

## NATIONAL ARCHIVES AND RECORDS ADMINISTRATION PRESERVATION PROGRAMS

*The information provided below is intended for emergency recovery and response, not general treatment recommendations.*

### BOUND VOLUMES WITH LEATHER OR VELLUM BINDINGS

#### *Priority Action:*

- Immediately **air dry, or freeze (if large quantities)**
- Books with **leather and vellum bindings are a priority** because
  - They distort and disintegrate in water
  - They are highly susceptible to mold growth

#### *Recommendations:*

- Leather bindings should be air dried (if quantities are small)
- Large quantities of volumes should be blast frozen, if possible, or frozen
- Thermaline or cryogenic drying is a new technique that looks promising for drying leather and vellum bindings
- To air dry wet or partially wet books –
  - Stand the book upright, on its head, on absorbent paper
  - Support the book by opening the covers, but not the pages
  - Once pages begin to dry, interleave with paper towels, unprinted newsprint, or thin blotter paper every 5-10 pages
  - Interleaving should extend beyond the edges of the text block, except at the edge on which the volume is standing
  - The sheets should not equal more than one third of the thickness of the volume, so the binding won't be strained
  - Separate the covers from the text block with absorbent paper
  - Open the covers of the book and stand it upright
  - Change interleaving as soon as it becomes wet, alternating the location of the interleaving
  - Once books feel dry to the touch, remove the interleaves and reshape the bindings
  - Flatten each book under a sheet of plastic or covered board with a weight on top
  - Do not pile books on top of each other – they can distort
  - Keep air moving at all times using fans
  - Aim fans into the air away from the drying volumes
  - Use dehumidifiers as needed to keep humidity at or below 50% RH
- To air dry damp books or books with wet edges –
  - Stand books upside down
  - Support the book by opening the covers
  - Fan open the pages
  - Support books with damaged covers with bookends or weights
  - Refan the pages every few hours
  - Turn book over to dry tops of pages
  - When book feels dry, flatten under sheet of plastic or covered board with weight on top

- **Fragile and oversized books** should be laid flat with absorbent interleaving placed intermittently between pages
  
- To pack leather bound volumes for freezing –
  - Do not open or close books, do not separate covers
  - Separate volumes with freezer paper to prevent sticking
  - Pack spine down in plastic crates or cardboard boxes 1 layer deep
  - Pack oversized volumes flat in containers 2-3 books deep
  - Do not stack large books on top of smaller ones
  - After boxes are packed, place on pallets if available
  - Do not stack boxes on pallets more than three high
  - Ship to a freezer facility as soon as possible
  - Mold will begin to grow after 48 hours if materials are not kept cold
  
- If leather bound volumes are freeze dried, note that they will likely suffer some distortion
  
- A book conservator should be consulted for advice on drying rare and vellum bindings
  - Vellum bindings should be monitored carefully
  - Place blotters between the covers and text and on the outside of the cover
  - Place volume under weights or in a book press
  - As the binding dries, it may shrink and cause damage to the text block, and should be removed
  - Vacuum freeze drying should be avoided for vellum bindings

*Recommended Supplies:*

- Wax or freezer paper
- Plastic crates or cardboard boxes
- Newsprint
- Blotter paper
- Paper towels
- Fans
- Dehumidifiers

Related media:

[Volumes with Cloth or Paper Covers](#)

[Volumes with Coated Paper](#)

*The information and links provided by NARA are offered as a service and do not imply endorsement of any company, institution, or person. The scale of the emergency and types of materials affected will determine the specific actions or techniques to be taken and whether in house salvage is possible or whether external resources and expertise are necessary.*