CALOMETRY DEGREDATION IN THERMAL ENVIRONMENTS

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MEDTHERM calorimeters have developed into the industry standard for measuring thermal environments ranging from 1 to 150 calories/cm2/sec thermal flux. The preparation, calibration and handling of these calorimeters dramatically effect the reliability of the calorimeters to accurately record the thermal environment. A study was conducted at the Defense Nuclear Agency, Coyote Canyon, Thermal Radiation Source (TRS) facility to document calorimetry performance during normal operation in a robust testing schedule.

This study examined and quantified the effect of different calorimeter paint on the sensitivity of calorimeters to measure thermal flux and fluence. The degradation of the paint over time due to exposure to successive thermal environments is examined to identify at what point repainting and recalibration is required. Techniques used to calibrate calorimeters slugs are documented for repeatability and the effectiveness of field stripping and painting in achieving recorded calibration factors is quantified.