



CCI Notes

11/3

Glazing Materials for Framing Works on Paper

Introduction

Glazing is the protective covering used in framing artwork. The two most common glazing materials are glass and plastic.

The primary function of a glazing material is to provide a work of art with protection. However, both aesthetic and conservation considerations should influence the choice of material and framing technique. When choosing a glazing material, it is important to be familiar with the different types of glass and plastic and with the properties of each.

All glazing materials should include the following basic properties. They should be inert, rigid, impervious to air and water vapour, and colourless. Other properties that glazing materials may have include being non-glare or anti-reflective, and UV filtering.

Ultraviolet Filtering

Ultraviolet radiation (UV) causes weakening and yellowing of paper and other organic materials. UV may also affect media, causing colours (dyes and pigments) to fade or change. Clear glass transmits over 90% of visible light and only cuts

out UV below 300 nanometres (nm). Therefore, UV-absorbing filters are designed to cut out the UV component between about 300 and 400 nm. If UV levels in a museum or gallery are higher than 75 microwatts/lumen and if windows and lights do not have UV filters, it is recommended that glazing with a UV filter be used.

Until recently, clear picture framing glass was not available with UV filters. However, Tru Vue Conservation Glass and Conservation Reflection Glass with UV filters are now available. Plastics, such as Plexiglas UF-5, are also available with UV filters. However, none of these materials filter out all of the harmful UV.^{1,2} Therefore, it is recommended that these glazing materials be used in conjunction with appropriate ultraviolet and lux levels to slow deterioration of the artwork.

The following types of glazing have been tested at the Canadian Conservation Institute and are recommended as UV filtering materials.³

Glass

Tru Vue Conservation Glass
Tru Vue Reflection Conservation
Glass

Plastic

Acrylite OP-2
Acrylite OP-3
Acrylite FF-OP-3
Acrylite FF-OP-3 P99
Lexan 9034
Lexan MR-5
Lucite UF-3
Lucite UF-4
Perspex UVA-5
Picture Saver UVF
Plexiglas UF-5
Shinkolite

If glazing is not UV filtering, other steps should be taken to eliminate or reduce the UV content of the light illuminating the artwork (see CCI Notes 2/1, *Ultraviolet Filters*).

Glass

Advantages of Glass

Electrostatic charge: Glass picks up very little electrostatic charge. It is therefore recommended for use with all friable (loosely bound) media.

Abrasion: Glass is more resistant to scratching than many plastics.

Rigidity: Glass is rigid. A 2 mm thickness of glass, accommodated by most frames, will remain rigid even when used for large works.

Thickness: Picture framing glass is usually 2.0 mm or 2.5 mm thick. The 2.5 mm thickness may be preferable because it is more resilient, is less likely to chip, and is easier to handle safely.

Glare reduction: “Non-glare” or “anti-reflective” are types of glass that have been treated to reduce or eliminate the reflections caused by ordinary glass. Standard non-glare glass is etched on one side to create a finely blurred surface that scatters light, thereby reducing glare. This glass has a hazy appearance that is reduced only if the glass is placed in direct contact with the artwork. Since conservation framing requires a space between the artifact and the glazing, this type of non-glare glass is **not** recommended.

Denglas, sheet glass treated with a coating, significantly reduces glare without sacrificing transparency. It is used in the same manner as uncoated glass, i.e., it can be placed at any distance from the object. However, it may show a slight purple or green cast. Two types of Denglas are available: standard and laminated. Laminated Denglas is a non-reflective glass that offers additional safety glass protection (impact resistance). However, it is too greenish, too heavy, and too expensive for framing purposes.

Ultraviolet filters: **Tru Vue** provides a “Conservation Series” of glass products with UV filters: Tru Vue Conservation Clear Glass and Conservation Reflection Control Glass. Like Denglas, the Tru Vue Conservation Reflection Control Glass is a non-glare glass that may be used at a distance from the artwork, with a breathing space (see below) of up to 3 matboards. These two Tru Vue products have been tested and are recommended as satisfactory UV filters, i.e., they transmit less than 75 microwatts/lumen as measured by a UV monitor.

Disadvantages of Glass

Weight: Glass is heavier than plastic. When using large sheets of glass, sturdy frames and adequate hanging systems are required. Hooks and wires must be strong enough to carry the weight of the mounting material, frame, and glazing.

Brittleness: Glass is sharp, breaks easily, and is a hazard when being cut, installed, or shipped. Before shipping works of art glazed with glass, apply masking tape in a grid pattern over the glass so that, should the glass break, the splinters will be less likely to fall onto and damage the artwork.

A recent study suggests that taping glass may cause damage to unfixed pastel and other friable media. The static charge that builds up during taping and tape removal may transfer pastel from the work to the glass.⁴

If it is necessary to transport pastel drawings, carry them flat and face up to help reduce media loss. Spacing between the artwork and its glazing may be increased to reduce static charge. Using laminated glass is another option.

Plastic

Advantages of Plastic

Weight: Plastic is lightweight and is therefore an ideal glazing for large works or for works in travelling exhibitions.

Breakage: Plastic is less breakable than glass. When plastic breaks, the fragments are less hazardous to the work and to staff.

Ultraviolet absorbers: Plastics are available with UV filters for glazing light-sensitive works.

Disadvantages of Plastic

Electrostatic charge: Plastic glazing readily picks up and holds an electrostatic charge. Excessively dry atmospheres and the rubbing of plastic when cleaning it aggravate this tendency. A charged sheet attracts and holds dust on the outside surface. On the inside, the electrostatic charge can attract and hold flaking paint, or can lift particles from the image of friable media such as charcoal, pastel, chalk, and conté crayon. **Plastic material is therefore not recommended for glazing works with friable images or those with cracked or flaking paint.**

If plastic glazing must be used for reasons of weight or breakage, the problem of the image lifting may be reduced by increasing the distance between the work and the glazing. This can be done using 8-ply matboard rather than the more usual 4-ply, or by using a double mat; that is, using two superimposed windows.

Abrasion: Uncoated plastic glazing materials are susceptible to scratching and abrasion unless carefully handled and cleaned. Some plastics are

designed to be abrasion resistant (see below).

Bowing: Plastic materials are less rigid than glass and tend to bow when used to glaze large works. Large pieces of plastic must be 3 mm thick to avoid bowing. Often, this thickness will not fit into an average frame, which is designed to accommodate thinner glazing.

Glare: Sheet plastics are not coated to reduce glare. If glare cannot be reduced by adjusting lighting, consider using coated glass.

Types of Plastic

Plexiglas, an acrylic, is the sheet plastic most commonly used for glazing. It is available with or without UV absorbers. **Plexiglas UF-5** has been tested and is recommended for eliminating most UV radiation. **Plexiglas UF-3** is also effective, but has a noticeable yellow tint.

Acrylite and **Lucite** are acrylics similar to Plexiglas. Both are also available with a UV filter, e.g., **Acrylite OP-2** and **Acrylite OP-3**. **Lucite SAR** and **Acrylite AR OP-3** are considered to be resistant to abrasion.

Lexan 9034, a polycarbonate plastic, is much stronger and more resistant to abrasion and impact than acrylics. It is advertised as being unbreakable. **Lexan Margard MR-5** is similar to Lexan 9034, but has a hard silicone coating for superior resistance to abrasion. When used on pictures or in windows, both Lexans act as a safeguard against vandalism. Both types incorporate UV filters.

Considerations

Regardless of the choice of glazing material, the following general rules apply.

Breathing Space

A framed work of art should not touch the glazing. Leave a small breathing space between the glazing

and the artwork. This will help to avoid image transfer, staining, or mould growth. The inside of glass is subject to moisture condensation, which can be transferred to paper. A breathing space should be routinely provided for all works, but is essential for works with friable or flaking media, which tend to adhere to the glazing.

Use of a window mat of sufficient thickness is a common way to separate the glazing from the artwork. Where a mat is not desirable for aesthetic reasons, a variety of other techniques will create the proper separation (see CCI Notes 11/9, *Framing Works of Art on Paper*).

Proper Fit

Glazing materials should fit properly in the frame. If it is too tight or snug, glass will snap and plastic will bow. A fit that is too loose will create gaps and will allow dust into the frame. As a general rule, cut the glazing 3 mm smaller than the inside rebate so that it just drops into place. This will allow for expansion and contraction of materials (see CCI Notes 11/9, *Framing Works of Art on Paper*).

Original Glazing

Old or original glass should be retained in a historic frame when possible. Carefully examine an original glass for damage. Replace any glazing that is chipped, broken, or brittle (see CCI Notes 11/9, *Framing Works of Art on Paper*).

Cleaning

Remove dust from glass and plastic periodically with a soft brush or lint-free cloth.

Uncoated plastics, like Plexiglas, scratch more easily than glass. Do not clean them with rough paper towels and abrasive detergents; use acrylic cleaner and cheesecloth. An anti-static cleaner will help to prevent scratches and reduce static build-up on the interior face of the acrylic.

Remove glazing from the frame before cleaning with a liquid cleaner of any type. If removal is not feasible, spray the cleaner onto the cloth rather than directly onto the glazing. This will avoid liquid staining the mat or the artwork itself. Leave the glazing to air after cleaning (see CCI Notes 1/2, *Cleaning Glass and Acrylic Display Cases*).

Coated glass and plastics often have special requirements. Check the manufacturer's information for cleaning, cutting, and handling instructions.

Endnotes

1. Thomson, Garry. *The Museum Environment*. 2nd edition. Toronto: Butterworths, 1986, p. 17.
2. MacDonald, Maureen A. *Evaluation of UV Picture Frame Glass*. EDR Report No. 1708. Ottawa: Canadian Conservation Institute, 1991 (unpublished).
3. MacDonald, Maureen A. *Evaluation of UV Glazing Materials*. EDR Report No. 1912. Ottawa: Canadian Conservation Institute, 1995 (unpublished).
4. Norville-Day, Heather. "Pastels at Risk?" *Paper Conservation News*, No. 62, June 1992.

Suppliers

Most materials mentioned in this Note are available from glass retailers, plastics suppliers, or frame shops. Check the yellow pages of the telephone book for local suppliers.

Further Reading

Canadian Conservation Institute. *Matting Works on Paper*. CCI Notes 11/5. Ottawa: Canadian Conservation Institute, 1988.

Canadian Conservation Institute. *Framing Works of Art on Paper*. CCI Notes 11/9. Ottawa: Canadian Conservation Institute, 1995.

Canadian Conservation Institute.
Ultraviolet Filters. CCI Notes 2/1.
Ottawa: Canadian Conservation
Institute, 1994.

Canadian Conservation Institute.
*Cleaning Glass and Acrylic Display
Cases*. CCI Notes 1/2. Ottawa:
Canadian Conservation Institute, 1996.

Clapp, Anne F. *The Curatorial Care
of Works of Art on Paper*. 4th revised
edition. New York: Nick Lyons
Books, 1987.

Ellis, Margaret Holbein. *The Care
of Prints and Drawings*. Nashville:
AASLH Press (American Association
for State and Local History), 1986.

Fairbrass, Sheila. *Conservation Framing
of Prints, Drawings and Watercolours*.
London: Atlantis Paper Company
Ltd., 1986.

Glaser, Mary Todd. *Framing and
Preservation of Works of Art on Paper*.
New York: Sotheby Parke Bernet Inc.,
n.d.

Holm, Suzanne-Marie. *Le montage
et l'encadrement des œuvres sur papier*.
Québec: Ministère des Affaires
culturelles, 1986.

MacDonald, Maureen A. *Evaluation
of UV Picture Frame Glass*. EDR
Report No. 1708. Ottawa: Canadian
Conservation Institute, 1991
(unpublished).

MacDonald, Maureen A. *Evaluation
of UV Glazing Materials*. EDR
Report No. 1912. Ottawa: Canadian
Conservation Institute, 1995
(unpublished).

Norville-Day, Heather. "Pastels at
Risk?" *Paper Conservation News*,
No. 62, June 1992.

Thomson, Garry. *The Museum
Environment*, 2nd edition. Toronto:
Butterworths, 1986.

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