

# Emissometer Model AE1 and RD1 Voltmeter



The D&S Model AE1 Emissometer with the Model RD1 Scaling Digital Voltmeter

## Introduction

The D&S Emissometer Model AE1 is a special purpose instrument for measuring hemispherical emittance in compliance with ASTM C1371. The outstanding features of the Emissometer are:

**REPEATABILITY:**  $\pm 0.01$  emittance units.

**EASY TO OPERATE:** The detector portion of the instrument is electrically heated so that the sample does not have to be heated. No temperature measurements are needed.

**RAPID MEASUREMENTS:** After an initial warm up period of approximately 30 minutes, emittance readings can be made every minute and a half.

**INEXPENSIVE:** Devices to make comparable measurements cost much more.

The Model AE1 emittance measurement approximates total hemispherical emittance at 150F (65C). The detector responds to radiation heat transfer and is designed to have a voltage output that is near linear with emittance.

- **COMPLIANT WITH ASTM C1371 AND ISO REQUIREMENTS**
- **EASY TO OPERATE**
- **ADAPTERS AVAILABLE FOR SMALL SAMPLE SIZES**
- **CUSTOM ADAPTERS FOR NON FLAT SAMPLES**
- **EXTENSIVE TECHNICAL SUPPORT LIBRARY AVAILABLE ONLINE**

The D&S Scaling Digital Voltmeter, Model RD1, is the readout device for the Emissometer. The RD1 has a variable gain knob to set the voltage reading equal to the emittance of the calibration standard. Once this is done, the RD1 indicates emittance directly when the AE1 detector is placed on the material to be measured.

The Model AE1 measures flat surfaces as small as 2.25 inches (5.7 cm) across. The optional Model AE-AD1 adapter is available for flat surface areas as small as 1.5" (3.8 cm) in diameter. The optional AE-AD3 adapter is available for flat surface areas as small as 1.0 inches (2.54 cm) across. The AE-ADP adapter for 1.5" (3.8 cm) samples is available for a number of special measurement applications as outlined in D&S Technical Note 11-2. Custom adapters can be designed for cylindrical surfaces or almost any other surface geometry.

Emittance is obtained in two steps after calibrating the Emissometer. (1) With the Emissometer resting on the high emittance standard sample, adjust the RD1 to indicate the emittance. (2) Place the Emissometer on the sample to be measured and read emittance directly on the RD1 (as pictured above).



## Devices & Services

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**OUTPUT:** 2.4 millivolts nominal, with sample emittance of 0.9 and sample temperature of 78F (25C).

**LINEARITY:** The detector output is linear with emittance to within + / - 0.01 units.

**TIME CONSTANT:** 10 seconds, nominal (time to reach 63% of final value).

**HEAT SINK:** A heat sink is provided to keep both a calibration standard and the material to be measured at the same temperature.

**SAMPLE TEMPERATURE:** 130F Maximum. Sample and calibration standards must be at the same temperature.

**DRIFT:** The output will change with time due to changes in ambient conditions. This effect is negligible over the time required to make the measurement.

**STANDARDS:** Two high emittance standards and two low emittance standards are provided. One set of high and low emittance standards are used as working calibration standards and the other set should be stored for reference.

**AC POWER ADAPTER:** Universal AC adapter, 100-240V, 50-60 Hz, 12 volts DC, with US standard modular power cord.

**MODEL AE1/RD1:** Includes the Model AE1 plus the Scaling Digital Voltmeter, Model RD1, for direct reading of emittance, emittance standards, calibration certificate, heat sink, power/output cable, universal power supply, power cord and carrying case.

#### OPTIONS:

**Model AE-AD1** - Emissometer adapter to measure flat materials as small as 1.5 inches (3.8 cm) in diameter.

**Model AE-AD3** - Emissometer adapter to measure flat materials as small as 1.0 inches (2.54 cm) in diameter.

**Model AE-ADP** - Emissometer adapter to measure flat materials as small as 1.5 inches (3.8 cm) in diameter, materials with low thermal conductivity, large radius (>2 inches) cylindrical

surfaces and rough or textured surfaces.

**Custom Adapters** – Custom adapters can be designed for cylindrical surfaces or almost any other surface geometry.

**Battery Pack** – For portable operation, a Li-ion battery pack providing 12 hours continuous operation, low battery indication and universal power adapter for charging.

**ISO Compliance** – ISO compliant Calibration and Conformance Certificates are available.

**10X Gain Option** – Optional gain setting for the RD1 Scaling Digital Voltmeter to read emittance to three digits.

#### PHYSICAL DIMENSIONS:

