Technical Services Bulletin

Carpet and Combustion Toxicity

Virtually every burning material, including carpet, emit toxic gases. In the case of most materials, and is the case with carpet, the most toxic gas is carbon monoxide (CO), a major pollutant of combustion emissions. Other trace gaseous compounds emitted from burning carpet can include hydrogen chloride (HCL), nitrogen oxides (NOx), sulfur dioxide (SO2), which is a major industrial pollutant, hydrogen cyanide (HCN), and hydrogen fluoride (HF).

Analysis by Southwest Research Institute of carpets and rugs in a simulated full-scale fire has been performed to determine the incapacitation and lethality of combustion gases on laboratory rats. This test, which was performed in a "head-only" mode, indicated that the major cause of death in these experiments was inhalation of carbon monoxide. However, it is very important to note several factors: 1) There was no notable differences in the results of these tests with and without carpet. 2) Significant toxic hazards did not develop in these tests until 1200 degrees Fahrenheit was reached at the 7-ft. level in the burning room. 3) The smoke detector activated prior to development of acutely toxic concentrations of combustion products (chair, sofa, and carpet). 4) The toxic potency values obtained for all carpet systems tested (nylon, olefin, polyester, and wool) were comparable to one another and of even more importance, were of the same magnitude as wood and other common building materials.

These tests indicate that carpet presents no more toxicological hazards from fire than virtually any other interior material.