



THE MARK OF ENVIRONMENTAL RESPONSIBILITY

# GS-14

**GREEN SEAL™ ENVIRONMENTAL STANDARD FOR**

# WINDOW FILMS

**FIRST EDITION**

**JUNE 2, 1994**

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## **GREEN SEAL™**

Green Seal is a non-profit organization devoted to environmental standard setting, product certification, and public education. Green Seal's mission is to work towards environmental sustainability by identifying and promoting environmentally responsible products, purchasing, and production. Through its standard setting, certification and education programs, Green Seal:

- identifies products that are designed and manufactured in an environmentally responsible manner;
- offers scientific analyses to help consumers make educated purchasing decisions regarding environmental impacts;
- ensures consumers that any product bearing the Green Seal Certification Mark has earned the right to use it; and
- encourages manufacturers to develop new products that are significantly less damaging to the environment than their predecessors.

The intent of Green Seal's environmental requirements is to reduce, to the extent technologically and economically feasible, the environmental impacts associated with the manufacture, use and disposal of products. Set on a category-by-category basis, Environmental Standards focus on significant opportunities to reduce a product's environmental impact.

Green Seal offers certification to all products covered by its Standards. Manufacturers may submit their products for evaluation by Green Seal. Those which comply with Green Seal's requirements may be authorized to use the Green Seal Certification Mark on products and in product advertising. Manufacturers authorized to use the Green Seal Certification Mark on their product are subject to an ongoing program of testing, inspection, and enforcement.

For additional information on Green Seal or any of its programs, contact:

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## FOREWORD

**A. Certification.** This environmental standard contains the basic requirements for certain products (as defined in the Scope section below) to be certified by Green Seal™ and for their manufacturers to receive authorization to use the Green Seal Certification Mark on products and their packaging, and in product advertising. The requirements are based on an assessment of the environmental impacts of product manufacture, use, and disposal and reflect information and advice obtained from industry, trade associations, users, government officials, environmental and other public interest organizations, and others with relevant expertise. These requirements are subject to revision as further experience and investigation may show is necessary or desirable.

**B. Compliance with the Standard.** Compliance with this Standard is one of the conditions of certification of a product by Green Seal.

**C. Compliance with Government Rules.** In order to be authorized to use the Green Seal Certification Mark, the manufacturer of the certified product must disclose all governmental allegations or determinations of violation of federal, state, or local environmental laws or regulations with respect to facilities in which the product is manufactured. Certification will be denied any product manufactured in violation of environmental laws or regulations if, in Green Seal's judgment, such violations indicate that the environmental impacts of the product significantly exceed those contemplated in the setting of the standard.

**D. Limitations on Purpose of Standard.** Green Seal's standards provide basic criteria to promote environmental quality. Provisions for product safety have not been included in this Standard because government agencies and other national standard-setting organizations establish and enforce safety requirements.

**E. Substantially Equivalent Products.** Products that are substantially similar to those covered by this standard in terms of function and environmental impact may be evaluated and certified by Green Seal against the intent of the requirements of this standard.

**F. Unanticipated Environmental Impacts.** A product which complies with this Standard will not necessarily be certified by Green Seal if, when examined and tested, it is found to have other features which significantly increase its impact on the environment. In such a situation, Green Seal will ordinarily amend its standards to account for the unanticipated environmental impacts.

**G. Certification Agreement and Green Seal Rules.** In order to be authorized to apply the Green Seal Certification Mark to a product or its packaging, or to use the Green Seal Certification Mark in product advertising, the manufacturer of the product must (1) undergo an initial product evaluation to determine that the product complies with Green Seal's requirements, (2) sign a Green Seal Certification Agreement that, among other things, defines how and where the Green Seal may be used, (3) pay fees to cover the costs of testing and monitoring, (4) agree to an ongoing program of factory inspections

and product testing, and (5) comply with the requirements found in the most recent version of "Rules Governing the Use of the Green Seal Certification Mark."

**H. Disclaimer of Liability.** Green Seal™, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. Green Seal shall not incur any obligations or liability for damages, including consequential damages, arising out of or in connection with the interpretation of, reliance upon, or any other use of this Standard.

**I. Care in Testing.** Many tests required by Green Seal's Standards involve safety considerations. Adequate safeguards for personnel and property should be employed in conducting such tests.

**J. Referenced Standards.** Standards referenced in this document may have been superseded by a later edition, and it is intended that the most recent edition of all referenced standards be used in determining compliance of a product with this standard.

**K. Labeling Requirements.** This standard neither modifies nor supersedes government labeling requirements. Labeling language which varies in form from the requirements of this section may be used with the written approval of Green Seal.

## Green Seal™ Environmental Standard for Window Films (GS-14)

### 1. Scope

This standard establishes environmental requirements for residential retrofittable window films.

### 2. Definitions

1. **Retrofittable Window Films:** A flexible film which may be applied to the surface of the glazing of existing windows.
2. **Solar Heat Gain Coefficient (SHGC):** The ration of solar energy transmitted through a product, from the products outdoor side to the indoor side, to the solar energy striking the outdoor side of the product, for a given angle of incidence and for a given set of environmental conditions (indoor/outdoor temperatures, outdoor wind speed, insolation). Included are directly transmitted solar radiation as well as solar energy absorbed and then re-radiated/conducted toward the indoor side.
3. **Standard Double Glazing:** A double glazing comprising two overlapping parallel 1/8-inch thermally rated untreated clear glass panes separated by 0.5 inches. The standard double glazing is to be used as the reference glazing for evaluation of the optical properties of the retrofittable window films.
4. **Visible Light Transmission Coefficient (VLTC):** The ration of intensity of visible light (wavelength range of 0.38 to 0.78  $\mu\text{m}$ ) transmitted through a product glazing from the product's outdoor side to the indoor side, to the intensity of the visible light striking the outdoor side of the product, for a given angle of incidence, a given set of environmental conditions (indoor temperature and outdoor temperature), and a given visible light source.

### 3. Product Characterization

1. The center-of-glass SHGC and VLTC of a retrofittable window film shall be determined using the standard double glazing to which the film has been applied as recommended by the film's manufacturer.
2. The center-of-glass SHGC shall be determined according to the provisions determined according to the provisions of National Fenestration Rating Council (NFRC) Standard No. 200-93: Procedure for Determining Fenestration Product Solar Heat Gain Coefficients at Normal Incidence.
3. The center-of-glass VLTC shall be determined according to the provisions of NFRC Standard No. 300-93: Procedure for Determining Fenestration Product Optical Properties.

### 4. Product Specific Performance and Environmental Requirements

The ratio of the visible light transmission coefficient (VLTC) over its solar heat gain coefficient (SHGC) of the product applied to standard double glazing shall be greater than 1.

### 5. Packaging Requirements

1. The corrugated box used to package the product must contain at least 25% post-consumer material. The percentage of post-consumer material is to be based on fiber weight and calculated according to the following formula:

% post-consumer material =

$$[\text{PCFil}(\text{FWil})+\text{PCFol}(\text{FWol})+\text{PCFm}(\text{FWm})] / [\text{FWil}+\text{FWol}+\text{FWm}]$$

where

PCFil = % post-consumer fiber in the inner liner

PCFol = % post-consumer fiber in the outer liner

PCFm = % post-consumer fiber in the medium

FWil = fiber weight of inner liner

FWol = fiber weight of outer liner

FWm = fiber weight of medium

2. The sum of the concentration levels of lead, cadmium, mercury, and hexavalent chromium present in the corrugated shipping box or other packaging directly in contact with the product shall not exceed 100 parts per million by weight.

#### 6. Consumer Education Requirements

Pre-sales education materials meeting the following requirements must be made available to the consumer:

1. Materials must recommend to the consumer the manufacturer's most appropriate film for a variety of U.S. climate zones and all cardinal orientations within each climate zone. This recommendation shall be based upon annual energy performance and/or annual energy cost optimization as predicted by window simulation software like RESFEN - A Prototype PC Program for Calculating Residential Fenestration Heating and Cooling Energy Use and Cost, Lawrence Berkeley Laboratory.
2. Materials must clearly state the SHGC of all recommended products.
3. Materials must recommend that, when installing the film on multiple-glazed windows, the consumer check the window manufacturer's warranty before applying the window film because application of the film may void the warranty.
4. Proper installation instructions must be provided with the product.

#### 7. Labeling Requirements

1. The Green Seal Certification Mark shall appear on the product packaging.
2. The Green Seal Mark shall not be used in conjunction with any modifying terms, phrases, or graphic images that might mislead consumers as to the extent or nature of the certification.
3. Whenever the Certification Mark appears on a package or product, the product or package must contain a description of the basis for certification. The description shall be in a location, style, and typeface that are easily readable by the consumer. Unless otherwise approved in writing by Green Seal, the description shall read as follows:

"This product meets the Green Seal™ environmental standards governing visible light and heat transmission, packaging, and consumer education materials."