

# Devices & Services Company

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## D&S Technical Note 04-1

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### EMISSOMETER MODEL AE – Slide Method for AE Measurements

Where emittance measurements need to be made on materials in place, on large samples that cannot be placed on the heatsink, or on materials with low thermal conductivity there is a potential for error if the surface temperature is different than that of the calibration standards. It is necessary to ensure that the surface temperature is the same as the calibration standards, or to calculate a corrected reading. Technical bulletin 79-17 describes two technical approaches to correcting the indicated emittance value.

A third approach is described here that avoids the need to calculate a correction. It does require a larger surface area that is allowed to come to room temperature as are the standards. First the instrument is calibrated on the low and high emittance standards. Then place the detector on the sample to be measured and allow about a minute for the detector reading to reach a near steady value. During that time it is expected that the surface will heat up directly underneath the detector and therefore the emittance reading will be lower than it should be. Then the detector should be slid several inches across the surface to a different spot without breaking contact with the surface. This will allow the detector a view of an area that is at the correct temperature therefore the emittance reading should increase a small amount and will be closer to the correct value because there is less time for the surface to heat up underneath the detector. This process can be repeated a few times, each time moving to a spot that has not previously been measured and the value should approach a steady reading.

It is recommended that a test of this method be conducted to ensure that the approach will produce correct readings. This can be done by measuring the emittance of a piece of wide vinyl tape that can be applied to a sample of the material to be measured. First the “correct” emittance value of the tape is determined by carefully measuring the tape as applied directly to the heat sink. Then apply the tape liberally to the surface to be measured so that the “slide” method can be tested on the tape as applied to the surface. It should be possible to obtain roughly the same reading if the emittance standards and the surface to be measured are coming to the same temperature in the operating environment. It may be helpful when using this technique to not leave the detector sitting constantly on the heatsink, causing the temperature of the heat sink to be slightly above ambient. Where the environmental temperature or the sample temperature cannot be controlled, this method can be extended by using the vinyl tape and a foil tape as high and low standards and applying strips of the two tapes to the surface to be measured. Then the “slide” method is used both during calibration and when making the measurement.