

FIRE SAFETY OF STEEL STRUCTURES

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Abstract: For determining the safety of steel structure exposed to fire, as random accidental action, it is possible to use only probabilistic methods, together with adequate laboratory researches. The procedure for determining the safety of load-bearing structures consists of four steps. The first step includes the determination of heat action in case of fire. The next step includes the determination of heat action upon the structure. Heating the structure brings about two effects: the elongation of the structure and the degradation of the mechanical properties of the material. This step is at the same time a third step in determining the safety of the load-bearing structures. Mechanical characteristics of the raw material are obtained by tension tests at high temperatures, while the element behaviour at high temperatures is determined by experiments in special laboratory researches carried out on real structures. The safety of steel structures expressed by the safety index β was also analyzed for the serviceability limit state for the combinations of permanent action and accidental fire action upon the structure, which represents the fourth phase of the process. The values of safety index β as well as degree of safety of the steel structures exposed to the fire will be determined on the basis of values for basis variables of resistance and fire action. These investigations of the actual temperature-time parameter curves, for large compartments and different fire loads have been carried out in Croatia within the National Application Documents in the field of accidental fire action..

Keywords: fire, accidental actions, safety, safety index, probabilistic methods.



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