



NSAI
Standards

Irish Standard
I.S. EN 15080-8:2009

Extended application of results from fire resistance tests - Part 8: Beams

I.S. EN 15080-8:2009

Incorporating amendments/corrigenda issued since publication:

<i>This document replaces:</i>	<i>This document is based on:</i> EN 15080-8:2009	<i>Published:</i> 7 October, 2009
This document was published under the authority of the NSAI and comes into effect on: 10 November, 2009		ICS number: 13.220.50 91.060.99
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		

ICS 13.220.50; 91.060.99

English Version

Extended application of results from fire resistance tests - Part 8: Beams

Application étendue des résultats des essais de résistance
au feu - Partie 8 : Poutres

Erweiterter Anwendungsbereich der Ergebnisse aus
Feuerwiderstandsprüfungen - Teil 8: Balken

This European Standard was approved by CEN on 10 February 2008.

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 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 Management Centre has the same status as the official versions.

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



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword	4
1 Scope.....	5
2 Normative references	5
3 Terms and definitions.....	5
4 Basis and methodology of establishing the extended application	6
4.1 General.....	6
4.2 Basic principles.....	7
4.2.1 General.....	7
4.2.2 Basis of the extended application	7
4.2.3 Mode of failure.....	7
4.2.4 Methods of analysis.....	7
4.3 Basic thermal analysis	8
4.4 Basic structural analysis.....	8
4.4.1 General.....	8
4.4.2 Modelling factor	8
4.4.3 Material properties	9
4.5 Analysis of other features	10
5 Critical parameters.....	10
5.1 General.....	10
5.2 Common thermal parameters	10
5.3 Common mechanical parameters	11
5.4 Common constructional parameters	11
5.5 Specific constructional parameters for beams without applied fire protection.....	11
5.5.1 Concrete beams	11
5.5.2 Steel beams	12
5.5.3 Composite steel-concrete beams.....	12
5.5.4 Timber beams.....	12
5.5.5 Mechanically jointed beams	13
5.6 Specific constructional parameters for beams with applied fire protection	13
6 Report of the extended application analysis	14
Annex A (informative) Guidelines for making assessments	15
A.1 Mode of failure.....	15
A.1.1 General.....	15
A.1.2 Failure of protection system.....	15
A.1.3 Change of structural mode of failure from bending to shear.....	15
A.1.4 Change of structure mode of failure from bending to connection failure	16
A.2 Effect of material strength	16
A.3 Extrapolation of fire resistance	17
A.4 Accuracy of predictions	17
A.5 Prediction based on material laws	18
A.6 Modifying predicted temperatures	18
A.7 Deflection limits	19
Annex B (informative) The Extended Application Of Steel Beams.....	20
B.1 Introduction	20
B.2 Analysis of reference tests	20
B.2.1 Thermal performance	20
B.2.2 Mechanical performance	21
B.2.3 Other features.....	22
B.3 Model for extended application	22

Annex C (informative) The Extended Application Of Timber Beams	24
C.1 Introduction	24
C.2 Extended application in the load domain (increase of load-bearing capacity)	24
C.2.1 Increasing of load-bearing capacity by higher strength class	24
C.2.2 Increasing of load-bearing capacity by increasing beam dimensions (braced beams)	25
C.2.3 Increasing of load-bearing capacity by decreasing the fire resistance	26
C.3 Extended application in the time domain: Increasing fire resistance by applied fire protection	30
Annex D (informative) The Extended Application of a Composite Steel Concrete Beam	32
D.1 Introduction	32
D.1.1 General	32
D.1.2 Reference test 1	33
D.1.3 Reference test 2	33
D.2 Analysis of reference tests	34
D.2.1 Thermal performance	34
D.2.2 Reference test 1	34
D.2.3 Reference test 2	35
D.2.4 Structural performance	36
D.2.5 Bending resistance	36
D.2.6 Assessment of reference test 1	36
D.2.7 Assessment of reference test 2	37
D.2.8 Conclusions of structural performance	38
D.2.9 Model for extended application	38
D.2.10 Extended application	38
Annex E (informative) The extended application of concrete beams	41
E.1 Introduction	41
E.2 Failure modes	41
E.3 Examples	41
E.3.1 Possible change of failure mode	41
E.3.2 Change of cross section	42
E.3.3 Change of material strength	42
E.3.4 Axial and rotational restraint	43
Bibliography	44

Foreword

This document (EN 15080-8:2009) 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 April 2010, and conflicting national standards shall be withdrawn at the latest by April 2010.

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 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directive(s).

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This part of EN 15080 identifies the parameters and factors that affect the fire resistance of beams and need to be taken into account when considering extended application of results of beams tested in accordance with EN 1365-3. It also gives the methodology to be used when preparing an extended application, including rules and calculation methods which can be applied to establish the resultant influence of a variation in one or more parameters and to determine the field of extended application.

2 Normative references

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

EN 338, *Structural timber — Strength classes*

EN 1194, *Timber structures — Glued laminated timber — Strength classes and determination of characteristic values*

EN 1363-1:1999, *Fire resistance tests — Part 1: General Requirements*

EN 1365-3:1999, *Fire resistance tests for loadbearing elements — Part 3: Beams*

EN 10025-1, *Hot rolled products of structural steels — Part 1: General technical delivery conditions*

EN 10025-2, *Hot rolled products of structural steels — Part 2: Technical delivery conditions for non-alloy structural steels*

EN 10080-1, *Steel for the reinforcement of concrete — Weldable reinforcing steel — Part 1: General requirements*

prEN 10138-1, *Prestressing steels — Part 1: General requirements*

EN 13501-2, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services*

EN ISO 13943:2000, *Fire safety — Vocabulary (ISO 13943:2000)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 13943:2000, EN 1363-1:1999 and EN 1365-3:1999, together with the following apply.

3.1

test result

outcome of a testing process and its associated procedures detailed within EN 1365-3 (which may include some processing of the results from the testing of a number of specimens). A test result is expressed in terms of one or more fire performance parameter(s)

3.2

direct field of application of test results

outcome of a process (involving the application of defined rules) whereby a test result is deemed to be equally valid for variations in one or more of the product properties and/or intended end use application(s)

NOTE The direct field of application of test results are presented in EN 1365-3.

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
-