

ISP-REF Integrating Sphere

The **ISP-REF INTEGRATING SPHERE** is an illuminated sampling optic that couples via optical fiber to Ocean Optics miniature fiber optic spectrometers to measure reflectance of solid objects or emission of spectral sources. The ISP-REF Integrating Sphere has a transfer optic assembly for restricting the fiber viewing angle, a 0.4" aperture sample port, and a built-in light source (tungsten halogen) with 12-volt DC adapter.

Application Tips

- ◆ The ISP-REF has two primary functions: 1) to provide even surface illumination for reflectance measurements, such as determining the color of flat surfaces; and 2) to collect light and funnel it to an optical fiber for emission experiments, such as measuring the spectral properties of an LED.
- ◆ The ISP-REF is small and compact -- it's just 2.11" x 2.25" x 3.25" (LWH) and weighs less than 1 pound -- yet is durable enough for use outside the laboratory. All instrument electronics -- including the lamp, which can be replaced by simply removing two screws -- are mounted into the bottom section of the unit.
- ◆ The sphere is made from Spectralon, a white diffusing material that provides a highly lambertian reflecting surface. A simple switch allows users to manipulate the sampling optic for the inclusion (I) or exclusion (E) of specular reflectance.
- ◆ The reflectivity value obtained by calculating the difference between the inclusion and exclusion of specular reflection is a direct measurement of the gloss of the surface.

Operation

1. Locate the on/off switch on the front of the lamp. The "1" position is the on position. The "0" position is the off position. Turn the lamp on.
2. Locate the shutter switch. It is located on the back of the sphere. The "I" (for includes) position means that the resulting reflection measurement includes both specular and diffuse reflections. The "E" (for excludes) position means that the resulting reflection measurement excludes specular reflection (the user will only obtain diffuse reflection measurements). Move the switch to the mode necessary for your application.

Using the Optical Fiber Ports

- ◆ The ISP-REF has SMA connectors for two optical fibers. The connector, or port marked "S" (for sample) is used to couple an optical fiber to the spectrometer to measure the reflection from a flat surface.
- ◆ The second port, marked "R" (for reference), offers two features not available with most other integrating spheres. One function of the R port is to couple an optical fiber to a second channel in the spectrometer. This channel can be used to monitor the Integrating Sphere's built-in tungsten halogen lamp, which provides even surface illumination. The other function of the R port is for the coupling of an optical fiber to collect light. This may be advantageous for applications involving the collection of a wide-angle beam of light, especially where the beam is much larger than the size of the entrance optics.

Specifications

Spectral range (of illumination source):	~360-1000 nm
Dimensions:	2.11" x 2.25" x 3.25" (LWH)
Sphere diameter:	1.5"
Sample port aperture:	0.4"
Sphere material:	Spectralon
Reflectance measurements:	specular included or excluded
Bulb life:	900 hours
Bulb color temperature:	3100K