace acidic folders with acid-free, permanent and durable folders.



PLASTIC COATINGS:

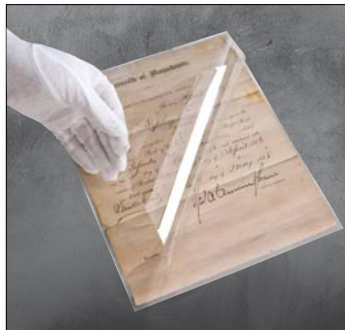
SLIP AGENTS, ANTI-STATIC

Purpose(s): Can be added to plastics to improve performance under certain conditions.

Safety Factors: AVOID. May cause fading, and other deterioration. There are many types of coatings, and it is not usually possible to know the characteristics of all of them.

Substitution(s): Use uncoated materials or materials that have passed the P.A.T. and/or Oddy test.

Mitigating Actions: None.



VINYL (POLYVINYL CHLORIDE)

Purpose(s): Clear plastic album pages, photo and document storage pockets, faux leather binder covers and many other storage items.

Safety Factors: AVOID. Vinyl is a plastic that has been highly plasticized to make it flexible. It is unstable, and produces hydrochloric acid as it deteriorates. Causes oily spots, yellowing, and will crack as it ages.

Substitution(s): Storage sleeves and pages are available in archival quality polyester such as Melinex, polyethylene and polypropylene. Purchase clear plastic storage materials from reputable archival product suppliers only.

Mitigating Actions: None.



POLYESTER (PET, MELINEX)

Purpose(s): Sleeves and pockets for photos and documents, clear lids for storage boxes

Safety Factors: RECOMMENDED. Excellent for storing photos, documents. Clear lids enable viewing of contents without handling. Static electricity attracts dust and may damage items with friable surfaces such as charcoals or pastels. Does not protect against UV or ambient light rays.

Substitution(s): Polypropylene and polyethylene are less expensive but not as clear and provide less physical support.

Mitigating Actions: Anti-static gloves and dust cloths will remove dust and particle from surface.



POLYPROPYLENE

Purpose(s): Sleeves and pockets for photos and documents, cases for digital media.

Safety Factors: RECOMMENDED (when uncoated). It is a less expensive, somewhat softer alternative to polyester for sleeves and pockets. As a case for media, it offers durability and an extremely strong hinge.

Substitution(s): Polyester is clearer, harder and provides more physical protection, but is more expensive. Polyethylene is not as clear.

Mitigating Actions: None required.



POLYETHYLENE

Purpose(s): Sleeves and pockets for photos and documents.

Safety Factors: RECOMMENDED. An inexpensive, alternative to polyester; less rigid or clear than either polyester or polypropylene.

Substitution(s): Polyester is clearer, harder and provides more physical protection, but is more expensive. Polypropylene is a more economical alternative than polyester.

Mitigating Actions: None required.



TYVEK (SOFT)

Purpose(s): Envelopes, enclosures for documents, photographs, pamphlets, books. Also used for wrapping, interleaving, covering large objects and garments.

Safety Factors: RECOMMENDED. This spun-bonded polyolefin is inert, water and tear resistant and breathable.

Substitution(s): Archival quality folder stock and acid free paper envelopes, polyester and polypropylene sleeves, muslin for garment covers.

Mitigating Actions: None required.



TISSUE

Purpose(s): Interleaving, wrapping, padding

Safety Factors: RECOMMENDED. Use only archival quality tissue from a respected archival supplier. Tissue buffered with an alkaline reserve can be used with undyed cellulose materials; for other objects, choose unbuffered tissue.

Substitution(s): Unbleached, unsized muslin, polyester batting, Ethafoam, Plastazote foams.

Mitigating Actions: None required.



BATTING, POLYESTER

Purpose(s): Padding folded textiles, artifacts and natural history specimens.

Safety Factors: RECOMMENDED. Polyester batting without chemical binders can be used, but batting fibers can catch on beads, protrusions and rough edges causing breakage.

Substitution(s): Crumpled archival-quality tissue.

Mitigating Actions: Use a barrier such as archival-quality tissue, unbleached/unsized muslin or Tyvek so objects don't come in contact with batting.



FOAMS: URETHANE, POLYURETHANE

Purpose(s): Shock absorption, cavity filling

Safety Factors: AVOID. Ordinary foams will break down and off-gas, damaging artifacts.

Substitution(s): Conservation-quality foams such as Ethafoam polyethylene foam; Plastazote, cross-linked, closed cell polyethylene blown with inert nitrogen

Mitigating Actions: The cut surfaces of Ethafoam can be rough and will abrade or catch on fragile objects; a barrier such as unbleached/unsized muslin, archival-quality Tyvek or archival quality tissue.



FASTENERS

Fasteners such as staples, paperclips, pins, rubber bands all cause damage to archival collections by causing holes, tears and distortion to documents. Traditional metal fasteners often rust and stain paper. Rubber bands often contain sulfur which can be converted to sulfuric acid. They become tacky, sticking to documents. Consider removing fasteners if it's possible to do so without damaging documents. The exception to this is when the fastener is part of the historic artifact (such as a wax seal). If fasteners are necessary, for fabricating storage materials or when pamphlets need to be secured in pamphlet binders, there are some less damaging, non-rusting options.

PAPER CLIPS

Purpose(s): Keeping pages of documents together

Safety Factors: AVOID. Standard paperclips can rust and cause depressions and tears in documents.

Substitution(s): PlastiKlips won't rust and are gentler on paper; stainless steel paperclips won't rust, but can still damage documents.

Mitigating Actions: If at all possible, don't use paperclips at all, but store documents in archival-quality file folders.



STAPLES

Purpose(s): Keeping pages of documents together; fastening pamphlets into pamphlet binder.

Safety Factors: AVOID. Standard staples can rust and cause depressions in documents.

Substitution(s): Stainless steel and monel staples won't rust.

Mitigating Actions: If at all possible, remove staples and store documents in archival-quality file folders.



TWINE, STRING

Purpose(s): Bundling books, documents, artifacts.

Safety Factors: AVOID. Twine is abrasive, and its narrow profile will cut into documents and artifacts.

Substitution(s): Natural cotton tying tape is flatter and gentler on artifacts.

Mitigating Actions: None.



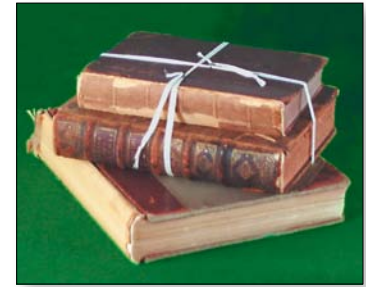
RUBBER BANDS

Purpose(s): Used to bundle books, documents, and objects.

Safety Factors: AVOID. Rubber contains sulfur, which causes damage to objects. Rubber bands cause structural damage, and degrade leaving hard or sticky residue.

Substitution(s): Replace with cotton tying tape or store documents in archival-quality file folders or boxes.

Mitigating Actions: None. Eliminate all rubber bands from your collection.



TAPES, SELF-ADHESIVE

Purpose(s): Repair tears

Safety Factors: AVOID. Hard to impossible to remove without damaging artifact; adhesive oozing from edges can stick to other objects.

Substitution(s): Torn documents can be repaired with wheat starch paste and Japanese tissue.

Mitigating Actions: Plastic self-adhesive tapes should not be used on or adjacent to artifacts; however, good quality tapes of polyethylene with acrylic adhesive can be useful in creating shipping and storage solutions.



VELCRO® (HOOK & LOOP)

Purpose(s): Closures for boxes and binders; mounting applications; One-wrap style can be used to secure wrapping over rolled textiles, etc.

Safety Factors: RESERVATIONS. Available with and without adhesive backing; and as One-Wrap style which has hook on one side, loop on reverse; adhesive should never come in contact with artifacts; Velcro hooks can catch on fabrics and cause damage.

Substitution(s): Unbleached cotton tying tape

Mitigating Actions: None.



METAL STORAGE FURNITURE & DISPLAY CASES

Choose cabinets, shelves and racks carefully. Storage furniture should have a smooth, non-abrasive finish and be free of burrs, exposed screws and bolts, and rough seams which can cause damage to artifacts and personnel. Chips in the finish will expose steel which can then rust. If there are drawers (as in flat files) they should move smoothly to reduce vibration, so ball bearings are the preferred mechanism. The structure should be strong enough not to bend or warp under the weight of stored objects. Shelves and cabinets should be anchored to the floor and/or ceiling to prevent shifting or toppling and the bottom shelf or drawer should be at least 4" (preferably 6") off the floor, so objects are protected in a water emergency. Powdered coated steel display case bases and legs are safe and sturdy. Anodized aluminum can safely be used for case and deck framing.

ANODIZED ALUMINUM

Purpose(s): Storage Cabinets, Exhibit Cases, Art Hanging Systems

Safety Factors: RECOMMENDED. Lightweight, non-reactive and uncoated so there's no off-gassing.

Substitution(s): None.

Mitigating Actions: None required.



POWDER COATED STEEL

Purpose(s): Storage Cabinets, Exhibit Cases, Art Hanging Systems.

Safety Factors: RECOMMENDED. Steel furniture coated with stable polymer and fused; little threat of off-gassing.

Substitution(s): None.

Mitigating Actions: The methyl ethyl ketone (MEK) rub test on an inconspicuous spot can confirm that the finish is not off-gassing.

CHROME-PLATED STEEL WIRE

Purpose(s): Racks for boxed storage.

Safety Factors: RECOMMENDED. Durable, relatively lightweight and provides good air circulation; wire will imprint on items that are not boxed.

Substitution(s): None.

Mitigating Actions: The wire deck can be covered with sheets of archival quality board to prevent the wire imprinting on stored items, but this will effect air circulation.



BAKED ENAMEL ON STEEL

Purpose(s): Storage Cabinets, Exhibit Cases, Art Hanging Systems

Safety Factors: RESERVATIONS. May off-gas harmful formaldehydes and other volatile compounds that will cause deterioration of collections if not properly baked.

Substitution(s): Substitute powder coated steel or anodized aluminum.

Mitigating Actions: The methyl ethyl ketone (MEK) rub test on an inconspicuous spot can be an indicator of whether the finish has been baked enough.



EXHIBITION MATERIALS

The potential for damage to items on display is always greater than when in storage. Exposure to changing environmental conditions, in addition to improper display and handling, vandalism and theft all need to be taken into consideration when planning an exhibit. Another important factor is the use of proper materials for exhibiting each object. The following table reviews materials in common use for such purposes.

WOOD

Purpose(s): Pedestals, display cases, risers, platforms

Safety Factors: RESERVATIONS. Acidic qualities produce off-gassing that will cause corrosion or deterioration of objects in direct contact.

Substitution(s): Medex Medium Density Fiberboard, Powder Coated Metal

Mitigating Actions: Low VOC paints, sealants, barrier material such as Marvelseal, ethafoam decks with linen covering, melamine decks.

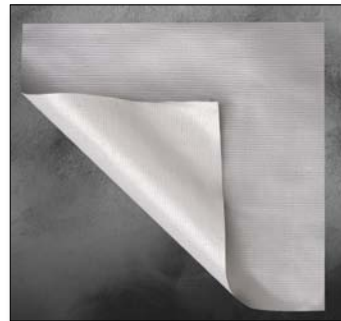
MEDEX® MEDIUM DENSITY FIBERBOARD (MDF)

Purpose(s): Pedestals, display cases, decks, risers, and platforms.

Safety Factors: RESERVATIONS. Low formaldehyde composition board does not off-gas as much as wood but should still not come into direct contact unless sealed.

Substitution(s): For Decks and Risers—Sintra, melamine; for Cases—fiberboard with melamine or other laminate

Mitigating Actions: Low VOC paints, sealants, barrier material such as Marvelseal, ethafoam decks with linen covering, melamine decks



ACRYLIC

Purpose(s): Risers, Case Vitrines, Frame glazing

Safety Factors: RECOMMENDED. Inert material is safe for most purposes, although highly static and will attract dust and is also susceptible to scratching. Glued edges can separate. Does not protect against UV rays or ambient light.

Substitution(s): For Decks and Risers—Sintra, melamine, For Vitrines and Framing—glass

Mitigating Actions: Anti-static spray cleaners and polishers



GLASS

Purpose(s): Risers, Case Vitrines, Frame Glazing, Case Panels, Shelving

Safety Factors: RECOMMENDED. Can shatter, damage items and injure individuals. Does not protect against UV rays or ambient light.

Substitution(s): For Decks and Risers—Sintra, melamine, For Vitrines and Framing—glass

Mitigating Actions: Tempered glass provides protection against breakage; UV screening

ETHAFOAM

Purpose(s): Case Decks and backboards, mannequins

Safety Factors: RECOMMENDED. Safe for most uses but surface may be abrasive.

Substitution(s): Medex or Melamine

Mitigating Actions: Cover with linen or muslin



WOOL

Purpose(s): Covering for risers, backboards, case decks

Safety Factors: AVOID. Material can tarnish metals, such as silver, and silver photographic images. Particularly attractive to insect infestation.

Substitution(s): Polyester felts, unbleached cotton, linen or muslin, all of which have passed the ODDY test for harmful materials.

Mitigating Actions: None. Do not use this material.



COTTON, COTTON VELVET, MUSLIN, LINEN

Purpose(s): Covering for risers, backboards, case decks

Safety Factors: RECOMMENDED. Unbleached, untreated cotton, muslin and linen will not harm objects and provide a safe covering for decks and risers.

Substitution(s): Polysuede and polyester felts which have passed the ODDY test for harmful materials.

Mitigating Actions: Make sure fabrics have passed ODDY test and are colorfast.

POLYESTER FELT & POLYSUEDE

Purpose(s): Covering for risers, backboards, case decks; padding for mounts

Safety Factors: RECOMMENDED. Fabrics with acrylic self-adhesive backing cushion mounts and provide a non-slide surface for objects on display.

Substitution(s): Untreated cotton, cotton velvet, linen, muslin which have passed the ODDY test for harmful materials for deck and riser coverings.

Mitigating Actions: Make sure fabrics have passed ODDY test.



MARVELSEAL®

Purpose(s): Covers exhibit case decks, storage boxes, crates, shelving as a barrier film between possibly damaging material and object being exhibited or stored.

Safety Factors: RECOMMENDED. Marvelseal is a flexible, multilayer 5mil aluminized nylon and polyethylene barrier film that resists transmission of water vapor and off-gassing from wooden surfaces.

Substitution(s): For cases—untreated fabrics, such as cotton, muslin or linen, low VOC paints and sealants; For storage—acid-free tissue, interleaving paper and paperboard

Mitigating Actions: None required.



SILICONE GASKETING

Purpose(s): Sealing spaces in openings between exhibit cases and vitrines; providing an airtight seal around museum cabinet doors, shelves and openings.

Safety Factors: RECOMMENDED. Creates a safe seal. For minimal air exchange. Does not deteriorate, crack or dry over time.

Substitution(s): None.

Mitigating Actions: None required.

LATEX, RUBBER GASKETING

Purpose(s): Sealing spaces in openings between exhibit cases and vitrines; providing an airtight seal around museum cabinet doors, shelves and openings.

Safety Factors: AVOID. Rubber contains sulfur and will degrade, leaving hard or sticky residue.

Substitution(s): Silicone gasketing.

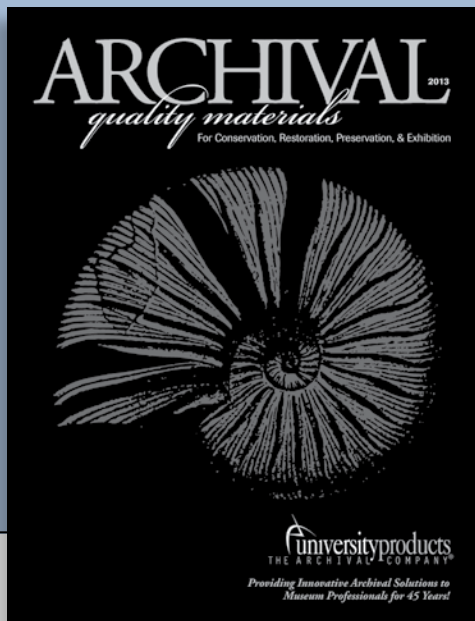
Mitigating Actions: None. Remove and replace with silicone gasketing where possible.



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