

**ENERGY STAR® Standard Operating Procedure: Submission of Maximum Ballast Operating Case Temperature for Optimal Performance Laboratory Test Report(s)**

Purpose: To ensure the quality of ENERGY STAR qualified residential lighting fixtures as it relates to durability.

**I. Data Request and Response:**

1. EPA will determine which fixture type(s) it wishes to collect performance data on and send those ENERGY STAR Residential Light Fixture (RLF) partners a letter requesting manufacturer laboratory test reports that show compliance with the ENERGY STAR specification requirement for Maximum Ballast Operating Case Temperature for Optimal Performance. This letter will list the specific high risk (in terms of heat build-up) fixture models for which manufacturer laboratory test reports will need to be supplied.
2. Each RLF partner must submit a manufacturer's laboratory test report within 60 days of receipt of the letter.

**II. Data Requirements and Requested Format:**

For products submitted under the Version 3.1 RLF specification, EPA will accept existing laboratory test results in accordance with UL 1598. For those products that do not have existing testing documentation, manufacturers will be required to submit a test report to EPA according to the following requirements:

1. At least one test must be completed for each fixture model listed in the letter.
2. The laboratory test report may come from one of the following: 1) "In-house" fixture manufacturer laboratory; 2) lamp or ballast manufacturer laboratory; 3) third party independent laboratory.
3. Provide the ballast manufacturer's data that describes the maximum allowable case temperature for performance and the "hot-spot location". **Note:** This data must be supplied from the ballast manufacturer; partner can attach this information to the manufacturer laboratory test report.
4. The following data must be supplied in the manufacturer laboratory test report:
  - a. Description of the testing method (reference applicable standards).
  - b. Description of the equipment used (reference applicable standards).
  - c. Maximum ballast operating case temperature for performance when tested inside the fixture. Indicate thermocouple locations. **Note:** The temperature of the ballast case should be taken at the "hot-spot" locations for performance as indicated by the ballast manufacturer. If the maximum ballast operating case temperature and hot-spot locations cannot be obtained from the ballast manufacturer, measurements should be completed in accordance with LRC's "Proposed Durability Testing Method: Temperature".

- d. Name of organization and engineer, along with signature, that conducted the test, and the test date.
5. If available, include photograph(s) of fixture(s) mounted on the testing apparatus.
6. Fixture manufacturers should follow LRC's "Proposed Durability Testing Method: Temperature" in all cases. This is attached for reference.

### **III. EPA Data Review:**

1. Upon receipt, EPA will review data and notify partners of next steps within 14 days. The review cycle will not begin until all necessary documentation has been provided by the RLF partner.

### **IV. Procedure for Products That Meet Maximum Ballast Operating Case Temperature for Performance Requirements:**

1. If test report proves acceptable, EPA will notify the partner in writing. No further action will be required.

### **V. Procedure for Products that Exceed Maximum Ballast Operating Case Temperature for Performance Requirements:**

1. EPA will contact the partner in writing to obtain clarification on the test results and identify discrepancies. At this time, EPA will also request a corrective action plan and any additional supporting documentation or data, all of which must be submitted by the RLF partner within 30 days of receiving the EPA letter of notification.
2. EPA will review the corrective action plan and any additional information submitted by the partner within 7 days of receipt of all requested documentation. If the product continues to be non-compliant, it will be **de-listed for up to six months so the partner can make necessary improvements**. The partner will be notified of this de-listing via written notification.
3. Anytime within this six-month period, a partner may resubmit products for ENERGY STAR re-qualification.
4. If the partner fails to submit or follow the corrective action plan as agreed within this six-month period, the product(s) will be removed from the ENERGY STAR Web site, indefinitely. (see Section VI, below)
5. Partners whose products are repeatedly found to be in violation of the specification will be terminated from the ENERGY STAR program.

### **VI. Procedure for Manufacturers That Fail to Provide Maximum Ballast Operating Case Temperature for Performance Test Report:**

1. If, after 60 days the partner has not yet provided EPA with the requested information, a second letter will be sent notifying the partner that the product(s) will be de-listed unless the laboratory test report is submitted within 21 days.
2. If EPA receives no response by the end of the 21-day deadline, all products in question will be de-listed from the ENERGY STAR Web site.

## LRC's Proposed Durability Testing Method: Temperature<sup>1</sup>

### Testing location

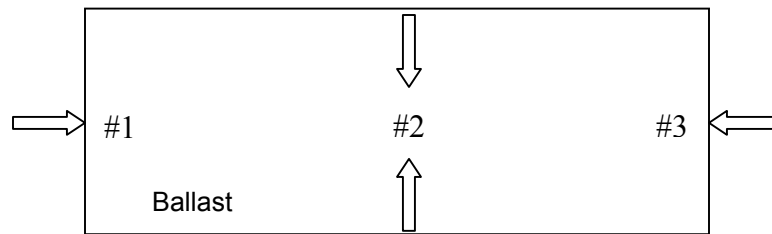
Testing shall be conducted in a room with ambient temperature of 25°C ±5°C.

### Apparatus

Underwriters Laboratory (UL) has established a thermal testing procedure and apparatus for safe operation of electric fixtures. The apparatus construction techniques for ENERGY STAR durability testing should follow those described in UL 1598 for normal temperature testing, but thermocouple locations will be different than the ones required by UL.

### Procedure

- a. Fixtures shall be connected to the apparatus in the manner described in UL 1598.
- b. Thermocouples will be placed on the ballast in the locations indicated by the ballast manufacturer. This information should be listed in the NEMA/ALA matrix, and/or clearly marked on the ballast, and/or clearly stated in the ballast manufacturer's literature (printed or web site). If more than one location is indicated, temperature measurements are to be made in every location. If none of the sources cite this information, thermocouples must be placed in three locations on the ballast: one on each edge of the ballast (# 1 and # 3) and one on the center of the ballast (# 2). See sketch below.



**Locations on the ballast (1, 2, 3) where thermocouples should be placed only IF no sources cite locations on the ballast where measurements should be made.**

- c. In addition to thermocouple location, ballast manufacturers shall also indicate the maximum allowable ballast case operating temperature for optimum performance. This information shall be listed in the NEMA/ALA matrix, and/or clearly marked on the ballast, and/or clearly stated in the ballast manufacturer's literature (print or web site). If none of the sources cite this information, the fixture manufacturer should assume that the maximum allowable ballast case operating temperature is 65°C at the indicated location or, if not indicated, at any of the 3 locations shown in the diagram above.
- d. Stabilization time shall be a minimum of 7.5 hours. Fixtures must be operating inside the testing box for a minimum of 7.5 hours before any measurements are taken.

<sup>1</sup> Note: The "Proposed Durability Testing Method: Temperature" is a modified version of LRC's proposed testing method. Steps 1, 2, and 6 were removed because the information is redundant to what is included in the Standard Operating Procedure (SOP). A full version of the revised testing method can be found in Appendix I of the LRC Durability Testing report that can be accessed at:  
<http://www.lrc.rpi.edu/programs/lightingTransformation/pdf/durabilityTestingFinalReport.pdf>