

# R-CFL Technology Innovation Competition

Sixteen reflector style compact fluorescent lamps (R-CFLs) designed specifically for use in high heat applications have successfully met all specifications and testing requirements of the U.S. Department of Energy's R-CFL Technology Innovation Competition. These models (see Table 1) offered by four manufacturers represent a broad spectrum of lamp types, ranging from 15 to 26 watts and include parabolic aluminized reflectors, elliptical reflectors, dimmable lamps, and lamps for indoor or outdoor use.

## Overview

This two-phase effort was designed to improve the performance of screw-based R-CFLs, to increase their market availability, and to encourage new technologies and products through a competitive performance solicitation. This project is sponsored by the U.S. Department of Energy (DOE) and implemented by the Pacific Northwest National Laboratory with the cooperation and assistance of several organizations with similar interests. A number of organizations stated their intent to give buying preference to winning models, given the concern in the marketplace over the quality and performance of this category of CFLs. The winning R-CFLs have passed rigorous specifications, as well as testing requirements that simulated the environment typically found in recessed downlights.

## Phase 1 Winners

Three of the 10 lamp models submitted to the R-CFL Project (Phase 1) successfully completed over 6,000 hours of elevated temperature life testing and were deemed winners in 2004.

## Phase 2 Winners

Fourteen of the 31 lamp models submitted to the R-CFL Project (Phase 2) successfully completed over 6,000 hours of elevated temperature life testing and joined the models from Phase 1. Announcements were made in October 2006 and April 2007.

## How It Works

DOE solicited from manufacturers R-CFLs that are specifically designed for use in high heat applications, such as airtight, insulated ceiling-rated recessed cans. R-CFLs that meet the program's minimum specifications and successfully complete Elevated Temperature Life Testing (ETLT) are declared competition winners. Initial evaluations, including the Short Term Acceptance Test, were completed on all models to identify those that met minimum requirements. Those that qualified were moved to ETLT.

**Table 1. Technology Innovation Competition Winners**

Manufacturer	Model	Type	Wattage	Average Rated Life	Lumens
GE	FLE15/2/DV/R30	R30 Dimmable	15	6,000	720
GE	FLE15/2/R30XL	R30	15	10,000	750
PHILIPS	EL/A BR30	BR30	15	7,000	590
FEIT	ESL15R30H	R30	15	8,000	750
PHILIPS	EL/A PAR 38	PAR38	23	8,000	1250
FEIT	ESL18 PAR38H	PAR38	18	8,000	950
FEIT	BPCE23 PAR38/3	PAR38	23	8,000	1300
GE	FLE26/2/PAR38/XL	PAR38	26	10,000	1300
PHILIPS	EL/A PAR38	PAR38	20	8,000	930
SYLVANIA	CFE 19PAR38	PAR38	19	10,000	1000
FEIT	ESL 18R40H	R40	18	8,000	950
FEIT	BPCE23 R40/3	R40	23	8,000	1300
PHILIPS	EL/A R40	R40	23	8,000	1250
GE	FLE26/2/R40XL	R40	26	10,000	1300
PHILIPS	EL/A BR40	R40	20	8,000	940
SYLVANIA	CFEL 20BR40	R40	20	8,000	900



See [www.pnl.gov/rlamps](http://www.pnl.gov/rlamps) for more information or how to purchase these lamps.



### Minimum Specifications

R-CFLs submitted to this competition met a number of minimum specifications (see Table 2) in addition to the ENERGY STAR Program requirements for reflector style CFLs. Models that met minimum specifications were moved to ETLT.

### Elevated Temperature Life Testing

ETLT involves a minimum of 6,000 hours of operation in a simulated insulated ceiling-rated airtight (ICAT) environment (laboratory testing). The minimum requirement for both this competition and the ENERGY STAR CFL Program is 6,000 hours. Models with rated life claims beyond 6,000 hours are required to continue testing until that claim is met. Ten lamps of each model are tested, and manufacturers are required to pay testing costs. The testing apparatus operates the lamps in an automated cycle of 3 hours “on,” 20 minutes “off,” for the test duration. Lamps are tested at an ambient temperature of 55°C. Light intensity for each lamp is measured every 2 weeks throughout the testing period to evaluate lumen maintenance over time. Manufacturers are provided with test results for their lamp(s) on a periodic basis.

### Periodic Reporting of Test Results

Check the project website <http://www.pnl.gov/rlamps> for periodic summaries of test results.

### Technology Innovation Competition Support

Numerous utilities and energy efficiency groups have provided letters of support for this program, including:

- Northwest Energy Efficiency Alliance
- Midwest Energy Efficiency Alliance
- ENERGY STAR Small Business and Congregations
- ENERGY STAR Homes
- Consortium for Energy Efficiency, Inc.
- Northeast Energy Efficiency Partnerships and Participating Program Sponsors
- Department of Defense, Defense Logistics Agency
- Sacramento Municipal Utility District
- Snohomish County PUD No. 1
- Southern California Edison
- Wisconsin Energy Conservation Corporation.

**Table 2. Minimum Specifications**

Feature	Minimum Requirement
<b>Operating Temperature Rating</b>	Maximum ambient temperature rating of at least 50°C for lamps 16 watts (measured) and lower, and 60°C for lamps greater than 16 watts (measured). The manufacturer shall provide a maximum ambient temperature for which the warranty is valid.
<b>Size Characteristics</b> R30-type Products R40-type Products (BR, PAR, etc. products also qualify)	Maximum Overall Length (MOL): 5.6 inches 6.6 inches
<b>Luminous Flux</b>	600 lumens (100 hours) minimum. Elevated temperature luminous flux: When operated at 55°C, lamp shall maintain 90% of 100-hour luminous flux achieved while operating at 25°C.
<b>Beam Angle</b>	Maximum 120°

**Exception to these Requirements:** Atypical and innovative R-lamp designs will be considered on an individual basis, provided 1) there is an overriding and compelling benefit, as described in the Offeror’s proposal, and 2) the design is approved by the evaluation committee as being consistent with the overall purposes and intent of this RFP.

### A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy’s Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.

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#### For Program Information:

**Linda Sandahl**  
Pacific Northwest National Laboratory  
Phone: (503) 417-7554  
E-mail: [linda.sandahl@pnl.gov](mailto:linda.sandahl@pnl.gov)

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