Abstract

The load-bearing capacity of timber members in fire conditions can be evaluated by an analytical design model known as effective cross-sectional method (ECSM). For this method, an effective cross section of a member in fire is calculated by decreasing the original cross section by a notional charring depth and a so-called zero-strength layer. Then, the load-bearing capacity can be evaluated by applying the mechanical properties as at ambient temperature to this effective cross section. The ECSM for timber frame assemblies (TFA) exposed to standard fire conditions according to European Norm 1363-1 has been presented earlier in the European technical guide-line Fire Safety in Timber Buildings (FSITB) with a limited field of application. This design model considers the fire protection provided by claddings and a limited range of cavity insulations. To cover the fire protection of a wider range of cavity insulation products, a new design approach has been developed. In this study, the zero-strength layers for TFA with different cavity insulations are determined by means of a series of thermal and mechanical simulations. This paper proposes the protection coefficient for TFA with generic stone wool products as cavity insulation and zero-strength layers for TFA with different cavity insulations.

Full paper

The full paper is available at: LINK
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