

UL launches ENERGY STAR® testing for decorative lighting strings ***Program assists manufacturers in marketing their products to*** ***United States and Canada***

Decorative lighting strings are typically used as seasonal decorations between late November and early January. Although operating for a relatively short period within the year, a high volume of lighting strings is used to decorate both residences and commercial buildings. Every year, in the United States alone, lighting strings are used to decorate about 100 million Christmas trees as well as the exteriors and interiors of residential properties and commercial buildings. Amidst the worldwide trend in environmental protection, the extensive use of lighting strings has prompted the U.S. and Canadian governments to review the energy consumption of these products.

Energy efficient lighting strings becoming popular

In 2006, Natural Resources Canada (NRC) set out, with manufacturers, utility companies and testing laboratories such as UL to develop an ENERGY STAR® program for decorative lighting strings in Canada; the test procedure and qualification criteria were announced in 2007. The U.S. Environmental Protection Agent (EPA) in 2008 also formally incorporated decorative lighting strings into the U.S. ENERGY STAR® program. The requirements for both countries are basically the same except for national deviations and they're expected to spur strong demand for energy efficient lighting strings in both markets.

To realize the greatest energy savings, the U.S. and Canadian governments as well as local utility companies have been encouraging decorative lighting string manufacturers to move away from traditional incandescent bulbs to LED lamps that use up to 90 percent less energy. In addition, significant effort has gone into consumer education to raise market awareness of LED lighting strings. As a result, Canada has seen widespread consumer adoption of LED lighting strings. In 2003, less than 10 percent of the lighting strings sold in the country employed LED technology. The situation was completely reversed in 2007 with the share of incandescent lighting strings available for sale dropping to less than 10 percent. The trend indicates that LEDs are fast being adopted by North American consumers and will soon become a mainstream technology in the decorative lighting string industry.

ENERGY STAR® qualification process

To qualify for an ENERGY STAR® rating, decorative lighting strings must meet performance and energy efficiency requirements. The products must be assessed for compliance by an independent laboratory accredited for testing Energy Efficient Lighting Products by the U.S. National Voluntary Laboratory Accreditation Program (NVLAP) or one of its mutual recognition arrangement signatories. UL's Melville, N.Y., and Taiwan facilities have been accredited to provide ENERGY STAR® testing service for decorative lighting strings.

Before submitting their products to UL for testing, manufacturers of decorative lighting strings need to register as an ENERGY STAR® partner. Once a product is certified as compliant with ENERGY STAR® requirements, its manufacturer can send a copy of the UL testing report together with the product qualification form, product package mock-up and other documents as identified in the product qualification form to the U.S. Environmental Protection Agent and/or the Office of Energy Efficiency of Natural

Resources Canada for approval. Qualified lighting string models will be included in the ENERGY STAR® product list and their manufacturers can then use the ENERGY STAR® label on relevant product packaging, documents, advertising and web pages.

ENERGY STAR® criteria for decorative lighting strings

The latest ENERGY STAR® program requirements for decorative lighting strings published by NRC and EPA is version 1.4, dated March 1, 2008. The table below summarizes the criteria and the corresponding ENERGY STAR® specifications.

Criteria	ENERGY STAR® Requirements
Inspection of packaging and label	
Number of lamps per string	For all strings in the sample, the number of lamps on the strings must be the same as indicated on the packaging.
Replaceable lamps	If the string has replaceable lamps, the socket and lamp must have a marking or means to ensure correct insertion of replacement lamps.
Safety	Lighting strings must be certified by an OSHA Nationally Recognized Testing Laboratory such as UL for its compliance with the applicable safety requirements: <ul style="list-style-type: none"> • United States – UL 588 • Canada – CSA-22.2 No. 37-M1989
Product suitability	A label on the string must indicate whether it is rated for indoor/outdoor use or indoor use only.
Warranty	Minimum 3-year warranty against all product defects must be provided to products under normal residential seasonal use. Warranty statement and contact information for consumer complaint resolution must be printed on the packaging or included as an insert.
Electrical requirements	
Input power	Operate the lighting strings for a 24-hour seasoning period at 120 V ± 1 V RMS AC. Measure input power at 120 V ± 0.5 V RMS AC. The input power consumption per lamp on each of the three strings in the sample should not exceed 0.2 W as measured by total input power of a lighting string ÷ total number of lamps on a lighting string.
Over-voltage	Energize lighting strings at 132 V ± 1 V RMS AC for one hour. The average percentage of failed lamps on all three strings in the sample may not be greater than 3 percent.
Lifetime requirements	
Maintained light output	Measure the light output of the lighting strings after a 24-hour seasoning period at 120 V ± 1 V RMS AC. Keep the lighting strings operating for 1,000 hours continuously. After that, measure the light output again and compare it to the measurement prior to the lifetime test. The maintained light output should not be less than <ul style="list-style-type: none"> • 70 percent for strings with colored lamps

	<ul style="list-style-type: none"> • 50 percent for strings with white lamps or any phosphor-based lamps
Failed lamps	After 1,000-hour lifetime test, the average percentage of failed lamps on all three strings in the sample may not be greater than 3 percent.
Weathering requirements (only applicable to products labeled for outdoor use)	
Maintained light output	Operate the lighting strings for a 24-hour seasoning period at 120 V ± 1 V RMS AC. Measure the light output of the strings before and after they are subject to 20 consecutive iterations (240 hours) of UV chamber conditioning, water spray and condensation. The maintained light output should not be less than <ul style="list-style-type: none"> • 70 percent for strings with colored lamps • 50 percent for strings with white lamps or any phosphor-based lamps
Failed lamps	After the weathering test, the average percentage of failed lamps on all three strings in the sample may not be greater than 3 percent.
Requirements for product packaging for consumer awareness	
Product suitability	Packaging must indicate the conditions of use: indoor/outdoor use or indoor use only.
Product description	Contains number of lamps on the decorative lighting string, total lighted length of the string and total rated wattage of the string.
Correlated color temperature for white lighting strings	Packaging must indicate the color of the lamps, e.g., “warm white,” “pure white” or “cool white.”

Note: A lamp is considered failed if its light output is less than half the output of a good lamp of the same color on the same string.

UL one-stop compliance solutions for decorative lighting strings

The global economic downturn has greatly impacted the purchasing power of the North American markets. Decorative lighting string manufacturers who can respond promptly to consumer demands for greater energy efficiency will have a decisive advantage in this challenging time.

UL is an expert product safety certification resource. By investigating the safety and energy efficiency of decorative lighting strings concurrently, UL’s one-stop compliance solutions not only simplify the ENERGY STAR® qualification process while reducing administrative costs for manufacturers.

UL also provides ENERGY STAR® registration support service to customers. We assist in preparing required documentation to expedite the application.

About the ENERGY STAR® program

With a goal of countering the increasingly serious effects of greenhouse gases, ENERGY STAR® is a voluntary labeling program jointly administered by the U.S. Environmental Protection Agency and the U.S. Department of Energy to help consumers

differentiate products of high energy savings and performance. Since its inception in 1992, remarkable results have been seen in energy savings and reduction of carbon dioxide emissions. At present, market recognition of the ENERGY STAR® label has reached over 70 percent.

After seeing the success of the U.S. program, Canada introduced its ENERGY STAR® program in 2001, to be managed and coordinated by the Office of Energy Efficiency of Natural Resources Canada. The ENERGY STAR® program requirements of the United States and Canada are essentially identical. As such, most products in compliance with the U.S. ENERGY STAR® specifications will also conform to the Canadian ENERGY STAR® qualification criteria. However, separate applications are required for submission to the U.S. Environmental Protection Agency and the Office of Energy Efficiency of Natural Resources Canada to achieve national ENERGY STAR® designations.

For more information on this service, please contact your local UL office. Contact information can be found at <http://www.ul.com/global/eng/pages/corporate/ulworldwide>.

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