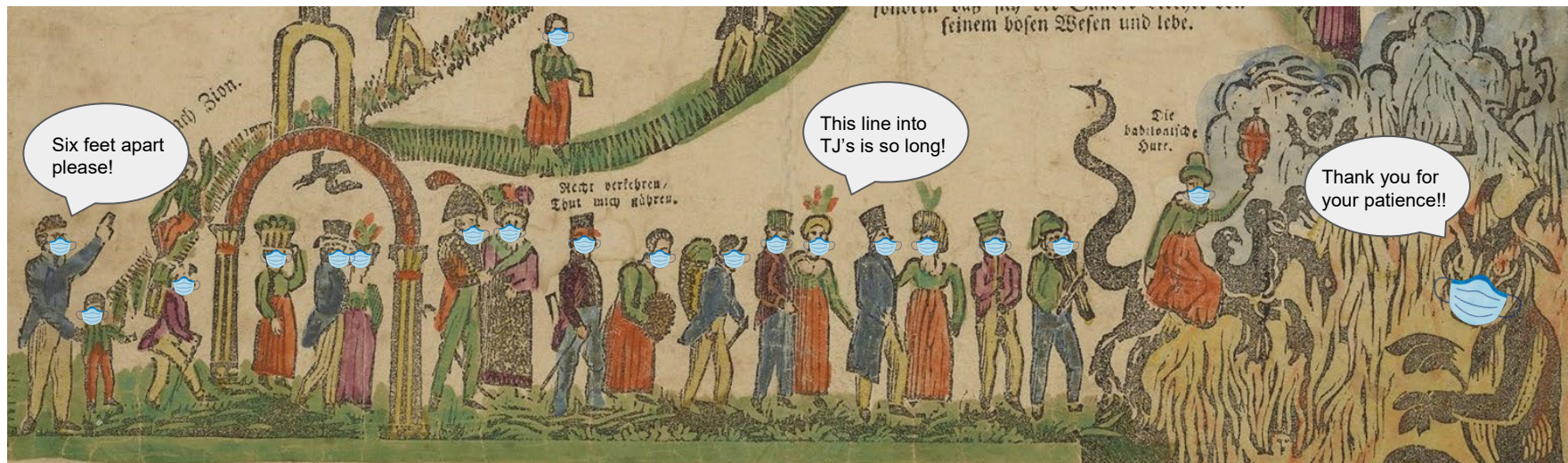




Taking It Into Your Own Hands

Caring for Drawings, Prints and Photographs



Arts Tune-Up Presentation
October 23, 2020

Nicole Alvarado
Kress Fellow
Academy of Motion Picture Arts and
Sciences' Margaret Herrick Library

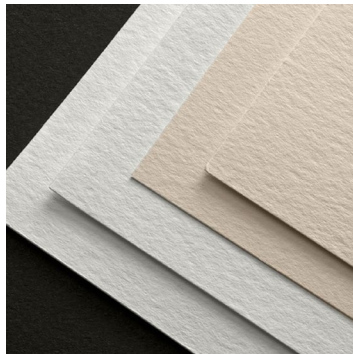
Jacklyn Chi
Paper Conservator
The Huntington Library, Art
Museum,
and Botanical Gardens



What will we cover?

Drawings, Prints and Photographs

- Types of Materials: Supports and Processes
- Common Condition Issues
- Tips for Care, Handling, and Storage
- Guidance on Framing and Display



TALAS

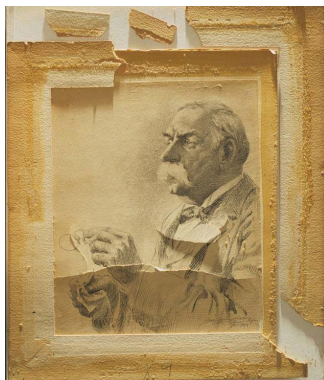


Photo courtesy of Nancy Ash



University Products



Tru Vue



Drawings and Prints

pre-photographic



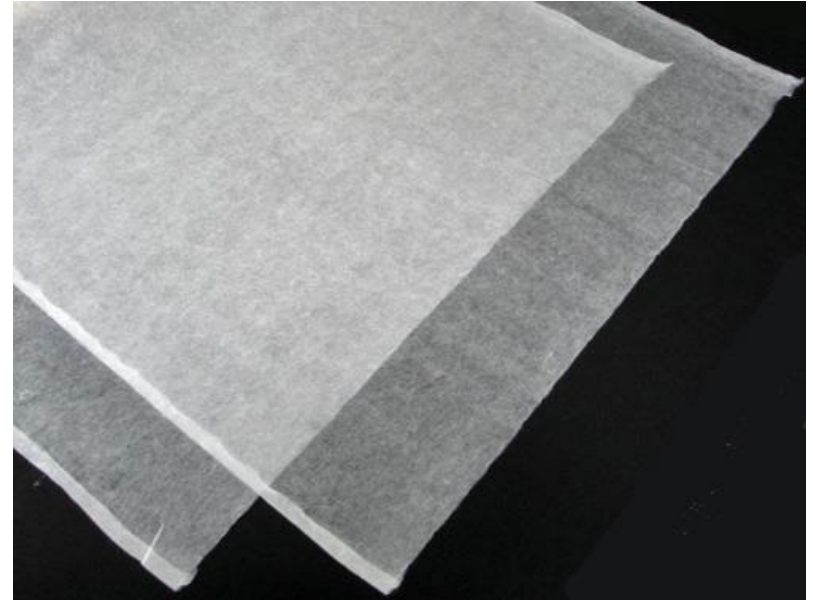
Drawings and Prints

Types of Materials: Supports

Western Paper



Asian Paper



Hiromi Paper International

*These are very broad and general categories and in no way represent the range of papers available across cultures with their papermaking practices and traditions.



Drawings and Prints

Types of Materials: Supports

Western Paper



Cotton Fiber (Raw)



Cotton Linters (Raw)



Cotton Linters (Processed)



Drawings and Prints

Types of Materials: Supports

Western Paper





Drawings and Prints

Types of Materials: Supports

Western Paper



Flax Fiber, Unbleached;
Type R



Sisal Fiber (from Haiti)



Sisal Fiber (cut into 1/4 inch
lengths)



Kenaf Fiber (cut into 1/4
inch lengths)

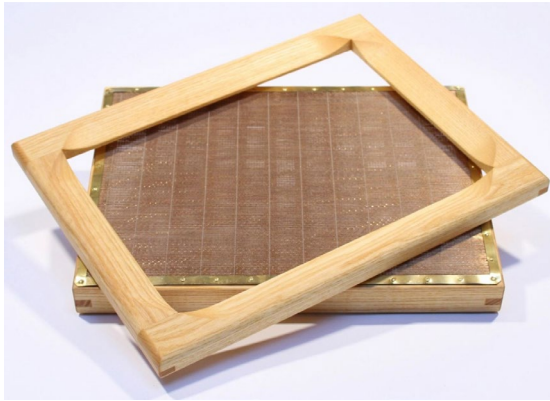
Carriage House Paper



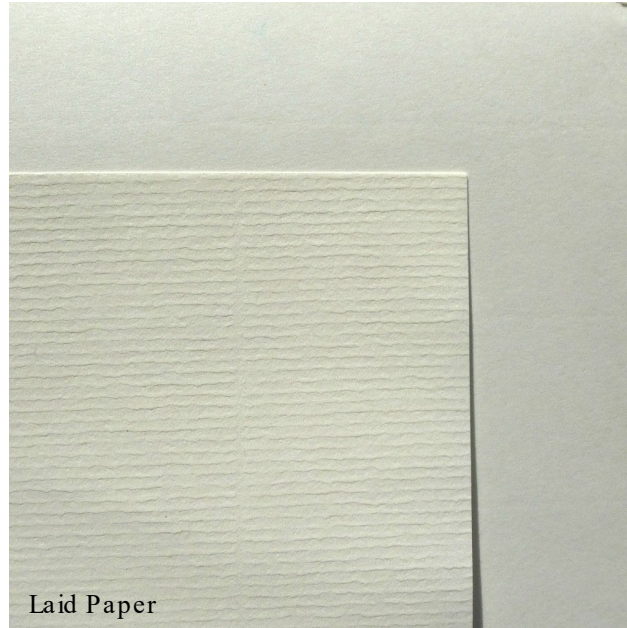
Drawings and Prints

Types of Materials: Supports

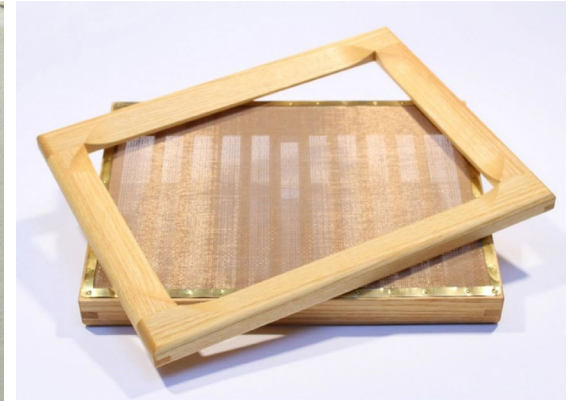
Western Paper



Laid Mould



Laid Paper



Wove Mould



Drawings and Prints

Types of Materials: Supports

Western Paper



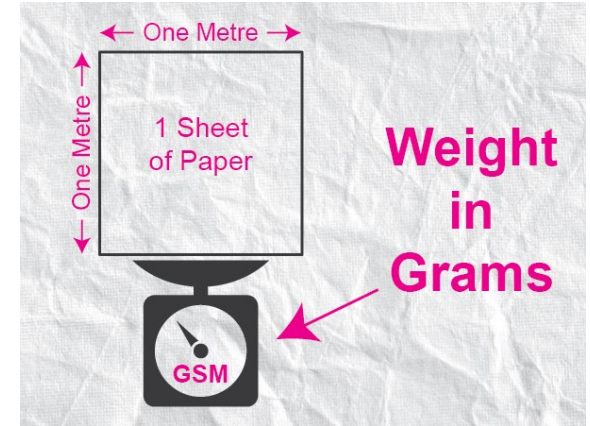
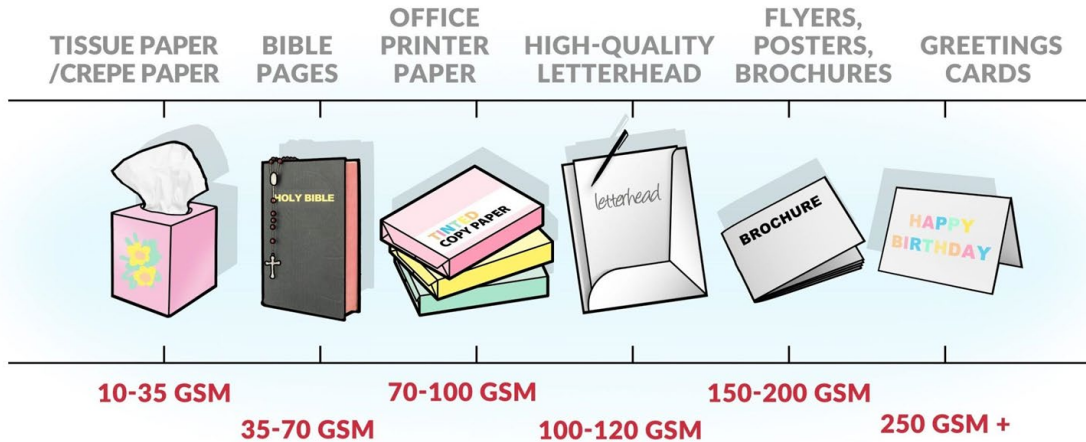
<https://blog.marinersmuseum.org/2020/05/paper-and-water-friends-or-foes/>



Drawings and Prints

Types of Materials: Supports

Western Paper





Drawings and Prints

Types of Materials: Supports

Western Paper



Fabrizio Tiepolo Printmaking Paper

★★★★★ 4.7 17 Reviews | Write A Review

SAVE 48% off List!

\$5.17

Exceptionally strong and versatile, Fabrizio Tiepolo Printmaking Paper withstands the wear and tear of rigorous techniques. Featuring a traditional Italian soft white color, this 100% cotton, mouldmade, acid-free paper has four deckle edges and a beautiful watermark. Its particularly smooth surface excels when used for printmaking techniques, silkscreening, embossing, and even digital printing. Fabrizio Tiepolo Printmaking Paper is also great for drawing, for loose watercolor washes, and for use with other fine art media.

Handling Charge - When ordering sheets of paper or board larger than 18" x 24" in quantities of less than 10, a \$3.00 per order handling fee applies. Paper or boards may be assorted to reach the quantity of 10.

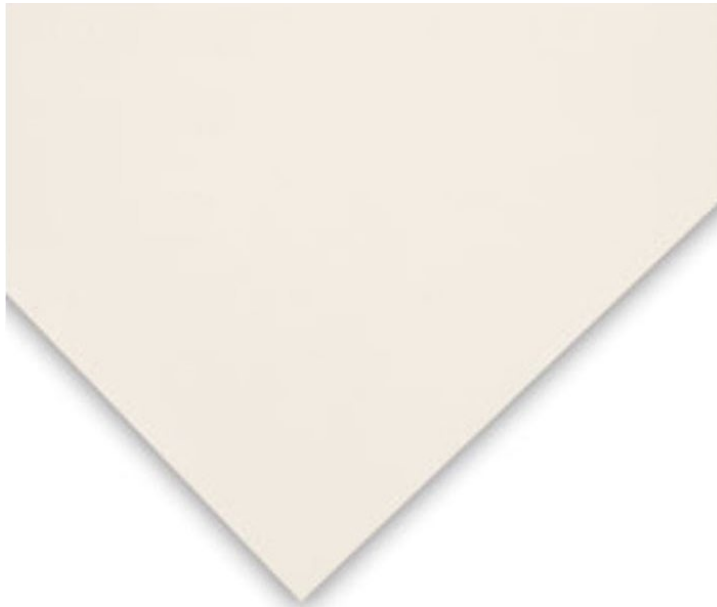
<https://www.dickblick.com/products/fabrizio-tiepolo-printmaking-paper/>



Drawings and Prints

Types of Materials: Supports

Western Paper



Fabriano Unica Printmaking Paper

★★★★☆ 4.5 6 Reviews | Write A Review | Ask Question

SAVE 25-42% off List!

\$2.46 - \$12.37

Fabriano Unica is an example of what happens when people who create papers and those who use them combine their efforts! In collaboration with a prominent printmaking research facility, Fabriano is proud to introduce Unica Printmaking Paper, a versatile paper for all printmaking applications, as well as drawing and light water media. This acid-free, environmentally friendly, 250 gsm sheet contains 50% cotton content, and is produced using hydro-energy. Flexible and resistant, it has excellent detail definition and high color fidelity. Both students and aspiring artists will appreciate its affordability. Available in as sheet or pad.

<https://www.dickblick.com/products/fabriano-unica-printmaking-paper/>



Drawings and Prints

Types of Materials: Supports

Western Paper

GSM vs LBS Paper Weight

The standard measurement used in Asia and Europe is GSM (Grams per Square Meter), whereas the United States uses pounds (lbs or #).

GSM refers to how many grams the paper weighs if you had one sheet cut to a 1 meter x 1 meter piece. Pounds refers to how many pounds 500 sheets of paper weighs at a certain cut size. This is called the Basis Weight. The following is a list of different cut sizes.

Office Paper	17 x 22 in.
Book Text, Coated Paper	25 x 38 in.
Cover Stock	20 x 26 in.

Based on these sizes, the following calculation can be used to convert lbs to gsm:

Text stock: # of lbs x 1.5 = gsm

Cover stock: # of lbs x 2.70 = gsm



Drawings and Prints

Types of Materials: Supports

Western Paper



BFK Rives Printmaking Papers

★★★★★ 4.8 318 Reviews | Write A Review

SAVE 16-50% off List!

\$3.40 - \$155.47

This very popular, fine printmaking paper is mouldmade in France and has a smooth, absorbent surface. Rives Papers, made of 100% cotton, are acid free, soft-sized and buffered. Rives is perfectly suited for lithography, intaglio, screenprinting, relief printing, linocut, collotype, and drawing. Each sheet is watermarked and has two natural deckles and two tear deckled edges. Three weights available.

<https://www.dickblick.com/products/bfk-rives-printmaking-papers/>



Drawings and Prints

Types of Materials: Supports

Western Paper



Canson Ingres Drawing Papers

★★★★☆ 4.3 23 Reviews | Write A Review

SAVE up to 10% off List!

\$2.20

Colored in the pulp to ensure light resistance, Canson Ingres papers follow the same lightfast color range as the Mi-Teintes papers. The 27 lb (100 gsm) weight paper is lighter weight than Mi-Teintes, with a "laid" finish for chalk, pastel, pencil, or charcoal. Ingres is a 65% rag, gelatin-sized, acid-free paper that is ideally suited for drawing and printing. Individual sheets measure 19" × 25" (483 mm × 635 mm).

<https://www.dickblick.com/products/canson-ingres-drawing-papers/>



Drawings and Prints

Types of Materials: Supports

Western Paper



Blick All-Media Paper

★★★★★ 4.5 22 Reviews | Write A Review

SAVE up to 14% off List!

\$0.41 - \$0.88

This white paper is smooth enough for pen and ink but has enough tooth for pencil and pastel. It is made with 30% post-consumer material and is acid-free and pH-neutral 80 lb (82 gsm) weight. This paper is recommended for educational and group recreational use. Note — Minimum order is 100 sheets.

<https://www.dickblick.com/products/blick-all-media-paper/>



Drawings and Prints

Types of Materials: Supports

Western Paper



Canson XL Newsprint

★★★★★ 4.9 51 Reviews | Write A Review

SAVE 29-39% off List!

\$4.11 - \$21.82

Canson XL Newsprint is the most earth-friendly of all, because it is made of 100% post-consumer waste. It has a rough textured surface, and is chlorine-free. Use it for sketching with pencils, pastels, or charcoal. Pads are tape-bound, and contain 50 or 100 sheets, 30 lb (45 gsm) weight.

<https://www.dickblick.com/products/canson-xl-newsprint/>



Drawings and Prints

Types of Materials: Supports

Western Paper

Strathmore 500 Series Heavyweight Mixed Media Pads



4.6

11 Reviews | Write A Review

SAVE 34% or more off List!

\$8.16 - \$21.33

The ultimate heavy-duty surface for mixed media art, Strathmore 500 Series Heavyweight Mixed Media Paper is internally sized to stand up to multiple layers of wet media, and has a durable vellum surface that's perfect for drawing. Use this 350 lb (570 gsm) paper with watercolors, gouache, acrylics, graphite, pen-and-ink, colored pencils, markers, pastels, and collage. Available in a variety of sizes, Strathmore Heavyweight Mixed Media Pads each contain 12 sheets of natural white paper made from 100% cotton. Gluebound for clean and easy removal, the 3-ply sheets are lignin-free and archival.



<https://www.dickblick.com/products/strathmore-500-series-heavyweight-mixed-media-pads/>



Archival “Terminology”

- Acid-free
- pH Neutral
- Lignin-free
- Buffered
- Non-buffered
- PAT
- ISO



Drawings and Prints

Types of Materials: Supports

Asian Paper



Japanese Kozo



Chinese Mitsumata



Thai Kozo - Cooked & Bleached



Thai Kozo



Philippine Gampi



Japanese Mitsumata



Drawings and Prints

Types of Materials: Supports

Asian Paper

Ino-cho
Paper
Museum

いの町紙の博物館
紙博
仁淀川・土佐和紙

<https://kamihaku.com/en>



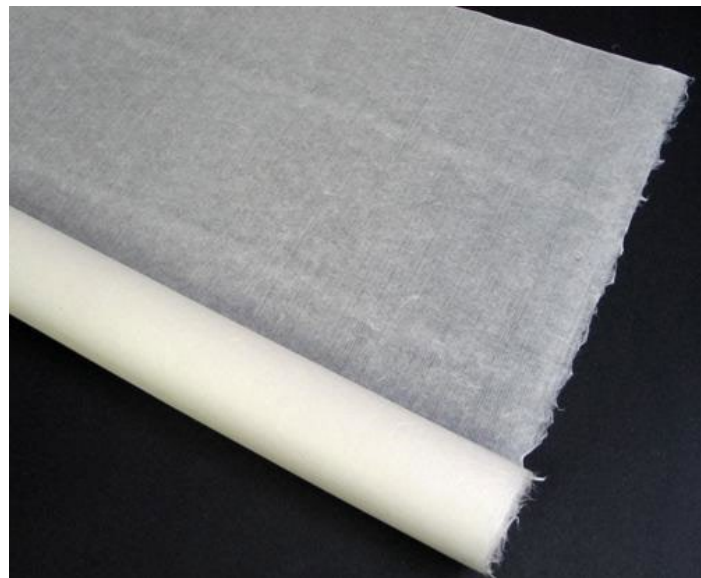
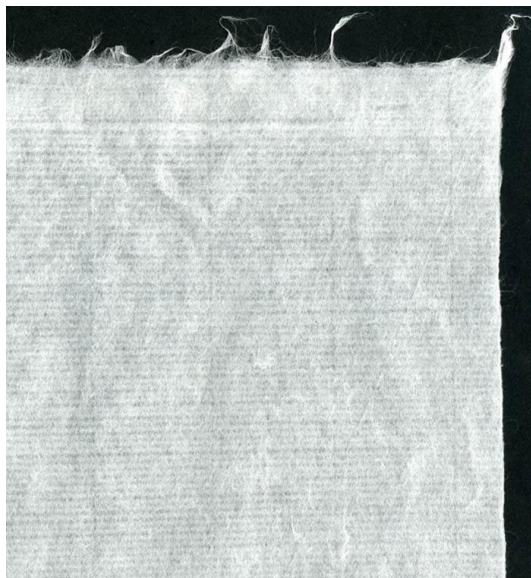
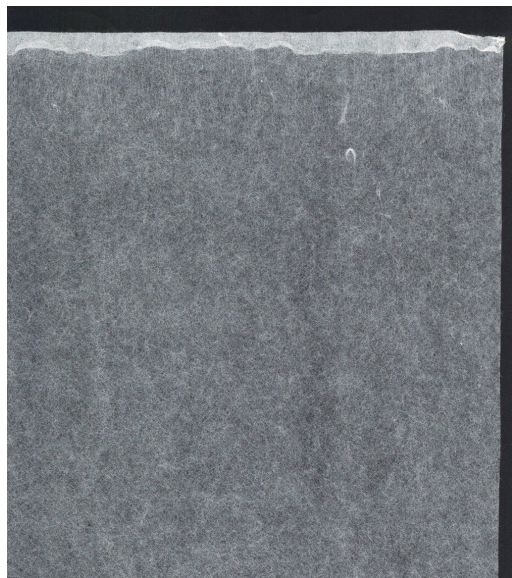
Image by Jacklyn Chi



Drawings and Prints

Types of Materials: Supports

Asian Paper





Drawings and Prints

Asian Paper



Types of Materials: Supports



Image by Jacklyn Chi



Drawings and Prints

Types of Materials: Supports

Asian Paper



<https://www.youtube.com/watch?v=swiu0YGU38Q>



Drawings and Prints

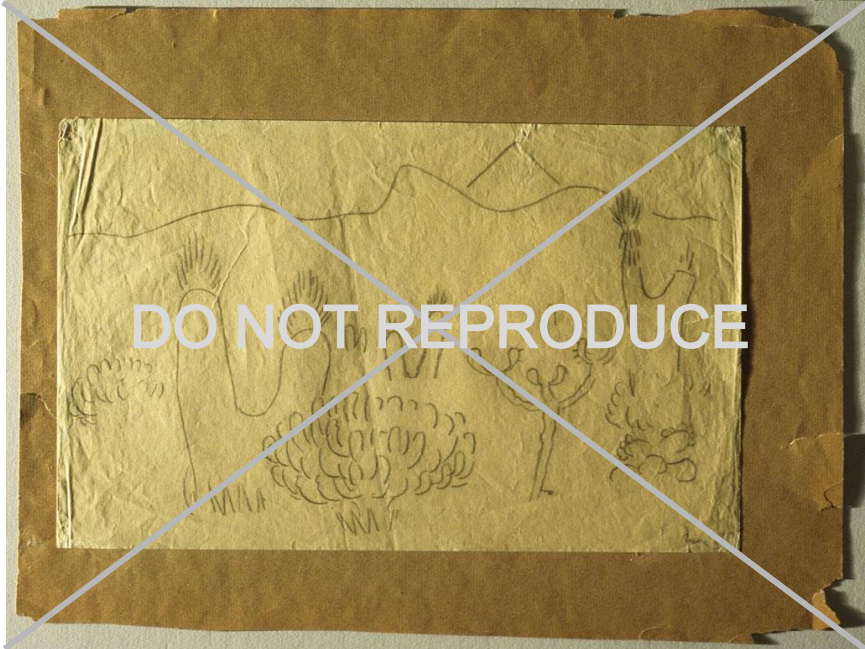
Common Condition Issues

 FOLDS and CREASES	 TEARS and LOSSES	 PESTS	 ADHESIVE RESIDUES	 VINE CHARCOAL CORNE L'AVAN
 STAINS, DIRT, and GRIME	 TIDELINES	 FOXING	 DARKENING	
 SKINNING	 SCRATCHES	 ABRASION	 UNSTABLE MEDIA	



Drawings and Prints

Common Condition Issues

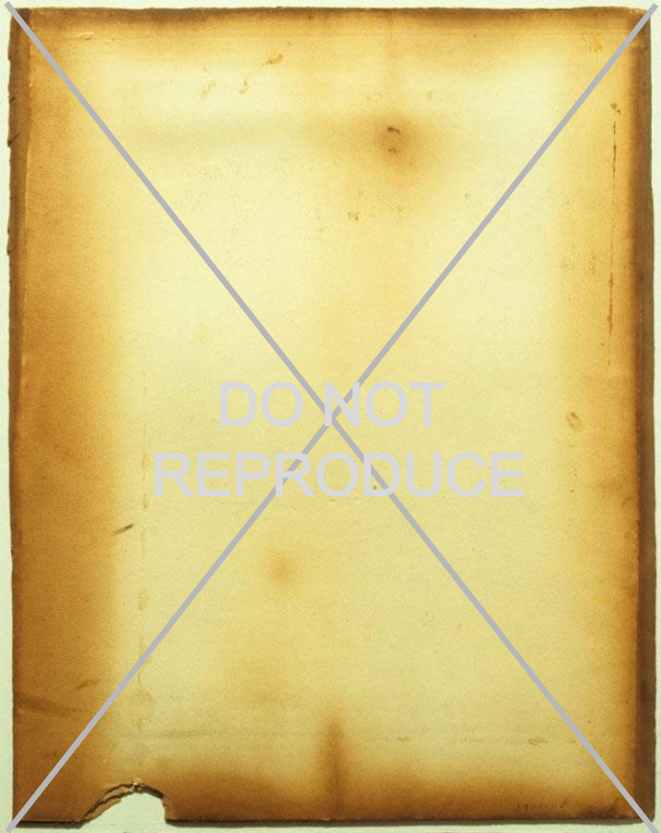
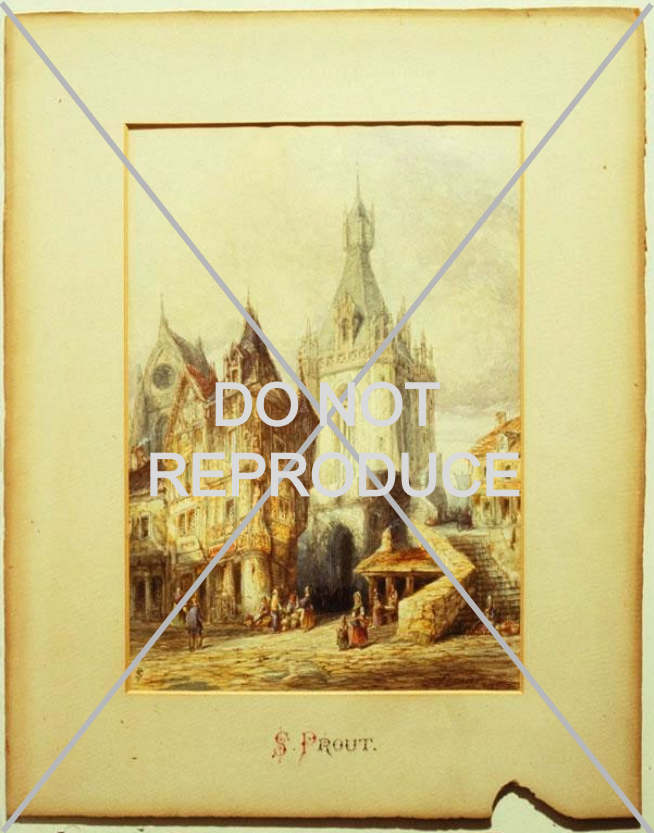


Courtesy of Nancy Ash



Drawings and Prints

Common Condition Issues



Courtesy of Nancy Ash



Drawings and Prints

Common Condition Issues

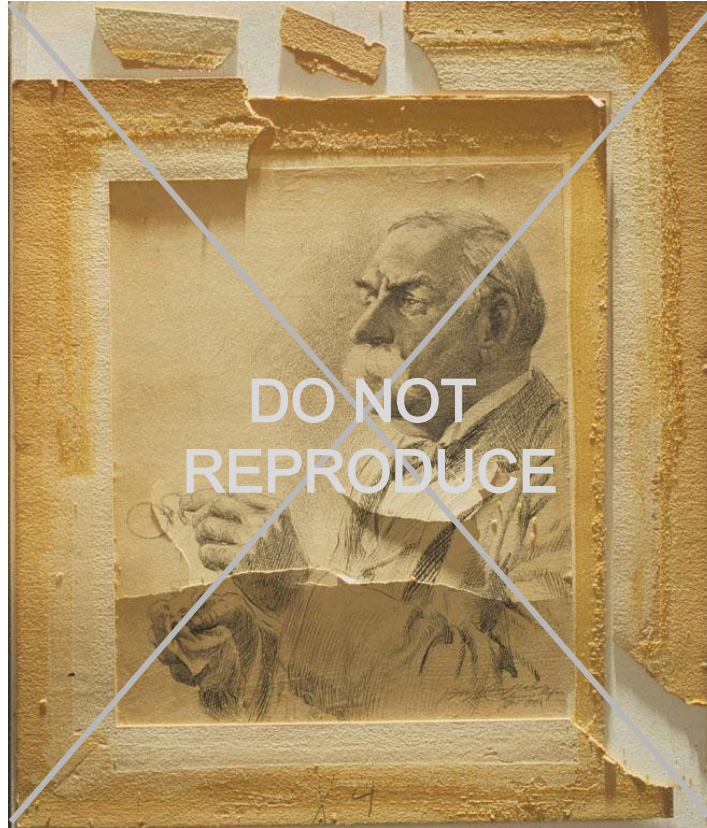


<http://www.theconservationcenter.com/articles/2015/10/14/preventative-conservation-proper-housing-and-storage-of-your-drawings>



Drawings and Prints

Common Condition Issues



Courtesy of Nancy Ash

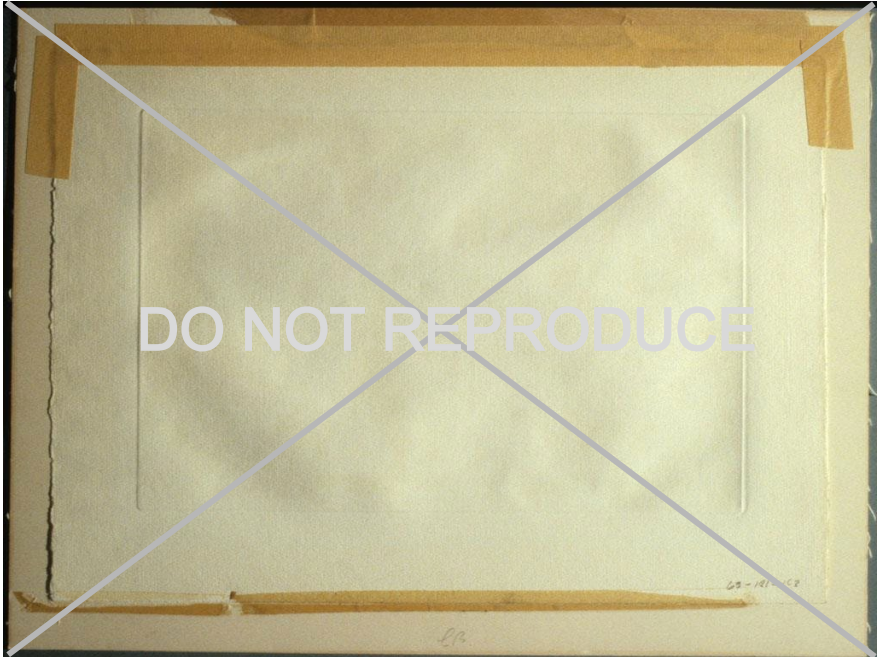


Drawings and Prints

Common Condition Issues



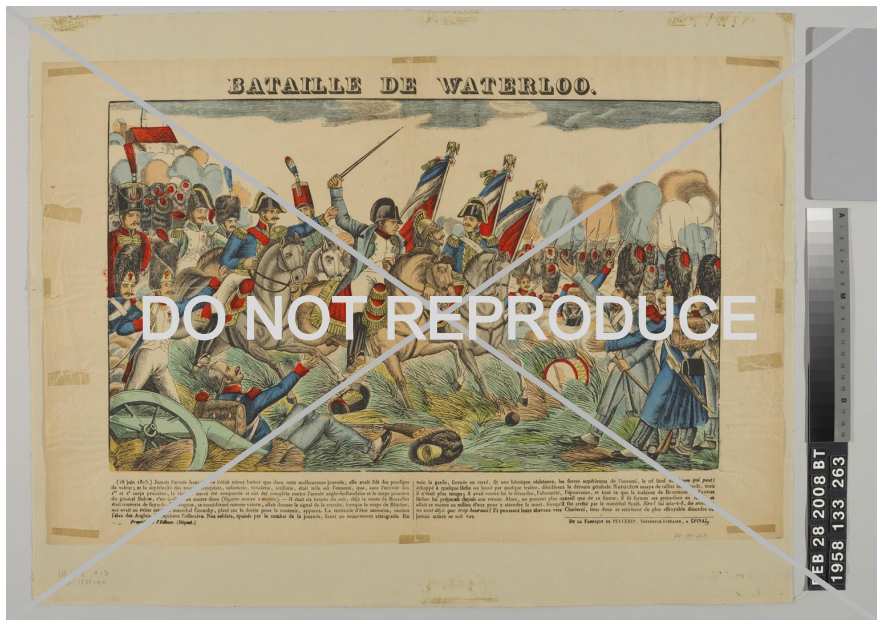
Courtesy of Nancy Ash





Drawings and Prints

Common Condition Issues



Courtesy of Nancy Ash



Drawings and Prints

Common Condition Issues



Courtesy of Nancy Ash



Drawings and Prints

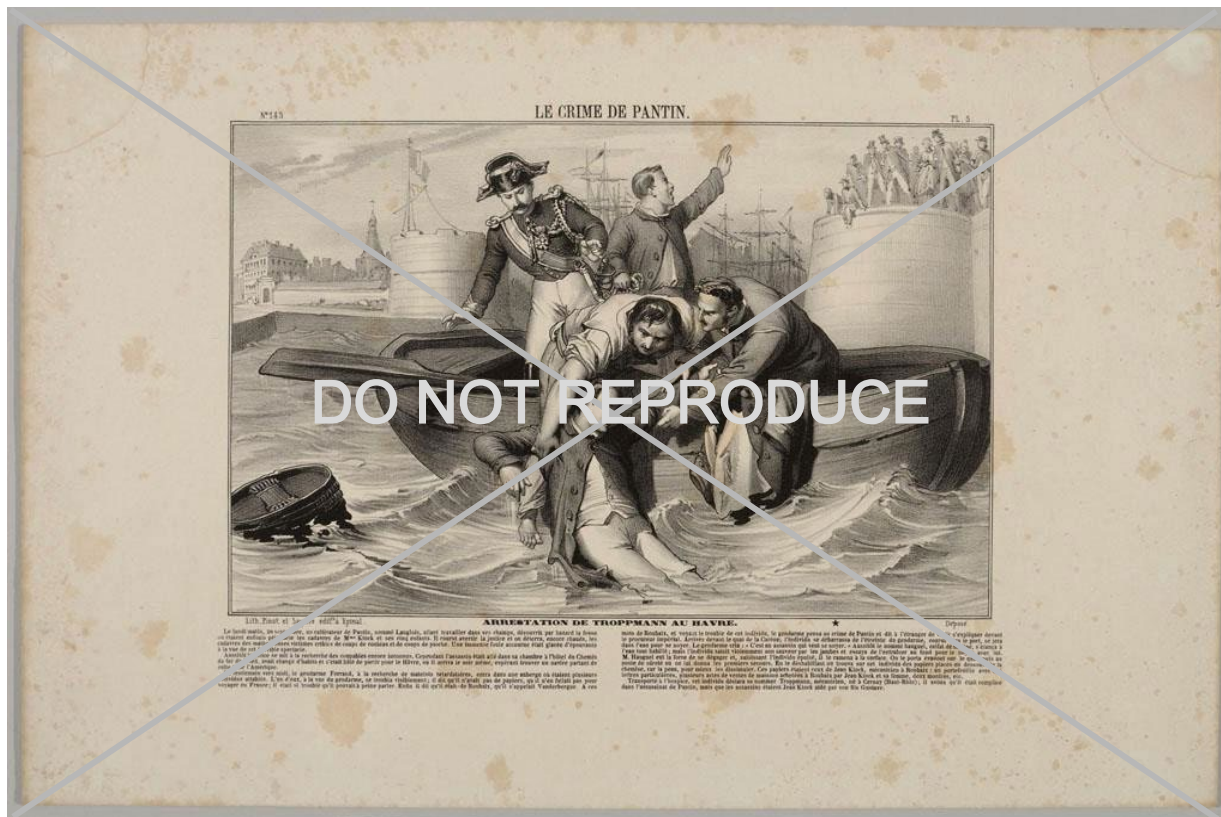
Common Condition Issues



Courtesy of Nancy Ash

Drawings and Prints

Common Condition Issues





Drawings and Prints

Common Condition Issues



Courtesy of Nancy Ash





Drawings and Prints

Tips for Care, Handling, and Storage



<https://www.gaylord.com/Storage-%26-Handling-Equipment/Flat-Files/Gaylord-Archival%26%23174%3B-Extra-Large-Locking-5-Drawer-Horizontal-Flat-File/p/HYB09105>

MarvelSeal360



<https://www.talasonline.com/Marvel-Seal>



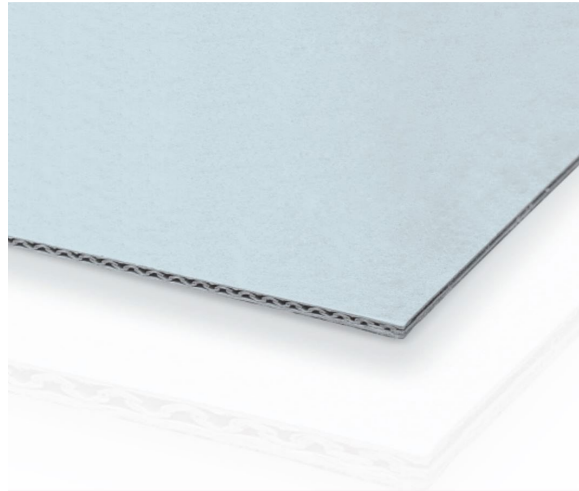
Drawings and Prints

Tips for Care, Handling, and Storage

Black Portfolio Box, White Lining, 8 1/2" x 10 1/2"



<http://www.lightimpressionsdirect.com/black-portfolio-box-white-lining-8-1-2-x-10-1-2-x-2/portfolio-boxes/>



<https://www.gaylord.com/Preservation/Conservation-Supplies/Boards-%26-Paper/Gaylord-Archival%26%23174%3B-Blue-E-flute-Corrugated-Board-Sheets-%2810-Pack%29/p/HYB00954>



<https://www.universityproducts.com/unbuffered-lightweight-folder-stock.html>

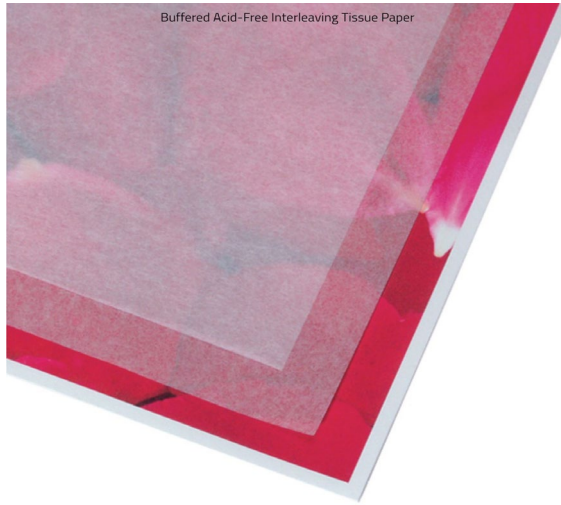
<https://www.universityproducts.com/perma-dur-heavy-duty-folder-stock.html>



Drawings and Prints

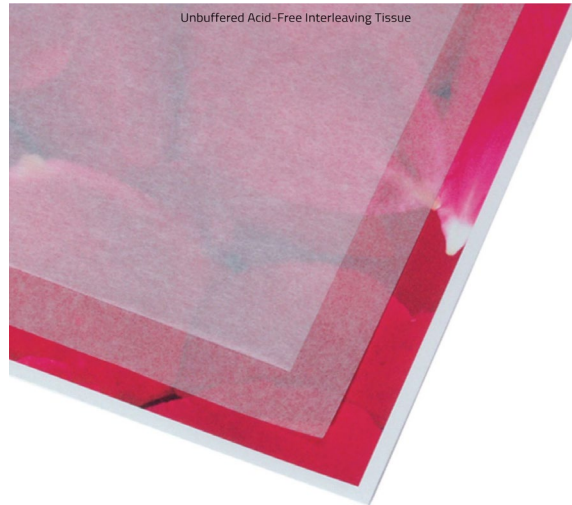
Tips for Care, Handling, and Storage

Buffered Acid-Free Interleaving Tissue



<https://www.universityproducts.com/buffered-acid-free-interleaving-tissue-paper-10-16-gsm.html>

Unbuffered Acid-Free Interleaving Tissue



<https://www.universityproducts.com/unbuffered-acid-free-interleaving-tissue-10-16-gsm.html>

Photo-Tex is an unbuffered, 100% cotton rag tissue with a very soft, smooth finish



<https://www.universityproducts.com/photo-tex-tissue-25-40-gsm.html>



Drawings and Prints

Tips for Care, Handling, and Storage



Image by Jacklyn Chi



How to care for works on paper

WHAT TO DO

Care and Storage

- Store your artwork in a smoke-free, stable, moderate environment, out of direct sunlight and away from food and drink. Use filters to block harmful ultraviolet light from windows and other sources of light.
- **Minimize fluctuation in temperature and relative humidity. For general home storage, it is recommended the temperature be below 70°F and the relative humidity be kept in the range of 30% -50%. Avoid relative humidity above 60%.**
- For display, it is best to hang artwork on interior walls with minimal light. Keep away from direct sunlight from windows.
- Store unframed and unmatted artwork face-up in supportive protective enclosures, for example, stiff folders in boxes made from archival (non-buffered and pH neutral) materials. It is best to store artwork individually in their folders.
- Place archival (non-buffered and pH neutral) tissue over the front of the artwork as a coversheet to prevent media from offsetting onto other surfaces. For especially, powdery media, such as charcoal or pastel, use glassine cut to size and change out the sheets, at minimum, every 5 years.
- Store oversized items (ex. maps and posters) flat or rolled.
- Window mats, made of acid- and lignin-free 100% cotton rag or museum board, minimize chances for mishandling by providing a protective margin around the artwork and additional rigidity.
- Mat your artwork before framing to prevent direct contact with the frame parts. Use acid- and lignin-free, 100% cotton rag matboard and UV-filtering acrylic in your frame.
- **Avoid tape and instead use mylar or paper photo corners to attach your piece to the mat.**
- Use Tyvek tape to close all openings on the backside of your frame to prevent pests from entering your framed artwork.
- Carefully remove dust in storage and display areas using a lint-free plain soft cloth or microfiber cloth. Avoid the use of chemical cleaners.
- Use dehumidifiers, air conditioning units, and fans to reduce humidity and curtail mold growth during warmer months. Use humidifiers and lowered heat levels to help combat extreme dryness during the winter. When using fans, place them in areas that promote air circulation and avoid pointing them directly at objects.
- Seek the help of a paper conservator for further assistance.



How to care for works on paper

WHAT TO DO

Handling

- Determine whether the artwork can be handled safely. Always consult a collections care professional or conservator if you are ever unsure.
- Minimize direct handling of your artwork as much as possible and be gentle when you must do so. Always handle your artwork on clean and uncluttered surfaces with clean and dry hands, avoiding areas of media.
- Determine an order in which your artwork in folders can safely be stored in their enclosures, and then maintain this order in the future when trying to access other materials in the same housing by removing and placing back folders one at a time in their correct sequence.
- Remove dangling accessories and jewelry, such as bracelets, rings, watches, and necklaces and tie long hair back before handling any work of art or object of importance.
- When moving short distances with unmatted works of art on paper (ex. between tables, storage spaces, or rooms), transport them in folders while supported from underneath in a horizontal position to avoid flexing. If you must lift the artwork itself, hold it by its two opposite corners, allowing the sheet to relax in the center. Do not do this near areas of creasing, where the support is weakened. A no contact alternative would be to place the artwork between sheets of tissue slightly larger in dimension than the artwork and similarly lifting from two opposite corners.
- Seek the help of a paper conservator for further assistance.



How to care for works on paper

WHAT NOT TO DO

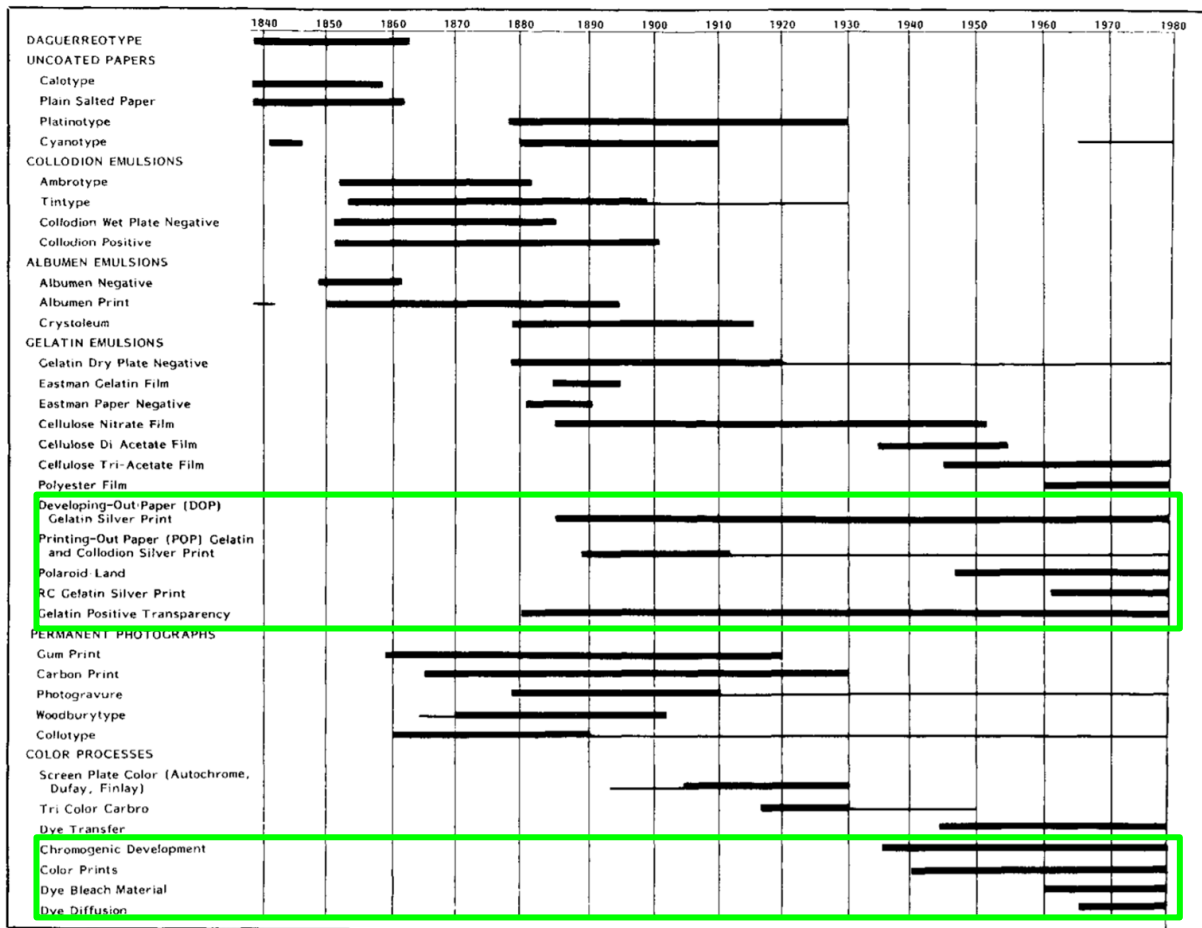
- Do not keep artwork in areas of the home prone to fluctuations in environment, such as basements and attics. Also keep away from radiators and vents. It is not advised to hang artwork over fireplaces.
- Do not store artwork in plastic sleeves. Electrostatic charge can lift powdery media such as pastel, charcoal, pencil, and flaking paint.
- Do not store an item folded if at all possible, especially if it is not already folded.
- Do not use glue, post-it notes, tape, staples, paper clips, and rubber bands on your artwork.
- Do not use wet media near artwork, including pens.
- Do not mat your artwork yourself. Matting and framing should be done by an experienced framer or under the direction of a conservator.
- Do not attempt to repair damages in your artwork yourself. Contact a paper conservator.



Photographs And Digitally Printed Images



Chronology of Photographic Processes



<https://www.nps.gov/museum/publications/consereogram/14-03.pdf>

Chronology of use of photographic processes. The dates represent approximate dates of use in the United States rather than invention or discovery. Dates are approximate and will vary by geographical area and photographer. The thickness of line indicates relative use. Processes listed are those most commonly found in repositories, with the exception of calotypes, crystoleums, and some of the color processes. Copyright 1984, reproduced with permission from the Society of American Archivists.



Photographs and Digitally Printed Images

Types of Materials: Supports and Processes

Silver Gelatin Photographs

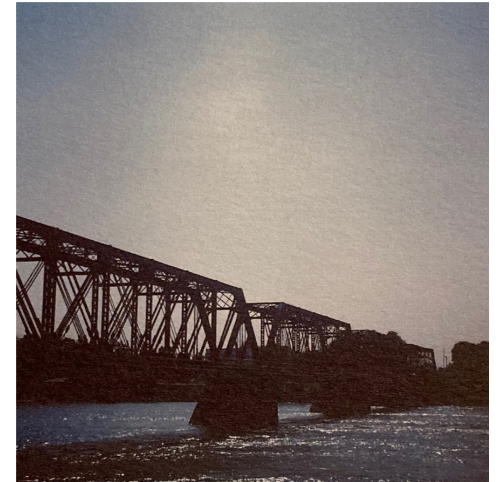


Photos courtesy of Nicole Alvarado

Chromogenic Photographs
(aka Dye Coupling)



Digitally-Printed Images:
Inkjet



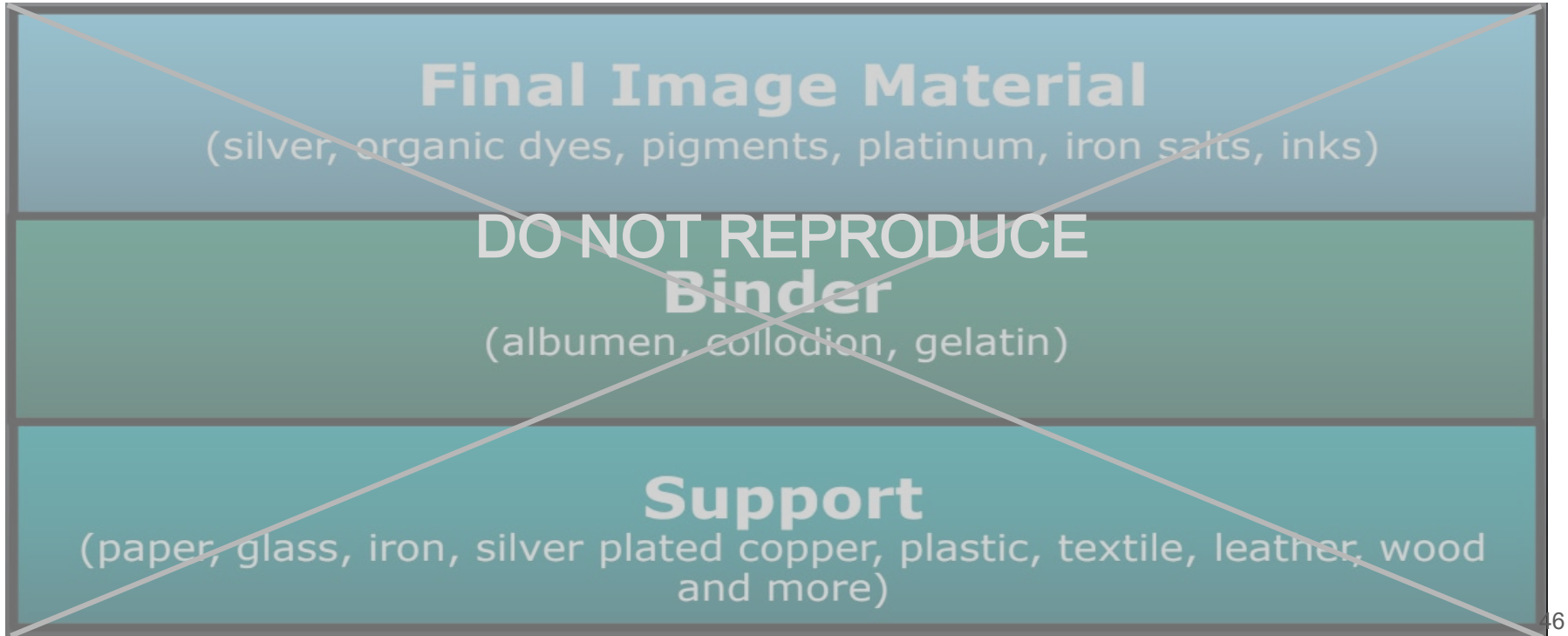
*These are just three of the vast variety of photographic techniques used to produce photographic images in contemporary art and home collections, and what will be focused on in this presentation



Photographs

Types of Materials: Supports and Processes

General Structure

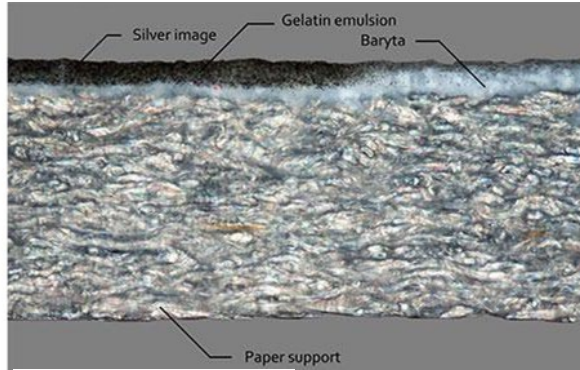




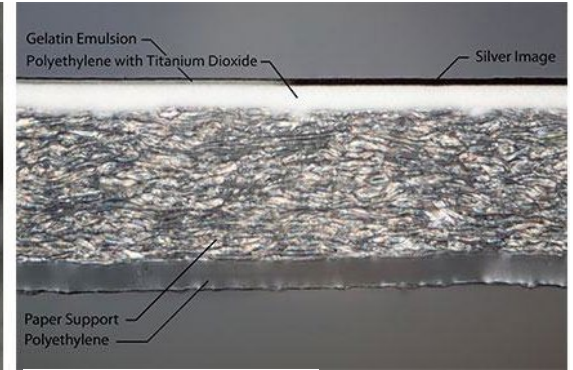
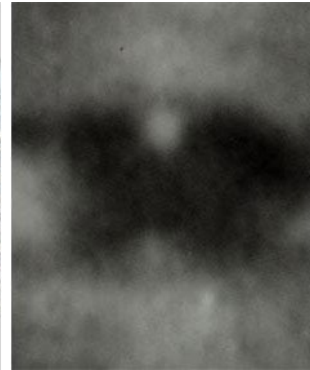
Photographs

Types of Materials: Supports and Processes

Silver Gelatin



Fiber-based paper print



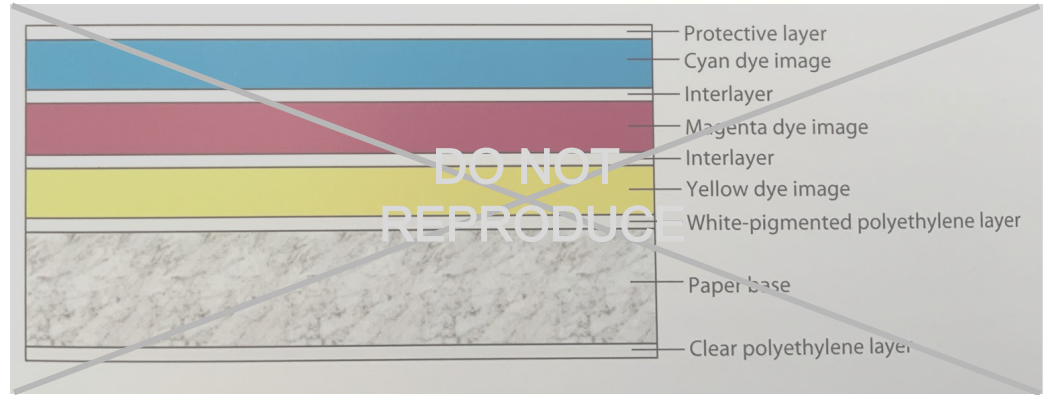
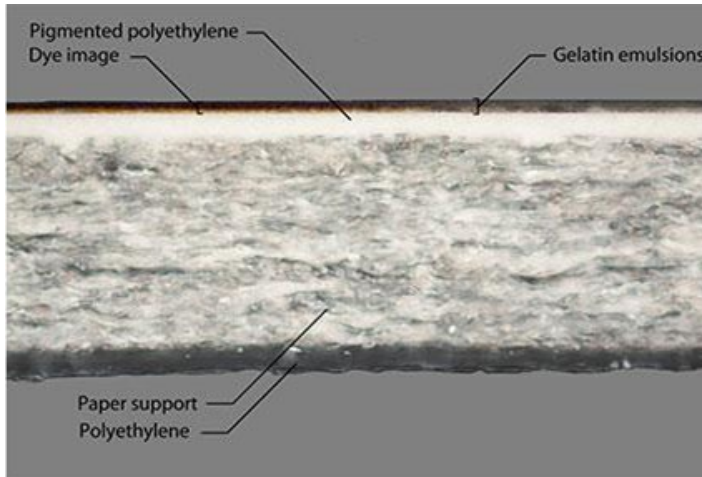
Resin-coated paper print



Photographs

Types of Materials: Supports and Processes

Chromogenic (Dye Coupling) Photographs



Schematic

Twentieth-Century Color Photographs by Sylvie Penichon

Cross-section

http://www.graphicsatlas.org/identification/?process_id=88#magnification

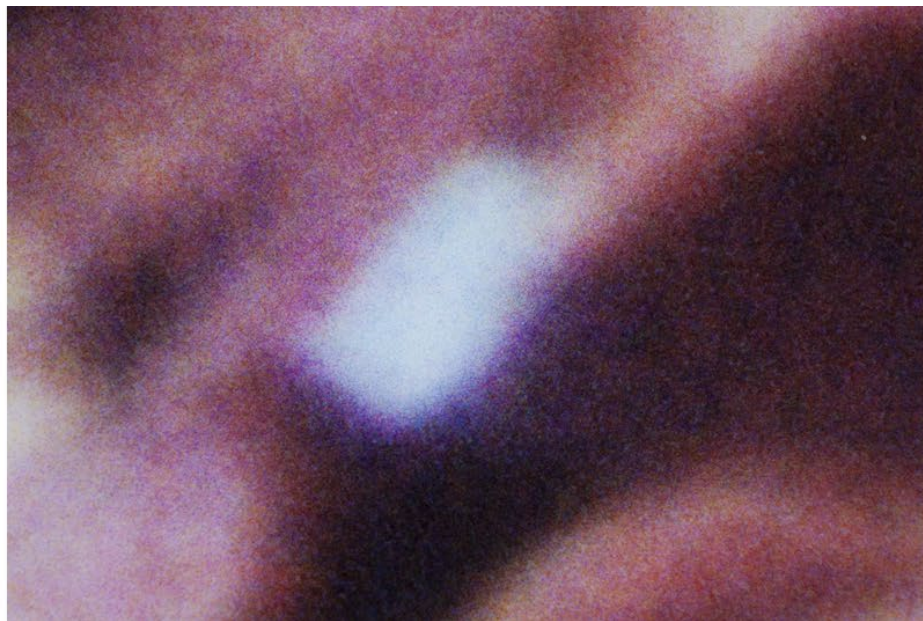
*Resin coated papers have a multilayer structure. The paper support is sandwiched between clear polyethylene on the back and white pigmented polyethylene on top.



Photographs

Types of Materials: Supports and Processes

Chromogenic (Dye Coupling) Photographs



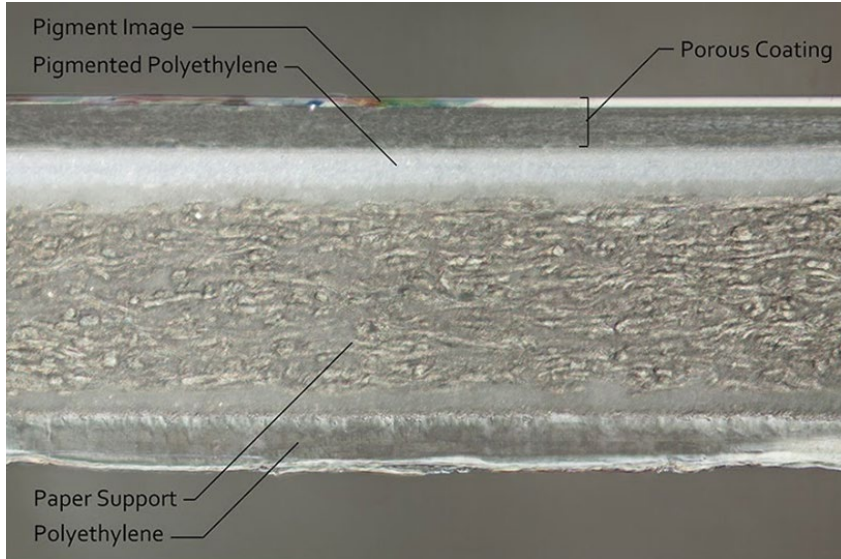
http://www.graphicsatlas.org/identification/?process_id=88#magnification_



Digitally Printed Images

Types of Materials: Supports and Processes

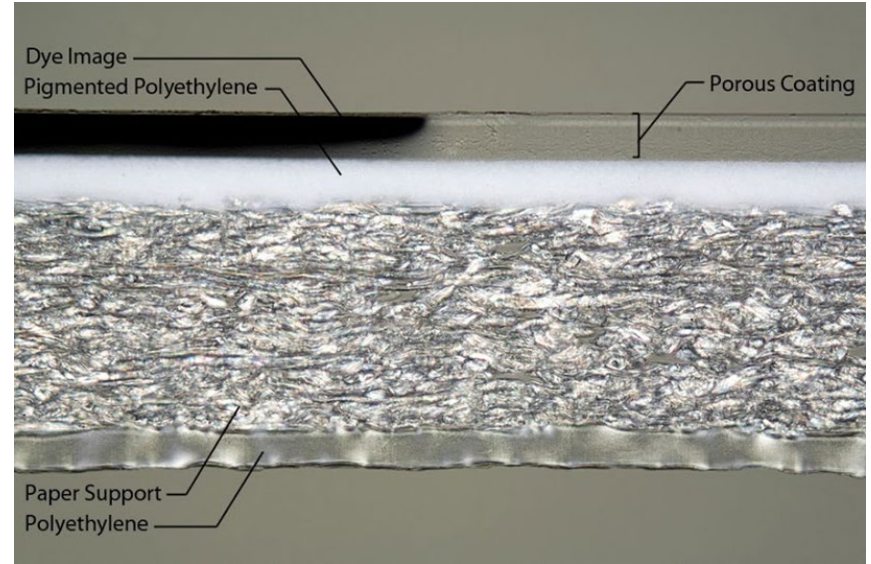
Inkjet Prints



Pigment-based Inks

http://www.graphicsatlas.org/identification/?process_id=43#magnification

*Resin coated papers have a multilayer structure. The paper support is sandwiched between clear polyethylene on the back and white pigmented polyethylene on top.



Dye-based Inks

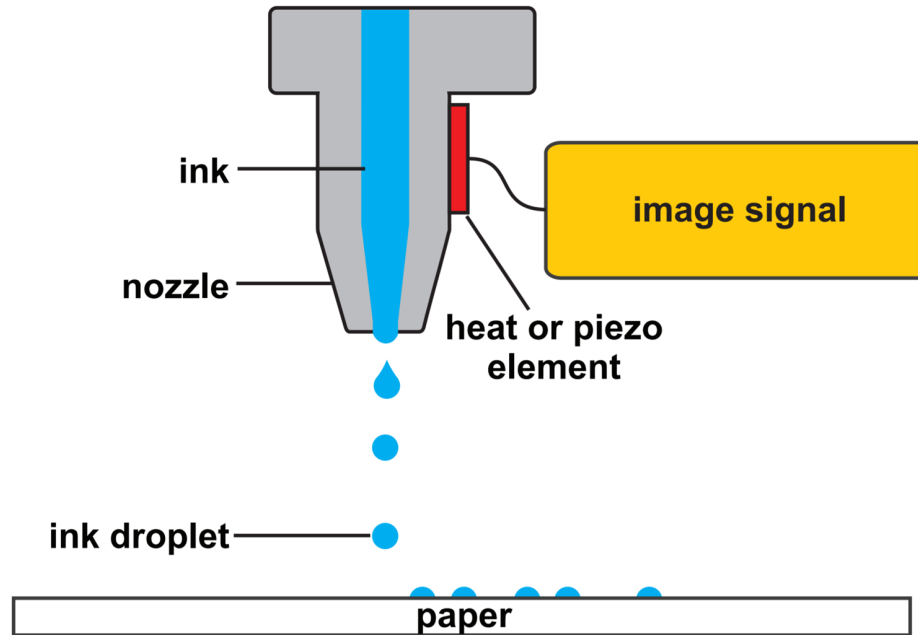


Digitally Printed Images

Types of Materials: Supports and Processes

Inkjet Prints

Drop-on-demand Inkjet

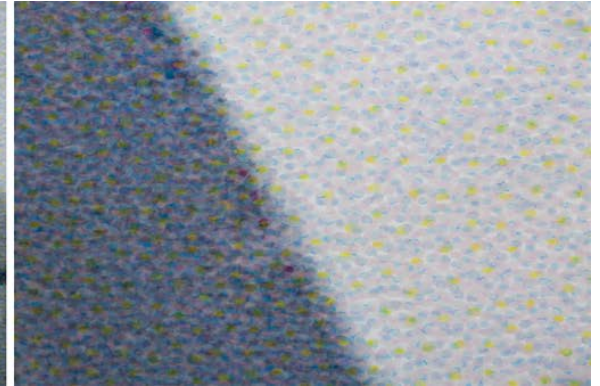
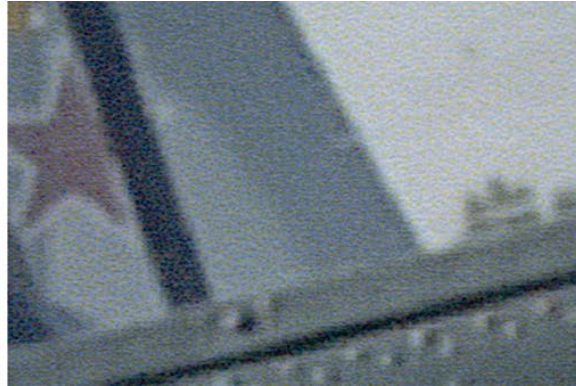




Digitally Printed Images

Types of Materials: Supports and Processes

Inkjet Prints



Pigment Inks

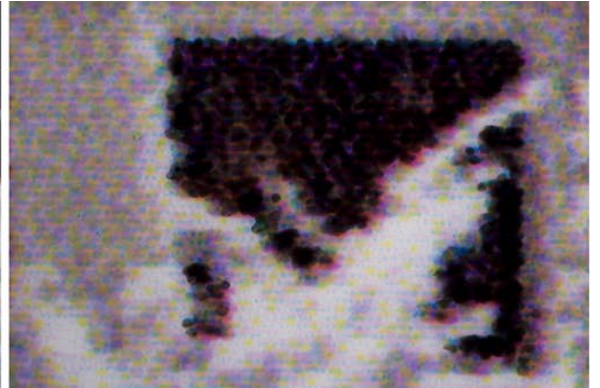
http://www.graphicsatlas.org/identification/?process_id=43#magnification_



Digitally Printed Images

Types of Materials: Supports and Processes

Inkjet Prints



Dye-based Inks

http://www.graphicsatlas.org/identification/?process_id=43#magnification



Digitally Printed Images

Types of Materials: Supports and Processes

Inkjet Prints

Porous-coated Inkjet Resin -coated Paper

Porous-coated photo papers can be used with both dye and pigment inkjet printers. One disadvantage is that because the pores remain open, even after drying, the colorants are not protected from the environment and are more susceptible to pollution induced fading.

Polymer-coated Inkjet Resin -coated Paper

Polymer-coated inkjet RC paper swells and absorbs aqueous inks as they are ejected onto the paper by a printer. These papers are typically used only with dye inks because many pigment particles are too large to be absorbed into the coating. Because the ink is absorbed fully into the polymer layer, the prints are more resistant to abrasion during handling or fading caused by airborne pollutants. These papers have, however, become less popular because they can take several minutes to several hours to fully dry. Handling polymer-coated prints while they are still wet can lead to smudging of the inks. They are also sensitive to high humidity bleed.

Baryta Inkjet Paper

Baryta inkjet paper has a smoothing layer between the paper surface and the porous ink receiver layer and the name is more a way of marketing that the paper tries to mimic the fiber -based silver gelatin papers used in traditional photography, but this smoothing layer may not actually contain baryta. The underside of the paper is not coated with polyethylene, as it would be in RC papers, in order to have that fibrous paper “feel.”

<http://www.dp3project.org/technologies/digital-printing/inkjet>



Digitally Printed Images

Types of Materials: Supports and Processes

Inkjet Prints

EPSON Poster Paper Production (210) offers sharp details and brilliant colors that dry instantly, this lightweight paper with a lowglare satin finish is perfect for posters, signs, and displays. This paper is easy to handle and offers superior light-fastness and excellent water resistance. You'll get top performance with Epson Stylus Pro and SureColor printers with UltraChrome® inks even when you're printing in "speed" modes.

Features/ Benefits

- Large color gamut
- Instant dry times
- Satin smooth finish
- 210 gsm weight
- 9 mil caliper

Technical Specifications

Product Type	Inkjet Printable Media
Applications - Media	Posters
	Photographs
Ink Type	Aqueous
Paper Weight	210 gsm
Thickness	9 mil
Media Type	Photo Paper
Finish	Satin



https://www.bhphotovideo.com/c/product/1306757-REG/epson_s450231_poster_paper_production_210.html



Digitally Printed Images

Types of Materials: Supports and Processes

Inkjet Prints



Hahnemühle Photo Gloss Baryta 320

320 gsm · 100 % α -cellulose · bright white · high gloss

Photo Gloss Baryta is a cellulose paper with an optimised inkjet coating for photo application and perfectly suitable for photo and poster prints.

The baryta coating gives the impression of a traditional silver halide photo paper. The smooth, bright white paper with a noble, high-gloss finish produces a very good print quality, ensuring the best results in daily printing.

<https://www.hahnemuehle.com/en/digital-fineart/hahnemuehle-photo.html>



Digitally Printed Images

Types of Materials: Supports and Processes

Inkjet Prints



CANSON® INFINITY BARYTA PHOTOGRAPHIQUE 310 GSM - SATIN



Canon® Infinity Baryta Photographique is a true Baryta paper developed for inkjet technology. It consists of an alpha-cellulose, acid-free pure white paper with the same barium sulphate coating as for traditional silver halide and a premium inkjet colour receiver layer.

Baryta Photographique offers the look and aesthetic of the original darkroom baryta print and complies with the ISO 9706 standard for maximum longevity.

This museum grade photo paper shows excellent black density and great image sharpness, making it ideal for black and white photography.

<https://www.canson-infinity.com/en/products/baryta-photographique>

[Download product sheet](#)

[Download product ICC profiles](#)

Digitally Printed Images

Types of Materials: Supports and Processes

Inkjet Prints

www.wilhelm-research.com

Category: Inkjet Photo and Fine Art Papers

Final Report June 1, 2020 (page 1 of 10)

Canson Infinity Papers with Epson HDX Inks – Print Permanence Ratings¹



The print permanence data given here are based on tests with samples printed with an Epson SureColor P9000 printer and Epson UltraChrome HDX 11-color pigment inks. Canson Infinity fine art papers, fine art canvas, and photo papers are supplied by Canson SAS, 67, Rue Louis et Laurent Seguin, CS 70139, 07104 Annonay, Cedex, France. Canson Infinity papers are available from suppliers and dealers in countries throughout the world. www.cansoninfinity.com



http://wilhelm-research.com/Canson/WIR_Canson_Fine_Art_and_Photo_Papers_Final_Report_2020-06-01.pdf

Display Permanence Ratings and Album/Dark Storage Permanence Ratings (Years Before Noticeable Fading and/or Changes in Color Balance Occur)²

Photo Papers, Fine Art Papers, and Canvas Printed With Epson UltraChrome HDX Inks	Displayed Prints Framed Under Glass ⁽³⁾	Displayed Prints Framed With UV Filter ⁽⁴⁾	Displayed Prints Not Framed (Bare-Bulb) ⁽⁵⁾	Album/Dark Storage Rating at 73°F & 50% RH (incl. Paper Yellowing) ⁽⁶⁾	Unprotected Resistance to Ozone ⁽⁷⁾	Resistance to High Humidity ⁽⁸⁾	Resistance to Water ⁽⁹⁾	Are Optical Brighteners Present ⁽²⁾⁽¹⁰⁾
Canson Infinity PrintMaKing Rag	136 years	345 years	77 years	>200 years	>100 years	very high	moderate ⁽¹¹⁾	no
Canson Infinity Edition Etching Rag	115 years	258 years	63 years	>200 years	>100 years	very high	moderate ⁽¹¹⁾	no
Canson Infinity Velin Museum Rag	138 years	314 years	73 years	>200 years	>100 years	very high	moderate ⁽¹¹⁾	no
Canson Infinity Rag Photographique	116 years	253 years	64 years	>200 years	>100 years	very high	moderate ⁽¹¹⁾	no
Canson Infinity Baryta Photographique	115 years	240 years	64 years	>200 years	>100 years	very high	moderate ⁽¹¹⁾	no
Canson Infinity Baryta Prestige	106 years	215 years	58 years	>200 years	>100 years	very high	moderate ⁽¹¹⁾	no
Canson Infinity Platine Fibre Rag	96 years	215 years	51 years	>200 years	>100 years	very high	moderate ⁽¹¹⁾	no
Canson Infinity Aquarelle Rag	132 years	347 years	68 years	>200 years	>100 years	very high	moderate ⁽¹¹⁾	no
Canson Infinity Photo Luster Premium RC	127 years	241 years	72 years	>200 years	>100 years	very high	high	yes

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See page 2 for Canson Infinity print permanence data with new Canon LUCIA PRO inks and page 3 for HP Vivera pigment inks.



Digitally Printed Images

Types of Materials: Supports and Processes

Inkjet Prints

www.wilhelm-research.com

Category: Large-Format Inkjet Printers

Updated February 15, 2019 (page 1 of 9)

Epson SureColor P7000 and P9000 – Print Permanence Ratings¹



On May 15, 2017, during one of his many trips to Yosemite National Park in California over the years, Joseph Holmes photographed an evolving spring storm moving up through Yosemite Valley. Toward the end of the rainy and foggy day, the afternoon sunlight began to break through the clouds and – for a few brief moments – a brilliant rainbow formed, crossing the entire valley, from one side to the other. Website: www.josephholmes.com

Ink System: Eleven new-generation pigment inks are provided, with ten inks used at any given time as determined by the paper type and print mode selected. The new Epson UltraChrome HDX pigment inks include Cyan, Light Cyan, Vivid Magenta, Vivid Light Magenta, Yellow, Orange, Green, Photo Black (for glossy and luster papers) or Matte Black (matte papers), Light Black, and Light Light Black. Depending on the type of paper, the greatly improved light stability of the new yellow ink provides a 2X to 3X improvement in WIR Display Permanence Ratings compared with previous Epson UltraChrome K3 and HDR inks.

Maximum Paper Width: 24 inches (61 cm) for the SureColor P7000 and 44 inches (112 cm) for the P9000. Handles roll or cut sheet media from U.S. Letter size (8.5" x 11") up to 24 inches (61 cm). Cut sheet paper thickness up to 500 gsm and 1.5 mm poster board can be accommodated. Rolls and sheets are easily top-loaded from the front.

Special Features: Epson "Advanced Black and White Print Mode" for beautiful and extremely long-lasting B&W prints. Built-in rotary cutter for roll photo papers, fine art media, and canvas.

Price: \$3,995 (USA) for the Epson SureColor P7000 (24-inch/61 cm) and \$5,995 for the P9000 (44-inch/112 cm). These printers and the improved-stability HDX pigment inks were first introduced in 2015.



The SureColor P7000 and P9000 printers use the new eleven-ink UltraChrome HDX pigment inkset. The greatly improved stability of the yellow ink gives prints 2X to 3X higher WIR Display Permanence Ratings compared with previous UltraChrome K3 and HDR inks.



http://wilhelm-research.com/epson/WIR_Epson_SureColor_P7000_and_P9000_Printers_2019-02-15.pdf

Display Permanence Ratings and Album/Dark Storage Permanence Ratings (Years Before Noticeable Fading and/or Changes in Color Balance Occur)²

Photo Paper, Fine Art Media, or Canvas Printed With Epson UltraChrome HDX Pigment Inks	Displayed Prints Framed Under Glass ^{2a}	Displayed Prints Framed With UV Filter ^{2a}	Displayed Prints Not Framed (Bare-Bulb) ^{2a}	Album/Dark Storage Rating at 73°F & 50% RH (incl. Paper Yellowing) ^{2b}	Unprotected Resistance to Ozone ^{2c}	Resistance to High Humidity ^{2d}	Resistance to Water ^{2e}	Are Optical Brighteners Present? ^{2f}
Epson Exhibition Canvas Satin	208 years	>360 years	108 years	>300 years	>100 years	very high	moderate ⁽¹⁾	yes
Epson Premium Luster Photo Paper (260)	138 years	289 years	66 years	>300 years	>100 years	very high	high	yes
Epson Ultra Premium Luster Photo Paper	138 years	289 years	66 years	>300 years	>100 years	very high	high	yes
Epson Legacy Baryta Paper	116 years	190 years	64 years	>400 years	>100 years	very high	moderate ⁽¹⁾	some
Epson Legacy Textured Paper	now in test	now in test	now in test	now in test	now in test	now in test	now in test	no
Epson Legacy Etching Paper	112 years	249 years	53 years	>400 years	>100 years	very high	moderate ⁽¹⁾	no
Epson Legacy Platine Paper	107 years	245 years	54 years	>400 years	>100 years	very high	moderate ⁽¹⁾	no

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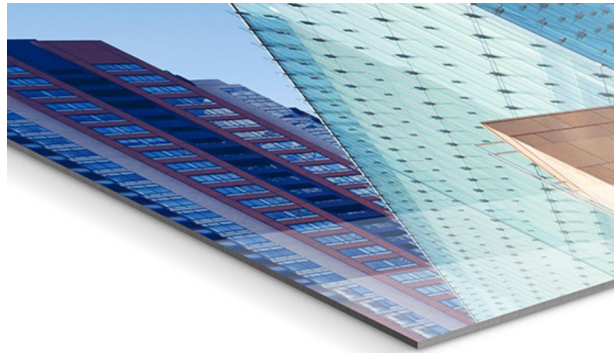
Photographs and Digitally Printed Images

Nonpaper Supports

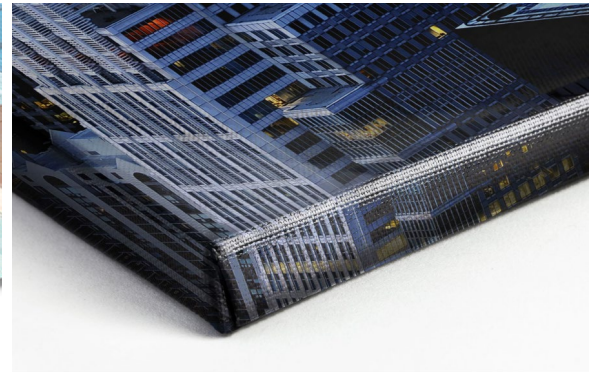
Types of Materials: Supports and Processes



Acrylic



Metal



Canvas



Photographs and Digitally Printed Images

Visual Identification Guide:
IMAGE DETERIORATION



COLOR SHIFTING



HIGHLIGHT YELLOWING



IMAGE GHOSTING



IMAGE FADING



RIT Image Permanence Institute

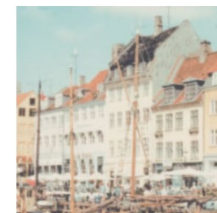
The Image Permanence Institute (IPI) is a university-based, research center in the College of Art and Design at Rochester Institute of Technology (RIT) dedicated to supporting the preservation of cultural heritage collections in libraries, archives, and museums around the world. Visit us online at: <http://www.imagepermanenceninstitute.org>

https://s3.cad.rit.edu/ipi-assets/publications/visual_id_guides/visual_id_image_deterioration.pdf

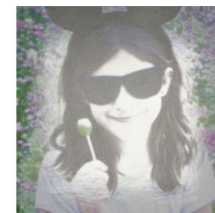
Common Condition Issues



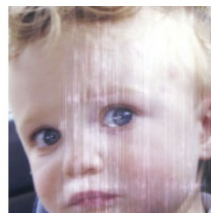
Fade



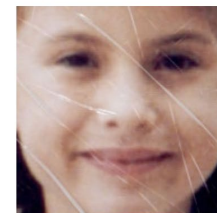
Yellowing



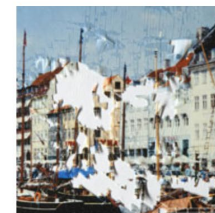
Gloss Change



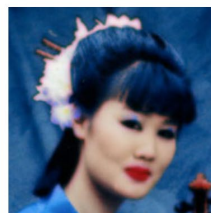
Abrasion



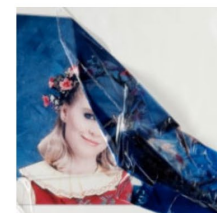
Scratch



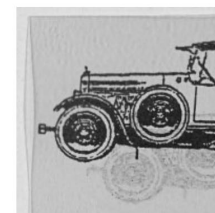
Cracking



Bleed



Delamination



Vinyl Offset

http://www.dp3project.org/deterioration_gallery



Photographs and Digitally Printed Images

Silver Gelatin Photograph



Image by Nicole Alvarado

Gelatin silver mirroring caused by poor environmental conditions, easily seen in dark areas of images

Chromogenic Photograph

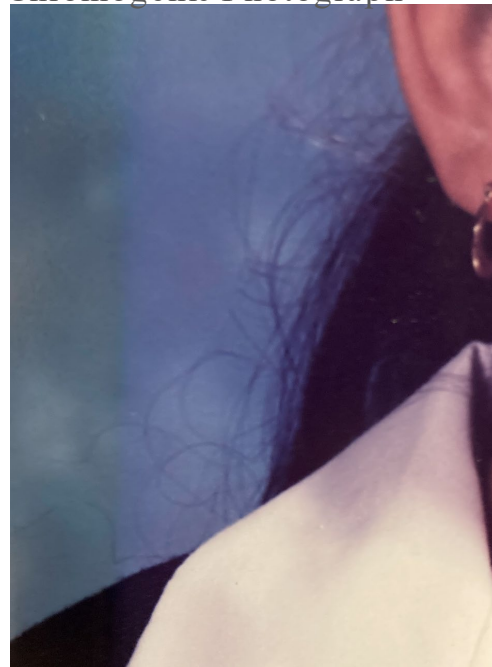


Image by Nicole Alvarado

Light exposure induced color shift from warmer tone to cooler tone

Common Condition Issues

Inkjet Print



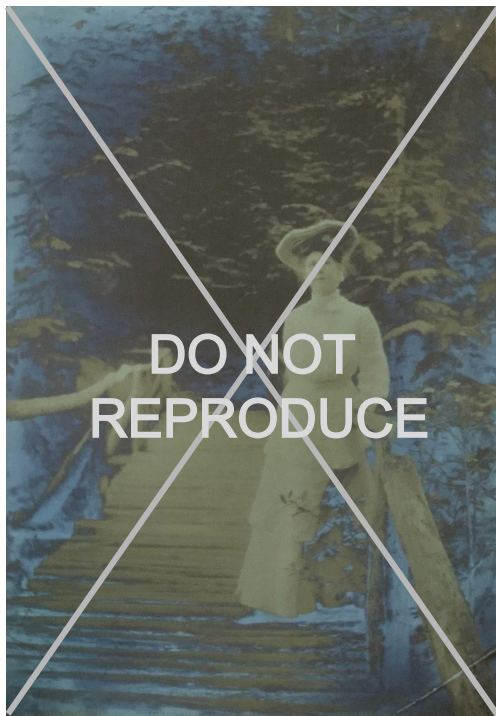
High humidity-induced colorant bleed. The original image has a neutral tone and after the high humidity exposure the image became more yellow. (Print: inkjet dye on polymer RC)



Photographs

Common Condition Issues

Silver Gelatin



A Guide to the Preventive Conservation of Photograph Collections by
Bertrand Lavédrine

Silver mirroring



A Guide to the Preventive Conservation of Photograph Collections by
Bertrand Lavédrine

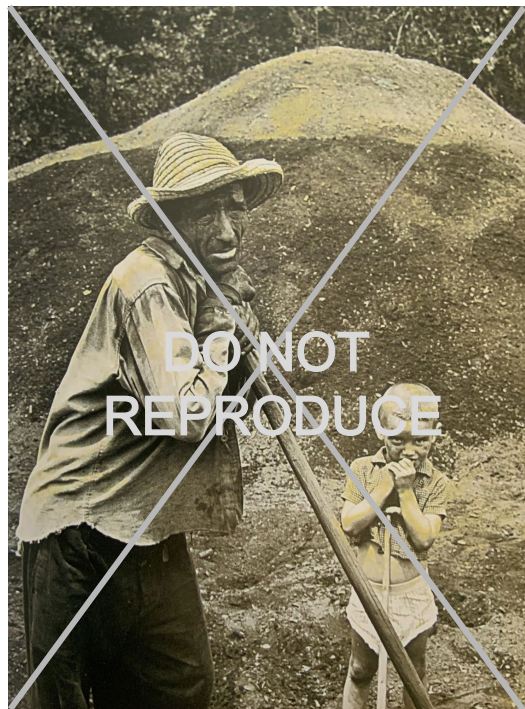
Yellowing, fading, and loss of contrast caused by insufficient washing and storage in a humid environment



Photographs

Common Condition Issues

Silver Gelatin



A Guide to the Preventive Conservation of Photograph Collections by
Bertrand Lavédrine



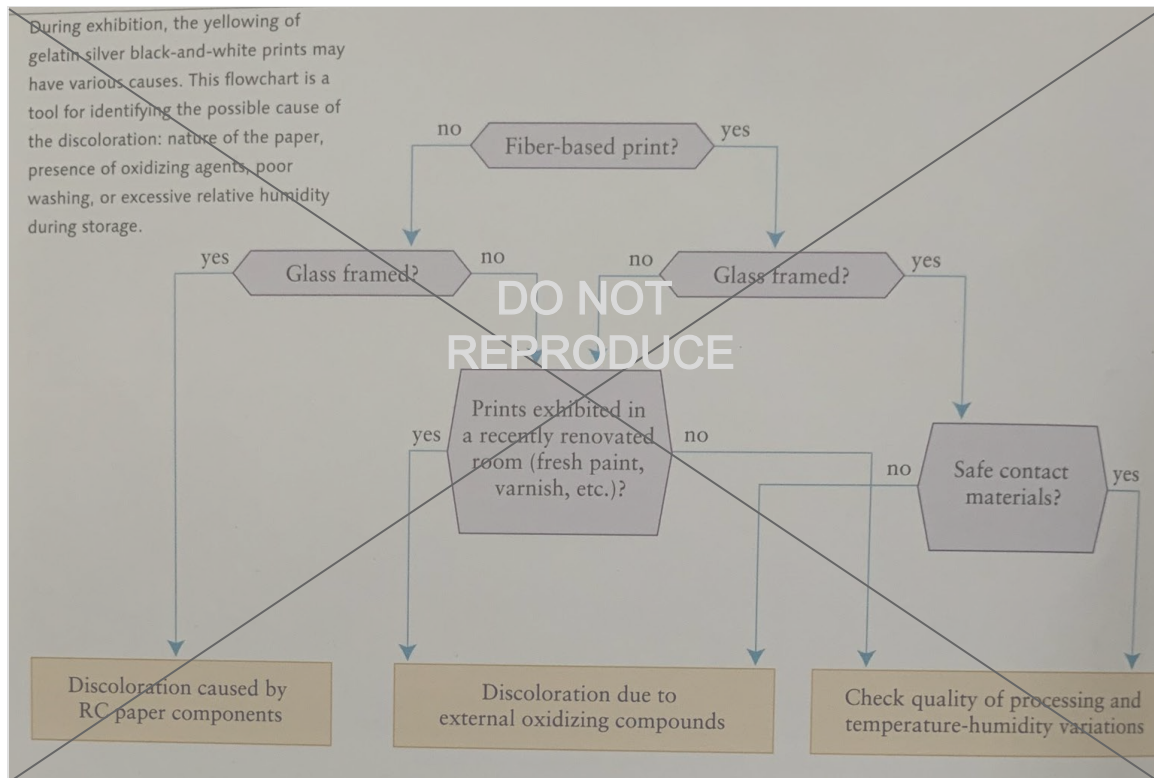
Sulfiding and staining resulting from insufficient fixing or using an exhausted fixer



Photographs

Common Condition Issues

Silver Gelatin



Flowchart to help determine possible cause of yellowing in black-and-white prints



Photographs

Chromogenic (Dye Coupling)



http://www.graphicsatlas.org/identification/?process_id=88

Common Condition Issues



Twentieth-Century Color Photographs by Sylvie Penichon



Photographs

This table shows the factors affecting photographic deterioration

Common Condition Issues

Factor	Cause	Sensitive Items	Type of Deterioration
humidity	• low humidity (<20%)	• cellulose acetate bases, paper prints, gelatin, albumin, glass negatives	• physical: desiccation, brittleness, breaking, deformation, delamination
	• high humidity (>50%)	• cellulose acetate and nitrate bases	• chemical: hydrolysis
	• very high humidity (>70%)	• silver image, residual chemical agents	• chemical: oxidation-reduction silver mirror, sulphiding, loss of transparency in glass
temperature	• room temperature	• protein (gelatin, albumin), paper	• biological: microorganism growth
	• variations in temperature and humidity	• cellulose acetate and nitrate bases, chromogenic dyes	• physical: softening and adhesion of gelatin
		• paper prints, film, gelatin, albumin	• chemical: hydrolysis
pollutants	• oxidant gases	• silver image	• chemical: oxidation-reduction
	• dust	• plastic surfaces, film and prints	• physical: spots, abrasions, scratches
light	• visible	• dyes	• chemical: fading, yellowing
	• ultraviolet	• dyes, resin-coated paper	• chemical: fading, yellowing, oxidation stains, crazing
disasters	• fire	• all bases	• destruction
	• flood	• all bases	• deformation, dissolution, adhesion, migration, stains, delamination, microorganisms

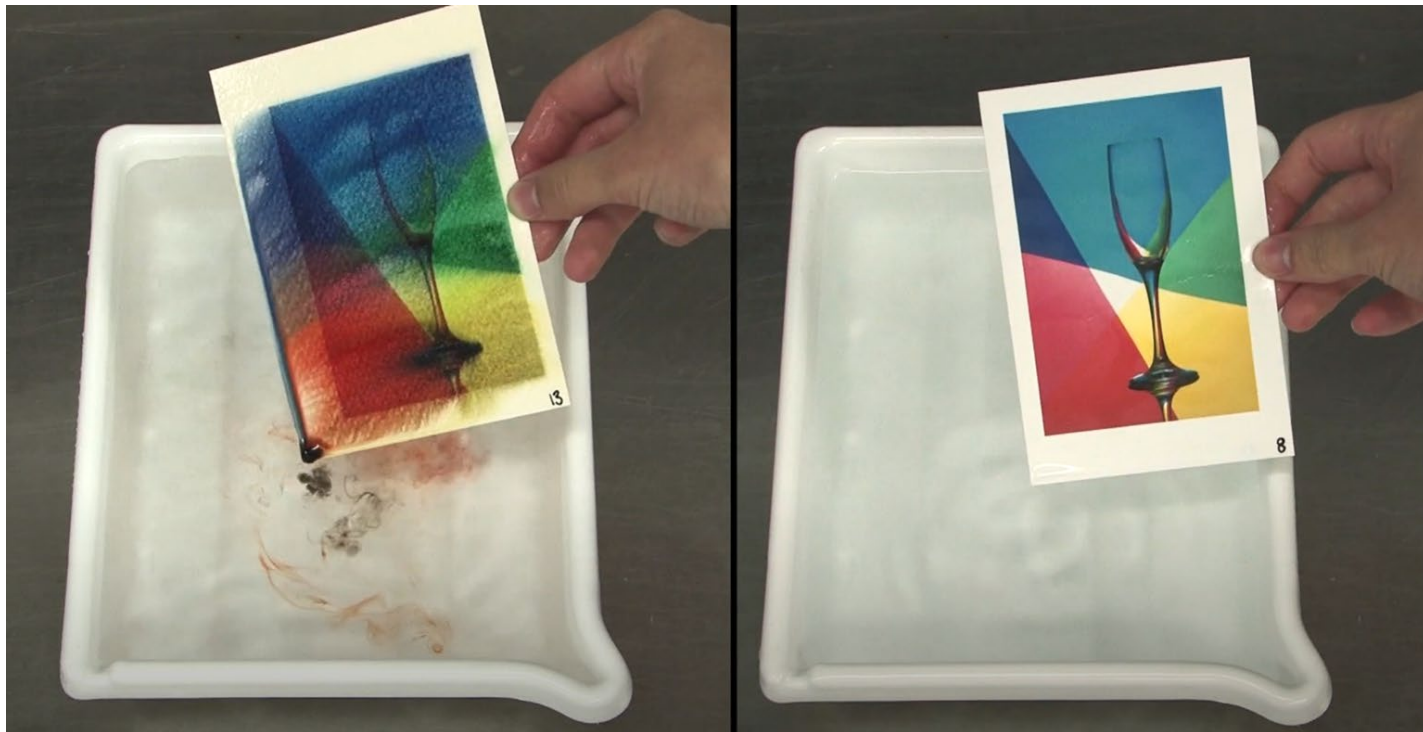
DO NOT REPRODUCE



Digitally Printed Image

Common Condition Issues

Inkjet



Dye inkjet on
Uncoated fine art
paper (left)

Pigment inkjet on
Uncoated fine art
paper (right)

<https://www.youtube.com/watch?v=loorvXpE358>



Digitally Printed Image

Inkjet



Colorant loss



Gloss change



Colorant smear or transfer

Common Condition Issues



Surface scuff



Digitally Printed Image

Tips for Care, Handling, and Storage

Print File[®]
ARCHIVAL STORAGE



NP46 – 4×6 Paper Envelopes



Film & Slide Storage (125)



Photo Pages (83)



Protective Enclosures (128)



Photographs

Tips for Care, Handling, and Storage

ARCHIVAL POLYESTER (PET):

Archival polyester or poly(ethylene naphthalate)(PET) is also known by the brand names Melinex and Mylar. It is chemically inert with a high tensile strength and chemical and dimensional stability. Inherent static electricity helps to keep items from shifting in enclosures but also means that archival polyester should not come in contact with charcoal, pastels or other loose media. For document storage, you will find envelopes, sleeves, L-sleeves, folders and page protectors made out of archival polyester. In sheets and rolls, it can be used to line wooden shelves as a protective barrier.

POLYPROPYLENE (PP):

A chemically inert material that is also heat-resistant and provides a highly protective barrier against moisture and vapors. It is slightly less clear than archival polyester but is clearer and more rigid than polyethylene.

POLYETHYLENE (PE):

A chemically inert material that is highly flexible and easy to work with. It has a filmy appearance but is an economical choice for items that need protection but not complete transparency. DO NOT use low density PE, only high density PE.

POLYSTYRENE (PS)

TYVEK B:

Heat- and pressure-bonded, high-density polyethylene fiber sheeting. There are many types, but Type B is an undtreated product (no antistatic treatments and coatings), and therefore best for preservation purposes.

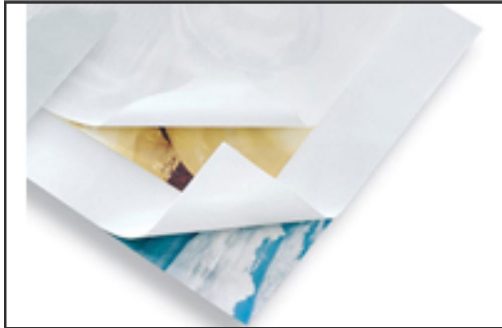




Photographs

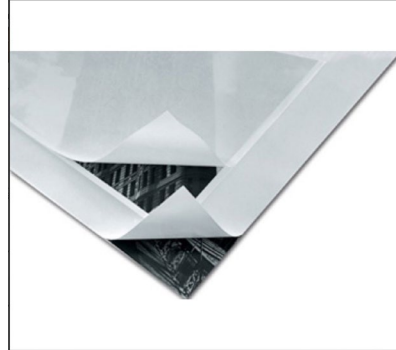
Silver Gelatin

Apollo Paper - 8" x 10" -



<http://www.lightimpressionsdirect.com/apollo-paper-8-x-10-100-pkg/apollo-storage-tissue/>

Apollo Tissue - 8" x 10" - 100/pkg



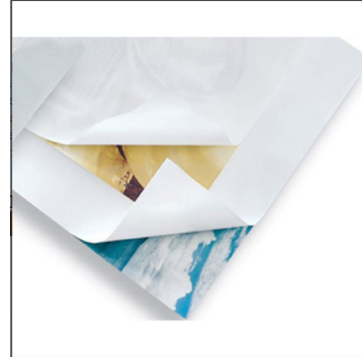
<http://www.lightimpressionsdirect.com/apollo-tissue-8-x-10-100-pkg/apollo-storage-tissue/>

Buffered to pH 8.0-8.5 with 2% calcium carbonate

Tips for Care, Handling, and Storage

Chromogenic (Dye Coupling)

Renaissance Paper (Non-Buffered) - 8" x 10" -



<http://www.lightimpressionsdirect.com/renaissance-paper-8-x-10-100-pkg/renaissance-tissue-paper-non-buffered/>

Renaissance Tissue (Non-Buffered) - 8" x 10" -



<http://www.lightimpressionsdirect.com/8x10-renaissance-tissue/renaissance-tissue-paper-non-buffered/>

Absent of Buffering Agents



Photographs and Digitally Printed Images



Tips for Care, Handling, and Storage



[Economical Polypropylene Clamshell Storage Boxes](#)



[Drop-Side Corrugated Storage Boxes](#)



[Drop Front Negative/Print Storage Boxes](#)



[Polypropylene Slide Storage Album Pages, Top Loading](#)



Photographs

Tips for Care, Handling, and Storage

Products and Materials that have been tested for use in contact with photographs

Category	Not Recommended: do not meet ISO 10214	Recommended: meet ISO 10214
cellulose materials	kraft paper glassine paper	acid-free paper permanent paper
polymers	PVC, CA	polyester
adhesives	tube and aerosol glues of unknown composition	methylcellulose (Tylose), Klucel G, Paraloid B72, starch, gelatin

DO NOT REPRODUCE

A Guide to the Preventive Conservation of Photograph Collections by Bertrand Lavédrine

*Products that have been tested for use in contact with photographs (not a complete list).

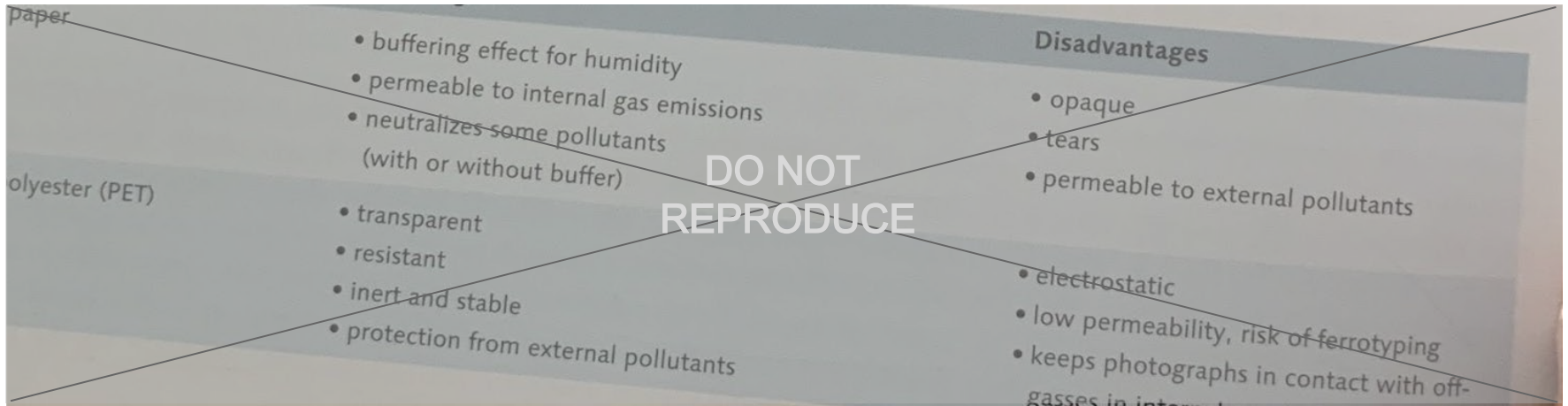
**Recent research indicates that many adhesives safe for traditional photos may be reactive with some digital prints. Paper enclosures and interleave tissues may also be too abrasive for sensitive digital prints.



Photographs

Tips for Care, Handling, and Storage

Advantages and disadvantages of paper and polyester for enclosure



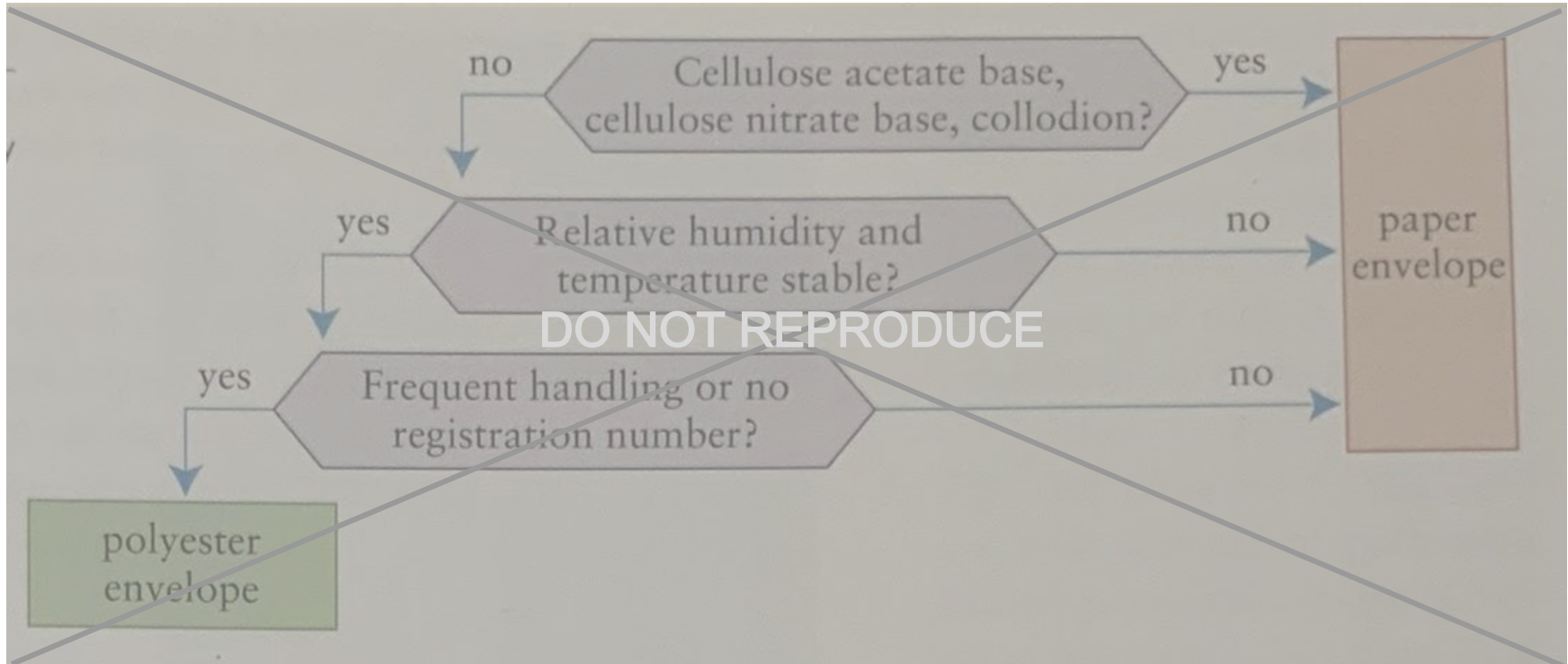
A Guide to the Preventive Conservation of Photograph Collections by Bertrand Lavédrine



Photographs

Tips for Care, Handling, and Storage

Flowchart to assist with choosing between paper and polyester enclosure materials for your collection

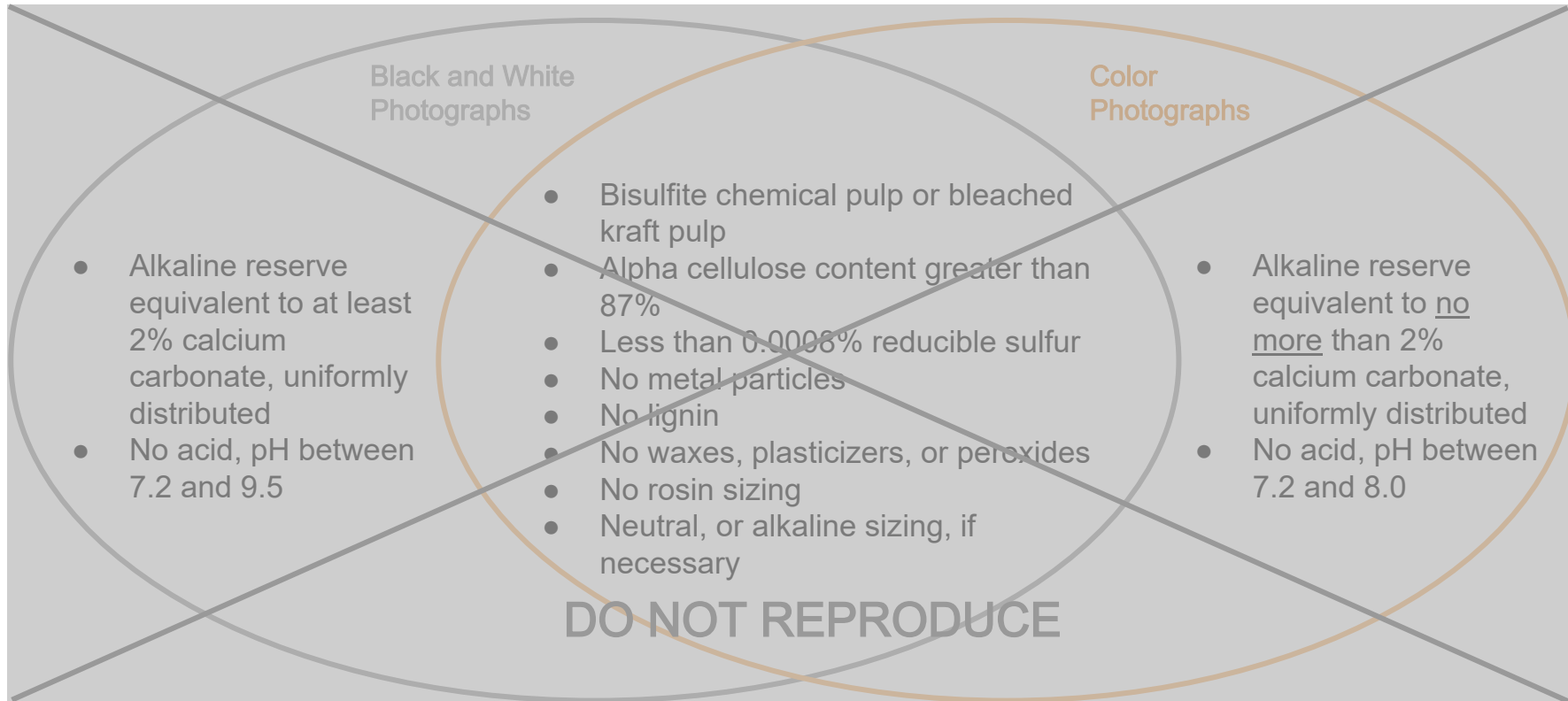




Photographs

Tips for Care, Handling, and Storage

Properties of papers that can be used for housing silver gelatin and color photographs



Photographs

Tips for Care, Handling, and Storage

Materials recommended and not recommended for storing photographs

Type	Not Recommended	Recommended
cellulose materials	paper of unknown composition, containing products capable of migrating or damaging images	archive-quality paper and cardboard*
polymers	<ul style="list-style-type: none"> cellulose acetate cellulose nitrate polyvinyl acetate poly(vinyl chloride)/PVC vulcanized rubber (rubber bands) plastic materials of unknown composition polymers containing chlorine polymers containing plasticizers 	<ul style="list-style-type: none"> polyester* polyethylene* polypropylene* extruded polystyrene* poly(tetrafluoroethylene)* poly(methyl methacrylate)* (Plexiglas) polycarbonate* ABS*
foam	PVC foam polyurethane foam	polyethylene foam* polypropylene foam*
furniture	wood: solid, particleboard, plywood, etc.	metal with baked-on enamel, anodized aluminum, stainless steel
floor coverings	carpet, parquet, particleboard, PVC tiles, porous and friable stone	semi-stoneware, stoneware, two-component epoxy resin
paint	organic solvent paint alkyd resin	acrylic paint vinyl paint acrylic emulsion
varnish	polyurethane cellulose nitrate	acrylic

DO NOT REPRODUCE

Each category and each batch of these materials should be checked for suitability according to ISO Standard 14523 and ISO Standard 10214.



Photographs

Tips for Care, Handling, and Storage

INTRODUCTION

The purpose of this guide is to help users select chemically inert photo-storage, display, and labeling materials in accordance with the International Standard ISO 18902 imaging materials – Processed imaging materials – Albums, framing and storage materials. **Photo-safe** is the term used by the standard to define and specify materials that will not induce chemical damage in photographs over time. It includes all photographic objects made by the following processes:

- Silver Gelatin
- Chromogenic
- Silver Dye Bleach
- Dye- and Pigment- based Inkjet
- Dye Diffusion Thermal Transfer (Dye Sublimation)
- Liquid- and Dry- toner Electrophotography

Materials that are not photo-safe can cause or accelerate the occurrence of fading, yellowing, silver mirroring, or brittleness among other types of chemical damage.

This side of the guide has a description of the standard's requirements. The opposite side of this guide illustrates which elements of a photograph are most likely affected by harmful components (reactants) in photo storage, display, and labeling materials. Photographs should be housed only with materials that are photo-safe.

ISO 18902 describes all the tests and additional requirements with which the different components of a photo-storage, display, or labeling material must comply in order to be deemed photo-safe (see table). As the table indicates, each type of material must meet a different set of tests and requirements. Only materials that meet all specifications of this International Standard can be considered photo-safe. Materials that pass only the pH requirements or only the PAT are not necessarily photo-safe.

It must be noted that the standard's definition of photo-safe refers only to the chemical reactivity of a material and does not imply that the material will not interact physically with a photograph causing damage such as abrasion, creases, or tears.

You can access the standard at www.iso.org. IPI provides testing services for all photo-safe required testing. More information on IPI testing services can be found at www.imagepermanenceninstitute.org.

TESTING REQUIREMENTS

PHOTOGRAPHIC ACTIVITY TEST (PAT) (all materials)

The Photographic Activity Test, widely known as the PAT, is an International Standard in itself: ISO 18916. The PAT explores the possibility of chemical interactions between photographs and a given material after prolonged contact. It uses two special detectors. One detector screens for **oxidation** and **reduction** reactions which can cause image fade, silver mirroring, and/or gold spots. The other detector screens for **chromophores** – compounds that can cause yellowing of the support. All materials must pass the PAT to be considered photo-safe.

ACID-FREE (paper and adhesives)

The acidity of a material is described by its pH value. The pH scale ranges from 0 to 14, where 7 is neutral, below 7 is acidic, and above 7 is alkaline. **Acidic** environments can accelerate the degradation of paper and plastic supports making them brittle. **Highly alkaline** environments, on the other hand, can also cause decay, such as weakening of a gelatin binder. Therefore, an upper pH limit is just as important as a lower pH limit, so the standard incorporates an upper pH limit of 10. To be considered photo-safe, paper-based materials and adhesives must have a pH equal to or greater than the reference water used in testing and less than 10 when measured by a cold extraction pH method.

ALKALI RESERVE (BUFFERING) (paper)

Paper-based materials must include an **alkali reserve** of at least 2% calcium carbonate (CaCO₃). The alkali reserve has the ability to capture acids that may be in the air, the photograph, or in the material itself. Its useful life, however, is limited since it is consumed as it reacts with acid.

LIGNIN-FREE (paper)

Lignin is abundant in unpurified wood-pulp paper and is known to generate oxidizers, reducers, acids, and chromophores over time. As a

result, photographs kept with materials that contain high levels of **lignin** may undergo silver image deterioration and yellowing. Kappa number is a measure of the lignin content of paper. The more purified a paper is, the less lignin it contains and the lower its Kappa number will be. In order to be considered lignin-free, papers and paper boards must have a Kappa number of 7 or below (equivalent to a lignin concentration of 1% or less).

COLORANT BLEED (colored paper and labeling materials)

The dyes or pigments used to color paper materials, as well as those used for labeling, must pass the colorant bleed test. This test assesses the risk of colorant bleed, transfer, or spread when the material is soaked in water. Colored materials that fail this test have the potential to bleed onto adjacent photographs and are, therefore, not photo-safe. These **unstable colorants** can affect the front or the reverse of a photograph.

ADDITIONAL REQUIREMENTS

ISO 18902 includes other requirements as well as recommendations depending on the material type (see table and refer to the standard for a comprehensive list of requirements to meet photo-safe designation).

ISO 18902 REQUIREMENTS BY MATERIAL TYPE						
	PAT	Kappa	pH	Alkali Reserve	Colorant Bleed	Examples of additional requirements (see standard for full details)
Paper	✓	✓	✓	✓	✓	- No post-consumer recycled paper. - If sizing is used, neutral or alkaline sizing chemicals shall be employed.
Plastic	✓					- No plasticizers - No chlorinated, nitrate, or acetate plastic. - Fire-retardant plastics used for containers shall contain antioxidants and non-halogenated fire retardants, such as antimony oxide.
Adhesive	✓		✓			- No rubber-based adhesive - Water-based adhesives should not be used directly on dye inkjet photographs as they may induce color bleeding of the image.
Metal	✓					- Shall be non-corrosive. - No lacquer and enamel that gives off reactive fumes, peroxides, or exudations.
Labeling Materials	✓				✓	- The ink in all writing instruments shall comply with the performance requirement for strike-through and with the requirements for water resistance and light resistance.
Glazing	✓					- All framed photographs shall be displayed behind glass or plastic glazing with optical density of at least 1.5 in the 300- to 380-nanometer range. - Photographs should not be framed in direct contact with glazing.
Frames	✓					- Plastic or metal frames that meet ISO 18902 should be used - Other materials (such as wood) may be used, however; their effects over time on framed photographs will be unknown, so the framing package (glazing, mat, and backing board) shall be sealed along the edges with aluminumized polyester tape (or other impermeable barrier) that meets ISO 18902 to minimize or prevent potential harm.

https://s3.cad.rit.edu/ipi-assets/publications/photo_safe/photo_safe_english.pdf



Photographs

Tips for Care, Handling, and Storage



ICS › 37 › 37.040 › 37.040.20

ISO 18902:2013

Imaging materials – Processed imaging materials – Albums, framing and storage materials

THIS STANDARD WAS LAST REVIEWED AND CONFIRMED IN 2018. THEREFORE THIS VERSION REMAINS CURRENT.

This standard details the chemical and physical requirements for products to be used as storage containers, exhibition framing packages, and photo albums for all imaging materials. The scope includes not only traditional photographic prints but also modern digitally printed materials including inkjet, direct dye thermal transfer ("dye-sub"), and electrophotographic.

<https://www.iso.org/standard/60377.html>



ICS › 37 › 37.040 › 37.040.20

ISO 18920:2011

Imaging materials – Reflection prints – Storage practices

THIS STANDARD WAS LAST REVIEWED AND CONFIRMED IN 2016. THEREFORE THIS VERSION REMAINS CURRENT.

This standard describes recommended storage practices including environmental conditions to maximize collection longevity. The scope includes not only traditional photographic prints but also modern digitally printed materials including inkjet, direct dye thermal transfer ("dye-sub"), and electrophotographic.

<https://www.iso.org/standard/46186.html>



Photographs

Tips for Care, Handling, and Storage

Key Points from ISO 18902

Enclosures should:

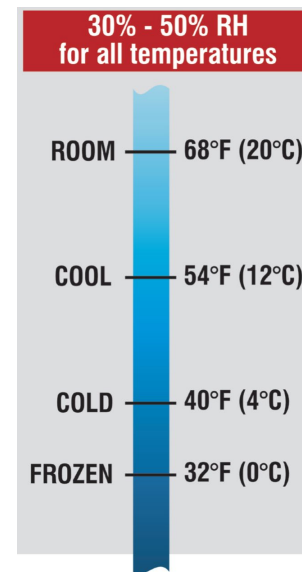
- **Be acid-free**
- **Be lignin-free**
- **Contain 2% alkaline reserve**
- **Pass the Photographic Activity Test (PAT)**
- **Not include chlorinated, plasticized, or cellulosic plastics**
- **Not include rubber adhesives**



Photographs and Digitally Printed Images

Tips for Care, Handling, and Storage

STORAGE CONDITIONS	TEMP F	TEMP C	TRADITIONAL PHOTOGRAPHS		DIGITALLY-PRINTED IMAGES		
			B&W	COLOR	INKJET	DYE SUB	EP
ROOM	68° F	20° C	Good	No	No	Good	Good
COOL	54° F	12° C	Good	No	Fair	Very Good	Very Good
COLD	40° F	4° C	Very Good	Good	Good	Very Good	Very Good
FROZEN	< 32° F	< 0° C	Very Good	Very Good	Very Good	Very Good	Very Good



QUALITATIVE RATING SYSTEM	
No	Likely to cause significant damage
Fair	Does not meet recommendations but may be satisfactory for extended periods
Good	Meets minimum recommendations
Very Good	Exceeds minimum recommendations



Color Photographs

Life Expectancy

TIME-OUT-OF-STORAGE TABLE FOR COLOR PHOTOGRAPHS
Predicted Time in Years to Reach 30% Dye Fading

Primary Storage Conditions			Average Number of Days Each Year Spent Out of Storage at Use Conditions of 75 F (24 C), 60 % RH						
C	F	% RH	0	1	5	10	30	90	120
21	70	20	175	175	175	150	100	60	50
		40	60	60	60	60	50	40	35
		60	25	25	25	25	25	25	25
16	60	20	450	400	350	300	150	70	50
		40	125	125	125	125	90	50	45
		60	60	50	50	50	40	35	
10	50	20	1000	1000	600	450	200	70	60
		40	300	300	250	200	125	60	50
		60	125	125	100	100	80	50	45
4	40	20	3000	2000	900	600	200	80	60
		40	700	600	450	350	175	70	60
		60	250	250	200	175	125	60	50
-1	30	20	>3500	3500	1250	600	250	80	60
		40	1500	1250	800	500	200	70	60
		60	600	500	400	300	175	70	50
-9	15	20	>>3500	>3500	1250	700	250	80	60
		40	>3500	3500	1250	600	250	80	60
		60	2000	1500	800	500	200	80	60
-18	0	20	>>3500	>3500	1500	700	250	80	60
		40	>>3500	>3500	1250	700	250	80	60
		60	>3500	3500	1250	600	250	80	60
-26	-15	20	>>3500	>3500	1500	700	250	80	60
		40	>>3500	>3500	1500	700	250	80	60
		60	>>3500	>3500	1250	700	250	80	60

How to use this table from the Image Permanence Institute:

Referring to the primary storage conditions of 60F and 40% RH, when a color photograph is removed from this storage environment and placed in room temperature conditions, here defined as 75F and 65% RH, for 3 months a year, it would take 45 years for 30% of the dye to fade

* The time-out-of-storage table is predicated on an office condition of 75°F (24°C), 60% RH. It is but one example of how time spent in a use environment modifies the life expectancy imparted to a color photograph by cold storage. Other use environments will impact life expectancy to a greater or lesser extent, depending on how different they are from the vault environment.

>: greater than >>: much greater than

The time-out-of-storage table is used to estimate the overall life expectancy of contemporary color photographic images that spend part of the year in a storage vault and part of the year under different conditions in an office or reading room. See text for more information.

Photographs

Tips for Care, Handling, and Storage

Wilhelm Imaging Research



Photographs stored in frost-free refrigerator

<https://www.sfmia.com/blog/renimg-photo-lab>



Photographic negatives in cold storage

Conserve O Gram

Cold Storage for Photograph Collections

<https://www.nps.gov/museum/publications/conservoogram/14-10.pdf>

National Archives

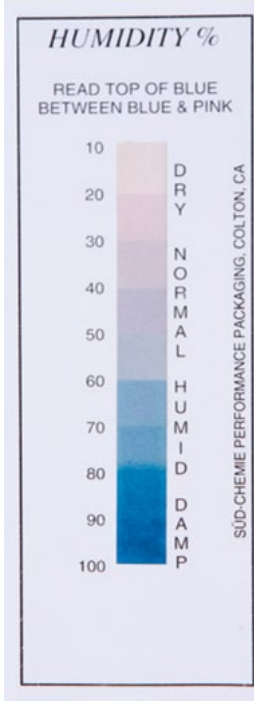
Cold Storage Handling Guidelines for Photographs

<https://www.archives.gov/preservation/storage/cold-storage-photos.html>

Wilhelm Imaging Research

Frost-Free Refrigerators for Storing Color and Black -and-White Films and Prints

http://www.wilhelm-research.com/pdf/HW_Book_19_of_20_HiRes_v1c.pdf



<https://www.universityproducts.com/humidity-indicator-cards.html>



Photographs

Tips for Care, Handling, and Storage





How to care for Photographs

WHAT TO DO

Care and Storage

- Store your photographs in a smoke-free, stable, moderate environment, out of direct sunlight and away from food and drink. Use filters to block harmful ultraviolet light from windows and other sources of light.
- Minimize fluctuation in temperature and relative humidity. For general home storage, it is recommended the temperature be below 70°F and the relative humidity be kept in the range of 30%-50%. Lower temperatures will prolong the life of your photographs. Avoid relative humidity below 15% and above 60%.
- For display, it is best to hang photographs on interior walls with minimal light. Keep away from direct sunlight from windows.
- Store unframed and unmatted photographs face-up in supportive protective enclosures, for example, stiff folders in boxes made from archival (unbuffered and pH neutral) materials.
- Place archival (unbuffered and pH neutral) tissue over the front of the artwork as a coversheet to protect the surface. It is best to store photographs individually in folders but use tissue as interleaving to separate multiple photographs kept within one folder.
- Window mats, made of acid- and lignin-free 100% cotton rag or museum board, minimize chances for mishandling by providing a protective margin around the photograph and additional rigidity.
- Mat your photograph before framing to prevent direct contact with the frame parts. Use acid- and lignin-free, 100% cotton rag matboard and UV-filtering acrylic in your frame.
- Avoid tape and instead use mylar or paper photo corners to attach your piece to the mat.
- Use Tyvek tape to close all openings on the backside of your frame to prevent pests from entering your framed photograph.
- Archival polyester, polypropylene, or polyethylene photo sleeves can be used for frequently handled photographs that do not exhibit flaking or severe damage. Consider producing facsimiles for display or use as an alternative to direct access and handling of the object when appropriate.
- Commercially available albums using archival-quality materials may be used. Avoid albums with self-adhesive pages and colored papers.
- If possible, keep negatives separate from print materials.

How to care for Photographs

WHAT TO DO

Care and Storage (con't)

- Use dehumidifiers, air conditioning units, and fans to reduce humidity and curtail mold growth during warmer months. Use humidifiers and lowered heat levels to help combat extreme dryness during the winter. When using fans, place them in areas that promote air circulation and avoid pointing them directly at objects.
- Carefully remove dust in storage and display areas using a lint-free plain soft cloth or microfiber cloth. Avoid the use of chemical cleaners.
- Seek the help of a photograph conservator for further assistance.

How to care for Photographs

WHAT TO DO

Handling

- Determine whether the object can be handled safely. Always consult a collections care professional if you are ever unsure.
- Minimize direct handling of your photograph as much as possible and be gentle when you must do so. Always handle your photographs on clean, uncluttered surfaces with gloved hands (nonabrasive and lint-free microfiber gloves or powder-free nitrile gloves), as fingerprints will cause permanent damage.
- Determine an order in which your photographs in folders can safely be stored in their enclosures, and then maintain this order in the future when trying to access other materials in the same housing by removing and placing back folders one at a time in their correct sequence.
- Remove dangling accessories and jewelry, such as bracelets, rings, watches, and necklaces and tie long hair back before handling any work of art or object of importance.
- When moving short distances with unmatted photographs (ex. between tables, storage spaces, or rooms), transport them in folders while supported from underneath in a horizontal position to avoid flexing.
- Seek the help of a photograph conservator for further assistance.

How to care for Photographs

WHAT NOT TO DO

- Do not keep artwork in areas of the home prone to fluctuations in environment, such as basements and attics. Also keep away from radiators and vents. It is not advised to hang artwork over fireplaces.
- Do not use glue, post-it notes, tape, staples, paper clips, and rubber bands on your photographs.
- Do not use wet media near photographs, including pens.
- Do not mark your photographs, even on the backside.
- Do not mat your photograph yourself. Matting and framing should be done by an experienced framer or under the direction of a conservator.
- Do not attempt to repair damages in your photograph yourself. Contact a photograph conservator.

Display



Drawings, Prints and Photographs

Display



Not recommended:

- Hanging artwork above fireplaces
- Placing artwork near radiators and vents
- Having sunlight directly fall on artwork



Drawings, Prints and Photographs

Display



<https://www.universityproducts.com/uv-filter-film.html>



<https://www.gaylord.com/Environmental-Control/Light-Filters/UV-Light-Filters-for-Fluorescent-Bulbs-%2810-Pack%29/p/T12>



Drawings, Prints and Photographs

Exhibition



*A Guide to the Preventive Conservation of Photograph
Collections by Bertrand Lavédrine*

- Low lighting levels require a transition area at the entrance to the exhibition, to allow the visitor's vision to adapt
- For most small flat objects, good lighting results can be achieved with light facing the object, but oriented at approximately 15 - 40 degrees vertical angle above the object

- Allow newly painted walls to thoroughly dry and offgas (minimum two weeks). If this minimum length of time is not possible, then use acrylic or latex paint and follow manufacturer instructions on dry times.
- Having artwork in sealed glass frames will mitigate against less than ideal environmental conditions in the gallery



Drawings, Prints and Photographs

Lighting

Maximum recommended lighting values for exposure to sources emitting no ultraviolet radiation (below 400 nm)

Category	Maximum Illuminance
Objects particularly sensitive to light	50 lux
Objects very sensitive to light	75 lux
Objects sensitive to light	150 lux
Objects not very sensitive to light	300 lux



Fading of a Single Colorant

Enter the parameters for the planned light exposure and then click the **Compute Fading** button.

Colorant:

Prior fade (fraction of the colour currently remaining):

Intensity of light (lux):

Exposure per day:

Flash exposure:





Flashes per day:

Days per year:

*** Years (numeric from 0 to 1000): (required)**

Compute Fading
 (required when any of the above options are changed)

Calculated colour values

	Original	Current	Future, with all UV removed	Future, with UV (equiv. to daylight through glass)
RGB values	 (230, 0, 65)	 (230, 0, 65)	 (255, 92, 110)	 (255, 119, 125)
Dose Mlx·h	0	0.0	7.2	7.2
ΔE (from original)	0	0.0	28.73	38.27
ΔE (from current)	N/A	0	28.73	38.27

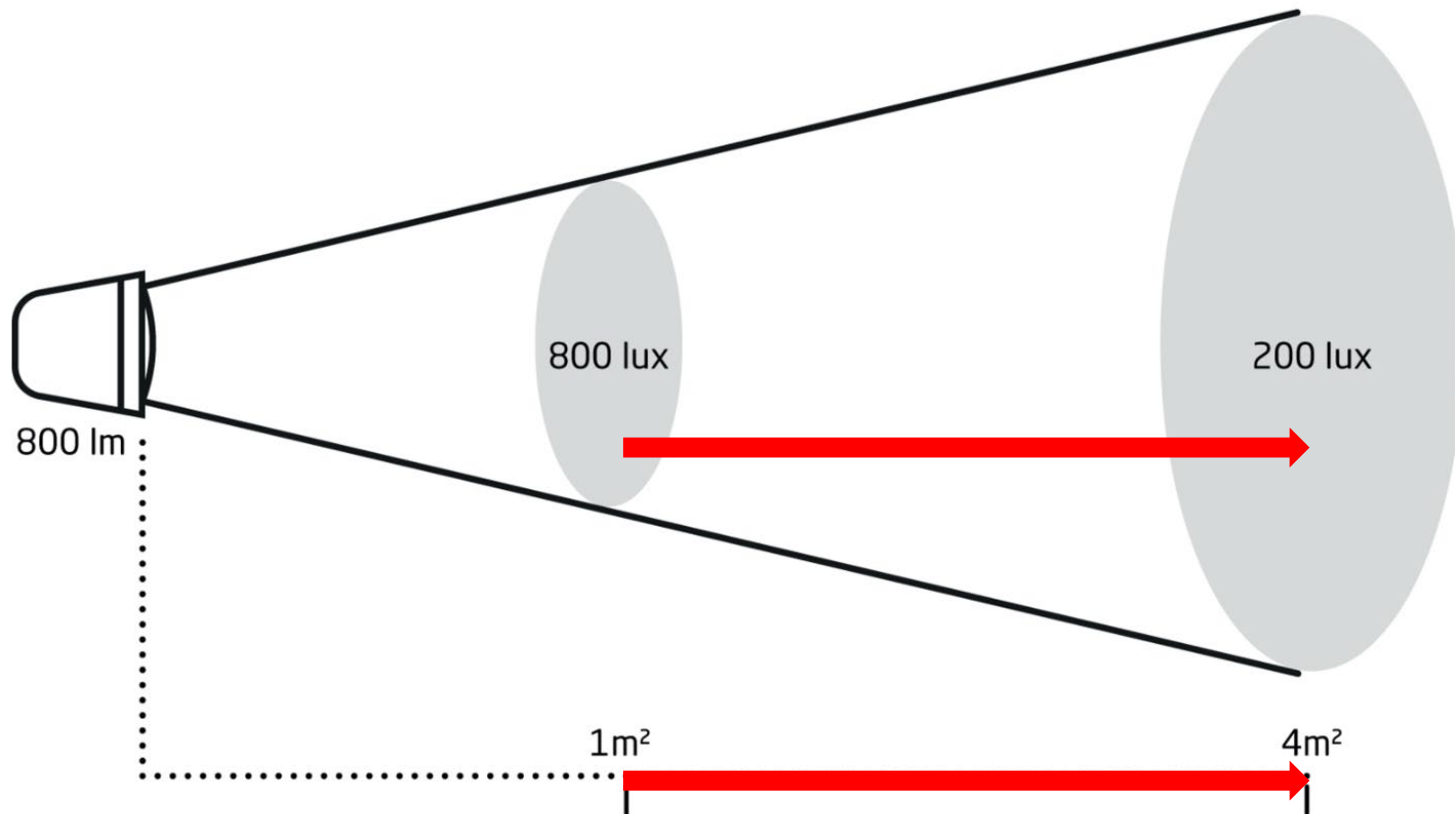
Note:

- A value of $\Delta E=1.6$ is approximately equal to a 'just noticeable fade'.
- The dose of Mlx·h in the current color is an estimated dose causing prior fade, assuming no UV. With UV, it would be estimated to be 0 Mlx·h.



Drawings, Prints and Photographs

Lighting

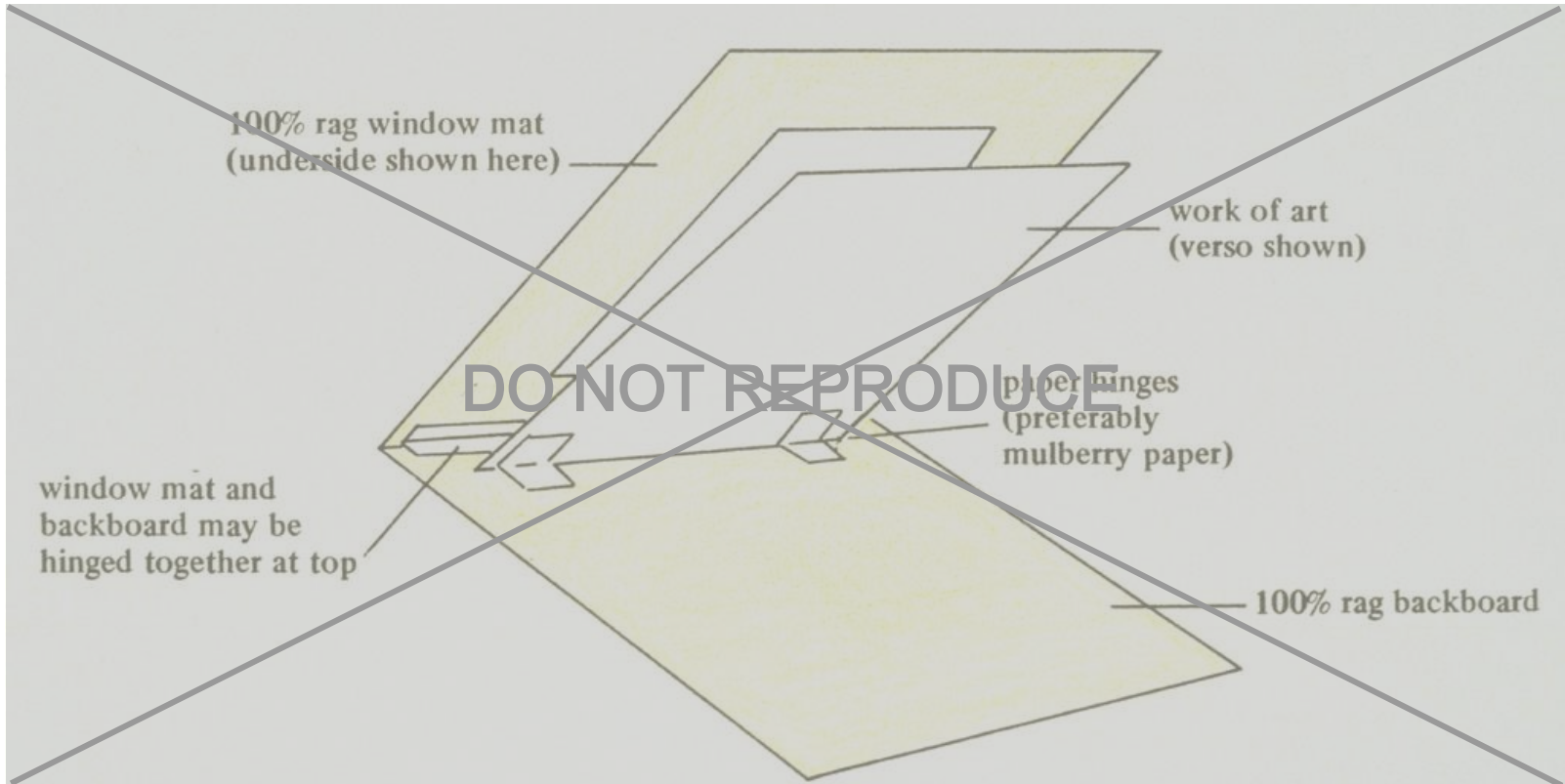


Matting and Framing



Drawings, Prints and Photographs

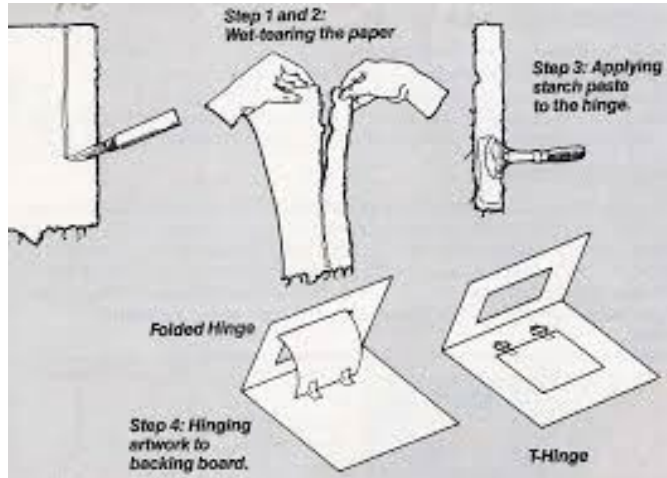
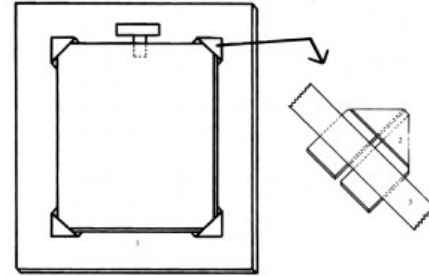
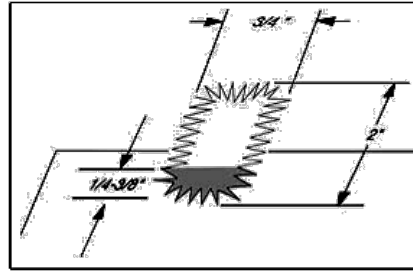
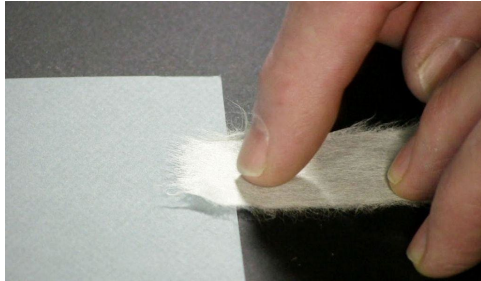
Matting and Framing



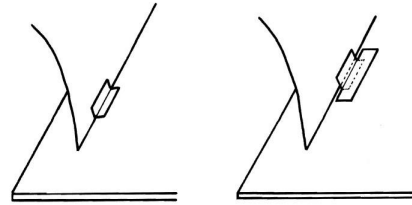


Drawings, Prints and Photographs

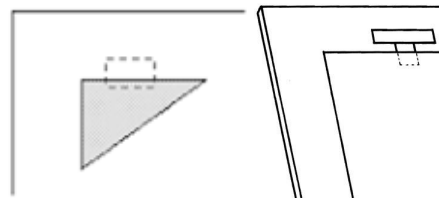
Matting and Framing



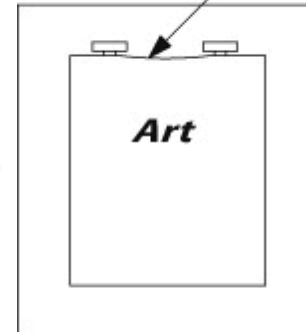
The Folded Hinge



Pendulum Hinge



Buckle

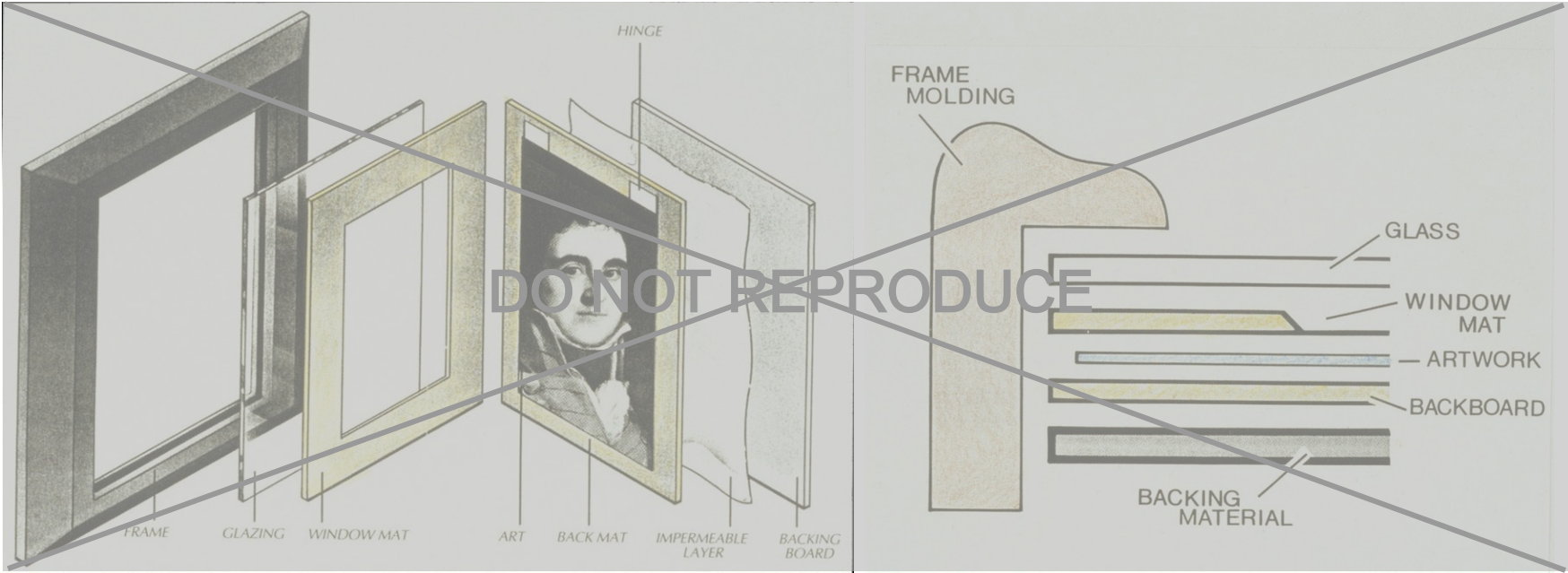


Courtesy of Nancy Ash



Drawings, Prints and Photographs

Matting and Framing



Courtesy of Nancy Ash



Drawings, Prints and Photographs

Matting and Framing



NOT IDEAL, BUT USE WITH CAUTION IF YOU MUST



Lineco Acid-Free Gummed Linen Tape

NOT IDEAL, BUT USE WITH CAUTION IF YOU MUST

This tape is compatible with paper, board, and most porous surfaces. It's pliable, and is ideal for use as a hinge material or for repair work. The adhesive is reversible with water.





Drawings, Prints and Photographs

Matting and Framing





Drawings, Prints and Photographs

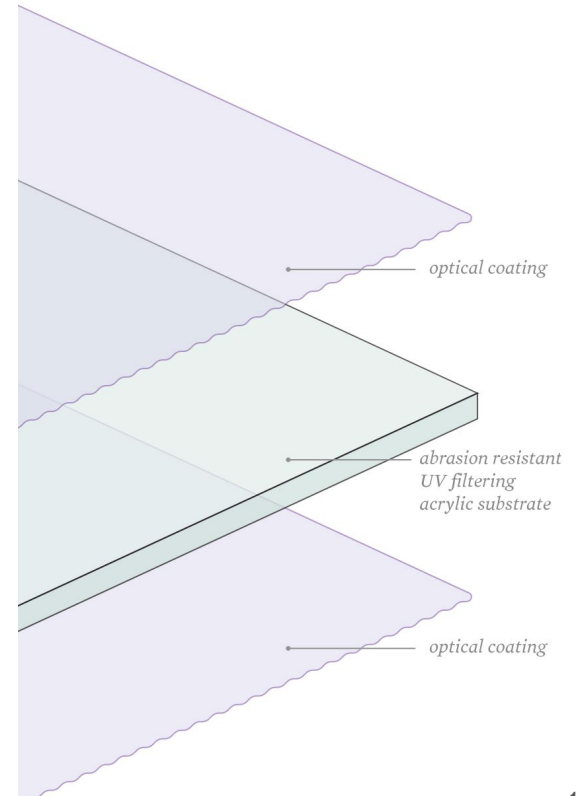


Courtesy of Nancy Ash



<https://preview-art.com/oldsite/Conservators/06-2009/conservation.html>

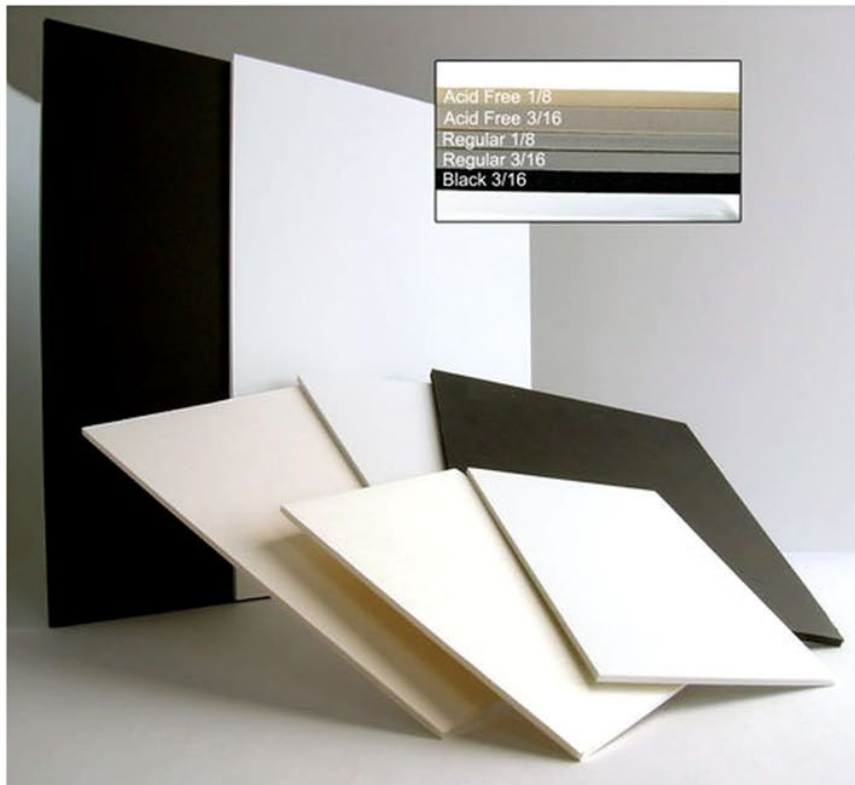
Matting and Framing



<https://tru-vue.com/solution/optium-museum-acrylic/>

Recommendations for Care and Handling of Glazing Materials

<https://tru-vue.com/products/care-handling/>



<https://matshop.com/backing/>

Backing

CUSTOM CUT BACKING FOR MATS AND FRAMES!

ORDER STANDARD SIZES USING THE LINKS BELOW. IF YOU NEED A CUSTOM SIZE BACKING BOARD - USE OUR CUSTOM DESIGN TOOL [HERE!](#)

Cardboard

Cardboard is a sturdy, inexpensive option for non-archival framing. We supply cardboard with a white surface on one side for a more finished look.

Flawboard

Flawboard is matboard that may have slight defects. Regular or acid-free is available.

Foamcore

Foamcore works well for most backing situations, but generally is more expensive. Several thicknesses, qualities, and colors are available.

Manilla

Manilla board is our least expensive option and is ideal for sizes 11x14 and under. Looks great in non-framed presentations such as in a poly bag.



Photographs and Digitally Printed Images

Mounting Adhesives

Matting and Framing

Gudy 831 (Gudy V) Mounting Adhesive

★★★★★ 8 Reviews



The strongest double-stick Gudy adhesive on a thin paper carrier especially suitable for use on rougher surfaces and heavier weight materials. It is often used to mount prints, photographs, and silk on mats without the need for a dry mounting press.

The adhesive used is very aggressive making it well suited for application on rough or textured surfaces. Coated both sides with polyacrylic ester adhesive that is acid and solvent free and can be removed with acetone or xylene.

Available on self-wound rolls with a single release liner. Easily applied by hand and will never dry out with age.

Acid free (pH 7), passed the Photographic Activity Test (PAT ISO 18916), and will not dry out or discolor with age.

Also referred to as Gudy V.

https://www.talasonline.com/images/PDF/ProductInformation/gudy_831.pdf



Photographs and Digitally Printed Images

Mounting Adhesives

Matting and Framing



Bienfang®

ADHESIVES

Fusion® 4000 Adhesive – is an ultra-clear, removable, thermal-activated, 100% inert, pure adhesive film that can conform around free-form shapes. Perfect for ghosting and decorative color tinting; great for mounting lithographs, newsprint, photographs (fiber-based and RC), photostats, art papers, engravings, silks, canvas and foils; also ideal for textured surfaces and fabrics.

https://www.bhphotovideo.com/c/product/432707-REG/Seal_Bienfang_SE_358_Fusion_4000_Dry_Mounting.html/overview



Photographs



Archival Materials

We use only the highest quality archival materials and methods at all levels of production. Our adhesives and laminates are optically clear and pH balanced with UV absorbers and stabilizers.

MOUNTING

Face mounting is a technique that creates a permanent fusion between the face of a print and an acrylic material. The back of the print can be treated with a back mount.

Back mounting is a technique that creates a permanent fusion between the back of a print and one of the materials listed below. The face is exposed and can be treated with either a face mount or a lamination, listed below.

SUBSTRATES

Back Mounting Substrates*:

- Anodized Aluminum
- Dibond
- Museum Acrylic
- Sintra
- Archival Museum Board

*Substrates come in different thicknesses and colors.

LAMINATION

- **Matte Lamination:** Non-reflective finish with a subtle, tactile quality
- **Glossy Lamination:** High-profile, ultra-reflective surface
- **Luster Lamination:** Satin finish, lightly reflective, between glossy and matte
- **Lexan Lamination:** A more stable, scratch resistant surface

PAT PHOTOGRAPHIC ACTIVITY TEST ISO 18916 - RESEARCH REPORT

JOB: 2397R

DATE: 24-May-2017

PREPARED FOR: Neschen Coating GmbH
Werner Markiewicz

MATERIAL: gudy 831
CONTROL: Whatman No. 1 filter paper

SILVER IMAGE INTERACTION	RESULT: PASS
Density change of control:	-1.11
Upper pass/fail limit:	-0.89
Density change of material:	-1.11
Lower pass/fail limit:	-1.34

Density change caused by material must be equal to density change caused by control $\pm 20\%$

GELATIN STAINING	RESULT: PASS
Density change of control:	0.10
Stain limit:	0.18
Density change of material:	0.10

Staining caused by material must be less than the stain caused by control ± 0.08

MOTTILING OF IMAGE INTERACTION DETECTOR	RESULT: PASS
Visual assesment of uniform action	

OPERATOR: Andrea Venosa

PERFORMANCE:	PASS
MUST PASS ALL CRITERIA TO PASS PAT	

Note: When selecting enclosures, the PAT should be used in conjunction with ISO 18902

This certificate is valid for this specific lot of product until any date and for subsequent lots until **24-May-2018**
This certificate is VOID upon any change in product formulation, manufacturer, or manufacturer supplier.



Photographs and Digitally Printed Images

Matting and Framing



Other Thoughts...

- Know your materials as best as possible and provide this information to those who will be entrusted with the care of your artwork(s). This will not only be crucial to a conservator, whose care and treatment considerations are linked with understanding the materials that makeup the artwork, but it is also valuable for representing the artwork accurately in internal cataloging and documentation, as well as outward facing text on gallery labels and in publications.
- Something you may come across in your artistic careers, especially as it pertains to photographic and digitally produced images, is museums may sometimes acquire two similar copies of the same work, one at market price and the other at a replacement cost. One copy is used for display and loans; the other is kept permanently in storage for future reference and possible replacement of the display copy.
- For images produced from a digital file, the museum may acquire the file and rights to reproduce the image once an assessment of unacceptable image loss has been made. As it has been already said in previous presentations, it is important for you as the artist to document and share what your definition of acceptable and unacceptable change is for your artwork, and this will allow conservators to approach the care of your work with your intentions in mind.
- Conservators gather information from artists both during informal communications and formal Artist Interviews. Sharing your knowledge of your own work is invaluable to us!

Additional Information: Where to start...



Caring for Your Treasures

<https://www.culturalheritage.org/about-conservation/caring-for-your-treasures>

Caring for Photographs

The prevalence of photographs allows us to forget that they are potentially fragile objects that can be easily damaged by careless handling, improper storage, and exposure to environmental influences such as light, humidity, and temperature.

DOWNLOAD

https://f9f7df2c79cc13143598-609f7062990e04dd7dd5b501c851683c.ssl.cf2.rackcdn.com/aichaw_c8362185071923e160aef031f10ba3e2.pdf

Caring for Paper

Documents, manuscripts, and works of art on paper such as prints, drawings, and watercolors are inherently fragile but can be easily and effectively protected from damage.

DOWNLOAD

https://f9f7df2c79cc13143598-609f7062990e04dd7dd5b501c851683c.ssl.cf2.rackcdn.com/aichaw_cff71b387b203b985d5d09a0572fafe3.pdf

Matting and Framing Works of Art and Artifacts on Paper

Works of art and documents on paper are also susceptible to chemical damage by components in paperboard and adhesives used to mat works of art and documents. The purpose of this brochure is to provide information about recommended materials for matting and framing and to indicate those materials to avoid.

DOWNLOAD

https://f9f7df2c79cc13143598-609f7062990e04dd7dd5b501c851683c.ssl.cf2.rackcdn.com/aichaw_cb535ca9951b0806c816e99201cef5ec.pdf





Additional Information: Where to start...



Wiki

*A Collaborative
Knowledge
Resource*

[https://www.conservation-wiki.com/wiki/PMG_Exhibition_Guidelines_for_Photographic_Materials_\(published_2004\)](https://www.conservation-wiki.com/wiki/PMG_Exhibition_Guidelines_for_Photographic_Materials_(published_2004))

https://www.conservation-wiki.com/wiki/BPG_Glossary_of_Terms

https://www.conservation-wiki.com/wiki/BPG_Exhibition,_Supports,_and_Transport

https://www.conservation-wiki.com/wiki/BPG_Housings

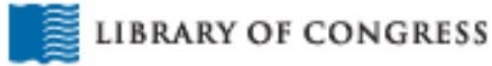
https://www.conservation-wiki.com/wiki/Environmental_Guidelines

https://www.conservation-wiki.com/wiki/Ten_Agents_of_Deterioration

<https://www.conservation-wiki.com/wiki/Light>

<https://www.conservation-wiki.com/wiki/Pollutant>

Additional Information: Where to start...



Collections Care Guidance

<https://www.loc.gov/preservation/care/>

Understanding Why and How Paper Degrades

- [Paper Deterioration: Some Essential Facts](#)

Collections Care

Additional information on preserving collections, beyond good storage and careful handling:

[Matting and Framing](#)

[Limiting Light Damage from Display/Exhibition](#)

[Reducing Risk from Pollutants](#)

[Marking Library Collection Materials](#)

[Digitizing Collections](#)

[Making Preservation Facsimiles \(Preservation Photocopying\)](#)

[Dealing with Water Damage](#)

[Library Binding using Advanced Bindery Library Exchange \(ABLE™ 7.0\)](#)

[Contracting for Library Binding](#) [PDF: 242 KB / 25 pp.]

[Contracting for Purchasing Pressure-Sensitive Labels](#) [Word: 132 KB / 7 pp.]

[Conservation Treatment Manual for General Collections](#)

Guidance for Various Format Types

Basic information and simple steps to take for the good care, handling, and storage of collections:

[Books](#)

● [Paper](#)

● [Photographs](#)

[Scrapbooks and Albums](#)

[Newspapers](#)

[Comic Books](#)

[Audio-Visual: Grooved Media, Magnetic Tape, and Optical Discs](#)

[Audio-Visual: Motion Picture Film](#)

[Asian Bindings](#)

[Other objects: Video on making a custom storage box for objects](#)

[Preservation Housing for Large Fragile Objects](#) [PPTX, 12 MB]

For other materials not listed above (e.g., objects, textiles, paintings), see [additional resources/references on caring for collections](#).

● [Where to get preservation supplies](#)

● [Preservation Supply Specifications](#) developed by the Library of Congress

Additional Information: Where to start...

CONSERVATION CENTER

for Art & Historic Artifacts

Guides and Fact Sheets

<https://ccaaha.org/resources>

ISO STANDARDS FOR HOUSING PHOTOGRAPHS

A worksheet of ISO standards for housing photographs.

MATTING AND FRAMING SPECIFICATIONS FOR OBJECTS ON PAPER

Choosing appropriate materials and methods for matting and framing paper artifacts has a lasting and significant effect on the condition of the artifact. Properly made mats can protect and aesthetically enhance an artifact for many years.

PAPER-BASED COLLECTIONS HANDLING ESSENTIALS

A worksheet of paper-based collections handling essentials.

GENERAL PRESERVATION TERMINOLOGY

A glossary of general preservation terminology.

KNOW YOUR BUGS!

Historic properties and cultural institutions should have an Integrated Pest Management (IPM) policy in order to effectively prevent damage to their collections. Having an IPM plan sets a schedule for monitoring, housekeeping, and identification of potential pests.

LIGHT EXPOSURE FOR ARTIFACTS ON EXHIBITION

Light can cause damage to collections. The amount of damage is determined by the intensity and type of light, the time of exposure, and the natural resistance of the object's components.

PAPER CONSERVATION TERMINOLOGY

A glossary of paper conservation terminology.

PHOTOGRAPH CONSERVATION TERMINOLOGY

A glossary of photograph conservation terminology.

POLLUTANTS AND COLLECTIONS

A worksheet of pollutants commonly found in collections, with tips for monitoring and mitigating damage.

PREVENTIVE CONSERVATION FOR ARTISTS

A worksheet and technical guide to material selection.

PREVENTIVE CONSERVATION PRIMER

A preventive conservation primer.

SELECTING MATERIALS FOR STORAGE AND DISPLAY

Collection Managers, Curators, Registrars, Conservators, Archivists and Librarians often have to make difficult decisions regarding appropriate storage and display materials for the preservation of historic objects and artworks.

STORING YOUR PHOTOGRAPHIC COLLECTION: A GUIDE TO CHOOSING THE PROPER MATERIALS FOR LONG-TERM STORAGE

This technical bulletin offers guidelines for the long-term preservation of photographic collections. One of the first steps to achieving this goal is to re-house collection materials in enclosures and containers that meet the proper criteria.

Additional Information: Where to start...



NEDCC Preservation Leaflets

<https://www.nedcc.org/free-resources/preservation-leaflets/overview>

4. Storage and Handling

- 4.1 Storage Methods and Handling Practices 2012 [HTML](#) [PDF](#)
- 4.2 Storage Furniture: A Brief Review of Current Options 1999 [HTML](#)
- 4.3 Cleaning Books and Shelves 2012 [HTML](#) [PDF](#)
- 4.4 Storage Enclosures for Books and Artifacts on Paper 1999 [HTML](#)
- 4.5 Packing and Shipping Paper Artifacts 2020 **NEW** [HTML](#) [PDF](#)
- 4.6 Packing and Shipping Audio Media 2020 **NEW** [HTML](#) [PDF](#)
- 4.7 The Book Shoe: Description and Uses 1999 [HTML](#)
- 4.9 Storage Solutions for Oversized Paper Artifacts 1999 [HTML](#)
- 4.10 Matting and Framing for Works on Paper and Photographs 2019 **UPDATED** [HTML](#) [PDF](#)

5. Photographs

- 5.1 A Short Guide to Film Base Photographic Materials: Identification, Care, and Duplication 2012 [HTML](#) [PDF](#)
- 5.2.1 Types of Photographs, part 1: 19th and Early 20th Century 2018 [HTML](#) [PDF](#)
- 5.2.2 Types of Photographs, part 2: Color 2020 **NEW** [HTML](#) [PDF](#)
- 5.2.3 Types of Photographs, part 3: Digital Output Media 2019 **NEW** [HTML](#) [PDF](#)
- 5.3 Care of Photographs 2019 **UPDATED** [HTML](#) [PDF](#)
- 5.4 Creating Long-Lasting Inkjet Prints 2020 **UPDATED** [HTML](#) [PDF](#)
- 5.5 Storage Enclosures for Photographic Materials 2018 [HTML](#) [PDF](#)

7. Conservation Procedures

- 7.1 Guidelines for Library Binding 2019 **UPDATED** [HTML](#) [PDF](#)
- 7.2 Surface Cleaning of Paper 2019 **UPDATED** [HTML](#) [PDF](#)
- 7.4 Custom Protective Enclosures 2018 [HTML](#) [PDF](#)
- 7.5 Conservation Treatment for Works of Art and Unbound Artifacts on Paper 1999 [HTML](#)
- 7.6 Conservation Treatment for Bound Materials of Value 2019 **UPDATED** [HTML](#) [PDF](#)
- 7.7 Choosing and Working with a Conservator 2018 [HTML](#) [PDF](#)
- 7.8 Removal of Damaging Fasteners from Historic Documents 1999 [HTML](#)

Additional Information: Where to start...

National Park Service
U.S. Department of the Interior



Conserve O Grams Leaflets

https://www.nps.gov/museum/publications/conserveogram/cons_toc.html#collactionpreservation

3. Agents of Deterioration

- 3/1 Using a Psychrometer to Measure Relative Humidity 1993
- 3/2 Calibration of Hygrometers and Hygrothermographs 1993
- 3/3 Comparing Temperature and Relative Humidity Dataloggers for Museum Monitoring 2011
- 3/4 Mold: Prevention of Growth in Museum Collections 2007
- 3/5 Volcanic Ash: Cleaning Museum Objects 1993
- 3/6 An Insect Pest Control Procedure: The Freezing Process 1994
- 3/7 Monitoring Insect Pests with Sticky Traps 1998
- 3/8 Controlling Insect Pests: Alternatives to Pesticides 1998
- 3/9 Anoxic Microenvironments: A Treatment for Pest Control 1999
- 3/10 Choosing UV-Filtering Window Films 2004
- 3/11 Identifying Museum Insect Pest Damage 2008

4. Museum Collections Storage

- 4/1 Museum Storage Cabinets 1993
- 4/2 Dust Covers for Open Steel Shelving 1993
- 4/3 Installing the Retrofit Gasket Kit 1993
- 4/4 Creating a Microclimate for Oversized Museum Objects 1993
- 4/5 Storage Techniques for Hanging Garments: Padded Hangers 1994
- 4/6 Storage Techniques for Canoe Paddles and Long-Handled Tools 1994
- 4/7 Museum Collection Storage Space: Is an Insulated Modular Structure Right for Your Collection? 1994
- 4/8 Selecting Environmental Control Systems for Insulated Modular Structures 1994
- 4/9 Buffered and Unbuffered Storage Materials 1995
- 4/10 Determining Museum Storage Equipment Needs 1997
- 4/11 Determining Museum Storage Space Requirements 1997
- 4/12 Ring Supports for Pottery and Round-Based Objects 1998
- 4/13 Modifying Museum Storage Cabinets 1998
- 4/14 Planning a Research Space 1998
- 4/15 Storage Techniques for Hanging Garments: Dust Covers 2001
- 4/16 Creating A Microclimate Box for Metal Storage 2011

13. Paper Objects

- 13/1 Window Mats for Paper Objects 1993
- 13/2 How to Flatten Folded or Rolled Paper Documents 1993
- 13/3 Polyester Encapsulation 1993
- 13/4 Exhibit Mounting Variations for Objects on Paper 1993

14. Photographs

- 14/1 Making Mounting Corners for Photographs and Paper Objects 1993
- 14/2 Storage Enclosures for Photographic Prints and Negatives 1993
- 14/3 Chronology of Photographic Processes 1993
- 14/4 Caring for Photographs: General Guidelines 1997
- 14/5 Caring for Photographs: Special Formats 1997
- 14/6 Caring for Color Photographs 1998
- 14/7 Caring for Photographs: Special Monochrome Processes 1998
- 14/8 Caring for Cellulose Nitrate Film 2004
- 14/9 Identification of Film-Base Photographic Materials 1999
- 14/10 Cold Storage for Photograph Collections – An Overview 2009
- 14/11 Cold Storage for Photograph Collections – Using Individual Freezer Unit 2009
- 14/12 Cold Storage for Photograph Collections – Vapor-Proof Packaging 2009



Exhibit Mounting Variations For Objects On Paper

Paper objects should not be placed on long-term or permanent exhibition because of their sensitivity to light. When planning for the temporary display of documents, works of art on paper, and photographs, ensure that mounting techniques meet the following criteria:

- **Employ archival-quality construction materials.** Archival-quality materials are used for all surfaces that will come in contact with the mounted object, such as mounting boards, plastics, and adhesives. Commercial double-sided and archival tapes are not used in direct contact with museum objects, but they often can be used to adhere other surfaces within the mount.

To mount photographs, use neutral (pH 7), lignin-free mat boards and papers. Use lignin-free, buffered or alkaline-reserve mounting materials (pH 8 to 8.5) for paper documents. Check vendor catalog descriptions or request this information from the supplier.

- **Employ reversible techniques.** All techniques applied are reversible, that is, able to be fully undone.

• **Permit expansion and contraction.** Since paper is a hygroscopic material (that is, it takes on and gives off water in response to the humidity of its environment), a proper archival mounting technique allows the paper or photographic object to expand and contract without distorting or buckling.

- **Employ spacers.** Once mounted, the document, art work, or photograph does not touch

the framing glass or plastic, but is held apart from it by a window mat or spacer.

Conserve O Gram 131 describes one of the primary traditional mounting techniques, employing Japanese paper strips with wheat starch paste to hinge documents, photographs, or works of art to mat board. The following describes four alternative safe mounting methods: paper channel supports, archival photo corners, polyester strip supports, and polyester wrap.

Paper Channel Supports

Suitability. Versatile. May not be appropriate for large objects, especially those with narrow borders.

Supplies and Equipment

- 4-ply pH neutral or buffered mat board
- pH neutral or buffered paper
- Neutral archival tape, pressure sensitive or water activated (e.g., Filomat[®], or linen tape)
- Mat or utility knife

Procedure

1. Cut a piece of 4-ply mat board (i.e., cut to fit the interior size of the frame) to serve as a back/mat for the object to be mounted.
2. Cut two strips of archival quality paper 3 to 4 inches longer than the horizontal dimension of the object to be mounted. To mount a letter-sized object, cut the strips 3/4 to 1 inch wide; for larger objects, cut them slightly wider.

Additional Information: Where to start...



Government
of Canada

Canadian Conservation Institute (CCI) Notes

<https://www.canada.ca/en/conservation-institute/services/conservation-preservation-publications/canadian-conservation-institute-notes.html>

Care of collections – general guidelines

- [N1/1 General precautions for storage areas \(2002\)](#) ([PDF Version](#), 1.41 MB)
- [N1/2 Cleaning Glass and Acrylic Display Cases \(1996\)](#) ([PDF Version](#), 464 KB)
- [N1/3 Closing a Museum for the Winter \(1988\)](#)
- [N1/4 Making Triwall Containers \(1997\)](#) ([PDF Version](#), 1.02 MB). Consult also [series 20](#).
- [N1/6 Time Capsules \(1995\)](#) ([PDF Version](#), 2.31 MB)
- [N1/7 Mercury in Museum Collections \(2002\)](#) ([PDF Version](#), 1.26 MB)
- [N1/8 Lead in Museum Collections and Heritage Buildings \(2010\)](#) ([PDF Version](#), 289 KB)
- [N1/9 Low-Cost Plastic/Aluminum Barrier Foil \(2010\)](#) ([PDF Version](#), 3.24 MB)

Care of photographic materials

- [N16/1 Care of Encased Photographic Images \(2007\)](#)
- [N16/2 Care of Black-and-White Photographic Glass Plate Negatives \(2007\)](#)
- [N16/3 Care of Black-and-White Photographic Negatives on Film \(2007\)](#) ([PDF Version](#), 160 KB)
- [N16/4 Care of Black-and-White Photographic Prints \(2007\)](#) ([PDF Version](#), 164 KB)
- [N16/5 Care of Colour Photographic Materials \(2007\)](#)
- [N16/6 Processing contemporary black-and-white photographic films and papers for maximum permanence \(2007\)](#)

Paper and books

- [N11/1 Making Protective Enclosures for Books and Paper Artifacts \(1996\)](#) ([PDF Version](#), 874 KB)
- [N11/2 Storing Works on Paper \(1995\)](#) ([PDF Version](#), 1.52 MB)
- [N11/3 Glazing Materials for Framing Works on Paper \(1996\)](#) ([PDF Version](#), 1.37 MB)
- [N11/4 Wheat Starch Paste \(1993\)](#) ([PDF Version](#), 604 KB)
- [N11/5 Matting Works on Paper \(1997\)](#) ([PDF Version](#), 1.23 MB)
- [N11/6 Removing Paper Artifacts from Their Frames \(1993\)](#) ([PDF Version](#), 957 KB)
- [N11/7 Basic Care of Books \(1995\)](#) ([PDF Version](#), 42 KB)
- [N11/8 Display Methods for Books \(1994\)](#) ([PDF Version](#), 709 KB)
- [N11/9 Framing Works of Art on Paper \(1995\)](#) ([PDF Version](#), 1.06 MB)
- [N11/10 Encapsulation \(1995\)](#) ([PDF Version](#), 1.22 MB)

Additional Information: Where to start...



Guide to Collections Care

<https://www.gaylord.com/resources/guide-to-collections-care>



Guide to Collections Care

Written by conservators, our illustrated primer covers the proper handling and storage of paper, photographs, textiles and books. This guide also includes case studies and a list of several additional resources.

Browse the guide online by section with the links to the left, request a printed copy, or view or download the digital version.

REQUEST COPY

<https://www.gaylord.com/request-a-catalog>

VIEW DIGITAL GUIDE

<http://online.fliphtml5.com/fjtq/gtnm/#p=1>

DOWNLOAD PDF

<https://p.widencdn.net/aqvadn>



Additional Information: Where to start...

The Permanence and Care of Color Photographs: Traditional and Digital Color Prints, Color Negatives, Slides, and Motion Pictures



Color by: *Photograph* - August 14, 1982. (Courtesy of the John F. Kennedy Library)

This document originated at www.wilhelm-research.com on June 6, 2003 under the name: *HW_Book_v1c_HiRes_v1.pdf*

Henry Wilhelm
with contributing author
Carol Brower

http://www.wilhelm-research.com/pdf/HW_Book_761_Pages_HiRes_v1c.pdf



Additional Information: Where to start...

Image Permanence Institute Websites

Image Permanence Institute

Graphics Atlas

Dew Point Calculator

eClimateNotebook

Sustainable Preservation Practices

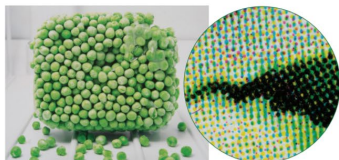
FilmCare.org

dp3project.org

Additional Information: Where to start...

IPI's Guide to: Preservation of Digitally-Printed Images

Electrophotography



Dye Sublimation



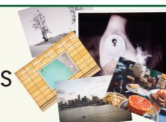
Inkjet



https://s3.cad.rit.edu/ipi-assets/publications/dp3_guide.pdf

IPI Guide to Preservation of Digitally-Printed Photographs

by Daniel Burge, Image Permanence Institute

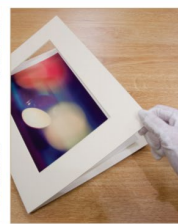


INTRODUCTION

This guide provides basic information on the storage and preservation of digitally-printed photographs in scholarly and cultural collections. While there are many printing technologies for output from computers, this guide focuses on the three most popular forms of image (i.e. pictorial) hardcopy:

- Inkjet
- Digital electrophotography
- Dye sublimation

Information on recommended storage conditions, selection of housing and framing materials, proper handling and display are included. Collection care personnel in cultural institutions are the intended audience for this guide, however, it will also be useful to photographers, artists, and the general public.



DIGITAL PRINT PRESERVATION PORTAL (DP3)

Since 2007, the Image Permanence Institute (IPI) has been evaluating the stability of digitally printed materials and developing techniques for mitigating damage and extending their useful lives. Years of laboratory research have characterized the strengths and particular vulnerabilities of the major digital printing materials and technologies. Results have led to some significant conclusions on the preservation of these objects including:

- Digitally-printed photographs are highly variable in their sensitivities to decay forces
- Cold storage significantly reduces deterioration rates caused by natural aging and pollution, especially for inkjet
- Prints made using pigment inkjet can be very sensitive to abrasion
- Inkjet dyes can bleed when exposed to high humidity even for short periods
- Prolonged exposure to light can cause fade, yellowing, and embrittlement of both dye and pigment inkjet-printed photographs

DP3
digital print preservation portal

All of the work has been under the umbrella of the DP3 (Digital Print Preservation Portal) Project. Funding for the DP3 Project was provided by grants from The Andrew W. Mellon Foundation and the Institute of Museum and Library Services (IMLS). This guide presents a summary of research results with recommendations for preservation. The project website, www.dp3project.org, contains all of IPI's scientific research in this area as well as supplementary information to aid in the care of digitally-printed photographs including descriptions of the materials and technologies for each type, an online print identification tool, examples of deterioration, best practices for care, and additional resources.

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Humidity Extremes and Inkjet	3
Simplified Mixed Photograph Storage	3
Air Pollution	4
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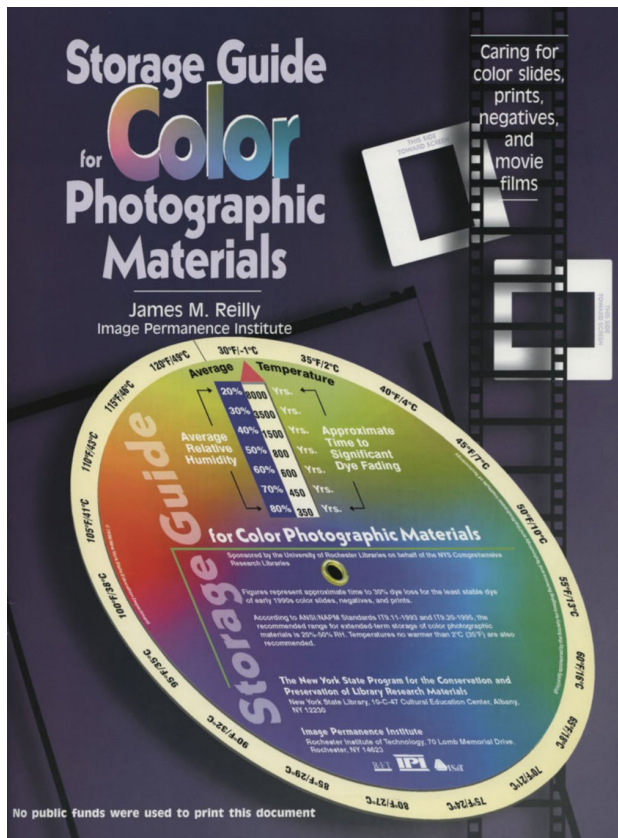
The DP3 Newsletter

You can keep up to date with all of IPI's work on digital print preservation by subscribing to the quarterly DP3 Newsletter. Sign up at www.dp3project.org.



http://www.dp3project.org/webfm_send/739

Additional Information: Where to start...



https://s3.cad.rit.edu/ipi-assets/publications/color_storage_guide.pdf




Additional Information: Where to start...

January 2010

A Consumer Guide to Materials for Preservation Framing and the Display of Photographic Images

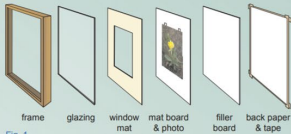
Created by Image Permanence Institute with support from Tru Vue



Framing and displaying your photographs (both traditional and modern digital) is one of the best ways to enjoy them and share them with your friends and family; however, it can also place great stress on them, resulting in fading, yellowing, embrittlement, and other types of decay, and ultimately reducing their lifespan. The goal of this guide is to help you understand why photos on display become damaged and how thoughtful framing and display practices can help keep your pictures safe. Let's start with describing the various parts of a good-quality frame.

ANATOMY OF A FRAME PACKAGE

A frame package is made up of several important parts that contribute to the decorative, rigid structure that protects a photograph on display. The individual parts of a good-quality frame package are shown in Fig. 1. More elaborate frame packages can include other components, but this shows the basic setup.



frame glazing window mat mat board & photo filler board back paper & tape

Fig. 1

The Frame
In addition to providing an attractive border, the frame functions as the structural support that holds the entire package together. The frame must be strong enough to support the weight of all of the other framing materials and the photo, while hanging on the wall or standing on a shelf.

The Glazing
The glazing, which can be either glass or plastic (such as acrylic or polycarbonate), is the clear sheet over the face of the photo that provides protection from dust and pollution and that also filters out some of the harmful UV energy (see page 3). Glazing can be treated or coated with a variety of substances to more fully block damaging UV energy as well as to reduce reflections from its surface, making it easier to view the photo.

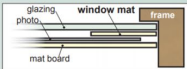


Fig. 2

The Window Mat or Spacer
The window mat can be a decorative element, but its main purpose is to hold the glazing away from the surface of the photo (see Fig. 2). In some instances, it may be desirable not to have a window mat but to have the edges of the photo go right under the edge of the frame. In this case, spacers are placed out of sight just inside the edge of the frame between the photo and the glazing (Fig. 3).

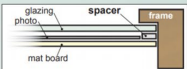


Fig. 3

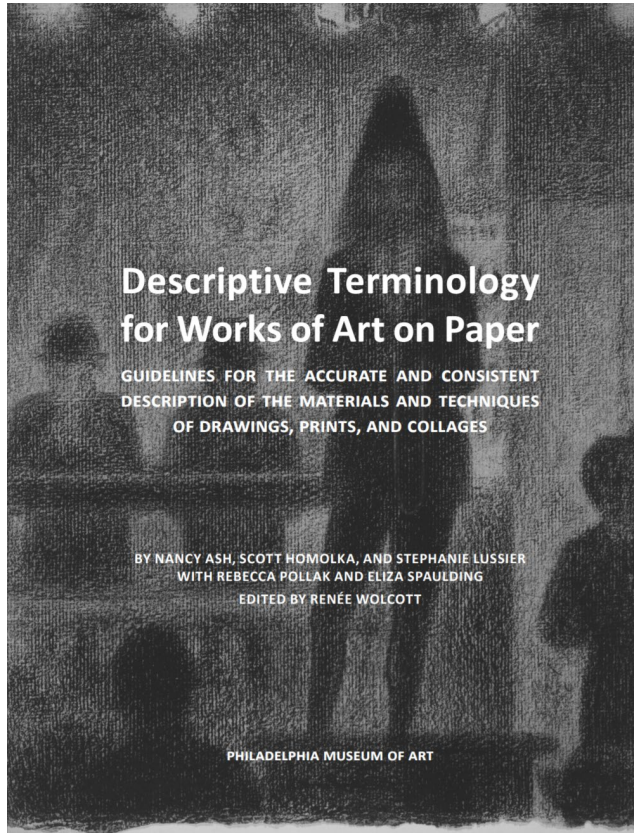
This document can be found in PDF format at <http://www.imagepermanenceinstitute.org>

1

https://s3.cad.rit.edu/ipi-assets/publications/framing_guide.pdf



Additional Information: Where to start...

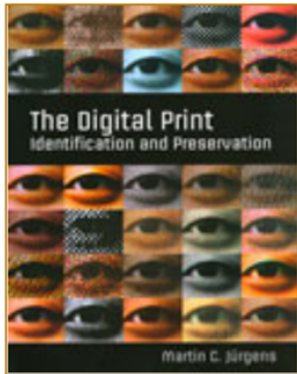


https://www.philamuseum.org/doc_downloads/conservation/DescriptiveTerminologyforArtonPaper.pdf



Additional Information: Where to start...

Books



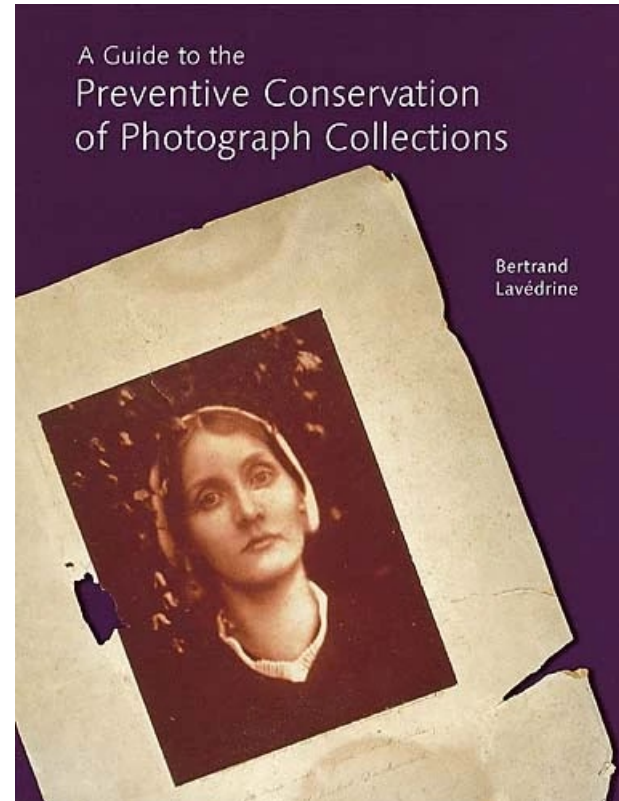
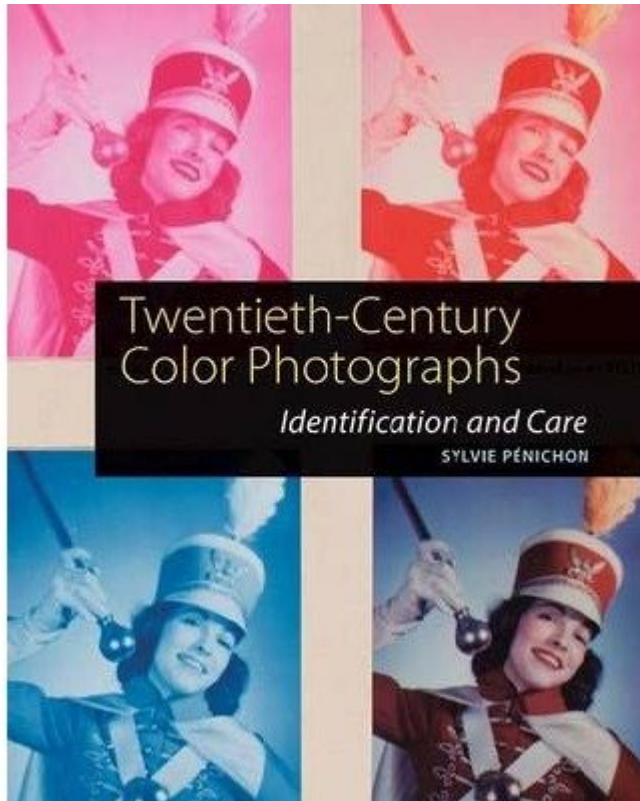
The Digital Print: Identification and Preservation by Martin C. Jürgens (2009)

This invaluable resource demystifies the complex, rapidly changing, and sometimes confusing world of digital print technologies. It describes the major digital printing processes used by photographers and artists over the past forty years, explaining and illustrating materials and their deterioration, methods of identification, and options for acquiring and preserving digital prints. A removable poster provides a ready reference for identifying specific processes and materials.

Available for purchase online from [The Getty](#).



Additional Information: Where to start...





Additional Information: Where to start...

