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TEST METHODS FOR DETERMINING THE CONTRIBUTION TO THE FIRE RESISTANCE OF STRUCTURAL MEMBERS - PART 6: APPLIED PROTECTION TO CONCRETE FILLED HOLLOW STEEL COLUMNS

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English version

Test methods for determining the contribution to the fire resistance of structural members - Part 6: Applied protection to concrete filled hollow steel columns

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.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This document ENV 13381-6:2002 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 of the European Committees 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 Prestandardisation 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 the 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 7: Applied protection to timber members.

Annexes A and B are normative.

Caution

The attention of all persons concerned with managing and carrying out this fire resistance test, is drawn to fact that fire testing may 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 test 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 for determining the contribution of fire protection systems to the fire resistance of structural concrete filled hollow steel columns. The concrete can be lightweight, normal-weight or heavy-weight concrete and of strength classes 20/25 (LC/C/HC) to 50/60 (LC/C/HC).

The method is applicable to all fire protection systems used for the protection of such structural columns and includes sprayed fire protection, coatings, cladding protection systems and multi-layer or composite fire protection materials.

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.

The test method is only applicable to fire protection systems which are fixed directly to the structural column. Fire protection systems where the fire protection material is not attached directly to the composite column, leading to a continuous cavity between the column and the fire protection material of size greater than 5 mm are the subject of ENV 13381-2.

This European Prestandard contains the fire test which specifies the tests which should be carried out to determine the ability of the fire protection system to remain coherent and fixed to the composite column and to provide data on the temperatures of the outer steel surface of the composite column, when exposed to the standard time/temperature 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.

This exposure, applicable to reactive fire protection materials, is used only in special circumstances, where specified in the national building regulations of a member state of the European Union, and is not intended to be mandatory for all fire protection materials applied to concrete filled hollow steel columns.

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 concrete/steel composite members in accordance with the procedures given in ENV 1994-1-2.

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 steel/concrete composite columns, steel types and thicknesses, concrete densities, strengths, thicknesses and production techniques over the range of thicknesses of the applied fire protection system tested.