

Roundtable Minutes: ENERGY STAR® Durability Testing
20 September 2002
Revised

Attendees:

Luminaire Manufacturers:

Angelo Bros. / Westinghouse (David Shapiro)
DESA International (Gary McGriff)
Energy Federation Inc. (Brad Steele)
Good Earth Lighting (Alex Kowalenko)
Lightolier (Randy Blanchette)
Maxlite (Paolo Camara and Steve Kang)
Save Energy of America (Yisroel Yarmush)
Seagull Lighting (Stefano Caposecco)

Other Interested Groups:

Universal Lighting Technologies (Mike Stein)
Philips (Al Rousseau)
OSRAM SYLVANIA (Howard Wolfman)
Pacific NW Ntl Lab (Jeff McCullough)
US EPA (David Schiller)
VEIC (Chris Granda)
ICF-Albany (Jeff Schwartz)

Brad Steele of Energy Federation, Inc., presented the results from the analysis of several years of sales and returns of energy efficient products. His paper was presented in a recent conference at ACEEE (American Council for an Energy-Efficient Economy). He showed compelling evidence that heat is a likely cause of premature failure in fluorescent luminaires.

Jeff McCullough of Pacific Northwest National Laboratory (PNNL) showed how temperature testing fits into the initial screening criteria used to evaluate CFL recessed downlights. PNNL has been working on a Technology Procurement Program for recessed, ICAT, hard-wired CFLs. They have developed specifications and issued RFPs for recessed products and are currently evaluating and testing products received. Testing is organized into "short term" and "long term." Short term testing targets steady state lamp and ballast temperatures as the determination of a "thermal factor" to account for elevated ambient lamp temperatures. Long Term testing is essentially IES life testing (3 hours "ON"/20 min "OFF") but within a simulated insulated ceiling environment. In addition, lumen measurements are taken biweekly to monitor lumen depreciation.

Mike Stein of Universal Lighting Technologies presented an update on the NEMA Matrix to allow luminaire manufacturers to avoid having to complete performance testing on several lamp and ballast combinations. This matrix has yet not been released by EPA – ENERGY STAR. <http://www.nema.org/lampballastmatrix/>

Andrew Bierman of Lighting Research Center presented information about the development of a simplified flux meter, allowing luminaire manufacturers to measure total light output on an actual luminaire much more easily than with an integrating sphere. Initial pilot tests show remarkable accuracy compared to an integrating sphere.
Comments:

- Manufacturers could envision this device being helpful in the design process, particularly with teams in remote facilities.
- This would need to be a product, not a device each manufacturer would need to build itself.
- Utilities use efficiency ratings when assigning rebate criteria. The results of a flux-meter may be helpful to these groups.
- Further research is needed to establish the accuracy of the flux-o-meter

Jennifer Brons and Conan O'Rourke from LRC presented the methodology and results used for sample selection of ENERGY STAR luminaires for pilot temperature testing and stress testing.

Temperature testing comments:

- The proposed procedure was acceptable to roundtable participants
 - Ballast manufacturers will need to indicate maximum case temperature for performance (not safety) and measurement point on the ballast
 - Luminaire manufacturers would perform temperature test in actual operating luminaire following the UL 1598 testing procedures for "normal" conditions.
- The testing apparatus described in UL 1598 is sufficiently representative of reality to be used for durability temperature testing
- UL temperature testing may not be commonly done since it is not required for most hardwired fluorescent luminaires (unless used for through-wiring)
- How would results be verified if performed in-house? The participants agreed that it is acceptable for a UL certified lab or third party lab to perform testing or verify results.

Stress testing comments:

- The point of the NEMA matrix is to remove testing requirements; if this stress testing procedure becomes required, it will put unacceptable burden on the manufacturers
 - May only be acceptable for non-ANSI products
 - In order for this procedure to be acceptable for use with ANSI-rated products, it will be necessary to show data proving:
 - they suffer from unacceptable premature failures, and,
 - that this testing method will predict premature failures in those products
- This method is only useful as an interim step to establishing a procedure, not as a procedure in itself.
- Many manufacturers expressed a concern about cost of additional testing reqs.
- Other possible factors to investigate: Current crest factor and current level

Action Steps:

- Complete collection of stress test data and present it to the industry
- Conduct literature review of typical voltage variation in residences
- Set up conference call with Al Rousseau of Philips Lighting and Howard Wolfman of OSI to learn about design of experiment ("d.o.e.") procedures.

- Run pilot study using voltage variation (per literature review) or use this variable on the d.o.e., as is more cost-effective
- Budget the interaction study using either pilot studies or the “d.o.e.” approach and propose next steps to EPA
- Interactions include:
 - Heat vs. stress
 - Heat vs. stress vs. low voltage
 - Heat vs. high voltage
- Mike Stein to investigate criteria to be used with durability testing (such as number of hours of operation)
- No further development is necessary with simple heat testing under “normal” or elevated conditions; procedure agreed upon by roundtable participants. Heat may be important in testing interactions (see above)