

For a fire engineering design of load bearing structures and partitions, an analytical procedure is permitted to be applied in Sweden, as one alternative, since about ten years. The procedure is a direct design method based on temperature characteristics of the fully developed compartment fire as a function of the fire load density, ventilation of the fire compartment and thermal properties of the structures enclosing the fire compartment.

The method is approved for a general use by the National Swedish Board of Physical Planning and Building (1). For facilitating the application, design diagrams and tables are systematically produced, giving directly, on one hand, the design temperature state of the fire exposed structure, on the other, a transfer of this information to the corresponding design load bearing capacity of the structure; cf., for instance (2), (3), (4).

The analytical design procedure is now further developed towards a reliability based method in connection with a Swedish handbook project in progress on fire exposed concrete structures (5).

The method is related to a semiprobabilistic approach based on a system of partial safety coefficients. The functional requirement then implies that the design value of the minimum load bearing capacity of the structure during the fire exposure R_d shall meet the design load effect on the structure S_d , i. e. $R_d - S_d \geq 0$

The functional requirements apply to all relevant types of failure-bending failure, shear failure, instability failure, etc. In the design, the following probabilistic influences should be taken into consideration:

- istics of the fire compartment,
- ties of the structural materials,
- fire, the heat transfer to and within the structure and the ultimate load bearing capacity of the structure