



THIRD PARTY CERTIFICATION IMPLEMENTATION

ENERGY STAR® PRODUCTS

SUBJECT: ENERGY STAR Luminaires Verification Testing Guidance for Certification Bodies – Test Requirements, Sample Sizes and Determining Testing Failures

DIRECTIVE NO. 2012-01

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Performance Criteria

Verification testing for ENERGY STAR certified luminaires is limited to the following core performance requirements as applicable to the specific model.

- Luminous Efficacy and Output
- Zonal Lumen Density (Directional Luminaires Only)
- Lumen Maintenance¹
- Correlated Color Temperature
- Color Rendering
- Color Angular Uniformity
- Color Maintenance¹ (Directional Solid State Indoor Luminaires Only)
- Source Start Time
- Source Run-Up Time
- Maximum Measured Ballast or Driver Case Temperature
- Off-State Power Consumption (Only Luminaires Employing External Power Supplies)
- Power Factor

To ensure luminaires continue to meet the ENERGY STAR specification, verification testing must be conducted for these performance requirements in the same manner it was for certification. Note that for luminaires that are required to ship with a lamp in the package, testing shall be conducted with that lamp. If the lamp is missing for such luminaires, CBs shall not test a replacement lamp. Instead, CBs shall obtain a new luminaire(s) for testing and make note of the issue to EPA when reporting test results.

Test Sample Sizes and Determining Testing Failures

The ENERGY STAR Luminaires specification includes tailored sample size requirements for each of the performance criteria. To ensure that testing is conducted the same for verification testing purposes as for certification, CBs shall use the following sample size approaches for the relevant performance criteria.

One Sample Requirements: For the performance criteria above that require all tested samples to meet ENERGY STAR requirements, a single sample shall be selected, obtained, and tested for verification testing. The measured performance must be equal to or better than the ENERGY

¹ For solid state lighting luminaires, lumen maintenance and color maintenance shall be verified consistent with how the luminaire was certified. If the luminaire was certified using IES LM-80 data and an IES TM-21 projection, the LED packages/modules/arrays shall be visually inspected and to the extent possible verified to ensure they are the same make(s) and model(s) as those included in the certification. The *in situ* temperature shall be measured in the same manner as originally tested, and a new TM-21 calculation run using the corresponding LM-80 data to determine if the product meets the relevant ENERGY STAR requirements. For color maintenance, the measured *in situ* temperature must be less than or equal to the case temperature in the originally referenced LM-80 report. If the luminaire was certified using IES LM-79 data at zero and 6,000 hours, the same method shall be employed for verification testing.

STAR requirements. A verification testing failure will result if the measured performance fails to meet any of these ENERGY STAR requirements.

Three Sample Requirements: For the performance criteria above that require multiple sample testing where it is not obligatory for all samples to meet the ENERGY STAR requirements (e.g., at least 90% of samples must meet ENERGY STAR requirements), three samples shall be procured at once for the purpose of verification testing. For lumen maintenance, all three samples shall be tested at once unless the manufacturer opts to have lumen maintenance treated as a one-sample criterion. For the other three-sample requirements, one sample shall be tested initially. If at any point during the testing that sample fails to meet any of these requirements, then the two additional samples must have testing initiated immediately for all three-sample requirements. For these three-sample requirements, if the measured performance of two or more samples fails to meet any of these ENERGY STAR requirements, it is considered a testing failure.

For both one-sample and three-sample requirements, even if a testing failure occurs, testing shall continue to completion, unless the manufacturer opts to have the model disqualified and to cease testing, which it may do at any point in the verification testing process.

Reporting to EPA

Consistent with procedures for other ENERGY STAR product categories, CBs are required to report testing failures on any of the performance requirements to enforcement@energystar.gov within two days of determining a testing failure, and include with this submission all relevant test reports. EPA will then notify the manufacturer per the [ENERGY STAR Disqualification Procedures](#).

Until further notice, CBs shall also submit test results and associated reports for luminaires meeting all applicable ENERGY STAR requirements to certification@energystar.gov within two weeks of receiving complete test results. [Note: EPA will reconsider the necessity of this requirement after gaining greater experience with CB-administered verification testing for these product types.]