

# Light Measurement Spheres

Designed to measure total and forward flux  
of LEDs, lamps and other light sources



## Accurate and Flexible

The LMS Light Measurement Spheres are integrating spheres designed for the measurement of the total flux of lamps.

The total flux of an unknown lamp is not measured directly; instead this measurement is based on comparison to a NMI traceable standard lamp. Labsphere's Light Measurement Spheres range in size from 25 to 300 cm in diameter. Six different sphere diameters accommodate lamp sizes from LEDs to 202 cm linear lamps. The sphere interior is coated with Spectrafect®, a diffuse white reflectance coating specifically formulated for light measurement spheres.

Labsphere offers an 80% reflectance coating for spheres used in photopically filtered applications. The integrating sphere design conforms to recommendations of industry standards, providing an easy-to-operate, highly accurate measurement component.

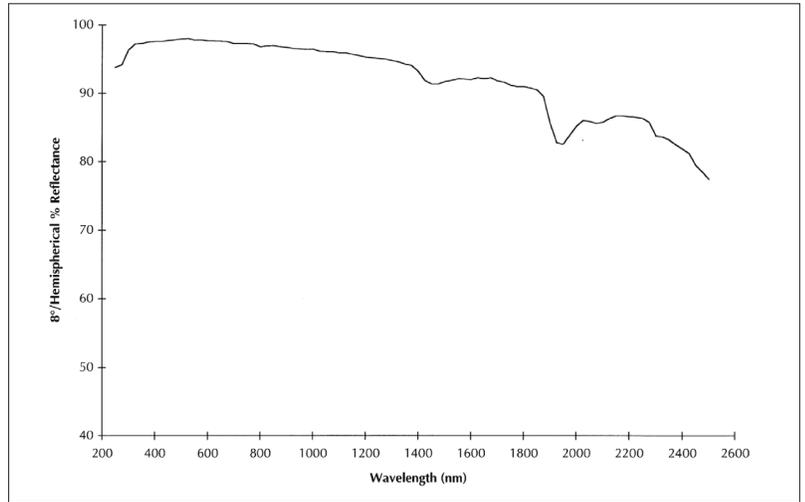
## Easy to Use

An electrical feed-through to connect the lamp to a power supply terminates at the lamp socket mounting plate in the sphere. The design of the sphere makes sources considered difficult to measure easier to do so with accessible ports and framing. The LMS spheres are equipped with a diffuser based near cosine receiver. This reduces errors associated with baffle shadow and improves spatial collection, uniformity and accuracy. The in-port Cosine receiver offers angle wide field-of view, necessary for accurate total flux measurements. The spheres provide measurement data that depends only on the light source's true power and not the shape, size, spectral or spatial light distribution. All light measurement spheres are compatible with Labsphere's spectrometers and flicker test instruments.

## Value

- Light tight closure
- Base-up or Base-down lamp mounting
- Socket mounting plate
- Adjustable fluorescent lamp holder
- Variable height electrical supply tube
- Interchangeable baffle
- Temperature sensor mounting port
- 2π port
- Absorption correction lamp port
- Absorption correction lamp baffle

## Spectralect Reflectance Coating



## Specifications

| Model Number:  | LMS-025                             | LMS-050                           | LMS-100                            | LMS-165                            | LMS-195                             | LMS-300 4π                 |
|--|-------------------------------------|-----------------------------------|------------------------------------|------------------------------------|-------------------------------------|----------------------------|
| Order Number:  | AA-30000-025                        | AA-30000-050                      | AA-30000-100                       | AA-30000-165                       | AA-30000-195                        | AA-30000-300               |
| Sphere Size:   | 25 cm                               | 50 cm                             | 100 cm                             | 165 cm                             | 195 cm                              | 300 cm                     |
| Sphere Coating:  | Spectralect                         | Spectralect                       | Spectralect                        | Spectralect                        | Spectralect                         | Spectralect                |
| Maximum Lamp Length:   | 13 cm                               | 25 cm                             | 61 cm                              | 86 cm                              | 132 cm                              | 285 cm                     |
| Maximum Lamp Wattage:  | 100 W                               | 400 W                             | 1500 W                             | 4000 W                             | 5000 W                              | 10000 W                    |
| Minimum Lamp Luminous Flux*:                                       | 0.003 lumens                        | 0.012 lumens                      | 0.04 lumens                        | 0.13 lumens                        | 0.18 lumens                         | 0.41 lumens                |
| Sphere Assembly Frame:   | Bench-top                           | Bench-top                         | On casters                         | On casters                         | On casters                          | On casters                 |
| Max Height:(cm)  | 39.05                               | 76.2                              | 179.07                             | 204.47                             | 229.87                              | 342.90                     |
| Required Foot Print:   |                                     |                                   |                                    |                                    |                                     |                            |
| Closed (cm)  | 45.9 x 30.2<br>x 39.1               | 74.1 x 50.4<br>x 74               | 128 x 98.1<br>x 166.7              | 185 x 165<br>x 200                 | 213.2 x 187<br>x 226                | 431.8 x 571.5              |
| Open (cm)  | 64.2 x 46.8<br>x 39.1               | 103.7 x 89.9<br>x 74              | 174.4 x 165.9<br>x 166.7           | 269.3 x 271.8<br>x 200             | 310 x 307.4<br>x 226                | 431.8 x 571.5              |
| Weight:  | 4 kg                                | 20 kg                             | 92 kg                              | 300 kg                             | 347 kg                              | 462 kg                     |
| Sphere Open Style:   | Clam Shell                          | Clam Shell                        | Clam Shell                         | Clam Shell                         | Clam Shell                          | Clam Shell                 |
| Sphere Assembly:   | Spun Aluminum                       | Spun Aluminum                     | Spun Aluminum                      | Spun Aluminum                      | Spun Aluminum                       | Fiberglass                 |
| Frame Style:   | Extruded Aluminum                   | Extruded Aluminum                 | Extruded Aluminum                  | Extruded Aluminum                  | Extruded Aluminum                   | Extruded Aluminum          |
| Sphere Coating:  | Spectralect                         | Spectralect                       | Spectralect                        | Spectralect                        | Spectralect                         | Spectralect                |
| Spectralect Coating Reflectance:                                   | > 97% (nominal)                     | > 97% (nominal)                   | > 97% (nominal)                    | > 97% (nominal)                    | > 97% (nominal)                     | > 97% (nominal)            |
| Total Number of Ports:   | 6                                   | 6                                 | 6                                  | 6                                  | 6                                   | 6                          |
| Detector Port Dimension:   | 1.25 cm                             | 1.25 cm                           | 1.25 cm                            | 1.25 cm                            | 1.25 cm                             | 1.25 cm                    |
| Detector Port Quantity:  | 1                                   | 2                                 | 2                                  | 2                                  | 2                                   | 2                          |
| Temperature Probe Port:  | 2.5 cm                              | 2.5 cm                            | 2.5 cm                             | 2.5 cm                             | 2.5 cm                              | 2.5 cm                     |
| Max Recommended Lamp Size: (LM-79) 4π geometry                     | 2.5 cm                              | <7 cm dia,<br>33 cm long          | <14 cm dia,<br>67 cm long          | <23 cm dia,<br>110 cm long         | <27 cm dia,<br>130 cm long          | <50 cm dia,<br>202 cm long |
| Max Recommended Internal Surface Size: (2% Rule)(cm <sup>2</sup> ) | 13 cm <sup>2</sup>                  | 50 cm <sup>2</sup>                | 200 cm <sup>2</sup>                | 545 cm <sup>2</sup>                | 760 cm <sup>2</sup>                 | 5600 cm <sup>2</sup>       |
| Max. Sphere Coating Temp:  | 100°C                               | 100°C                             | 100°C                              | 100°C                              | 100°C                               | 100°C                      |
| Max Port or DUT Area: (2π)   | 5.08 cm dia.;<br>20 cm <sup>2</sup> | 15 cm dia.;<br>71 cm <sup>2</sup> | 33 cm dia.;<br>337 cm <sup>2</sup> | 53 cm dia.;<br>879 cm <sup>2</sup> | 63 cm dia.;<br>1246 cm <sup>2</sup> | Optional                   |
| Port Frame Reducer:  | n/a                                 | 15 - 2.5 cm                       | 33 cm - 15 cm;                     | 53 cm - 15 cm;                     | 63 cm - 15 cm;                      | N/A                        |
| Max Recommended Linear DUT Dimension: (2/3 sphere diameter)        | 15 cm                               | 15 cm - 2.5 cm                    | 15 cm - 2.5 cm                     | 15 cm - 2.5 cm                     | 15 cm - 2.5 cm                      | 130 cm                     |

\* Based on Cool White LED and 2600 Spectrometer



Advancing the Technology of Light: Measure. Create. Reflect.

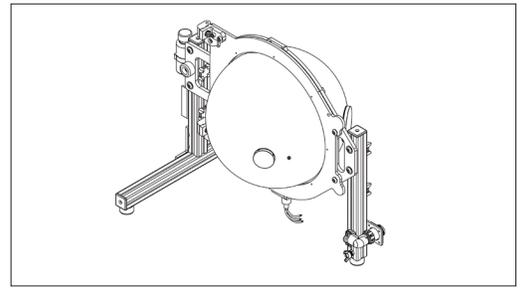
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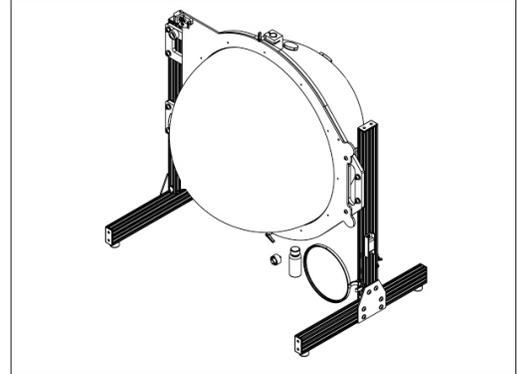
### LMS-025 Light Measurement Sphere

Labsphere's LMS-025 Light Measurement Sphere has a 25 cm diameter for the measure of miniature and subminiature lamps with maximum lamp wattage up to 100 watts and high brightness LEDs. The sphere is designed to accommodate rail mounted heat sinked LEDs measurements as well as other forward flux measurements without having to open the sphere.



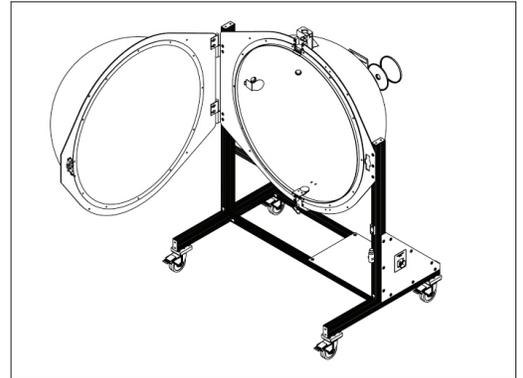
### LMS-050 Light Measurement Sphere

Labsphere's LMS-050 Light Measurement Sphere has a 50 cm diameter integrating sphere mounted on a hinged frame designed for bench-top use. The hinged configuration allows the sphere to be easily opened and closed to change lamps or perform a measurement. The sphere is designed for measurement of miniature and small lamps with a maximum lamp wattage up to 400 watts.



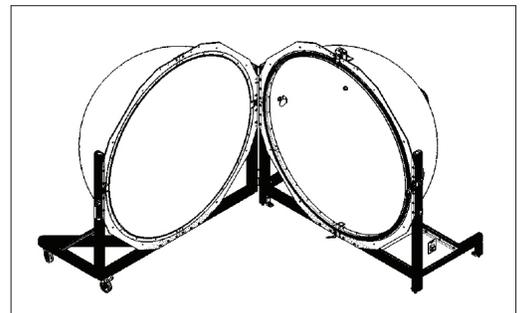
### LMS-100 Light Measurement Sphere

Labsphere's LMS-100 Light Measurement Sphere has a 100 cm diameter and is mounted on a hinged frame equipped with rugged locking casters to allow the sphere to be rolled and locked into position. The hinged configuration allows the sphere to be easily opened and closed to change lamps or perform a measurement. The sphere contains a lamp mounting bracket designed to accept a variety of sockets for single contact and double contact lamps and accommodates small and medium lamps with a maximum length of 61 cm and a maximum lamp wattage up to 1500 watts.



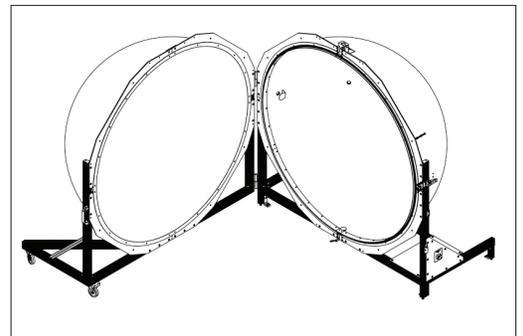
### LMS-165 Light Measurement Sphere

Labsphere's LMS-165 Light Measurement Sphere has a 165 cm diameter integrating sphere mounted on rails to allow the non-stationed hemisphere to be rolled open for interior access. The dual, rail-mounted configuration of the two hemispheres allows the sphere to be opened and closed easily to change lamps or perform a measurement. The sphere contains a lamp mounting bracket designed to accept a variety of sockets for single contact and double contact lamps and accepts medium to large lamps with a maximum length of 122 cm, and a maximum lamp wattage up to 4000 watts.

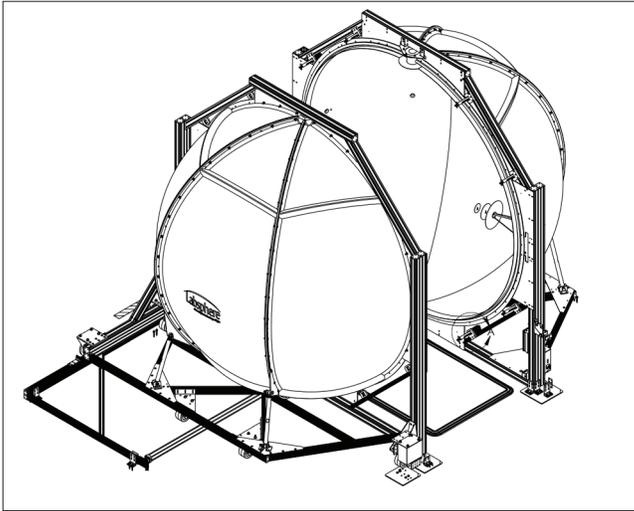


### LMS-195 Light Measurement Sphere

Labsphere's LMS-195 Light Measurement Sphere has a 195 cm diameter integrating sphere mounted on rails to allow the non-stationed hemisphere to be rolled open for interior access. Each hemisphere is mounted to a separate carriage, allowing the sphere to be easily opened and closed to change lamps or perform a measurement. The sphere contains a lamp mounting bracket designed to accept a variety of sockets for single contact and double contact lamps and accepts medium to large lamps with a maximum length of 132 cm and a maximum lamp wattage up to 5000 watts.



# 3 Meter Light Measurement Spheres



## Value

- Reinforced structure for base up/base down mounting of DUT
- External jack for easy switch from base up to base down mounting of DUT
- Great for testing indoor and outdoor lighting
- Baffled ambient temperature control intake and output ports
- Design meets IESNA LM79 and LM-78 requirements for  $4\pi$  measurements
- Stress-free pneumatic open and close
- Compatible with Labsphere light measurement systems, software, and accessories
- Two cosine receiver ports allow for mounting of more than one detector for simultaneous broadband and spectral measurements

## Measures Large and Complex Devices

Complete optical characterization of large lamps and luminaires in  $4\pi$  geometry.

## Accurate, Reproducible Results

Complies with IESNA LM-79 and LM-78 standards. Enabling photometric and colorimetric data for Total Spectral Flux, Luminous Flux, Correlated Color Temperature (CCT), Color Rendering Index (CRI), and Chromaticity.

## Available as illumiaPlus® System

Works with all spectrometers and components of Labsphere's modular light measurement systems.

## Base Up, Base Down, Longitudinally

Easily and efficiently accommodates virtually any lamp type, including linear lamps up to 2.5 meters; indoor, outdoor and roadway lighting.

## Efficient and Reliable

With lighting technology advancing to include larger more complex devices, Labsphere has introduced the LMS-3M three meter integrating sphere for complete optical characterization of large lamps and luminaires. The sphere design complies with IESNA LM-79 and LM-78 and many other recommended guidelines and standards to deliver accurate, reproducible and compliant measurements.

The three meter lamp measurement integrating sphere accommodates light sources positioned base up, base down or longitudinally to easily and efficiently measure virtually any lamp or luminaire type. The design also allows for directional and non-directional flux and color measurement of light sources. The large sphere better integrates light enabling more reliable testing of a device's photometric and colorimetric performance with measurements of Total Spectral Flux, Luminous Flux, Correlated Color Temperature (CCT), Color Rendering Index (CRI), Chromaticity, and more.

The near Lambertian properties of the sphere's interior coating, Spectrafect, provides a uniform dispersion of light that integrates and reduces hot spots better than any other sphere coating available. Spectrafect® exhibits reflectance values of  $>98\%$  and is spectrally flat throughout the visible spectrum, therefore providing higher optical efficiency for low lumen lamps.

The LMS-300 is designed to measure a variety of lamps and luminaire types on the same system with little adjustment. The standard sphere geometry accommodates  $4\pi$  measurement and can easily be configured for  $2\pi$  measurement with optional apertures. Baffled intake and output ports and an ambient air temperature controller module are available to maintain and monitor temperature inside the measurement environment enabling elevated temperature testing. The larger sphere size fully integrates with all Labsphere photometric and spectroradiometric components and software, making it easy for current users to upgrade to this new size sphere.

