



Museum Textile Services

Assessing Modern Materials

Learning to characterize changes to modern materials in clothing and textile collections allows you to catch the early warning signs that indicate material is deteriorating.

- Blistering – Small surface bubbles where there is physical or chemical distortion
- Bloom – Growths on the surface as a result of additives migrating to the surface of the plastic
- Crazing – Pattern (regular or irregular) of microscopic cracks either at the surface of the plastic or internally
- De-lamination – Peeling apart of multi-layer plastics due to incompatibility as the layers degrade
- Discoloration – Change in color produced by degrading plastics caused by UV light and environment
- Warping – Distortions, often accompanied by weeping, that can result in cracking
- Weeping – Surface liquid caused by migrating plasticizer or acidic degradation products

Material	Appearance										Odor	Deterioration of nearby materials		
	Blistering	Bloom	Brittleness	Cracking	Crazing	Crumbling	De-lamination	Discoloration	Fraying	Warping		Weeping	Corrodes Metals**	Disintegrates Paper***
<i>Cellulose nitrate</i>	X	X		X	X			X		X	X	<i>Mothballs, camphor</i>	X	X
<i>Casein</i>					X			X				<i>Burnt milk/hair</i>		
<i>Phenol formaldehydes</i>				X								<i>Antiseptic soap</i>		
<i>Regenerated cellulose (Rayon)</i>												<i>Musty</i>		
<i>Cellulose tri-acetate (Acetate)</i>	X	X		X	X			X	X	X	X	<i>Vinegar, burning paper</i>	X	X
<i>Poly vinyl chloride (PVC)</i>								X		X	X	<i>Sharp and acidic, or sweet; new car seats</i>	X	X
<i>Urea formaldehydes</i>				X								<i>Formaldehyde, preserving fluid</i>		
<i>Poly (methyl methacrylate)</i>				X	X									
<i>Polyamide (Nylon)</i>			X					X	X	X		<i>Burnt hair or wool; celery</i>		
<i>Polyethylene</i>			X					X				<i>Wax, paraffin, candles</i>		
<i>Polyethylene terephthalate (Polyester)</i>								X				<i>Burning rubber, raspberry jam, cinnamon</i>		
<i>Polyurethane (Spandex, Lycra)</i>			X			X		X			X*	<i>Acrid, stinging odor, faint apple</i>		
<i>Polyacrylonitrile (Acrylic)</i>								X				<i>Sweet, fruity</i>		
<i>Polypropylene</i>			X					X	X	X		<i>Wax, candles</i>		

* Polyurethane foams

**Corrosion of metals caused by the gradual release of acids produced by materials when they start to degrade

***Disintegration of paper (ex. tissue, card) caused by the release of acidic vapors, which can attack the paper on the molecular level eventually leading to the breakdown and crumbling of the paper.