

## Abstract

A multi-phase study program has been established to develop a rational test procedure for evaluating the fire resistance of residential floor assemblies.

The first phase of this research program was aimed at characterizing the severity of fires originating in residential rooms and developing a specified set of fire exposure conditions applicable for fire resistance testing of floor constructions.

A total of 16 burnout tests were conducted to investigate the fire behavior in typical residential recreation rooms of single family-houses. These fire tests were usually run for one hour and were performed in two instrumented test rooms, 3.3 x 3.3 x 2.4 m and 3.3 x 4.9 x 2.4 m in width, length, and height respectively, furnished with household furniture and lined with interior finish materials typical of actual occupancies.

Measurements were made of the temperature, heat flux, static pressure, smoke density, gas velocity, species concentration, and oxygen consumption.

The effects of such parameters as the ventilation, fire load density, initial item ignited, room size, and thermal and flammable properties of the wall and ceiling materials on the fire severity were evaluated quantitatively. A fire exposure temperature-time curve which is different from the ASTM E 119 curve, has been developed for testing the fire resistance of such building structures.