

In North America, some of the products used in building construction (e.g. resilient floor coverings, carpets and electrical cable) are regulated using ASTM E 662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.

However, technical shortcomings, in this ASTM standard, as symbolized by its many limitations on use, cautionary statements and caveats, often renders results of E 662 smoke density tests meaningless. In recent years, many leading fire scientists have suggested that the small-scale laboratory test most proficient in illustrating the propensity of materials to release smoke in larger fires is ASTM E 1354 Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter (cone calorimeter), and as a result this test procedure has been suggested as an alternative to E 662.

Modifications were made to the smoke chamber and the procedure for reporting the resulting data so that static smoke generation data produced with the smoke chamber could be related to dynamic smoke release rate data from cone calorimeter tests. The values for peak extinction area for smoke released by four flooring materials (Douglas fir plywood, oak lumber, carpet and resilient flooring) as determined using the modified smoke chamber method were approximately one-half the values obtained from the cone calorimeter.

However, when specified time intervals were considered, the values for specific extinction area were approximately equal by these two procedures. This suggests that values for specific extinction area are independent of the irradiance to which samples were exposed.