TDD Task Group Notes

Monday, November 7, 2011

7:30 a.m. – 8:30 a.m.

Chair: *Dave De Block, ODL, Inc.*

1. **Call to Order**
   a. Welcome to All Attendees ….Cell phones & laptops to Silent Mode
      i. Attendees: D. DeBlock, D. Anderson, N. Digert, R. LeBrun, K. Brenden, J. Allardyce, S. Coble, S. Urich, B. Amberg, R. Hedgepeth, M. McDonald, R. VanVoorst, M. Thoman, S. Skoglund, N. Peña, A. Saroufiem, R. Hamber, R. McCluney, J. Brain, G. Vincent, and C. Curcija.
   b. Antitrust reminder
   c. NFRC Meeting Guidelines
2. **Appointment of Recording Secretary: Neall Digert**
3. **Review and Approval of Agenda**
4. **Unfinished Business**
   a. Review of LBNL VT testing and project report.
      i. C. Curcija provided a brief review of the research performed at the LBNL test facility, highlighting key elements of the LBNL integrating sphere experimental test process, data, and findings (as presented in the LBNL report titled "Visible Transmittance Test Procedures for Tubular Daylighting Devices").
      ii. Key Findings and Concerns:
         1. Optimizing the number of required solar altitude and solar azimuth angle pairs is a critical issue relative to establishing a test protocol that can be easily and economically applied by future industry test laboratories. For the current LBNL integrating sphere test apparatus, the vertical altitude angle movement is motorized, but azimuth angles are set manually by rotating the test apparatus relative to the sun's position.
         2. The experimental process was simplified by adopting an Exterior Referencing Technique (ERT) instead of an Internal Reference Technique (IRT).
         3. Four TDD samples were tested (one open reference tube and three commercial products).
         4. LBNL established the Sphere Response Factor (SRF) which relates the open integrating sphere's exterior and interior sensor sensor readings.
         5. It was decided to establish a ***relative*** reference reporting condition for tested solar azimuth and altitude input angles. The Relative Solar Azimuth is determined with 0-degrees reflecting that the due-south vertical axis of the tube is coincident with the vertical plane through the sun. For the Relative Solar Altitude, an incident angel of 90-degrees is established when the suns's rays are perpendicular to the

opening of the sphere, and 0-degrees represents the condition when the sun's rays are parallel to the opening of the sphere.

6. C. Curcija presented potential annual zonal time weighted VT ratings (using the Yearly Efficiency function developed and proposed by Ross McCluney) calculated using the experimental test data for the 180-degree, 210-degree, and 240-degree *relative* solar azimuth tests, using specimen data from 7, 6, and 3 vertical angles. C. Curcija asserted that there was very little difference between the zonal time weighted yearly VT ratings based upon 3 or 6 vertical angles, and he felt that the resulting calculated efficiencies indicated that simplifying the measurement process to collect 3 vertical angles per solar azimuth plane was sufficiently accurate. Other TDD TG members requested that this topic be discussed further before any decisions are made.
7. The current apparatus is not conducive to testing any TDD products with diameters greater than 14-inches. Since TDD's are becoming more prevalent in the market, the use of larger product sizes in commercial applications will mean that a testing apparatus and/or test procedure will be needed for larger product sizes. Currently, though, NFRC has determined industry standard product sizes to be 14-inches in diameter for standard TDDs and 21-inches for Hybrid TDD products. Proposals for larger product sizes should go before the Technical Committee for consideration before new test methodologies need to be explored. It was discussed that all TDDs should be tested for the size that will be applied.

b. Discussion of TDD VT rating and PCP language for the NFRC 200 document.
   i. It was proposed that we develop an method for averaging the azimuth-specific data for an Annual VT rating.
   ii. The TDD TG needs to develop and propose a calculation process before anything should be presented to the general Memebership.
   iii. Dave DeBlock will work on the first draft of a proposed change to the NFRC 20x language for physical testing of TDDs.
c. NFRC 201 Working Group
   i. This working group will be replaced by a new NFRC 20x working group for developing a physical test methodology.

5. New Business

a. Discussion of the number of glazing layers listed in the CPD for TDDs.
   i. The TDD TG must determine how the number of glazings should be referenced. The TDD TG will research this further, and Greg Vincent will develop an initial proposal.
   ii. R. LeBrun proposed defining the number of glazing layers at the dome, and the glazing levels below the dome.
b. Energy Star Version 6
   i. The TG reviewed the proposed Energy Star changes for U-factor and SHGC ratings.
   ii. Discussion:
      1. The proposed changes are quite stringent, and are difficult for products to achieve.

2. Credit should be given for the amount of light delivered, therefore the TDD products should not be penalized for maximizing VT. Since the TDD surface area is significantly less than that for a skylight, the Energy Star requirements should allow a higher U-factor and SHGC rating for TDDs than would be required for a traditional skylight.
3. Establishing an LSG rating might be a good option, and a process for supporting this in NFRC documents needs to be explored.
4. Further discussion of the proposed changes will be on the agenda for the next TDD TG conference call.

6. Meeting Adjourned at 8:35 AM