



National Standards Authority of Ireland

IRISH STANDARD

**I.S. ENV 13381-5:2002**

ICS 13.220.50

**TEST METHODS FOR DETERMINING THE  
CONTRIBUTION TO THE FIRE RESISTANCE  
OF STRUCTURAL MEMBERS - PART 5:  
APPLIED PROTECTION TO  
CONCRETE/PROFILED SHEET STEEL  
COMPOSITE MEMBERS**

National Standards  
Authority of Ireland  
Dublin 9  
Ireland

Tel: (01) 807 3800  
Tel: (01) 807 3838

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EUROPEAN PRESTANDARD  
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**ENV 13381-5**

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English version

**Test methods for determining the contribution to the fire  
resistance of structural members - Part 5: Applied protection to  
concrete/profiled sheet steel composite 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.

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.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: rue de Stassart, 36 B-1050 Brussels**

## ENV 13381-5:2002 (E)

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## Foreword

This document ENV 13381-5:2002 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 by the European 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 6:                      Applied protection to concrete filled hollow steel composite columns.
- 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 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 European Prestandard specifies a test method for determining the contribution of fire protection systems to the fire resistance of structural concrete/profiled sheet steel composite members or slabs. 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 composite members or slabs and includes sprayed fire protection, coatings, cladding protection systems and multi-layer or composite fire protection materials.

The test method and its assessment procedure are 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 underside of the concrete/steel composite member or slab. Fire protection systems where the fire protection material is not attached directly to the composite member, leading to a continuous cavity between the concrete/steel composite member and the fire protection system of size greater than 5 mm is the subject of ENV 13381-1.

This European Prestandard contains the fire test which specifies the tests which shall be carried out to determine the ability of the fire protection system to remain coherent and fixed to the composite member and to provide data on the temperatures of the steel sheet, throughout the depth of the concrete (for extended application purposes) and the unexposed surface of the concrete, 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 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 structures, steel types and thicknesses, concrete densities, strengths, thicknesses and production techniques 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 206-1	Concrete - Part 1: Specification, performance, production and conformity.

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