



CCI Notes

2/1

Ultraviolet Filters

Introduction

The damage caused to museum objects by light can be minimized by controlling the intensity of light and the amount of ultraviolet (UV) radiation to which the objects are exposed. Ultraviolet radiation, which is present in daylight and in the light from most fluorescent lamps, can damage many types of materials found in museum collections, such as textiles, paper, paint mediums, and pigments. In all areas where sensitive materials are exposed to fluorescent light, it is important to remove as much of the UV component of the light as possible. Removing UV radiation does not alter the level of illumination or the visual quality of the light.

The amount of UV radiation in any light can be measured with a UV monitor, such as the Crawford Type 760 (which is no longer manufactured) or the Elsec Type 762. These instruments read the **proportion** of UV radiation in the light source, so the reading is independent of the intensity of the light. According to museum norms, UV filtration is necessary when the proportion of UV radiation in the light is greater than 75 $\mu\text{W}/\text{lumen}$. The greater the reading, the more urgent the need for filtration. CCI Technical Bulletin No. 7, *Fluorescent Lamps*, lists the ultraviolet emissions from a variety of fluorescent lamps that were

measured in 1980. The majority of these lamps emit more than 75 $\mu\text{W}/\text{lumen}$ of UV radiation.

Recommendations

The simplest way to reduce UV radiation from fluorescent lamps is to install UV-filtering sleeves or tubes. Certain diffusers will also absorb UV radiation, but these are not necessarily adaptable to all fixtures.

There are two types of UV filters for lamps: soft, thin plastic sleeves and hard plastic tubes. Both types are equivalent in terms of efficiency and life expectancy. Both will retain their UV-absorbing properties for at least 10 years. It has been reported that thin sleeves with seams tend to separate at the seam after a few years. This can be remedied with a little adhesive tape. With time, some deterioration of the plastic (embrittlement) can occur, however this will not affect the UV-absorbing qualities of the plastic.

The amount of UV radiation in daylight can also be reduced by using UV-absorbing film on windows. UV-absorbing film can be either clear or tinted. The latter is useful for reducing the overall light intensity in a room as well as for reducing UV radiation. Most manufacturers recommend that the film be applied by professionals. According to most manufacturers, the life expectancy

of the film is five years, but this seems to be a conservative estimate. Many suppliers of plastics sell tubes, sleeves, and films, but there can be wide variations in the ability of these materials to absorb UV radiation. This Note lists the suppliers of a few products that have been found to be satisfactory and that are quite widely available (see "Suppliers"). However, if clients from Canadian museums or galleries wish to use a product from a different source, they may send a small sample (5 cm x 5 cm) of the product to be evaluated by the Canadian Conservation Institute for its UV-absorbing efficiency. Please note that any samples submitted should come from an actual product that is intended for use, as opposed to a sample from a manufacturer's advertisement display.

Suppliers

UV Monitor (Esec Type 762):

Cansel Survey Equipment
2414 Holly Lane
Ottawa, Ontario
K1V 7P1
(613) 731-4703

*Filter sleeves (UVA7 Acrylic
Tube Guard):*

The American Louvre of Canada Ltd.
650 Steeprock Drive
Downsview, Ontario
M3J 2X1
(416) 636-8111

*UV films (e.g., 3M Film product
SH2CLAR):*

Manufactured by 3M Canada Inc.
155 Lesmill Road
P.O. Box 1500
North York, Ontario
M3C 3V3
(416) 449-8010

Check the Yellow Pages under
"Glass Coating and Tinting" for an
office or distributor in your area.

Further Reading

Canadian Conservation Institute. *CCI Environmental Monitoring Equipment*. CCI Notes 2/4. Ottawa: Canadian Conservation Institute, 1993.

Lafontaine, Raymond H. *Environmental Norms for Canadian Museums, Art Galleries and Archives*. Technical Bulletin no. 5. Ottawa: Canadian Conservation Institute, 1979.

Lafontaine, Raymond H. and Patricia A. Wood. *Fluorescent Lamps*. Technical Bulletin No. 7. Rev. ed. Ottawa: Canadian Conservation Institute, 1982.

Copies are also available in French.

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