

## CALIBRATION CERTIFICATE

REPORT NUMBER: 40095-2-1

DATE OF CALIBRATION: October 14, 2003

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RENDERED TO: USDA/ARS

AUTHORIZATION: Purchase Order Credit Card

CALIBRATION LABORATORY: Labsphere, Inc., Reflectance Calibration Laboratory

### CALIBRATED STANDARD OR SAMPLE

Spectralon Reflectance Target, Sample I. D: SRT-75-120

### CALIBRATION REQUESTED

8°/Hemispherical Spectral Reflectance Calibration from 250-2500 nm reported in 50 nm intervals.

### APPLICABLE DOCUMENTS

Labsphere #QP-14012-000 General Reflectance Calibration Requirements

#QP-14069-000 Background Correction for RSA-PE-19

#QP-14068-000 Procedure For Calibration of Spectralon Material

#QP-14074-000 Morning Check for RSA-PE-19

### TEST AND TEST METHOD

The 8°/Hemispherical Spectral Reflectance was measured for the sample listed above. The calibration was performed with standards traceable to the U.S. National Institute of Standards and Technology (NIST). The reflectance was determined by using a Perkin-Elmer Lambda 19 double beam ratio recording spectrophotometer (serial #1035) equipped with a Labsphere RSA-PE-19 integrating sphere accessory (serial # 1631). Incident flux at 8° from normal was reflected from the above sample then radiated onto the internal surface of the integrating sphere. The sphere's internal surface radiance was proportional to that of a laboratory working standard used to determine the spectral reflectance.

### NATIONAL LABORATORY TRACEABLE STANDARD

SRS-99-020-WS-2 ( NIST)

### CALIBRATION RESULTS

See Table I "8°/Hemispherical Spectral Reflectance Factor"

See Graph I "8°/Hemispherical Spectral Reflectance Factor"

### LABORATORY ENVIRONMENT

Temperature: 23 ± 3°C.

### ESTIMATE CALIBRATION UNCERTAINTY

The random uncertainty, expressed by standard deviation, of reflectance measurements performed by Labsphere, Inc. is less than 0.005 for the spectral range 300-2200 nm, and is less than or equal to 0.020 over the spectral range 250-2500 nm.

### CALIBRATION INTERVAL

If the product is handled with care, recalibration is recommended one year after the date of this certificate, at the discretion of the user.

This certificate shall not be reproduced except in full, without the written approval of Labsphere, Inc.

Calibrated by: *BRC*

Title: Optical Calibration Technician

Date : October 14, 2003

**labsphere.**

P.O. Box 70 No. Sutton, N.H. 03260

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**Table I**  
8°/Hemispherical Spectral Reflectance Factor for SRT-75-120

<u>Wavelength</u> (nm)	<u>Reflectance</u> Factor	<u>Wavelength</u> (nm)	<u>Reflectance</u> Factor
250	0.736	1400	0.786
300	0.735	1450	0.788
350	0.738	1500	0.788
400	0.734	1550	0.792
450	0.736	1600	0.792
500	0.740	1650	0.794
550	0.744	1700	0.798
600	0.748	1750	0.795
650	0.750	1800	0.796
700	0.753	1850	0.799
750	0.756	1900	0.797
800	0.760	1950	0.799
850	0.763	2000	0.800
900	0.765	2050	0.805
950	0.766	2100	0.803
1000	0.772	2150	0.804
1050	0.772	2200	0.802
1100	0.778	2250	0.805
1150	0.778	2300	0.805
1200	0.778	2350	0.806
1250	0.780	2400	0.807
1300	0.785	2450	0.801
1350	0.785	2500	0.802

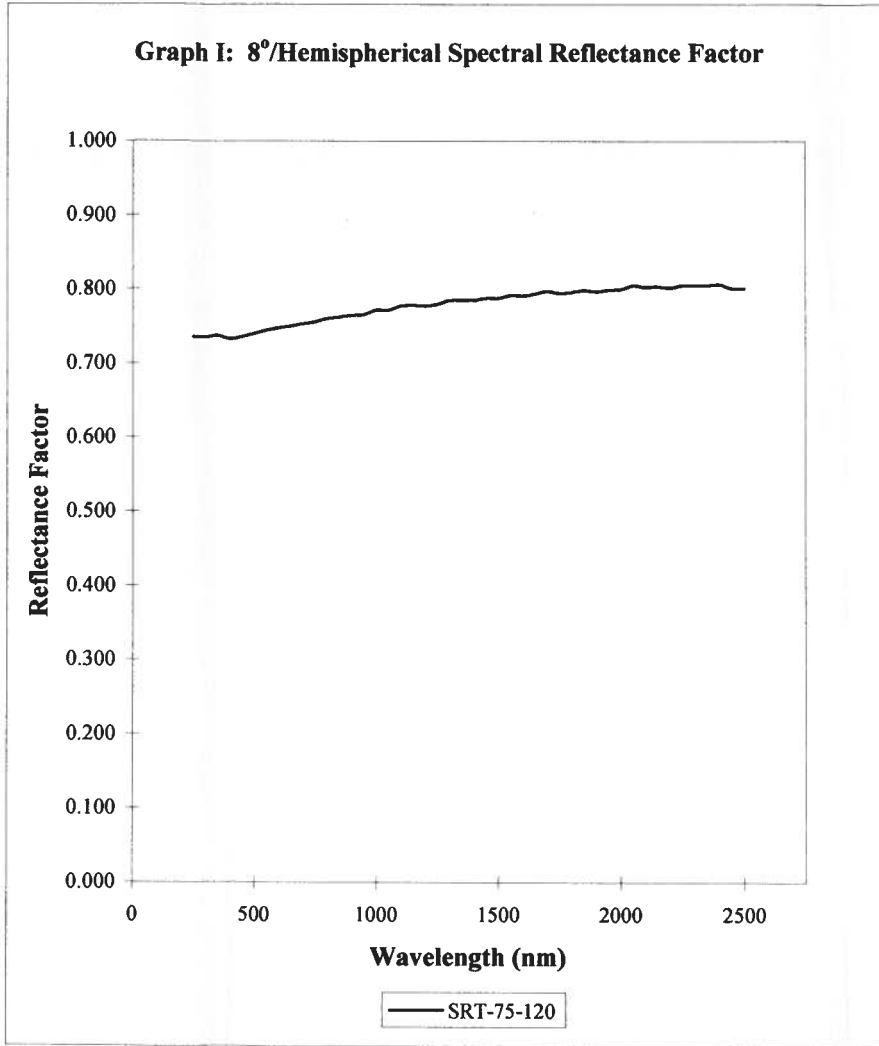
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