

# Application-Based Sample Slide Infragold Sphere

## Technical Challenge

A national testing laboratory needed to perform tests to measure the emissivity of various blackbodies. The system needed to be able to perform in the infrared range and be compatible with different reference materials.

## Labsphere's Solution

Blackbodies can be measured with Labsphere's standard Infragold® reflectance spheres, but this system was equipped with several important features that allowed it to meet the needs of the client:

- Custom-built concave port covers with slits made for laser input
- Unique port holes with flanges designed to mount detectors or optics
- Two sets of interchangeable internal baffles, one specular and one diffuse
- Easily separable hemispheres to allow placement and removal of baffles
- Knife-edge design around every port to eliminate error from extraneous walls created by recessed components
- Diffuse-coated plugs for every port, including baffle holes
- Custom frame with holes compatible with an optical table
- The Reference Rotary Slide (RRS), a wheel capable of holding up to eight reference materials
- Two remote-controlled radial motors connected to the RRS and the port covers

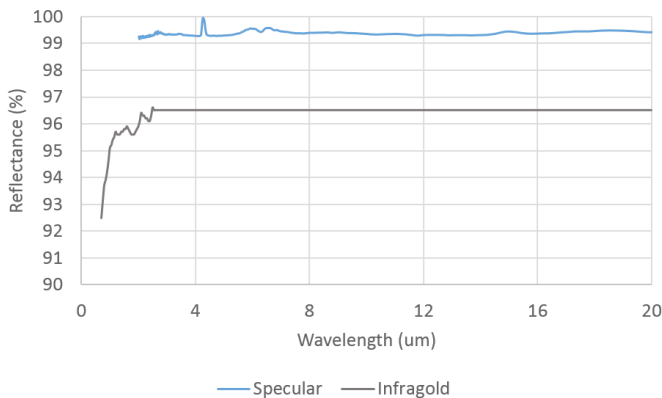
The motor connected to the RRS allowed the user to easily choose and switch to the next reference material without having to adjust it manually. The slots around the RRS were perfectly aligned with the exit port, creating a light-tight environment within the sphere. The motor connected to the port cover on the opposite side rotated it, enabling the user to perform a unique testing method that doesn't require the use of baffles. Both motors were connected to their own power supplies and were controlled with the use of one remote.

## Benefits

- The RRS allows the user to prepare up to eight different samples, improving testing quality and variability.
- The motors on the system make performing tests faster and give the user more accurate control.
- Client can easily add or remove baffles, adding flexibility for multiple test configurations in one system.
- Optimal measurement accuracy achieved with knife-edge port design.



Typical Reflectance of Gold Surfaces



Infragold BRDF in plane at 5°

