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Test methods for determining the contribution to the fire resistance of structural members - Part 7: Applied protection to timber members

This European Prestandard (ENV) was approved by CEN on 1 March 2002 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

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Foreword

This document ENV 13381-7:2002 has been prepared by Technical Committee CEN/TC127 "Fire safety in buildings", the secretariat of which is held by BSI.

This document has been prepared under the mandate given to CEN/TC127 by the Commission and the European Free Trade Association.

As there was little experience in carrying out these tests in Europe CEN/TC127 agreed that more experience should be built up during a prestandardization period before agreeing text as European Standards. Consequently all parts are being prepared as European Prestandards.

This European Prestandard is one of a series of standards for evaluating the contribution to the fire resistance of structural members by applied fire protection materials. Other parts of this ENV are:

Part 1: Horizontal protective membranes.

Part 2: Vertical protective membranes.

Part 3: Applied protection to concrete members.

Part 4: Applied protection to steel members.

Part 5: Applied protection to concrete/profiled sheet steel composite members.

Part 6: Applied protection to concrete filled hollow steel columns.

Annexes A and C are normative. Annexes B and D are informative.

Caution

The attention of all persons concerned with managing and carrying out this fire resistance test, is drawn to fact that fire testing can be hazardous and that there is a possibility that toxic and/or harmful smoke and gases can be evolved during the test. Mechanical and operational hazards can also arise during the construction of test elements or structures, their testing and the disposal of test residues.

An assessment of all potential hazards and risks to health should be made and safety precautions should be identified and provided. Written safety instructions should be issued. Appropriate training should be given to relevant personnel. Laboratory personnel should ensure that they follow written safety instructions at all times.

The specific health and safety instructions contained within this prestandard should be followed.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this European Prestandard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This Part of this European Prestandard specifies a test method to be followed for determining the contribution of fire protection systems to the fire resistance of structural timber members.

Such fire protection systems include claddings, sprayed fire protection and coatings.

The method is applicable to all fire protection systems used for the protection of timber members. These can be fixed directly, totally or in part, to the timber member and can include an air gap between the fire protection system and the timber member, as an integral part of its design.

Evaluation of timber constructions protected by horizontal or vertical protective membranes are the subject of ENV 13381-1 or ENV 13381-2 respectively.

The test method is applicable to the determination of the contribution of fire protection systems to the fire resistance of loadbearing timber structural members and non-loadbearing parts of the works, including floors, roofs, walls, beams and columns. It is also applicable to timber structural members incorporating insulating materials between the timber members, e.g. between timber joists in floor constructions.

The test method and its assessment procedure is designed to permit direct application of the results to cover a range of thicknesses of the applied fire protection material.

This European Prestandard contains the fire test which specifies the test to be carried out to determine the ability of the fire protection system to delay the temperature rise throughout the timber member, to determine the ability of the fire protection system to remain coherent and fixed to the timber member and to provide data of the temperature profile throughout the timber test member, when exposed to the standard temperature/time curve according to the procedures defined herein.

In special circumstances, where specified in national building regulations, there can be a need to subject reactive protection material to a smouldering curve. The test for this and the special circumstances for its use are detailed in annex A.

The fire test methodology makes provision for the collection and presentation of data which can be used as direct input to the calculation of fire resistance of timber members in accordance with the procedures given in ENV 1995-1-2.

A description of the relationship of this test method and the assessment of the results obtained therefrom to ENV 1995-1-2 and guidelines for the use of this test method in accordance with that standard are given in annex B.

This European Prestandard also contains the assessment which prescribes how the analysis of the test data should be made and gives guidance to the procedures by which interpolation should be undertaken.

The limits of applicability of the results of the assessment arising from the fire test are defined, together with permitted direct application of the results to different timber constructions over the range of thicknesses of the applied fire protection system tested.

2 Normative references

This European Prestandard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Prestandard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 1363-1	Fire resistance tests - Part 1: General requirements.
EN 1363-2	Fire resistance tests - Part 2: Alternative and additional procedures.
EN 1365-1	Fire resistance tests for loadbearing elements - Part 1: Walls.
EN 1365-2	Fire resistance tests for loadbearing elements - Part 2: Floors and roofs.
EN 1365-3	Fire resistance tests for loadbearing elements - Part 3: Beams.
EN 1365-4	Fire resistance tests for loadbearing elements - Part 4: Columns.
ENV 1995-1-2	Eurocode 5: Design of timber structures Part 1-2: General rules - Structural fire design.
EN 338	Structural timber - Strength classes.
EN 312	Particleboards - Specifications.
ISO 8421-2	Fire protection -Vocabulary - Part 2: Structural fire protection.
ISO 13943	Fire safety - Vocabulary (ISO 13943:1999).

3 Terms and definitions, symbols and units

3.1 Terms and definitions

For the purposes of this European Prestandard, the terms and definitions given in EN 1363-1, EN ISO 13943 and ISO 8421-2, together with the following, apply.

3.1.1
timber structural member
element of building construction which may be loadbearing or non-loadbearing and which is mainly constructed from solid timber and/or other wood based products

3.1.2
fire protection material
material or combination of materials applied to the surface of a timber structural member for the purpose of increasing its fire resistance

3.1.3
passive fire protection materials
materials which do not change their physical form upon heating, provide fire protection by virtue of their physical or thermal properties. They may include materials containing water which, on heating, is removed to produce cooling effects

3.1.4
reactive fire protection materials
materials which are specifically formulated to provide a chemical reaction upon heating such that their physical form changes and in so doing provide fire protection by thermal insulative and cooling effects