



Article: Basic Care of Face-Mounted Photographs at The Museum of Modern Art

Author(s): Erin Murphy

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Compiler: Brenda Bernier

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BASIC CARE OF FACE-MOUNTED PHOTOGRAPHS AT THE MUSEUM OF MODERN ART

Erin Murphy

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ABSTRACT

This study investigates the preservation of face-mounted photographs including conservation treatment, storage and handling practices. Cleaning materials for maintenance and protection of the surface were tested on facsimiles in order to determine the extent of their mechanical interaction with the acrylic surface. The results of treatment were evaluated qualitatively by photomicrographs and quantitatively by measuring percent change in specular and diffuse reflectance with the assistance of a Minolta CM2500d spectrophotometer. The second portion of this study includes results of a detailed condition survey of face-mounted photographs at The Museum of Modern Art and other fine art institutions, as well as a summary of current recommended storage and handling guidelines. Results of the study emphasize the importance of sound preservation practices for long-term protection of face-mounted photographs. The full paper, including images, is on file in the Conservation Department at the Museum of Modern Art.

1. INTRODUCTION

The Museum of Modern Art (MoMA) currently owns, acquires and exhibits face-mounted photographs by various contemporary artists such as Andreas Gursky, Thomas Ruff and Thomas Demand. As part of a long-term project by the Conservation Department at MoMA, this paper presents cleaning options and storage practices which may prolong the life of face-mounted photographs. The findings, supported by materials research, testing and surveys may be applied in other institutions and private collections to better inform conservators, artists, collectors and curators in their efforts to preserve these unique objects. Although each artist uses slightly different materials and methods, the general construction of a face-mounted photograph consists of a sheet of poly (methyl methacrylate) permanently mounted to the image side of a chromogenic or silver- dye bleach photograph using a silicone adhesive or double-sided acrylic adhesive film. The photograph, adhesive and acrylic sheet are adhered by placing the layers together in an electronic press. Once mounted, the three layers become one indivisible object. Face mounting serves a dual purpose in that it provides a rigid support for large photographs and at the same time creates a unique aesthetic. The adhesive layer and acrylic sheet act much like the varnish layer on a painting by creating a super-saturated, luminous appearance, inviting the viewer into the scene. Any imperfection in the acrylic surface compromises the illusion.

Several terms have been used to refer to these photographic constructions including “face-mounted”, “face-laminated”, “Diasec[®]”, and “transverse-mounted”, although the latter is not widely used. “Diasec[®]” refers to a specific process involving use of a patented primer and silicone adhesive with mounting conducted at a licensed facility. Use of the term Diasec[®] should be limited only to those photographs whose mounting is known to have been completed at a licensed facility using the patented process and materials. The term “face-laminated” has been confused with “lamination”: a finishing technique involving direct application of a plastic film to the surface of a photograph. Therefore, “face-mounted” is the appropriate term for photographs mounted to acrylic or glass on the image side. Furthermore, the acrylic sheet itself is more appropriately referred to as “acrylic” rather than Plexiglas, Perspex or other proprietary names. Because each company produces a range of acrylic sheeting products with varying properties, it is not always possible to specifically identify the type of acrylic used unless the mounting facility or artist has provided the information. Whenever known, of course, the brand should be documented, as this information will ultimately be useful in evaluating the long-term aging properties of each acrylic type. Further discussion of the history, manufacture and aging properties of face-mounted photographs can be found in the research of Sylvie Pénichon and Martin Jürgens.

2. CONSERVATION CONCERNS AND TESTING METHODOLOGY

Poly (methyl methacrylate), commonly referred to as PMMA, is a relatively soft and thermoplastic material susceptible to mechanical damages through normal use and handling. PMMA may yellow upon aging and can swell, crack or craze due to internal manufacturing stresses or external stresses such as impact, high temperatures, or exposure to moisture or organic solvents. Several excellent conservation studies have been conducted on the interaction between PMMA and organic solvents. (Blank, 1990, 1988; Sale, 1988, 1993; Braun, 1999; van Oosten et al. 2002) Given the physical properties of PMMA and its interaction with solvents, even routine care of acrylic-based artwork requires careful consideration. Regular dusting is necessary for most objects while on exhibition and since the usual methods may cause scratching by dragging debris across the surface or from abrasiveness of the cloths or brushes, it is important to choose materials that are non-abrasive, lint-free and able to remove accretions with minimal interaction with the acrylic. Although there are many anecdotal accounts of both successful and unsuccessful conservation treatments of face-mounted photographs, there has been little published research on the effects of treatment. For this project a method of surface characterization was devised to quantitatively and qualitatively assess the effects of dusting materials, cleaning cloths and cleaning fluids – including proprietary cleaners. Since storage and handling practices can also cause significant damage, a group of commonly used packing materials was included in the testing. Products for this study represent only a small sample of those currently in use by conservators or those recommended by acrylic sheet manufacturers.

Dusting materials included:

1. Lambswool duster
2. Hake brush

3. Static Master brush
4. Cotton swab
5. Forced air (Dust Off)
6. A natural bristle dusting brush

Cleaning cloths included:

1. MicroFiber Cloth
2. Lint Free Wyp All
3. Pec Pad
4. Dust Bunny
5. Wet conditioned chamois-skin (10 ml deionized water)
6. Dry conditioned chamois-skin
7. Cotton flannel
8. Loose cotton

Acrylic cleaning materials included:

1. Deionized water
2. Deionized water:ethanol (1:1)
3. Novus 1
4. Brillianize
5. Sparkle
6. Saliva
7. Photo-flo (full strength)
8. Photo-flo (diluted 1:200)

Facsimile face-mounted samples were created for testing and the methodology simplified to ensure that testing could be repeated in a variety of situations without the need of specialized testing equipment. All the materials tested are commercially available. The facsimile face-mounted samples consisted of a black and white grid (printed on Kodak Picture inkjet paper) mounted to a 5x5 x 3/8-inch thick piece of CYRO Acrylite FF continuously manufactured acrylic sheet. A clear, double-sided, pressure-sensitive adhesive film (Clear Mount acrylic adhesive film) was used to adhere the image to the acrylic. The samples replicated the essential components of a face-mounted photograph and the solid black background allowed changes to the acrylic surface to be readily apparent. Each grid was divided into 1½ x 1½ inch testing areas so that up to eight different materials could be tested on a single grid with a center square designated as the control area. Each testing category had its own grid: Dusting Materials, Cleaning Cloths, Cleaning Fluids and Packing Materials.

Changes in the acrylic surface were evaluated by two methods: 1) spectrophotometric assessment of changes in specular and diffuse reflectance and 2) visual assessment using photomacrographs of the acrylic surface. Reflectance changes were measured with a Minolta CM2500d spectrophotometer capable of reading both diffuse and specular reflectance. Each square on the grid was measured before and after testing to determine percent change in reflectance. Visual assessment was carried out by taking photomacrographs before and after testing each area. A Mylar grid was used to realign

the facsimile at each stage of the testing procedure. Images were captured digitally at 50x magnification under bright field and dark field illumination and using Differential Interference Contrast (DIC). DIC is a microscopy lighting technique that emphasizes the surface characteristics of a sample. Differences in thickness of the specimen, in this case due to scratches, appear as differences in brightness or contrast. Ultimately, the images captured using DIC lighting provided the most useful visual information.

For repeatability and accurate comparison between materials, the amount of force used during testing was standardized. For dusting, each material was attached to a ring stand with the tips touching the acrylic surface; the grid was then moved back and forth 50 times. The forced air was tested with 15 short bursts. To test the cleaning cloths and packing materials, a small sample of each was wrapped around the end of a wooden tongue depressor and secured with double sided tape. During the test, each sample was aligned in the center of its designated square and weighted with 2 pounds (approximately 1.3 pounds per square inch). The weight standardized the amount of force exerted in each test and to exaggerated the mechanical interactions, thus simulating repeated cleaning over time. When placed on the acrylic mock-up, the weighted paddle was moved back and forth over the square thirty times. To evaluate cleaning fluids, thirty drops of each fluid were placed on a wooden paddle covered with MicroFiber cloth and moved back and forth across the grid square thirty times.

2.1 RESULTS OF TESTING

Following testing, each square was measured for change in percent reflectance and assessed visually using photomicrographs. The results of testing are summarized in the following tables.

Table 1. *Dusting Materials*

PRODUCT	VISUAL CHANGE	% SPECULAR CHANGE	% DIFFUSE CHANGE	OVERALL PERFORMANCE
A1: Lambswool	Minor scratches	-0.45	0.97	Good
A3: Static Master	Moderate debris and scratches	-0.60	1.99	Poor
B1: Forced Air	Minor debris	0.02	0.07	Good
B2: Control	Minor debris	-0.11	0.27	-
B3: Hake Brush	Minor scratches Moderate debris	-3.17	4.55	Poor
C1: Dusting Brush	Severe debris	-3.00	4.28	Poor
C3: Cotton Swab	Moderate debris Moderate scratches	-2.34	4.79	Poor

All contact-dusting materials showed an *increase* in diffuse reflectance (indicating scratching or deposition of debris) and a *decrease* in specular reflectance. The reflectance data shows that removal of dust using a non-contact, forced air method (B1)

caused the least amount of change in surface reflectance. Please note, however, forced air in a can contains propellants that may be detrimental to the acrylic surface and should not be considered a viable option. An air bulb is recommended as an alternative. Portable, static-neutralizing compressed air units and ionizing guns like those used in industrial clean rooms show more promise although these have not yet been tested with works of art. Until other non-contact methods are fully tested, the use of a lambswool duster appears to be an acceptable method of dust removal. Compared to other contact methods, the lambswool duster created significantly less reflectance change.

The reflectance data was supported by the changes observed in the photomicrographs. An increase in diffuse reflection for the swab and the brushes was confirmed by multiple scratches and significant debris on the surface of the acrylic. The lambswool and Dust-Off, which created comparatively minor changes in diffuse or specular percent reflection, showed little or no debris deposition or scratching on the acrylic mock-up in the post-testing photomicrographs.

Table 2. *Cleaning Cloths*

PRODUCT	VISUAL CHANGE	% SPECULAR CHANGE	% DIFFUSE CHANGE	OVERALL PERFORMANCE
A1: MicroFiber	Light, minor scratches	1.42	-0.32	Good
A2: Lint Free Wyp All	Multiple deep grooves	-0.45	-1.27	Poor
A3: Pec Pad	Multiple deep grooves	-0.12	1.20	Poor
B1: Dust Bunny	Minor scratches	-0.75	2.28	Fair
B2: Control	Minor debris	0.26	0.86	-
B3: Wet Chamois	Deep scratches Pooling of moisture	0.11	0.88	Poor
C1: Cotton Flannel	Moderate debris Deep scratches	0.14	0.65	Poor
C2: Loose Cotton	Moderate scratches Moderate debris	-0.33	1.83	Poor
C3: Dry Chamois	Light, minor scratches	0.23	0.33	Good

The results of the cleaning cloth tests were more ambiguous than those of the dusting materials. In general, all cloths showed an increase in diffuse reflectance but relatively minor change in percent reflectance overall (a range of -1.27% to 2.28%).

However, visual examination of the samples conflicted with much of the spectrophotometric data. For instance, even though the data for the Lint-Free Wyp-All (A2) and the Pec Pad (A3) indicated minor reflectance change, these materials consistently produced deep grooves in the acrylic surface. Likewise, cotton flannel (C1), loose cotton (C2) and wet chamois (B3) produced an unacceptable amount of scratches, debris and other surface anomalies despite relatively small changes in reflectance data. Overall, the best performers, visually, were the dry chamois (C3) and the MicroFiber cloth (A1). The dry chamois produced minor reflectance changes and minor scratches,

but under high magnification, the MicroFiber cloth showed significantly fewer scratches. In repeated tests, the MicroFiber cloth produced the fewest number of scratches and least amount of debris in comparison to all the other cloths tested.

Table 3. *Cleaning Fluids*

PRODUCT	VISUAL CHANGE	% SPECULAR CHANGE	% DIFFUSE CHANGE	OVERALL PERFORMANCE
A1: Deionized water	Minor pooling	1.02	0.23	Good
A2: Deionized water:ethanol (1:1)	Minor pooling	1.14	-0.19	Good
A3: Novus 1	Significant residues	-2.40	0.59	Poor
B1: Brilliantize	Moderate residues	0.19	0.08	Fair
B2: Control	Minor debris	-0.04	0.45	
B3: Sparkle	Moderate residues with circular rings	0.44	-0.15	Poor
C1: Natural Enzymes	Significant residues and pooling	-0.37	0.77	Poor
C2: Photo-flo	Significant, grainy residues with moderate pooling	0.11	0.69	Poor
C3: Photo-flo (1:200)	Minor residues and pooling	0.76	0.38	Fair

Most of the cleaning fluids showed minor reflectance changes within the range of -0.37% to 0.77% . Note that although deionized water (A1) and deionized water: ethanol mixture (A2) exhibited an increase in specular reflectance of 1.02% and 1.14% respectively; an increase in specular reflectance may be considered a desirable result of cleaning.

The photomicrographs showed that all of the cleaners left a residue on the acrylic surface. This emphasizes that cleaning needs to be followed with a water rinse and drying in order to avoid pooling. (This technique was not used in the tests) The best performers, visually (indicated by minor residues; minor pooling; minor disturbance of the surface) were deionized water, deionized water and ethanol (1:1), Brilliantize and dilute Photo-Flo. Brilliantize was the only cleaner which had both acceptable visual results and minimal change in percent reflectance. Clearly, more investigation of cleaning fluids is necessary especially with regard to their long-term effects on acrylic. Since the use of cleaners requires rinsing with water to remove residues, perhaps the most conservative method is to use deionized or filtered water whenever possible followed with drying of the surface.

Table 4. *Packing Materials*

PRODUCT	VISUAL CHANGE	% SPECULAR CHANGE	% DIFFUSE CHANGE	OVERALL PERFORMANCE
A1: Bubble Wrap	Multiple severe scratches Minor residues	-8.90	6.36	Poor
A2: Dartek	Multiple, moderate scratches	-2.03	2.56	Fair
B1: Tyvek (textured)	Multiple, moderate scratches	-1.84	1.45	Fair
B2: Control	Minor debris	-0.15	0.62	-
B3: Tyvek (smooth)	Multiple, minor scratches. Minor residues	-1.52	1.71	Fair
C1: German material (textured)	Multiple moderate scratches. Moderate residues	-1.67	1.03	Fair
C2: German material (smooth)	Multiple moderate scratches. Significant residues	-15.87	13.99	Poor

The changes caused by packing materials were far more dramatic than those caused by cleaning cloths, dusting materials or cleaning fluids. Packing materials tested include bubble wrap, Dartek, Tyvek, and an opaque white wrapping material used during shipment of photographs from Germany (referred to in the chart as “German material”). For the Tyvek and the German wrapping material, both smooth and textured sides were tested. The reflectance data showed relatively minor changes to the acrylic surface with the use of either Dartek, Tyvek or the textured side of the German material (a change of approximately 1 -2%). However, the smooth side of the German material showed a 15.87% reduction in specular reflectance and 13.99% increase in diffuse reflection. FTIR analysis of this material reveals that it is made of polyethylene with a polyisoprene (rubber-like) material added for extra flexibility. This rubbery additive likely accounts for much of the surface gloss disturbance.

When the acrylic mock-ups were viewed under magnification, it was evident that all the packing materials tested caused damage. These results indicate that whenever possible, nothing should come in contact with the face of the photograph. For situations where the object absolutely must be wrapped, Tyvek appears to be an acceptable choice. Among its advantages: Tyvek contains no binders, sizing materials or fillers; creates very little lint; has excellent heat, chemical, moisture and tear resistance; and is an adequate light barrier. While several different types of Tyvek are manufactured by DuPont, archival grade 14M is most widely used in with fine art.

2.2 COMMENTS ON TESTING RESULTS

All of the dusting, cleaning and packing materials tested cause some degree of change to the acrylic surface. It is important to note, however, that the changes observed during testing were relatively small (less than +/- 5% for dusting, cleaning cloths and cleaning fluids) and that almost none of the treatments resulted in obvious visual changes under normal viewing conditions. Since the testing method was designed to exaggerate the mechanical interaction of the materials, the force used (1.3 pounds per square inch) is likely to be excessive for conservation treatment occurring during the lifetime of the piece. It is also important to keep in mind that although minimal change is best, an increase in specular reflectance may be considered a desirable result of cleaning. Overall, the testing results confirm that in order to ensure long-term preservation, contact with the face of the photograph should be strictly limited by providing adequate protection of the photographs during storage or transport.

3. CONDITION SURVEYS AND STORAGE AND HANDLING GUIDELINES

3.1 SURVEYS

Condition surveys of face-mounted photographs were conducted at the Museum of Modern Art, the Solomon R. Guggenheim Museum, Metropolitan Museum of Art, Los Angeles County Museum of Art, and Museum of Contemporary Art in Los Angeles. Sixty-three face-mounted works were examined from these venues and an additional eight photographs were examined for the Thomas Demand exhibition at MoMA in the spring of 2005. The survey documented date of production and acquisition, provenance, edition number as well as specific information regarding framing and hanging devices, storage environment, and materials and methods of manufacture. The final section covered condition of the acrylic sheet, photographic image, paper support and adhesive layer. The works encompassed a variety of range of dates, sizes, formats, artists and dates ranging from the late 1980s to those made only months before the survey in early 2005. The following chart is a summary of the types of condition characteristics and their frequency among the sample group.

Table 5. Survey Results

CONDITION	NUMBER OF PHOTOGRAPHS EXHIBITING CONDITION (OUT OF 71 TOTAL)	PERCENTAGE OF PHOTOGRAPHS EXHIBITING CONDITION
<i>Acrylic Damage</i>		
• Scratches/Abrasions	60	85%
• Dust/Debris	59	83%
• Accretions	37	52%
• Fingerprints/Smudges	35	49%
• Distortion	9	13%
• Cleaning Residues	8	11%
• Cracking/Crazing/Loss	1	1.4%
<i>Adhesion Problems</i>		
• Snowflakes, bubbles, delamination	9	13%
• Embedded debris	7	10%
<i>Damage to Image</i>		
• Image Deterioration (discoloration)	4	5.6%
• Losses/Mechanical Damage	2	2.8%

By far, most problems observed during the survey involved the acrylic sheet. Nearly every work exhibited some degree of debris, scratches, abrasions, accretions, fingerprints or other problem related to or requiring cleaning of the acrylic surface. More extensive mechanical damages such as loss, cracking, crazing, and distortion were observed far less frequently. While it is unclear exactly which factors play the greatest role in the development of distortions, it has been observed that works backmounted with Dibond or aluminum tend not to become distorted, while photographs backmounted with acrylic or other light-weight materials are more vulnerable. This indicates that mounting to a material with greater dimensional stability than acrylic can reduce the tendency towards distortion.

Surprisingly, the survey also revealed that there were very few problems related to deterioration of the photographic image (staining, fading, mechanical damage) or adhesion between acrylic and photograph. Occasionally, small local delaminations were encountered but these were generally associated with an uneven surface for example, due to a seam or debris trapped during the mounting process. Only two of the 71 works showed overall delamination patterns which Jürgens and Pénichon have indicated may be indicative of poor mounting or exposure to elevated temperature.

The survey also revealed that polishing marks are visible on the surface of the acrylic both during close examination and normal viewing depending on the skill with which the buffing was done. Whereas fresh, unpolished acrylic has an absolutely smooth surface, polished acrylic exhibits very fine, regular, circular or linear scratches. This indicates that even when polishing is expertly accomplished, the acrylic surface is permanently changed from its original appearance.

The survey also provided an opportunity to look closely at the impressive array of backmounting, framing and hanging techniques and materials used with face-mounted works. Artists are continually finding new and better ways of finishing and presenting their work; some of the materials used in backmounting include Masonite, Sintra, Dibond, aluminum, acrylic sheet, MDF board and aluminum honeycomb panels. Hanging systems include D-rings; metal, wood or acrylic cleats; and aluminum strainers or channels attached using silicone adhesive or pressure sensitive tape. The variety of finishing systems and materials presents a challenge for the conservator not only because of their varying aging properties, but also because storage systems and travel frames must be individually designed to accommodate the unique characteristics of each piece. Photographs with traditional wooden frames can be hung on racks using conventional hanging hardware while those without frames must be secured using customized cleats or other hardware. During the survey, many ingenious and practical solutions were observed including travel frames with padded restraint bars, foam blocks, and setscrew or cam-lock attachment mechanisms. Photographs were also stored on screens, in tills and flat files and housed in blue board boxes, wrappers and custom made trays. Colleagues are encouraged to share with one another their storage solutions as a means of collective problem solving.

3.2 BASIC STORAGE AND HANDLING GUIDELINES

3.2.1 Storage Enclosures

A travel frame is one of the best investments that an institution or an individual can make to ensure the longevity of a face-mounted photograph. These frames allow the work to be handled, packed, stored, viewed and transported without direct contact with the artwork. In addition, they provide a structure on which to attach non-contact, protective covers such as Tyvek, polyethylene sheeting or a rigid lid. Furthermore, travel frames can be adapted to fit various mounting styles of artists. Photographs with frames can be placed in a travel frame that holds the work in place by pressure on the frame with a system of pads, while frameless works must be secured into the travel frame via the hanging system. When a travel frame is not possible, protection can be provided by placing a wide rigid collar around the exterior of the artwork with polyester sheeting attached to the front of the collar to minimize dust from settling on the surface during storage.

3.2.2. Storage Environment

The impact of cool or cold storage on the composite materials of face-mounted photographs has not yet been fully studied. At MoMA, storage is decided on a case by case basis. In general, small face-mounted works are stored vertically in tills, while medium size face-mounted works (approximately 30 x 40 inches to 4 or 5 feet) are stored

in travel frames on sliding screens. The largest photographs (those over 5 feet in length) are generally stored in travel frames on platforms and secured to the wall. MoMA continues to reevaluate and refine storage options.

3.2.3. Packing and Handling

Works are packed, stored and traveled in an upright position in order to reduce bowing of the acrylic and stress on the structure of the artwork. In general, face-mounted photographs are wrapped for transport only if an appropriate crate has not been made. In addition to other factors, an appropriate crate is one that is waterproof and allows for expansion and contraction of the acrylic face. If for some reason a custom travel frame is not made, the work is wrapped in Tyvek to protect against other more abrasive materials, such as wood or Ethafoam, which may come into contact with the artwork. The workrooms or galleries are cleaned before packing, unpacking or installation and a photograph conservator and several art preparators are present when the works are handled. When photographs are unpacked, they rest on carpet-covered blocks or neoprene pads to elevate them from the floor surface.

Because of their weight, size and delicacy, face-mounted photographs must be handled using common sense. While gloves are strongly suggested, those handling the art must be sure to have a secure grip in order to avoid injury and damage. Cotton gloves do not always provide the grip necessary and gloves with rubber “nubs” on the fingers or palms leave marks requiring further cleaning. Latex or nitrile gloves provide adequate grip and reduce fingerprints on the surface of the photograph which ultimately reduces the need for cleaning. In addition, having an appropriate number of trained, experienced art handlers is paramount to successful and trouble-free installation or packing. Larger works can require between three to six art handlers to safely hold or lift the artwork while one or two additional people install hanging hardware.

3.2.4. Exhibition

Photographs are generally displayed at 5-10 footcandles. At the current time, stanchions or “electronic eye” systems are not being used to separate the public from the photograph during exhibition. Instead, each gallery is staffed with a guard who has been informed of the fragility of the artwork.

3.2.5. Travel

The photographs are fitted into travel frames and custom front-loading crates for transit. MoMA has rigid specifications for crate requirements covering all aspects of construction, linings, closures, travel frames, case markings and glazing treatment. Several modifications have been made to standard crate designs in order to accommodate the specific needs of face-mounted photographs, including lining the interiors with Tyvek or Marvelseal and enlarging the crates to allow space in front for natural expansion and contraction of the acrylic sheeting.

4. CONCLUSION

The results of the study emphasize the overwhelming importance of prevention of damage through appropriate preservation practices. To avoid unnecessary or possibly irreparable damage, contact with the acrylic surface of face-mounted photographs should be kept to a minimum. The following sections summarize basic recommended treatment and storage guidelines.

4.1 RECOMMENDATIONS FOR TREATMENT

1. Remove dust first.

If possible, remove dust using a non-contact method such as an air-bulb. A clean lambswool duster is also acceptable. Purchase and clearly label a duster that will be used only for face-mounted photographs. Keep it clean by storing it in a plastic bag, and shake it out often during dusting (away from the front of the photograph) or invest in a vacuum made just for cleaning lambswool dusters.

2. Follow dust removal with local cleaning of accretions or fingerprints.

The dry chamois and MicroFiber cloth created minimal disruption of the surface. Both are acceptable, but under high magnification, the MicroFiber cloth produced fewer scratches. These cleaning cloths consistently produced good visual results and very little debris during testing.

3. Use cleaning fluids in moderation.

Since all cleaning fluids leave a residue and need to be followed with rinsing and drying to avoid pooling, the most conservative approach is to clean with water only. More investigation into the long-term effects of solvents and other cleaning fluids is necessary.

4.2 RECOMMENDATIONS FOR STORAGE

1. Limit contact with the face of the artwork.

2. Invest in a travel frame or other protective enclosure.

Any institution actively collecting face-mounted photographs should also invest in a travel frame or other protective enclosure at the time of acquisition. The initial investment will yield long-term benefits by providing a sturdy structure for handling and protection against mechanical damage. If a rigid lid or a protective sheet is added to the front of the travel frame, accumulation of dust and debris will be also minimized. .

3. Use caution with packing materials.

It is best if the surface of a face-mounted photograph is not in direct contact with any material. However, Tyvek may be considered in cases where wrapping is absolutely necessary in order to provide some protection for the artwork. Tyvek tested relatively well for non-abrasive qualities and is a durable, effective moisture and light barrier.

4.3. SUGGESTIONS FOR FUTURE RESEARCH

The research presented in this paper represents a preliminary effort to understand the preservation of face-mounted photographs. At the present time, a number of conservators and institutions are researching other cleaning and treatment options such as filling and polishing. The long-term effects of aqueous-based cleaning fluids and other solvents require further examination including aging tests of samples which have been cleaned. Similar testing needs to be done to determine the effects of various packing materials on acrylic and a variety of acrylic sheet brands need to be tested in order to compare their physical properties and long-term aging characteristics.

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SOURCES OF MATERIALS

ClearMount Acrylic Adhesive Sheet
Available from Talas
20 West 20th Street, NY, NY 10011
www.talasonline.com

CYRO Acrylite FF acrylic sheet
CYRO Industries
379 Interpace Parkway Drive
Parsippany, NJ 07054-0677
Tel: 800-631-5384
Fax: (973) 541-8447
www.cyro.com

Tyvek and Dartek
E.I. duPont de Nemours and Company
P.O. Box 80728, Wilmington, DE 19880
(800) 448-9835
www.tyvek.com

Static Master brush
Available from Talas
20 West 20th Street, NY, NY 10011
www.talasonline.com

Forced air (Dust Off)
Available from Talas
20 West 20th Street, NY, NY 10011
www.talasonline.com

MicroFiber cloth
TAP Plastics, Inc
800-246-5055
www.tapplastics.com

WypAll X-70
Kimberly-Clark Corp
1400 Holcomb Bridge Road
Roswell, GA 30076
Phone: 888-346-4652
Fax: 800-654-8270

Pec Pads
Photographic Solutions, Inc.
PO Box 135, Onset MA 02558
508-759-2322
www.photosol.com.

Dust Bunny Cloth
Formerly available from Talas
www.talasonline.com

Chamois cloth (sheep skin)
Available from Talas
www.talasonline.com

Novus 1
Novus Inc.
10425 Hampshire Avenue South
Minneapolis, MN 55438

Brillianize
Kleenmaster: The Brillianize Company
4966 Industrial Way
PO Box 867
Benecia, CA 94510
1-800-445-9344
www.brillianize.com.

Sparkle Glass Cleaner
A.J.Funk & Co.
1471 Timber Drive
Elgin, IL 60123
877-225-3865
www.glasscleaner.com

Photo-Flo 200
Kodak Picture Paper
Eastman Kodak Company
Kodak Professional Division
Rochester, NY 14650.
www.kodak.com/go/professional

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