L•PRIZE® APPARATUS

Integrating robotics, sensors, and software to measure tomorrow's technologies today

Pacific Northwest NATIONAL LABORATORY

Proudly Operated by Battelle *Since 1965*

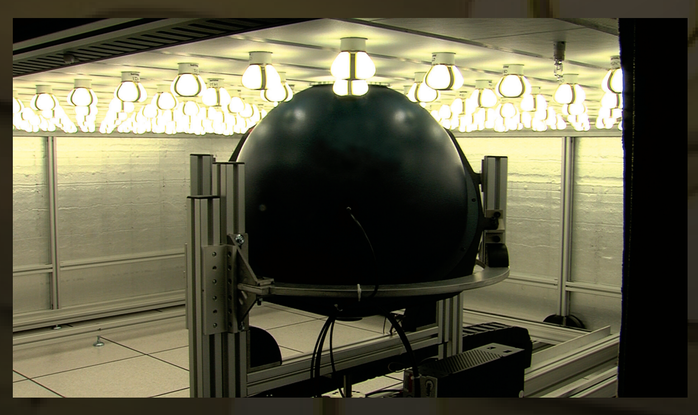
The Lumen Maintenance Test Facility is housed at PNNL's Applied Process Engineering Laboratory (APEL) in Richland, Wash.

The first apparatus, LMTA1, houses 202 lamps for the 60W A-lamp replacement category. The apparatus operates around the clock, allowing researchers to monitor change in light output and color over time.

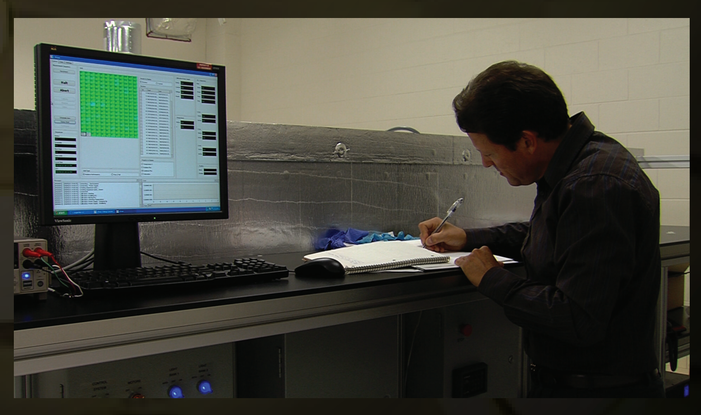
A fully automated data collection sequence measures light output and color on predetermined schedules. The robotics system moves the integrating sphere along x, y, and z axes to measure the spectral power distribution of each bulb, from which the software calculates light output and color. Temperature sensors and an integrated exhaust system maintains a 45°C inside the apparatus to simulate the temperature of bulbs in recessed cans or enclosed fixtures – common applications for 60W bulbs.

A second apparatus, LMTA2, will test submissions for the second L Prize competition – the PAR38 replacement. The LMTA2 is similar to the LMTA1, but modified to accommodate larger bulbs.

PNNL researchers designed and built the innovative Lumen Maintenance Test Apparatus (LMTA) to support the U.S. Department of Energy's first ever lighting technology competition – the L Prize®. The LMTA combines robotics, sensors, software, and an integrating sphere to measure the spectral power distribution of L Prize bulb entries and determine if they meet the competition's stringent requirements.



The integrating sphere takes about 3 seconds to measure each bulb, measuring all 202 in just over an hour.



Principal Investigator Jeff McCullough led the team of scientists and engineers that developed the Lumen Maintenance Test Facility and two automated test systems (LMTAs) to test L Prize competition entries.

For more information about the L Prize competition, go to www.lightingprize.org.

MEASURING TOMORROW'S TECHNOLOGIES TODAY

Contact:
Jeff McCullough • Senior Research Engineer
Phone: (509) 375-6317 • jeff.mccullough@pnnl.gov

U.S. DEPARTMENT OF ENERGY

Pacific Northwest NATIONAL LABORATORY

Proudly Operated by Battelle *Since 1965*

PNNL-SA-88583