COMPARISON OF THERMAL RESPONSE DATA TAKEN AT VARIOUS THERMAL RADIATION TEST FACILITIES

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Several types of thermal facilities are being used to test the response of Army material in a simulated nuclear thermal radiation environment, as well as to execute thermal hardness verification and validation tests. It is desirable that the thermal response of a particular sample be independent of the test facility used. This paper describes the characteristics of the thermal environment at several different facilities used for thermal testing and compares the thermal response of samples exposed to the environment at each facility. The facilities compared were the White Sands Solar Facility, the Thermal Radiation Test Facility, and the Tri-Service Thermal Radiation Source Test Facility (both a xenon flashlamp and a quartz lamp bank are located the latter facility). The types of thermal response parameters studied were the temperature rise of aluminum plates and the fracture threshold of glass. Results show that while the qualitative response of each sample was similar at all facilities, some significant quantitative differences were observed which can be correlated when simulator parameter variations are taken into account.