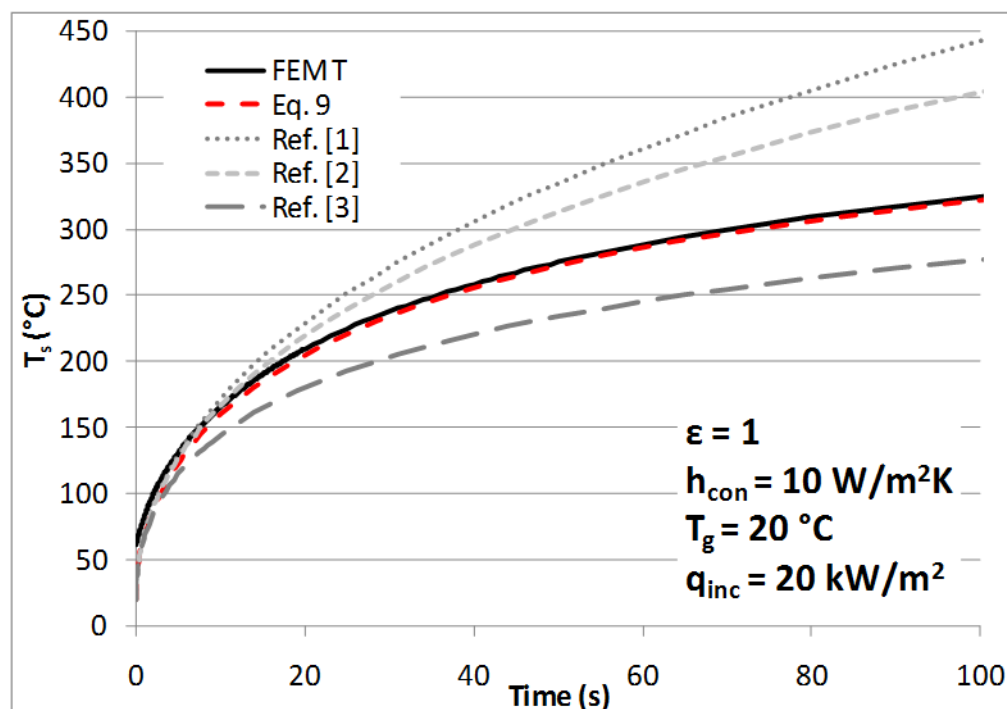


Development of theory for the calculation of time to ignition.

Fire protection i buildings.

A new simple and precise formula has been developed for calculating time to ignition of surfaces exposed to thermal radiation. The method can be used to assess the time to ignition for objects/surfaces that are exposed to radiation from flames. It may, for example be an item in the early stages of a room fire or a façade of a neighboring house where the flame comes out through the window openings. The method may, for example, be used for evaluating the results of cone calorimeter tests when determining the ignition properties of materials. The new method has been developed with the support of detailed numerical calculations including the finite element method and the Duhamel's superposition technique. Comparisons have been made with established calculation models that were proven to be very grossly inaccurate.

The figure below shows an example of the relationship between ignition time and ignition temperature for specified levels of incident radiation, emissivity, convective heat transfer coefficient and ambient temperature. The figure also shows how wrong if using calculation algorithms according to three different popular methods that are published in the international well-known text and reference books.



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