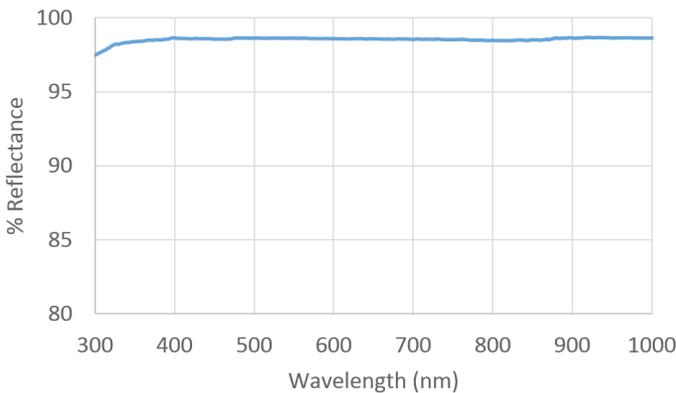


Water-Cooled High Power Calibration Source



Typical Diffuse Reflectance of
Labsphere's Spectralon



Technical Challenge

Many laboratories have unique testing environments with space constraints that may require a measurement system to be designed uniquely before it can be incorporated. Labsphere was asked to design a uniform source system with a high luminous output and could fit on the client's preexisting optical table. Due to the size of the table, the system could not be larger than eight inches in any direction.

Labsphere's Solution

Mounting a strong light source to a four-inch sphere generates a significant amount of heat within the materials, which can cause injuries and deal costly damage to optical components. To prevent this, Labsphere used a sealed chamber around the sphere to allow for a flow of cooling water across the sphere.

- Watertight aluminum exterior shell surrounding the sphere to hold cooling water and insulate inner sphere
- Inlet and outlet ports fixed in opposite corners to create a diagonal water flow
- Spectralon diffuse material, offering near-perfect Lambertian reflectance in the UV-VIS-NIR range to optimize the accuracy of test results
- Watertight connecting tubes that allow the light source and detector to reach the inside of the sphere
- Application-specific exit port tube with threading to couple with the client's filter wheel
- Internal halogen light source for reaching the desired spectral output
- Silicon detector for measuring spectral radiance in the visible and monitoring the degradation of the light source over time
- Baseplate with mounting holes designed to fit on a standard optical table

Benefits

- Strong communication with Labsphere allowed the client to receive a system that matched their in-house components could easily be integrated into their testing environment.
- The system outputs 450,000 cd/m² at the exit port, making it an incredibly bright light source for its size.
- The water cooling system ensures the user's safety and protects the components from heat damage.
- Labsphere's Spectralon material gives exceptionally high diffuse reflectance in the visible, UV, and NIR spectral region, allowing for great testing flexibility.

