



November 13, 2009

Green Seal has been updating its Environmental Standard for Compact Fluorescent Lamps (CFLs), GS-5 since October 2007. The development of this standard is now complete. This standard includes product performance and quality requirements, health and environmental requirements, and packaging and manufacturing requirements. The result is that this standard will enable consumers to make more informed purchasing decisions and shift the marketplace to more responsible products. Certification applications to the standard will be accepted beginning November 13, 2009.

The last step to completing this standard was a final review by the stakeholders involved in the development of the standard. The stakeholders were invited to comment on the Draft Final Revised Standard with modifications made since the last version they reviewed (Proposed Revised Standard). These modifications were made as a result of the comments received on the Proposed Standard. This period was intended to serve as a final opportunity for stakeholders to review the modifications made in response to the stakeholder comments on the Proposed Standard before the standard was issued. Below are the notes on the slight modifications made as a result of this final review period. This is also followed by the comments received from the stakeholders.

**Note, that the project web site includes progress throughout the standard development process that led to this final version of the standard; scoping, proposed standard, response to comments, draft final standard, and issued standard.**

**Summary of Modifications to the Draft Final Standard**

*Specific changes are noted in the response to comments and a highlighted version of the final standard that follow.*

Magnetic ballasts are not allowed.

Ballast adapter performance was made more explicit. Alternative test methods for testing these products will be permitted.

Lead glass is not allowed

Lamp recycling requirements are above and beyond municipal options. And explanation of options will be made available through product information (e.g. web site) along with other important product information that may not be communicated on the product label like mercury content, CRI, and lamp clean up.

*By participating in Green Seal’s standard setting process, the following organizations that provided comments played an important role in Green Seal’s effort to encourage the design, manufacture and end use of environmentally superior products. Their assistance and involvement is greatly appreciated*

Green Purchasing Institute  
Osram Sylvania  
Public Research Works  
The United States Department of Energy  
Individuals

## **Comments from Stakeholders on the Draft Final Standard**

### **1.0 Scope**

#### **COMMENT:**

The scope of the standard is broader than that of the Energy Star program, which only covers CFLs with integral ballasts. Green Seal includes those with both screw based and pin based lamps and those with integral and non-integral ballasts. It also includes special purpose lamps (germicidal and bug).

#### **COMMENT:**

ENERGY STAR only qualifies products that have integrated ballasts and come in 3 distinct ANSI standardized bases (E-26, E-12, and GU-24 [which is administered by EPA under the Residential Light Fixture Program]). Are other base types eligible? In section 3.2 there is a reference to “units packaged with replaceable lamps, the ballast shall be tested to assure an average minimum rating of 1 lamp life cycle of 10,000 hours with ongoing testing to confirm a life expectancy of an average minimum of 4 lamp life cycles. How does the Green Seal label apply to ballasts?

#### **Response:**

The Green Seal standard does have a scope that is broader than ENERGY STAR, for example ballasts adapters and kits of lamps with ballast adapters are included. The lamps that are not covered by ENERGY STAR will be evaluated by Green Seal according to the lamp they most resemble that is included in ENERGY STAR – this is in line with the approach of rebate programs across the US, plus any additional requirements specified in the standard. Ballast adapters do not need to meet the requirements noted for lamps only. Integral ballasts are not evaluated separately from their corresponding self-ballasted lamps.

### **2.0 Definitions**

#### **COMMENT:**

The term “containers commonly used” is vague—taking 50% off ‘commonly used’ containers has no meaning if it is not defined. It would be better to provide weights by package type.

The term “substantial majority of communities” able to recycle packaging is vague. It would be clearer if certain types of packaging material that could be used, such as #1 or #2 plastic or paperboard/cardboard were included in the standard or accompanying guidance.

**Response:**

The term source-reduced is only referenced in the packaging section of the standard (7.2), as a result the term containers will be replaced with packages. Weights cannot be used in its place due to the wide range of package size and options available in the marketplace. The term substantial majority is aligned with the FTC guidance on the topic of recyclable. It is currently interpreted to include #1, #2 and paperboard/cardboard. The standard will remain aligned with FTC guidance since it permits for future development beyond those cited.

**3.1 ENERGY STAR compliance.**

**COMMENT:**

Only CFLs with integral ballasts can meet this requirement, since the ENERGY STAR criteria for CFLs does not cover CFLs with non-integral ballasts. This requirement contradicts the scope of the Green Seal standard.

**Response:**

The Green Seal standard does have a scope that is broader than ENERGY STAR, for example ballasts adapters and kits of lamps with ballast adapters are included. The lamps that are not covered by ENERGY STAR will be evaluated by Green Seal according to the lamp they most resemble that is included in ENERGY STAR – this is in line with the approach of rebate programs across the US. Ballast adapters do not need to meet the requirements noted for lamps only. This will be clarified throughout the standard, including performance requirements separated out for the ballast adapters, aligned with rebate programs. Integral ballasts are not evaluated separately from their corresponding self-ballasted lamps.

*ENERGY STAR Compliance. Lamps shall meet or exceed the ENERGY STAR Program Requirements for CFLs according to the base and type/design that applies, or most closely applies. The lamps that are not included in the scope of the ENERGY STAR program, will be evaluated against all the requirements for the product they most closely resemble with the option of using alternative test methods (see section 3.7).*

*Ballast. Integral ballasts and ballast adapters shall not be magnetic.*

*Ballast Adapter Power Quality. Ballast adapters shall have a high power factor (>0.9) based on an average of 10 samples and the current harmonic distortion in triplens shall be less than or equal to 20%.*

**COMMENT:**

ENERGY STAR is referenced as a requirement of Green Seal. How does Green Seal determine that products are in fact qualified? Do you reference the ENERGY STAR qualified products list? Do manufacturers self-report their qualification status? How are product performance requirements verified?

**Response:**

Green Seal will require the documentation that was submitted to ENERGY STAR. Green Seal will reference the ENERGY STAR partner web site, but will not rely on it as the sole source of information to verify compliance to this requirement.

**3.2 Product Performance Requirements**

**COMMENT:**

Minimum lamp life for all covered products is inconsistent with ENERGY STAR. In addition, lamp life for replaceable lamps is measured differently from that of CFLs with integral ballasts. The lamp life requirements need to be reconsidered and explained in better detail.

**Response:**

It is the intention of Green Seal to require a higher minimum lamp life than ENERGY STAR since the Green Seal standard identifies a more environmentally preferable subset of the marketplace and since this attribute of the product is a leading source of its environmental preferability. It is understood that different methods may be needed for some of the product types not covered in ENERGY STAR. As a result, an alternative test method section was added to the standard.

*Alternative Test Methods. Alternatively, a product can demonstrate adequate performance through using another scientifically validated test method under controlled and reproducible laboratory conditions if accompanied by justification for the method modification and documented in sufficient detail.*

**COMMENT:**

Bare CFLs should have a minimum rated life of 12,000 hours rather than the proposed 10,000 hours in order for GS-5 to remain a leadership standard (capturing the top 25% of the market). Our review of the list of ENERGY STAR-rated lamps reveals that there are hundreds of models that can meet a minimum rated life of 12,000 hours. We would support a proposal to allow manufacturers of lamps with a 15,000 hour rate life to be labeled “long life” but given the availability of cold cathode CFLs and LEDs with a much longer life, we think extra-long-life should be reserved for lighting products with a rated life of at least 25,000 hours. While there are fewer ENERGY STAR-rated CFLs with a rated life of 10,000 hours or more that are covered models, including A- reflectors- globe- candelabra-, and bullet-shaped bulbs, there are still enough models to give consumers a substantial choice at the marketplace. A higher rated life requirement will

encourage manufacturers to continue to strive for continuous improvement in the marketplace.

**Response:**

Green Seal reviewed the entire ENERGY STAR product listing and found that the average of all the products' lamp life was less than 9000 hours. Further, it was found that less than 7% of the products had a life of 12000 hour or more. When the CFLs are evaluated within more specialized lamp types (e.g. recessed lights), this significantly decreased. Thus, the life of 12000 hours or more represents more of a very high performing product, a niche, at this point. In this assessment, it was also found that products with lamp life with 15000 hours or more was 1.5% of the total. 15000 hours represents nearly twice the life expectancy for the products, thus a claim of extra long life is applicable. With the inclusion of the extra long life claim, there is incentive for manufacturers to provide products with such a market differentiating claim.

**3.3 – 40% of Lamp Life.**

**COMMENT:**

Requiring that the lumen output measured at 40% of lamp life be no more than 15 percent below average initial lumens is inconsistent with ENERGY STAR and would require additional testing. Furthermore, these are different specs than ENERGY STAR and would require different tests and a complete re-rating of the lamps. This inconsistency is extremely problematic, would lead to higher priced lamps and would not result in much added benefit.

**Response:**

The method used will be aligned with ENERGY STAR, and clarified in the requirement. The higher level of performance at 40% of lamp life results in higher quality products; products that have better lumen maintenance, and will be maintained in the standard.

*40% of Lamp Life. The lamp lumen output, measured as specified by ENERGY STAR, at 40% of the lamp's life shall be within 15% of average initial lumens.*

**3.4 – Safety.**

**COMMENT:**

Further clarification of a “third party” is needed.

**Response:**

A definition for third-party has been added to the standard.

*Third-Party. An entity without any financial interest or stake in the sales of the product or service being evaluated or other conflict of interest.*

**4.1 Product Specific Health and Environmental Requirements (Hg content)**

**COMMENT:**

The mercury content references a standard of less than 3 milligrams of mercury per unit. How is this tested? To our knowledge, there is not an industry adopted test procedure to determine Hg content.

**Response:**

**Green Seal will inspect manufacturing and quality control information, at a minimum, to confirm the level of mercury.**

**COMMENT:**

Requiring that all lamps contain less than 3 milligrams of mercury is arbitrary and vague. Is there a degree of manufacturing tolerance allowed? How much less than 3 mg? What if the lamp is exactly 3 mg? Furthermore, all lamps cannot be put into a single category. Are three-way lamps that operate on two separate burners considered two lamps or one? Some lamps are dosed differently and may never meet this criterion. However, the voluntary agreement of the NEMA companies sets a maximum mercury content for lamps, which is referenced by ENERGY STAR. It is recommended that this criterion, should Green Seal be determined to include it, be limited to a specific subset of CFLs where this is a technological possibility and there is, in fact, currently a wide range of doses.

**COMMENT:**

We continue to suggest reducing the mercury content limit to 2 mg of mercury, particularly for CFLs under 25 watts. We concede that high-wattage CFLs, such as those above 50 watts may need slightly more mercury to operate effectively over their life. However, because the State of California, under its Lighting Efficiency and Toxic Reduction Act (AB 1109) is adopting the European Union's Restriction on Hazardous Substances (RoHS) mercury content standards – which for self-ballasted CFLs was recently lowered 3.5 mg by 2012 according to a proposal adopted by the EU member states – setting a 3 mg limit would only be a marginal improvement rather than a leadership standard.

Green Seal should require manufacturers to disclose on their product packaging the amount of mercury in milligrams in each CFL model. Consumers have a right to know how much mercury is contained in the products they buy, and the relative potential hazard they could be exposing themselves to in the event of a broken bulb. The mercury content of CFL bulbs should also be easily accessible on each manufacturer's website. The European Union has adopted a similar labeling requirement under its Eco-Design Directive for Energy-Using Products. Such labeling would also help consumers choose low-mercury models. In addition, it would not only help ensure that each product meets the standard, but would also help Green Seal in establishing leading-edge standards for CFLs in the future. Currently, it is difficult for third party organizations to understand where to set mercury-content limits because there is limited data available about the mercury content of CFLs currently offered on the market. There is no reason why the verification of mercury content should be any less stringent than the verification of performance requirements for which manufacturers are required to submit third party documentation.

COMMENT:

I understand that the .01% equals 30 grams of lamp weight so the 3 mg restriction and the total weight of the mercury will always be below .01%. was that your intent? (assuming there are no other hazardous materials)

Response:

The information that is available suggests that the average mercury level is between 3-4 mg per lamp. As a result, mercury content of less than 3 mg was used to identify leaders in the product category (the purpose of this standard). There are a few examples of lamps with lower amounts of mercury, but these are typically the smaller or mini-spiral bulbs or cold-cathode bulbs, a small niche of the market. If legislation and industry progress to the point that a lower amount of mercury is more widespread, then this requirement will be updated later. The amount of mercury in the product should be accessible to the purchaser, thus the mercury content will be required to be readily accessible to consumers and purchasers (e.g. web site).

*Mercury Content. The product shall contain less than 3 milligrams of mercury per unit.*

*Right-To-Know. The following information, if it is not on the product label, shall be readily available to consumers and purchasers on the product web site and product information sheets:*

- *Color-Rendering Index*
- *Mercury content*
- *Lamp recycling collection options (see section 6.1)*
- *Broken lamp clean up instructions; unless otherwise approved in writing by Green Seal, the description shall read as follows:*

*“If lamp breaks, do not inhale. Open window, leave room, and close door behind you. Shut off air system. Stay away for 20 minutes. With gloves or plastic bags to protect hands, scoop up broken material with stiff paper or cardboard and seal in plastic bag or container with lid. Clean area with damp paper towels and seal in a separate plastic bag or container, include gloves. Dispose of properly. Wash hands thoroughly. Do not allow children or pregnant/nursing women to help with cleanup. Do not vacuum or sweep.”*

### **4.3 Product Specific Health and Environmental Requirements (Lead)**

COMMENT:

The standard should prohibit the use of lead in the glass of the CFL as well as the solder. In addition, at a minimum all CFLs should be RoHS-compliant and should only contain

lead, and also shall not be us in components (such as ceramics) when there is no other alternative technically feasible. `

**Response:**

Upon further investigation it was found that many of the major lamp manufacturers claim to be RoHS-compliant and even further, do not contain lead in the glass. Thus, the requirement will be modified to not allow for lead in the glass and the solder components. As a result, the lead-free claim will be removed and added to the statement of the basis for certification.

*Lead. The glass and solder components shall not contain lead.*

**4.4 Product Specific Health and Environmental Requirements (Flame Retardants)**

**COMMENT:**

A long list of flame retardants has been added. Please explain the rationale for this.

**COMMENT:**

Green Seal should prohibit all flame retardants that are brominated or chlorinated to prevent manufacturers from reformulating with slightly different recipes in order to meet the standard. Why is there a 5 gram minimum? We support the application of this standard to all components, no matter their weight.

**Response:**

The flame retardant section was added to be consistent with the EU Flower ecolabel program. It addresses chemicals that may not be specifically listed by name, but that are known to be hazardous. Thus, it will not be changed.

**5.2 Manufacturing Requirements (Code of Conduct)**

**COMMENT:**

Green Seal should ensure that the EICC code of conduct is enforced by requiring manufacturers to submit workplace audits at least on an annual basis.

**Response:**

The on-site audit during certification will verify compliance with this requirement and ongoing compliance will be included in the certification monitoring program. The criterion will be modified to make this clear.

*Code of Conduct. Manufacturers shall have and implement, documented with annual audit records, a code of conduct program that includes the criteria established by the Electronic Industry Code of Conduct (from EICC) covering labor, health and safety, environment, management systems, and ethics.*

**5.3 Manufacturing Requirements (Mercury in Manufacturing)**

**COMMENT:**

Green Seal should not permit mercury spraying in the dosing process and should require the safety of all alternative dosing methods be independently documented.

**Response:**

The intent of the requirement was to ensure that dosing is done in a closed or encapsulated method to minimize losses and worker exposure. This will be clarified in the standard. Green Seal will independently verify that any alternate methods are of equivalent efficiency and worker protection.

*Mercury in Manufacturing. If mercury is in the product, the manufacturer shall use encapsulated dosing methods to minimize mercury exposure to workers during product manufacturing. Other methods of closed, accurate, and precise dosing would be acceptable if proven, with documentation, to have similar or better dose efficiency and protection to worker exposure.*

**6.1 Lamp Recycling**

**COMMENT:**

Is an online program such as what many manufacturers currently have in place sufficient to meet this requirement? The second bullet requires information on the package, as pursuant to section 8.1. Currently, manufacturers include a label stating that the lamp contains mercury, manage in accordance with state and local guidelines, and offers a toll-free telephone number and the lamprecycle.org website where information pursuant to section 8.1 is located. Is this acceptable to meet this requirement? Also, how is the requirement to “provide direct consumer/customer access to a CFL collector and recycler” defined? Is information on a website sufficient?

**COMMENT:**

We recommend changing the word ‘can’ to ‘shall’ in the following sentence: “...This access can include a third-party provider or retailer partnership.” Further, ‘direct’ access needs to be defined.

Since CFL recycling rates have historically been very low, manufactures should be required to set recycling goals and achieve (with documentation) minimum lamp recycling rates of at least 50%.

**COMMENT:**

The end of life requirements are too weak. They should require the producers to have free, convenient and safe takeback programs for mercury-containing lighting, not just information on collectors. The State of Maine recently passed legislation to this effect. Some companies, such as GE, already participate in voluntary producer takeback programs such as the Thermostat Recycling Corporation for mercury-containing thermostats, are have supported producer takeback legislation for TVs, as they did this year for TVs. Having such weak proposed criteria in this regard is a disservice to Green Seal and the consumers you hope to serve. This requirement can help drive the industry

towards more responsible design, manufacturing and end-of-life of their products and speed the pace towards mercury-free energy efficient lighting.

**Response:**

This requirement will be clarified and reflect the progress in extended producer responsibility legislation in Maine and others emerging from different states. Further, relying on municipalities for take-back services may not be economical for the municipality. As a result, the manufacturer will be required to provide the take-back program themselves or through a relationship with a third-party - typically retailers.

*Lamp Recycling. Manufacturers shall have a recycling program in place to encourage and facilitate recycling of lamps in all markets where their CFLs are sold, including at least:*

- *Providing convenient CFL collection options free of cost to the user. This shall include options beyond municipal programs, such as but not limited to a third-party provider or retailer partnership.*
- *Information on the company website on the recycling program that links consumers/customers to the CFL collection options, through a link on the main CFL or lighting page for the company.*

**7.1 – Polyvinyl Chloride Package.**

**COMMENT:**

Retailers often dictate packaging requirements. In fact, many club stores (BJs, Costco, Sam’s Club) require plastic packaging for theft deterrence. It is often not possible to eliminate PVC from all packaging. Furthermore, section 7.3 states specific post-consumer material which may not be an option given global purchasing agreements for many of the manufacturers and existing global specs that may include post-consumer material but not in the amounts required by Green Seal.

**Response:**

Plastic packaging is permitted and thus would allow for meeting any retailer specification for this packaging design. However, PVC can not be used as the packaging material. PVC alternatives are currently used in the marketplace, thus feasible. As a result, the requirement will not be changed.

**7.3 Packaging Requirements**

**COMMENT:**

Source-Reduced Package—this is not the proper terminology for this heading, it should read “Recycled Content”. Source-reduced packaging is discussed in another section of the standard.

**Response:**

The heading for this section will be updated to be “Recycled Content Package.”

**7.5 – Heavy Metal Restrictions.**

COMMENT:

This is extremely confusing, as it relates to packaging. Is this in reference to Prop 65 in California? Please clarify this section as it is unclear.

Response:

This requirement is aligned with The Model Toxics in Packaging Legislation adopted by the Coalition of Northeast Governors (CONEG). This requirement is typically met by the packaging manufacturer attesting to meeting it. Given the this CONEG legislation widespread use, packaging manufacturers are used to this requirement.

**8.1.2 – Color Rendering Index.**

COMMENT:

Why is this included? ENERGY STAR defines this and it is unnecessary. Furthermore, the FTC is currently undergoing a process to re-evaluate packaging requirements for lamps, and CRI may be included in a different way that would be inconsistent with Green Seal’s requirements.

COMMENT:

Why is CRI a packaging requirement? Our understanding of the consumer tells us that they have a hard enough time grasping the concept of lumens and color temperature, CRI in our opinion, is not quite as important for the consumer to consider as these others which is why we do not require it on the packaging.

Response:

Green Seal will align with ENERGY STAR for the package labeling of CRI – not required on the label. However, to provide this information to purchasers looking for it, a section has been added for the CRI, and other relevant information, to be readily available to the consumer/purchaser in the product information sheets and web site.

*Right-To-Know. The following information, if it is not on the product label, shall be readily available to consumers and purchasers on the product web site and product information sheets:*

- *Color-Rendering Index*
- *Mercury content*
- *Lamp recycling collection options (see section 6.1)*
- *Broken lamp clean up instructions; unless otherwise approved in writing by Green Seal, the description shall read as follow:*

*“If lamp breaks, do not inhale. Open window, leave room, and close door behind you. Shut off air system. Stay away for 20 minutes. With gloves or plastic bags to protect hands, scoop up broken material with stiff paper or cardboard and seal in plastic bag or container with lid. Clean area with damp paper towels and*

*seal in a separate plastic bag or container, include gloves. Dispose of properly. Wash hands thoroughly. Do not allow children or pregnant/nursing women to help with cleanup. Do not vacuum or sweep.”*

### **8.1.3 – Mercury.**

#### **COMMENT:**

The added requirements for safe cleanup of broken product are almost impossible. First, there is very little room on the package to begin with, and most manufacturers sell lamps throughout NAFTA, requiring that any text be translated in three languages. This information can be made available on the manufacturer’s website, which is more appropriate – if a lamp breaks, it is unlikely that the consumer will have kept the packaging for referral. Even adding an insert with this information will add cost to the lamp for the consumer and will likely be ineffective since it will probably not be retained. Furthermore, any change to the cleanup guidelines by EPA cannot be changed on packaging overnight. They can, however, be changed on a website overnight.

#### **COMMENT:**

We are concerned about the mercury issue although we think that the health hazards due to breakage have been somewhat over blown. Eating tuna poses as much a risk as breaking a CFL according to some studies. In our opinion, the packaging requirement would do more harm than good and will only scare people of an issue that may be not that big of a threat.

#### **COMMENT:**

CFLs and their packaging should have the words, “This product contains mercury” printed on it, not just the abbreviation ‘Hg’ which the vast majority of consumers will not recognize. Information about the health hazards of mercury should also be included on the packaging. Consumers should be directed on product packaging to recycle CFLs and given specific information about how to recycle CFLs.

#### **Response:**

ENERGY STAR includes the requirements for the label to state “Lamp contains mercury.” So this does not need to be added. The requirement on mercury clean up and recycling will be moved from the label, which likely will not be available to the consumer/purchaser at that point in time, to the product web site and other product information sources. This also provides for the information to be more comprehensive – since labels have limited space for such information.

*Right-To-Know. The following information, if it is not on the product label, shall be readily available to consumers and purchasers on the product web site and product information sheets:*

- *Color-Rendering Index*
- *Mercury content*
- *Lamp recycling collection options (see section 6.1)*

- *Broken lamp clean up instructions; unless otherwise approved in writing by Green Seal, the description shall read as follows:*

*“If lamp breaks, do not inhale. Open window, leave room, and close door behind you. Shut off air system. Stay away for 20 minutes. With gloves or plastic bags to protect hands, scoop up broken material with stiff paper or cardboard and seal in plastic bag or container with lid. Clean area with damp paper towels and seal in a separate plastic bag or container, include gloves. Dispose of properly. Wash hands thoroughly. Do not allow children or pregnant/nursing women to help with cleanup. Do not vacuum or sweep.”*

### **8.1.6 Application Exceptions.**

#### **COMMENT:**

There are 3 way and dimmable CFLS, are you requiring that the non 3 way and non dimmable have a specific warning not to use the lamps in 3 way or dimming sockets? None of the manufacturers do that at this point.(and they will object that space is at a premium on the packing) Also looking at product literature, no one says not to use these lamps in those sockets. All the three way and dimming labels are positive messages on those lamps which will work in the 3 way and in the dimming sockets. What many manufacturers do say is that the dimming lamps do not work as the incandescent lamps do. Dimming will work down to about 20% and then cut the lamp off. At the higher end it may not begin dimming until power is reduced to about 50-60%

#### **Response:**

*The application exceptions are included in the ENERGY STAR program requirements, thus this requirement will be removed.*

### **8.3 – Certification.**

#### **COMMENT:**

This section requires a “third-party certification program.” This is vague and needs to be clarified. What is an acceptable third-party, and who would conduct an on-site audit?

#### **Response:**

*Definitions for third-party and third-party certification program have been added.*

*Third-Party. An entity without any financial interest or stake in the sales of the product or service being evaluated or other conflict of interest.*

*Third-Party Certification Program. A program without any financial interest or stake in the sales of the product or service being certified, or other conflict of interest. There must be a standard to base the certification upon and the standard must be appropriate and meaningful for its intended purpose. The standard must be publically available and developed with stakeholder input. Certification to the standard must be completed by an independent party*

*(e.g., not the manufacturer of the product being certified), include site inspections, where applicable, and have a monitoring program to verify ongoing compliance.*

COMMENT:

Certification Agreement and Green Seal Rules. The agreement includes the requirement to pay fees to cover the costs of testing and monitoring. Testing is not well defined, and there is no clear direction as to who would do the testing.

Response:

Green Seal certification is a voluntary program. Thus, fees are only required when one desires to be certified or claim to be certified to this standard. Testing requirements are aligned with ENERGY STAR and thus were not repeated in this standard. The manufacturer submits the testing data from reputable labs for Green Seal's independent third-party review.

## HIGHLIGHTED CHANGES

# GREEN SEAL™ ENVIRONMENTAL STANDARD FOR COMPACT FLUORESCENT LIGHTING (GS-5)

## 1.0 SCOPE

This Standard establishes environmental requirements for compact fluorescent lamps **and lamp systems**. This includes those lamps used for general illumination purposes, and can include those for some special purposes such as germicidal and bug lamps. The product group includes those with both screw based and pin based lamps and those with integral (e.g. self-ballasted) and non-integral ballasts (e.g. ballast adapters). **This standard excludes linear fluorescent lamps.**

**This standard assumes compliance with all applicable laws and regulations. As a result, in order to be certified to this standard, the service provider must disclose all governmental allegations or determinations of violation of federal, state, or local laws or regulations with respect to its business. Certification shall be denied any service provider in violation of laws or regulations if, in the certifier’s judgment, such violations indicate that the impacts of the service significantly exceed those contemplated in the setting of the standard.**

## 2.0 DEFINITIONS

**2.1 Ballast Adapter.** A unit that contains all elements that are necessary for starting and stable operation of the lamp, with an integral socket for a lamp.

**2.2 Compact Fluorescent Lamp (CFL).** A fluorescent lamp that is small and compact that may be self-ballasted or function with a ballast adapter. **May be referred to as a “lamp” in this standard.**

**2.3 Conversion Kit.** A set of field-installed components which converts a portable luminary (fixture) to a permanently installed ballast adapter, or remote ballast and socket adapter, with a replaceable compact fluorescent lamp.

**2.4 Intentional Introduction.** The act of deliberately utilizing a restricted material in the formation of packaging or a packaging component where its continued presence is desired in the final package or packaging component to provide a specific characteristic, appearance, or quality.

**2.5 Post-Consumer Material.** Material that would otherwise be destined for solid waste disposal, having completed its intended end-use and product life cycle. Post-consumer material does not include materials and by-products generated from, and commonly reused within, an original manufacturing and fabrication process.

**2.6 Primary Packaging.** The material physically containing and coming into contact with the product.

**2.7 Recovered Material.** Material that has been recovered from or otherwise diverted from the waste generated after a material manufacturing process. Recovered material may include post-consumer material, cuttings, trimmings, obsolete inventories, and rejected unused stock, but does not include material capable of being re-used within the process that generated it.

**2.8 Recyclable Package.** The package can be collected in a substantial majority of communities, separated or recovered from the solid waste stream and used again, or reused in the manufacture or assembly of another package or product through an established recycling program:

**2.9 Secondary Packaging.** Any packaging or material other than primary packaging, including wrappers, but excluding shipping containers.

**2.10 Self-Ballasted Lamp.** A unit that incorporates, permanently enclosed, all elements that are necessary for starting and stable operation of the lamp, and which does not include any replaceable or interchangeable parts. The unit including all elements is discarded at the end of the lamp life.

**2.11 Source-Reduced Package.** A package that has at least 50% less material (by weight) compared to **packages** commonly used for that product type.

**2.12 Third-Party.** An entity without any financial interest or stake in the sales of the product or service being evaluated or other conflict of interest.

**2.13 Third-Party Certification Program.** A program without any financial interest or stake in the sales of the product or service being certified, or other conflict of interest. There must be a standard to base the certification upon and the standard must be appropriate and meaningful for its intended purpose. The standard must be publically available and developed with stakeholder input. Certification to the standard must be completed by an independent party (e.g., not the manufacturer of the product being certified), include site inspections, where applicable, and have a monitoring program to verify ongoing compliance.

### **3.0 PRODUCT-SPECIFIC PERFORMANCE REQUIREMENTS**

**3.1 ENERGY STAR Compliance.** Lamps shall meet or exceed the ENERGY STAR Program Requirements for CFLs according to the base and type/design that applies, or most closely applies. The lamps that are not included in the scope of the ENERGY STAR program will be evaluated against all the requirements for the product they most closely resemble, with the option of using alternative test methods (see section 3.7).

**3.2 Life.** The average minimum rated lamp life shall be 10,000 hours at 3 hours per start as measured in accordance with the ENERGY STAR Program Requirements for CFLs. In units packaged with replaceable lamps, the ballast shall be tested to assure an average minimum rating of 1 lamp life cycle of 10,000 hours, with ongoing testing to confirm a life expectancy of an average minimum of 4 lamp life cycles, as measured in accordance with the ENERGY STAR Program for CFLs or IES LM 65.

**3.3 40% of Lamp Life.** The lamp lumen output, measured as specified by ENERGY STAR, at 40% of the lamp's life shall be within 15% of average initial lumens.

**3.4 Ballast.** Integral ballasts and ballast adapters shall not be magnetic.

**3.5 Ballast Adapter Power Quality.** Ballast adapters shall have a high power factor (>0.9) based on an average of 10 samples and the current harmonic distortion in triplens shall be less than or equal to 20%.

**3.6 Safety.** The products shall be tested by a third-party and listed to the applicable UL standard, or equivalent, by a NRTL accredited by OSHA.

**3.7 Alternative Test Methods.** Alternatively, a product can demonstrate adequate performance through using another scientifically validated test method under controlled and reproducible laboratory conditions if accompanied by justification for the method modification and documented in sufficient detail.

#### **4.0 PRODUCT-SPECIFIC HEALTH AND ENVIRONMENTAL REQUIREMENTS**

**4.1 Mercury Content.** The product shall contain less than 3 milligrams of mercury per unit.

**4.2 Radioisotopes.** The products shall not contain radioisotopes.

**4.3 Lead.** The glass and solder components shall not contain lead.

**4.4 Flame Retardants.** Plastic components weighing more than 5 grams shall not contain flame retardant substances or preparations that contain

substances that carry the risk phrases R45, 46, 50, 51, 52, 53, 60, 61. In addition, the plastic components weighting more than 5 grams shall not contain any of the following flame retardants:

- Decabromodiphenyl 13654-09-6
- Monobromodiphenyl ether 101-55-3
- Dibromodiphenyl ether 2050-47-7
- Tribromodiphenyl ether 49690-94-0
- Tetrabromodiphenyl ether 40088-47-9
- Pentabromodiphenyl ether 32534-81-9
- Hexabromodiphenyl ether 36483-60-0
- Heptabromodiphenyl ether 68928-80-3
- Octabromodiphenyl ether 32536-52-0
- Nonabromodiphenyl ether 63936-56-1
- Decabromodiphenyl ether 1163-19-5
- Chloroparaffins with chain length 10-13 C atoms, Chlorine content > 50 % by weight 85535-84-8

## 5.0 MANUFACTURING REQUIREMENTS

**5.1 Compliance to Laws and Regulations.** The product shall be produced in compliance with applicable laws and regulations.

**5.2 Code of Conduct.** **Manufacturers shall have and implement, documented with annual audit records,** a code of conduct program that includes the criteria established by the Electronic Industry Code of Conduct (from EICC) covering labor, health and safety, environment, management systems, and ethics.

**5.3 Mercury in Manufacturing.** **If mercury is in the product, the manufacturer shall use encapsulated dosing methods to minimize mercury exposure to workers during product manufacturing.** Other methods of closed, accurate, and precise dosing would be acceptable if proven, with documentation, to have similar or better dose efficiency and protection to worker exposure.

## 6.0 END OF LIFE REQUIREMENTS

**6.1 Lamp Recycling.** Manufacturers shall have a recycling program in place to encourage and facilitate recycling of lamps in all markets where their CFLs are sold, including at least:

- Providing convenient CFL collection options **free of cost** to the user. This **shall include options beyond municipal programs,** such as but not limited to a third-party provider or retailer partnership.

- Information on the company website on the recycling program that links consumers/customers to the CFL collection options, through a link on the main CFL or lighting page for the company.

## 7.0 PACKAGING REQUIREMENTS

**7.1 Polyvinyl Chloride Package.** The package shall not be made from polyvinyl chloride.

**7.2 Recyclable Package.** The product's package shall be recyclable or source-reduced, or a combination of the two.

**7.3 Recycled Content Package.** Plastic, or similar, packaging shall contain at least 25% post-consumer material and paperboard, or similar, packaging shall contain at least 50% post-consumer material.

**7.4 Secondary Packaging.** Secondary packaging shall not be used. An exception may be made for packaging of multiple units when the total packaging (primary plus secondary) is a reduction in packaging material use.

**7.5 Heavy Metal Restrictions.** Heavy metals, including lead, mercury, cadmium, and hexavalent chromium, shall not be intentionally introduced. Further, the sum of the concentration levels of these metals present shall not exceed 100 parts per million by weight (0.01%); an exception is allowed for refillable packages or packages that would not exceed this maximum level but for the addition of recovered materials. Further, intentional introduction does not include the use of one of the metals as a processing aid or intermediate to impart certain chemical or physical changes during manufacturing, where the incidental retention of a residual of that metal in the final packaging or packaging component is not desired or deliberate, if the final packaging or packaging component complies with the incidental concentration restrictions of 100 ppm.

## 8.0 LABELING REQUIREMENTS

**8.1 Primary Packaging Information for CFLs, Self-Ballasted Lamps, Ballast/Lamp Systems, and Conversion Kits.**

**8.1.1 ENERGY STAR Compliance.** Lamps shall meet or exceed all of the ENERGY STAR Program Requirements for CFLs. **The lamps that are not included in the scope of the ENERGY STAR program will be evaluated against all the requirements for the product they most closely resemble.** If the lamp does not contain mercury, it does not need to include the mercury labeling requirements in the ENERGY STAR Program Requirements for CFLs.

**8.1.2 Extra Long Life.** If the lamp has an average minimum rated lamp life of greater than 15,000 hours it can make a claim about the extended life of the product, such as “extra long life.”

**8.2 Primary Packaging Information for Ballast Adapters.** The total input watt rating and average rate life shall be displayed on the front face (the package side intended to face forward in merchandising) or adjacent side panels (not top, bottom, back or flaps) of the primary package.

**8.3 Right-To-Know.** The following information, if it is not on the product label, shall be readily available to consumers and purchasers on the product web site and product information sheets:

- Color-Rendering Index
- Mercury content
- Lamp recycling collection options (see section 6.1)
- Broken lamp clean up instructions; unless otherwise approved in writing by Green Seal, the description shall read as follows::

“If lamp breaks, do not inhale. Open window, leave room, and close door behind you. Shut off air system. Stay away for 20 minutes. With gloves or plastic bags to protect hands, scoop up broken material with stiff paper or cardboard and seal in plastic bag or container with lid. Clean area with damp paper towels and seal in a separate plastic bag or container, include gloves. Dispose of properly. Wash hands thoroughly. Do not allow children or pregnant/nursing women to help with cleanup. Do not vacuum or sweep.”

**8.4 Certification.** Whenever a claim on the product or package is made that it has been certified to this standard, it shall be based on a third-party certification program with an on-site audit and a description of the basis of certification 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 Standard for Compact Fluorescent Lamps (GS-5) for energy efficiency, long-life, low mercury content, lead-free glass, and in a package with post-consumer content.”