



NSAI
Standards

Irish Standard
I.S. EN 13381-2:2014

Test methods for determining the contribution to the fire resistance of structural members - Part 2: Vertical protective membranes

I.S. EN 13381-2:2014

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:

EN 13381-2:2014

Published:

2014-09-24

*This document was published
under the authority of the NSAI
and comes into effect on:*

2014-10-11

ICS number:

13.220.50

13.220.99

NOTE: If blank see CEN/CENELEC cover page

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD

EN 13381-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2014

ICS 13.220.50; 13.220.99

Supersedes ENV 13381-2:2002

English Version

Test methods for determining the contribution to the fire resistance of structural members - Part 2: Vertical protective membranes

Méthodes d'essai pour déterminer la contribution à la résistance au feu des éléments de construction - Partie 2: Membranes de protection verticales

Prüfverfahren zur Bestimmung des Beitrages zum Feuerwiderstand von tragenden Bauteilen - Teil 2: Vertikal angeordnete Brandschutzbekleidungen

This European Standard was approved by CEN on 25 July 2014.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	4
1 Scope	6
2 Normative references	6
3 Terms and definitions, symbols and units.....	7
3.1 Terms and definitions	7
3.2 Symbols and units	8
4 Test equipment	8
4.1 General.....	8
4.2 Furnace	9
4.3 Test frame	9
4.4 Supporting construction	9
4.5 Furnace closure	9
5 Test conditions	10
5.1 General.....	10
5.2 Support and restraint	10
5.2.1 Standard conditions	10
5.2.2 Other support and restraint conditions.....	10
6 Test specimens	10
6.1 General.....	10
6.2 Number of tests.....	11
6.3 Size of test specimen	11
6.4 Structural building members	11
6.4.1 Standard vertical structural building members	11
6.4.2 Practical vertical structural members.....	12
6.5 Properties of test materials	13
6.6 Verification of the test specimen	13
6.7 Optional and additional plate thermometers within the cavity	13
7 Installation of the test construction	14
8 Conditioning.....	14
9 Application of instrumentation.....	14
9.1 General.....	14
9.2 Instrumentation for measurement of furnace temperature	14
9.3 Instrumentation for measurement of specimen temperature	15
9.3.1 General.....	15
9.3.2 Instrumentation for measuring cavity temperature	15
9.3.3 Instrumentation for measuring surface temperatures	15
9.3.4 Optional and supplementary instrumentation for measuring temperature	16
9.4 Instrumentation for measurement of pressure.....	16
10 Test procedure	16
10.1 General.....	16
10.2 Furnace temperature and pressure	16
10.3 Temperatures of the test specimen	17
10.4 Observations	17
10.5 Termination of the test	17

11	Test results	17
11.1	Acceptability of test results.....	17
11.2	Presentation of test results	17
12	Test report.....	18
13	Assessment	18
13.1	General	18
13.2	Assessment of loadbearing capacity	19
13.2.1	General	19
13.2.2	Characteristic temperature curve: cavity temperatures.....	19
13.2.3	Characteristic temperature curve: surface temperatures (steel or concrete or composite columns).....	19
13.2.4	Application of method of limiting temperatures	19
13.3	Assessment of integrity and insulation	20
13.4	Assessment of data for calculation purposes.....	20
14	Report of the assessment.....	20
15	Limits of applicability of the results of the assessment	21
15.1	Type of vertical structural building member	21
15.2	Type of steel column.....	23
15.3	Size of concrete column	23
15.4	Size of concrete filled hollow steel composite column.....	23
15.5	Type of concrete.....	23
15.6	Timber column	24
15.7	Depth of the cavity	24
15.8	Type of closure opposite to the vertical protective membrane.....	24
15.9	Properties of the vertical protective membrane.....	24
15.10	Size of the vertical protective membrane	24
15.11	Size of panels within the vertical protective membrane	24
15.12	Fixtures and fittings	24
15.13	Applicability of results from test columns to beams or combined column /beam structural building members.....	25
Annex A	(normative) Measurement of properties of vertical protective membranes and components	30
A.1	General	30
A.2	Thickness of vertical protective membrane and components thereof	30
A.3	Density of vertical protective membranes and components thereof.....	31
A.3.1	General	31
A.4	Moisture content of vertical protective membrane and components thereof.....	32
Annex B	(normative) Test method to the smouldering fire (slow heating curve)	33
B.1	Introduction.....	33
B.2	Test equipment.....	33
B.3	Test specimens.....	33
B.4	Termination of test	33
B.5	Evaluation of the results.....	34
	Bibliography.....	35

EN 13381-2:2014 (E)**Foreword**

This document (EN 13381-2:2014) has been prepared by Technical Committee CEN/TC 127 “Fire safety in buildings”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2015 and conflicting national standards shall be withdrawn at the latest by March 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes ENV 13381-2:2002.

The main changes with respect to the previous edition are listed below:

Clarifications regarding the following items:

- a) preparation of the test specimen;
- b) instrumentation of the test specimen (no more steel plate within the cavity);
- c) limits of applicability.

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

This European Standard 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 standard are:

- *Part 1: Horizontal 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,*
- *Part 7: Applied protection to timber members,*
- *Part 8: Applied reactive protection to steel members.*

The fire protection capacity of the vertical protective membrane can be nullified by the presence of combustible materials in the cavity behind the membrane. The applicability of the results of the assessment is limited according to the quantity and position of such combustible materials within that cavity. The amount of combustible material permissible in the cavity should be given in national regulations.

Caution

The attention of all persons concerned with managing and carrying out this fire resistance test, is drawn to the 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 shall be made and safety precautions shall be identified and provided. Written safety instructions shall be issued. Appropriate training shall be given to relevant personnel. Laboratory personnel shall ensure that they follow written safety instructions at all times.

The specific health and safety instructions contained within this standard shall be followed.

When testing concrete filled hollow steel composite columns steam release holes shall be provided for the release of steam from the column, during the test, as specified in EN 13381-6.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 13381-2:2014 (E)**1 Scope**

This European Standard specifies a test method for determining the ability of a vertical protective membrane, when used as a fire resistant barrier, to contribute to the fire resistance (loadbearing capacity R) of loadbearing vertical structural building members fabricated from steel, concrete, steel/concrete composites or timber. The method described is applicable to any type of vertical protective membrane, which can be associated with a separate bracing membrane.

The vertical protective membrane can be either separated from or attached to the structural building member and is self-supporting. This test method is applicable to vertical protective membranes where there is a gap and a cavity between the vertical protective membrane and the structural building member, otherwise alternative test methods prEN 13381-3, EN 13381-4, EN 13381-6 or prEN 13381-7 should be used as appropriate.

This test method and assessment is not applicable to the following:

- a) all situations where the cavity is to be used as a service or ventilation shaft;
- b) all situations where the vertical protective membrane acts as a bracing membrane.

This European Standard contains the fire test which specifies the tests which shall be carried out whereby the vertical protective membrane together with the structural member to be protected is exposed to the specified fire. The fire exposure, to the standard temperature/time curve given in EN 1363-1, is applied to the side which would be exposed in practice.

The test method makes provision, through specified optional additional procedures, for the collection of data which can be used as direct input to the calculation of fire resistance according to the processes given in EN 1992-1-2, EN 1993-1-2, EN 1994-1-2 and EN 1995-1-2.

This European Standard also contains the assessment which provides information relative to the analysis of the test data and gives guidance for the interpretation of the results of the fire test, in terms of loadbearing capacity criteria of the protected vertical structural member.

The results of the fire test and the assessment can be applied, with certain defined provisions, to vertical structural building members which can be beams, columns or a combination of both and / or which could form part of a separating element or partition.

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 structures, membranes and fittings.

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

Tests should be carried out without additional combustible materials in the cavity.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 206, *Concrete - Specification, performance, production and conformity*

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- Looking for additional Standards? Visit Intertek Inform Infostore
 - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-