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Inadequate scientific information exists at present to allow meaningful regulation of materials based upon smoke generated. In spite of this fact, some regulatory agencies limit the use of carpet, based upon smoke generation.

The most widely used test method is known as the NBS Smoke Density Chamber and is referenced under NFPA Standard–258 and ASTM E-662. This test method had been referenced by some agencies in spite of the ASTM scope statement which indicates, “This test is intended for use in research and development and not as a basis for ratings for building code purposes. At the present time, no basis is provided for predicting the density for smoke that may be generated by the materials upon exposure to heat and flame under fire conditions”.

In the ASTM E-662 test, a 3 x 3 inch (76 x 76 cm) sample is placed in a closed chamber and is exposed to a radiant heat energy source of 2.5 watts per square centimeter. Tests may be conducted in a flaming and nonflaming mode. A light beam is projected vertically through the closed chamber. The reduction in light transmittance is measured for the duration of the test. Using chamber volume, light path, exposed specimen area, and reduction in light transmittance, calculations are performed to determine specific optical density. The regulatory limit presently applied by a number of agencies is a maximum specific optical density (corrected) of 450 based on tests conducted in the flaming mode.

Data is available to show reasonable reproducibility; however, application should be approached with care, as correlation has not been established between ratings developed in the chamber and the performance of materials in the real world.

Note: This information is extracted from CRI's Carpet Specifier's Handbook, 1992 edition.