

## DRYING TECHNIQUES FOR WATER DAMAGED BOOKS AND PAPER

TECHNIQUE	PROCEDURE	SPEED	DIRECT COST	STAFF & LABOR	AVAILABILITY	RESULTS
Air Drying	Items dried by circulating air, preferably in a cool, low humidity space	days or week	negligible	high	very good	<ul style="list-style-type: none"> <li>• swelling (20-30%)</li> <li>• cockling</li> <li>• blocking</li> <li>• inks running</li> <li>• mold threat</li> </ul>
Dehumidification	Large, commercial dehumidifiers installed to dry building, furnishings, and collections in place	varies	varies	moderate	good	<ul style="list-style-type: none"> <li>• limited cockling, if used only on damp items</li> <li>• inks may run</li> </ul>
Freezer Drying	Items placed in <b>self-defrosting</b> freezer (under -10° F) are frozen, then ice is slowly sublimated	months or year	negligible (if done at home)	moderate	very good	<ul style="list-style-type: none"> <li>• swelling</li> <li>• blocking</li> </ul>
Vacuum Freeze Drying	Frozen items placed in chamber; vacuum drawn; small amount of heat introduced. Items remain frozen during drying. Ice crystals drawn out by sublimation	1-2 weeks per load	\$5 - \$10 per volume	low	good	Very good results IF frozen quickly <ul style="list-style-type: none"> <li>• leather &amp; vellum may warp</li> <li>• photos may lose gloss</li> </ul>
Vacuum Thermal Drying	Wet or frozen items placed in chamber; vacuum drawn; heat introduced; items dried by evaporation (above 32° F, up to 100° F)	1-2 weeks per load	\$5 - \$10 per volume	low	good	Damaging to cellulose. Potential: <ul style="list-style-type: none"> <li>• swelling/cockling</li> <li>• inks running</li> <li>• blocking</li> </ul>

**Note:** Water-damaged books & paper often need additional treatments (cleaning, sanitizing, deodorizing) depending on water source or damage from fire extinguishing agents. See NEDCC Technical Leaflet "*Emergency Salvage of Wet Books and Records*" [www.nedcc.org](http://www.nedcc.org) for additional information on drying techniques.