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# APPLICATION OF UPWARD FLAME SPREAD FOR THE PREDICTION OF SBI AND ISO ROOM CORNER (AND PARALLEL WALL) EXPERIMENTS AND CLASSIFICATION

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ABSTRACT

The flammability hazard assessment of wall and ceiling linings has occupied the attention of fire scientists and engineers and regulators over the last fifty years. Several tests (small, medium, and large) have been developed to classify the flammability of linings and predict their burning behaviour in real enclosure fire situations. We examine in some detail three such efforts: (a) the development of an experimental room and a 9 ft vertical wall full scale test by Ferris leading to the Early Fire Hazard test in Australia, (b) the ISO room corner test, and (c) The new SBI (Single Burning Item test) which maybe the most thoroughly examined test in the history of flammability testing. Of these tests, the experimental room used by Ferris and the ISO room corner test may be considered as end use applications for medium size rooms whereas the SBI test and the vertical wall test by Ferris are intermediate scale test designed to represent the room fire behaviour in a more controlled way. Performance criterion in the ISO room corner test is the time to reach flashover. Performance criteria in the SBI test are related to the fire growth in an open corner (no ceiling) configuration due to upward flame spread. Performance criterion in the experimental room of Ferris was the time to reach untenable conditions in the room. Finally, performance criterion in the vertical wall of Ferris was the time interval from ignition until the flames reach the top of the wall. Examination of all these efforts has led to consistently validating a new correlation of the performance criteria of these tests with small-scale cone calorimeter tests whenever both data are available. Previous correlations are also discussed. The new correlation compares well with essential features of upward flame spread as this is related to flammability properties. Comparison between the ISO room corner test and the SBI test leads to suggestions regarding the suitability of these tests as a regulatory tool. Some comments are also directed towards a new test method of parallel wall panels recently proposed by Fmglobal. This test method can be analyzed using the same methodology outlined in this paper.

KEYWORDS

fire spread, fire growth, single burning item, ISO room corner

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