

A review is presented of different methods for determining the thermal properties of construction materials at elevated temperatures. The different methods are discussed in terms of applicability to fire safety technology.

One method, termed "the constant rate of temperature rise method", has been selected for a more detailed investigation. This method was originally developed in Australia, by Miles, Grubits and Whitlock, Å1Å, and has since been used more or less as a standard test method for masonry. It is here considered as a candidate of becoming a standard method for the measurement of thermal properties of arbitrary construction materials. A measuring device based on this concept has been produced and tested for three different materials, brick, concrete and mineral wool.

The results from the measurements are evaluated and used to compute the temperature history in brick and concrete walls exposed to an ISO 834 standard fire. The results from the theoretical computations are compared to measurements from full scale tests. It is found that the results agree reasonably well for the case with concrete, for the brick material the calculated temperatures are considerably higher than the measured ones. This is mainly due to difficulties in measuring the specific heat of the brick, causing uncertainties in the estimated thermal conductivity values.

The measuring accuracy of the present method is discussed. Inherent weaknesses of the method are identified and possible improvements are suggested.