

A study was undertaken to evaluate the fire performance of composite materials using the cone calorimeter as the bench-scale method of test simulating the thermal irradiance from fires of various magnitudes. Five parameters were derived from the calorimetry measurements to characterize the ignitability and flammability of the composite materials.

Three of the parameters are, to a large extent, empirical since radiative heat losses from the samples were unknown. These parameters are:

- 1) minimum external radiant flux (MERF) required to produce pilot ignition in a predetermined exposure time;
- 2) thermal sensitivity index (TSI) which indicates the burning intensity dependence on external heat flux and;
- 3) extinction sensitivity index (ESI) which indicates the propensity for continued flaming combustion without an external heat flux.

MERF values at 300 s for 3 mm composite panels of a FR epoxy resin and a poly(phenylene sulfide) (PPS) resin composite were about 18 and 28 kW/square metres, respectively. The TSI of the PPS resin composite had the greatest dependency on external flux. Additionally, the ESP of the PPS composite was the only one to indicate an external flux requirement to sustain combustion during the first 60 s after ignition.

The other two parameters determined were yields of gaseous products of combustion and average extinction area, "sigma", normalized to the carbon dioxide yields.