SURFACE OPTICS CORPORATION

Portable Emissometer & Solar Reflectometer SOC 410 Vis-IR

- Measures directional thermal emittance at near normal and near grazing incidence angles
- Predicts hemispherical thermal emissivity
- Measures solar absorptance / reflectance
- Partitions reflected energy between total, specular and diffuse components in the spectral range of 335 to 2500 nm
- Combined operational spectral range: from UV to far IR.
- NIST traceable
- Fast & Portable

One platform; two measurement heads and an optional Command Module for hand held operation.

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Specification

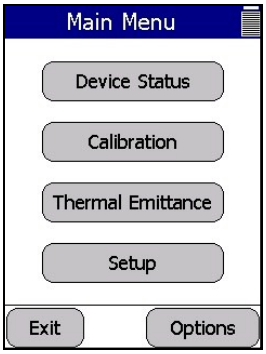
Measured parameters:	Directional Hemispherical Reflectance (DHR)
Method:	Integrated Total Reflectance in a band
Calculated values:	Solar absorptance for air mass 1.5 and 0, directional thermal emissivty, and hemi-spherical emissivity
Angle of incidence:	20 in the Vis range, and 20 and 60 degrees in the IR range
Surface curvature:	Any surface; convex 6 inch radius; concave 12 inch radius
Measurement time:	10 seconds/measurement per spectral range, user controlled (2 angles in IR)
Warm up time:	90 seconds
Power source:	12 Volt external power supply or a rechargeable NiMH battery for hand held operation
Weight:	4.7 lbs with battery
Radiation source	Vis and IR sources
Modularity:	Modular construction, interchangeable measurement heads
Operator interface:	a standard PC computer or a PDA computer in hand held operation
Diagnostics:	On screen status and signals monitor. Signal values stored with the data. Raw data collection and display.
Data format:	The data files can be opened and post processed with Excel, or a text processor.
Environmental:	Storage: -25 to 70 °C; Operating 0 to 40 ºC, non-condensing

410 Vis-IR has been developed as a modern replacement for the classic Gier Dunkle DB100 reflectometer.

The 410 Vis-IR measures total reflectance at combined 13 spectral bands. The Vis head operates from 335 nm to 2500 nm, and the IR head operates from 1.5 microns to far IR. The reflectances in the bands are converted to spectral information. Solar irradiance function or black-body function is applied to calculate solar absorptance or thermal emissivity for two angles 20 and 60 degrees. Hemispherical total emissivity is predicted based on calculated directional emissivity.

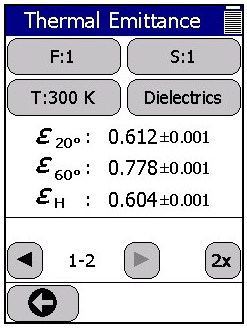
To perform measurements The samples are placed on the top of the measurement unit. The base of the instrument can be replaced with the optional handle, and the instrument can be operated as a hand held unit. It takes about 10 seconds to take a measurement in each spectral range. The spectrometer is calibrated with NIST traceable calibration coupons.

Software
In the portable operation the instrument is controlled from a PC type computer in the hand held operation it is controlled by a PDA computer residing in the Command Module, the handle.

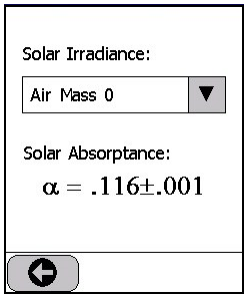


Main Menu

The data is formatted and stored in a standard spreadsheet format which can be opened in the Microsoft Excel application.



Thermal emissivity measurement



Solar absorptance measurement

Applications
Radiation heat transfer
Thermal barriers evaluation
Green building inspections.

Patent: 7,236,243

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