

Deterioration of photographic artifacts

NOTE:
It is difficult to predict the future condition of individual collections. The graphs below constitute one plausible case.

ORIGINAL ENVIRONMENT:
Clean air, no mold/insects
Temperature: 25°C, humidity: 60% RH
Paper envelope/box enclosures, original cardboard boxes, stacked, mounted in boxes or stacked prints

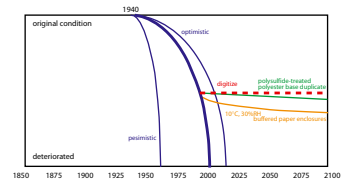
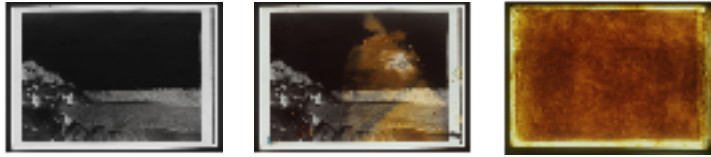
KEY:
— original in original environment
— original in improved environment
— photographic duplicate
- - - digital duplicate

Nitrate Film (1889-1955)

Filamentary silver in gelatin on cellulose nitrate with anti-curl layer

DEFECTS:

Image: density loss (fading), discoloration from black to yellow/amber, severe silver mirroring, frequently occur around the center of film first.
Binder: softening or swelling, stickiness of gelatin.
Support: physical distortion, brittleness, sickly sweet/francic odor.



Acetate Film (1920-present)

Filamentary silver in gelatin on cellulose acetate

DEFECTS:

Image: buckling/channeling/separation of the emulsion.
Binder: crystals and bubbles from anti-curl side.
Support: vinegar odor, physical distortion (warping, shrinkage, brittleness), blue or pink stain

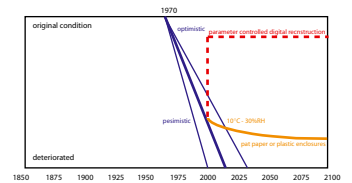


Chromogenic Positive Film (1935-present)

Multiple organic dyes on acetate base with anti-halation layer

DEFECTS:

Image: significant dye fading, fading across the whole image Color shift.

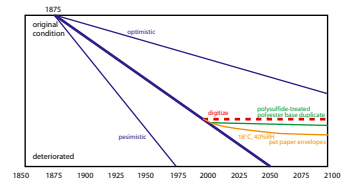


Glass Dry Plates (1870-1930)

Filamentary silver in gelatin on glass

DEFECTS:

Image: silver and silver sulfide stains caused by oxidizing gases, Density loss, Silver mirroring.
Binder: Delamination, tacky varnish.
Support: breaks, decomposition products, frosting/fine cracking.

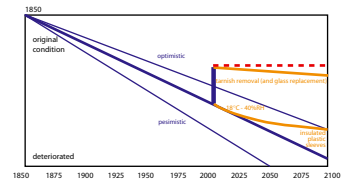


Daguerreotype (1840-1855)

Filamentary silver on metal

DEFECTS:

Image: Oxidation/sulphiding film (tarnish), corrosion, abrasions.
Support: tarnish films, abrasion, exfoliation.

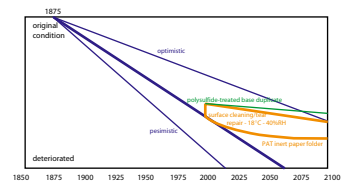


Albumen Print-Out Paper (1850-1895)

Photolytic silver in albumin on purified cotton fiber paper

DEFECTS:

Image: fading, color change from purple-brown to yellowish brown, loss of detail in the lighter tones.
Binder: cracking, yellowing of the whites.
Support: paper tears, curls.

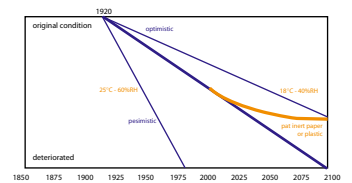


Monochrome Gelatin Develop-Out Paper (1880 - present)

Filamentary Silver in gelatin on paper

DEFECTS:

Image: fading, loss of detail, image color change from black to yellow-brown, silver mirroring.
Binder: discoloration.

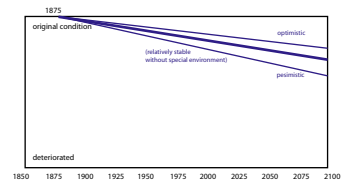


Carbon Print (1865-1950)

Carbon pigment in gelatin on paper

DEFECTS:

Binder: may display cracks in deep shadows.



The expertise for the image construction work comes from Grant Romer, head of film preservation at Eastman House and Dave Wilson, with support from the staff at the Image Preservation Institute at RIT