

BETOON. SPETSIFITSEERIMINE, TOIMIVUS, TOOTMINE
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Concrete - Specification, performance, production and
conformity

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 206:2014+A2:2021 sisaldab Euroopa standardi EN 206:2013+A2:2021 ingliskeelset teksti.	This Estonian standard EVS-EN 206:2014+A2:2021 consists of the English text of the European standard EN 206:2013+A2:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 17.03.2021.	Date of Availability of the European standard is 17.03.2021.
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ICS 91.100.30

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EUROPEAN STANDARD

EN 206:2013+A2

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2021

ICS 91.100.30

Supersedes EN 206:2013+A1:2016

English Version

Concrete - Specification, performance, production and conformity

Béton - Spécification, performances, production et conformité

Beton - Festlegung, Eigenschaften, Herstellung und Konformität

This European Standard was approved by CEN on 27 July 2016 and includes Amendment 2 approved by CEN on 4 January 2021.

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.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword.....	6
Introduction	8
1 Scope	9
2 Normative references	10
3 Terms, definitions, symbols and abbreviations	12
3.1 Terms and definitions	12
3.1.1 General	12
3.1.2 Constituents	15
3.1.3 Fresh concrete	17
3.1.4 Hardened concrete	19
3.1.5 Conformity and production control	20
3.2 Symbols and abbreviations	21
4 Classification	23
4.1 Exposure classes related to environmental actions	23
4.2 Classes for properties of fresh concrete	26
4.2.1 Consistence classes	26
4.2.2 Classes for additional properties of SCC	28
4.3 Classes for properties of hardened concrete	29
4.3.1 Compressive strength classes	29
4.3.2 Density classes for lightweight concrete	31
5 Requirements for concrete and methods of verification	32
5.1 Basic requirements for constituents	32
5.1.1 General	32
5.1.2 Cement	32
5.1.3 Aggregates	32
5.1.4 Mixing water	33
5.1.5 Admixtures	33
5.1.6 Additions (including mineral fillers and pigments)	33
5.1.7 Fibres	33
5.2 Basic requirements for composition of concrete	33
5.2.1 General	33
5.2.2 Selection of cement	34
5.2.3 Selection of aggregates	34
5.2.4 Use of mixing water	35
5.2.5 Use of additions	35
5.2.6 Use of admixtures	37
5.2.7 Use of fibres	38
5.2.8 Chloride content	38
5.2.9 Concrete temperature	39
5.3 Requirements related to exposure classes	39
5.3.1 General	39
5.3.2 Limiting values for concrete composition	39
5.3.3 Performance-related methods	40
5.4 Requirements for fresh concrete	40
5.4.1 Consistence, viscosity, passing ability and resistance to segregation	40

5.4.2	Cement content and water/cement ratio.....	41
5.4.3	Air content.....	41
5.4.4	Fibre content.....	41
5.5	Requirements for hardened concrete.....	42
5.5.1	Strength.....	42
5.5.2	Density.....	42
5.5.3	Resistance to water penetration.....	43
5.5.4	Reaction to fire.....	43
6	Specification of concrete.....	43
6.1	General.....	43
6.2	Specification for designed concrete.....	44
6.2.1	General.....	44
6.2.2	Basic requirements.....	44
6.2.3	Additional requirements.....	45
6.3	Specification for prescribed concrete.....	45
6.3.1	General.....	45
6.3.2	Basic requirements.....	45
6.3.3	Additional requirements.....	46
6.4	Specification of standardized prescribed concrete.....	46
7	Delivery of fresh concrete.....	46
7.1	Information from the user of the concrete to the producer.....	46
7.2	Information from the producer of the concrete to the user.....	47
7.3	Delivery ticket for ready-mixed concrete.....	48
7.4	Delivery information for site-mixed concrete.....	49
7.5	Mix adjustments after the main mixing process and prior to discharge.....	49
8	Conformity control and conformity criteria.....	49
8.1	General.....	49
8.2	Conformity control for designed concrete.....	50
8.2.1	Conformity control for compressive strength.....	50
8.2.2	Conformity control for tensile splitting strength.....	55
8.2.3	Conformity control for properties other than strength.....	56
8.3	Conformity control of prescribed concrete including standardized prescribed concrete.....	60
8.4	Actions in the case of non-conformity of the product.....	60
9	Production control.....	61
9.1	General.....	61
9.2	Production control systems.....	61
9.3	Recorded data and other documents.....	62
9.4	Testing.....	64
9.5	Concrete composition and initial testing.....	64
9.6	Personnel, equipment and installation.....	64
9.6.1	Personnel.....	64
9.6.2	Equipment and installation.....	64
9.7	Batching of constituents.....	65
9.8	Mixing of concrete.....	66
9.9	Production control procedures.....	66
10	Evaluation of conformity.....	70
10.1	General.....	70
10.2	Assessment, surveillance and certification of production control.....	71
11	Designation for designed concrete.....	71

Annex A (normative) Initial test	72
A.1 General	72
A.2 Party responsible for initial tests	72
A.3 Frequency of initial tests	72
A.4 Test conditions	72
A.5 Criteria for adoption of initial tests	73
Annex B (normative) Identity testing	74
B.1 General	74
B.2 Sampling and testing plan	74
B.3 Identity criteria for compressive strength	74
B.3.1 Concrete under production control certification	74
B.3.2 Concrete not under production control certification	75
B.4 Identity criteria for consistence and air content	75
B.5 Identity criteria for fibre content and homogeneity of fresh concrete	75
Annex C A_2 (informative) A_2 Provisions for assessment, surveillance and certification of production control	76
C.1 General	76
C.2 Tasks for the inspection body	76
C.2.1 Initial assessment of the production control	76
C.2.2 Continuous surveillance of the production control	77
C.3 Tasks for the certification body	78
C.3.1 Certification of production control	78
C.3.2 Measures in case of non-conformity	78
Annex D (normative) Additional requirements for specification and conformity of concrete for special geotechnical works	80
D.1 General	80
D.2 Constituents	80
D.2.1 Cement	80
D.2.2 Aggregates	81
D.3 Concrete	81
D.3.1 General requirements for specification and acceptance of the mix design	81
D.3.2 Minimum fines content and minimum cement content	82
D.3.3 Water/cement ratio	82
D.3.4 Fresh concrete	83
Annex E (informative) Recommendation for the use of aggregates	84
E.1 General	84
E.2 Natural normal-weight and heavy-weight aggregates and air-cooled blast furnace slag	84
E.3 Recommendation for the use of coarse recycled aggregates	85
E.4 Recommendation for the use of lightweight aggregates	86
Annex F (informative) Recommendation for limiting values of concrete composition	88
Annex G (informative) Guidelines for self-compacting concrete requirements in the fresh state	90
G.1 General	90
G.2 Recommendations on classification of self-compacting concrete	91
G.2.1 Consistence	91
G.2.2 Viscosity	91
G.2.3 Passing ability	91
G.2.4 Segregation resistance	91
Annex H (informative) Rules of application for 8.2.1.3, Method C	92

H.1	Introduction	92
H.2	Control based on the cusum system	92
H.3	Control based on Shewhart charts with modified limits by variables	93
Annex J	(informative) Deviation to accommodate a notified Spanish Regulation	94
Annex K	(informative) Concrete families	95
K.1	General	95
K.2	Selection of the concrete family	95
K.3	Flow chart for the assessment of membership and conformity of a concrete family	96
Annex L	(informative) Further information regarding specific paragraphs	97
Annex M	(informative) Guidance on provisions valid in the place of use	99
Bibliography	101

Bibliography 101

European foreword

A2 This document (EN 206:2013+A2:2021) has been prepared by Technical Committee CEN/TC 104 “Concrete and related products”, the secretariat of which is held by SN.

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 September 2021 and conflicting national standards shall be withdrawn at the latest by September 2021.

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

Based on a CEN/BT Decision (T 42/2013) EN 12620:2013 was withdrawn. Therefore, this document has been aligned with the specifications given in EN 12620:2002+A1:2008. As soon as CEN/TC 154 publishes a new version of EN 12620, CEN/TC 104 intends to amend EN 206.

This document includes Amendment 1 approved by CEN on 27 July 2016 and Amendment 2 approved by CEN on 4 January 2021.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1** and **A2** **A2**.

This document supersedes EN 206:2013+A1:2016.

In particular, the following main items had been subject to revision when preparing EN 206:2013:

- a) adding application rules for fibre concrete and concrete with recycled aggregates;
- b) revising *k*-value concept for fly ash and silica fume and adding new rules for ground granulated blast furnace slag;
- c) introduction of principles for the performance concepts for the use of additions, e.g. equivalent concrete performance concept and equivalent performance of combinations concept;
- d) revising and adding new concepts for the conformity assessment;
- e) including EN 206-9 “Additional rules for self-compacting concrete (SCC)”;
- f) including additional requirements for concrete for special geotechnical works (Annex D).

NOTE Annex D was jointly prepared by CEN/TC 104 and CEN/TC 288.

Amendment 2 are changes deemed necessary to clarify guidance for conformity assessment in clause 10.2 and correcting the status of Annex C to informative. **A2**

Figure 1 illustrates the relationships between EN 206 and standards for design and execution, standards for constituents and test standards.

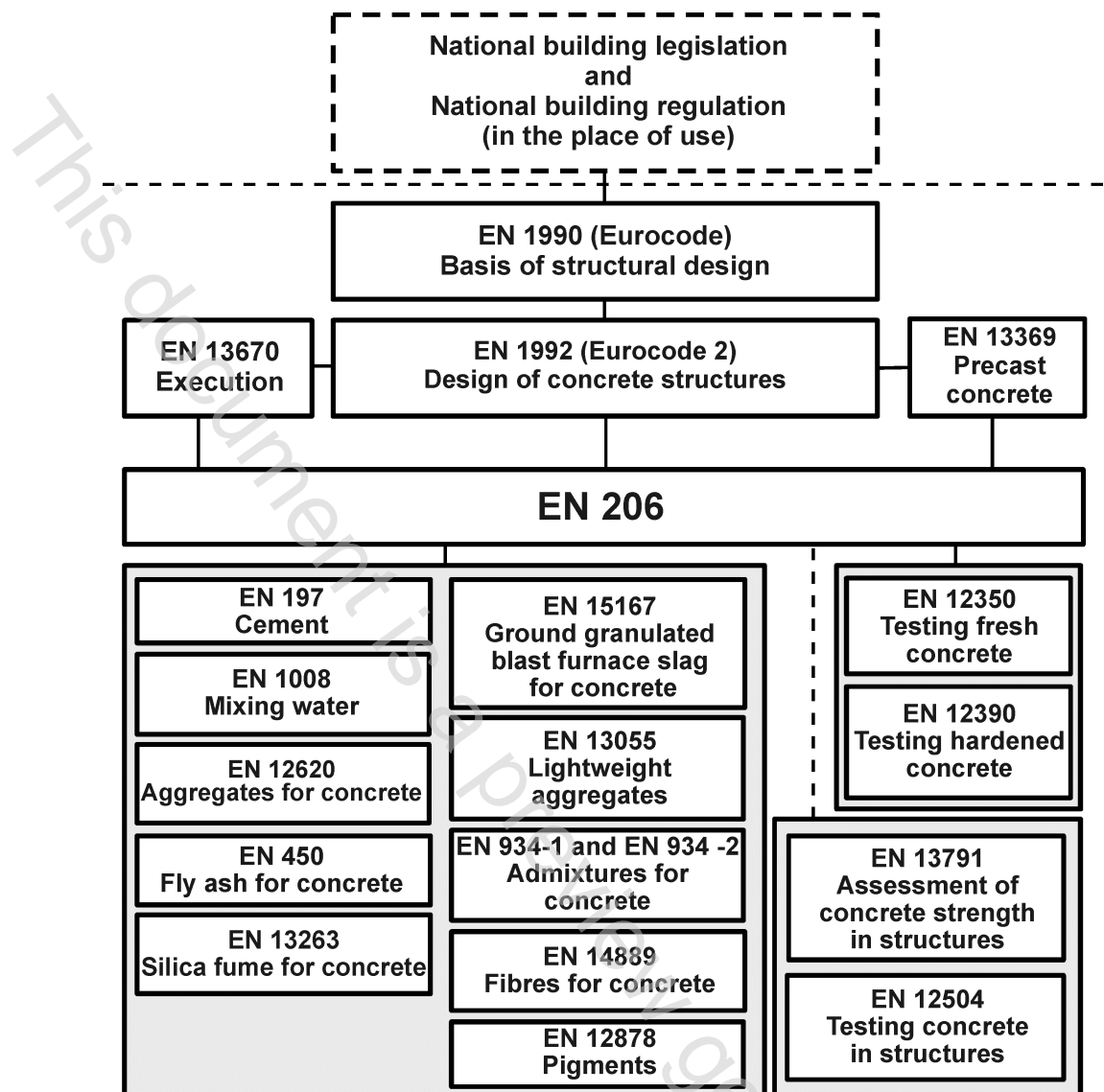


Figure 1 — Relationships between EN 206 and standards for design and execution, standards for constituents and test standards

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

Introduction

This European Standard will be applied under different climatic and geographical conditions, different levels of protection and under different, well established, regional traditions and experience. Classes for concrete properties have been introduced to cover these situations. Where such general solutions were not possible, the relevant clauses contain permission for the application of provisions valid in the place of use of the concrete.

This European Standard incorporates rules for the use of constituents that are covered by European Standards. Constituents not covered by European Standards may be used in accordance with provisions valid in the place of use of the concrete.

If the concrete is in conformity with the limiting values, the concrete in the structure is deemed to satisfy the durability requirements for the intended use in the specific environmental condition, provided:

- the appropriate exposure classes were selected;
- the concrete has the minimum cover to reinforcement in accordance with the relevant design standard required for the specific environmental condition, e.g. EN 1992-1-1;
- the concrete is properly placed, compacted and cured, e.g. in accordance with EN 13670 or other relevant standards;
- the appropriate maintenance is applied during the working life.

Performance based concepts as alternatives to the concept of limiting values are under development.

Concrete conforming to this European Standard may be assumed to satisfy the basic requirements for materials to be used in all three Execution Classes as defined in EN 13670.

This European Standard defines tasks for the specifier, producer and user. For example, the specifier is responsible for the specification of concrete, Clause 6, and the producer is responsible for conformity and production control, Clauses 8 and 9. The user is responsible for placing the concrete in the structure. In practice there may be several different parties specifying requirements at various stages of the design and construction process, e.g. the client, the designer, the contractor, the concreting sub-contractor. Each is responsible for passing the specified requirements, together with any additional requirements, to the next party in the chain until they reach the producer. In the terms of this European Standard, this final compilation is known as the “specification of concrete”. Conversely, the specifier, producer and user may be the same party (e.g. a precast concrete manufacturer or a contractor doing design and build). In the case of ready-mixed concrete, the purchaser of the fresh concrete is the specifier who gives the specification of concrete to the producer.

This European Standard also covers the necessary exchange of information between the different parties. Contractual matters are not addressed. Where responsibilities are given for parties involved, these are technical responsibilities.

Notes and footnotes in tables of this standard are normative unless stated otherwise; other notes and footnotes are informative.

Further explanations and guidance on the application of this standard are given in other documents, such as CEN Technical Reports.

1 Scope

(1) This European Standard applies to concrete for structures cast in situ, precast structures, and structural precast products for buildings and civil engineering structures.

(2) The concrete under this European Standard can be:

- normal-weight, heavy-weight and light-weight;
- mixed on site, ready-mixed or produced in a plant for precast concrete products;
- compacted or self-compacting to retain no appreciable amount of entrapped air other than entrained air.

(3) This standard specifies requirements for:

- the constituents of concrete;
- the properties of fresh and hardened concrete and their verification;
- the limitations for concrete composition;
- the specification of concrete;
- the delivery of fresh concrete;
- the production control procedures;
- the conformity criteria and evaluation of conformity.

(4) Other European Standards for specific products e.g. precast products or for processes within the field of the scope of this standard may require or permit deviations.

(5) Additional or different requirements may be given for specific applications in other European Standards, for example:

- concrete to be used in roads and other trafficked areas (e.g. concrete pavements according to EN 13877-1);
- special technologies (e.g. sprayed concrete according to EN 14487).

(6) Supplementing requirements or different testing procedures may be specified for specific types of concrete and applications, for example:

- concrete for massive structures (e.g. dams);
- dry mixed concrete;
- concrete with a D_{\max} of 4 mm or less (mortar);
- self-compacting concretes (SCC) containing lightweight or heavy-weight aggregates or fibres;
- concrete with open structure (e. g. pervious concrete for drainage).

(7) This standard does not apply to:

- aerated concrete;

- foamed concrete;
- concrete with density less than 800 kg/m³;
- refractory concrete.

(8) This standard does not cover health and safety requirements for the protection of workers during production and delivery of concrete.

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 196-2, *Methods of testing cement — Part 2: Chemical analysis of cement*

EN 197-1, *Cement — Part 1: Composition, specifications and conformity criteria for common cements*

EN 450-1, *Fly ash for concrete — Part 1: Definition, specifications and conformity criteria*

EN 934-1:2008, *Admixtures for concrete, mortar and grout — Part 1: Common requirements*

EN 934-2, *Admixtures for concrete, mortar and grout — Part 2: Concrete admixtures — Definitions, requirements, conformity, marking and labelling*

EN 1008, *Mixing water for concrete — Specification for sampling, testing and assessing the suitability of water, including water recovered from processes in the concrete industry, as mixing water for concrete*

EN 1097-3, *Tests for mechanical and physical properties of aggregates — Part 3: Determination of loose bulk density and voids*

EN 1097-6:2013, *Tests for mechanical and physical properties of aggregates — Part 6: Determination of particle density and water absorption*

EN 1536, *Execution of special geotechnical work — Bored piles*

EN 1538, *Execution of special geotechnical work — Diaphragm walls*

EN 12350-1, *Testing fresh concrete — Part 1: Sampling*

EN 12350-2, *Testing fresh concrete — Part 2: Slump-test*

EN 12350-4, *Testing fresh concrete — Part 4: Degree of compactability*

EN 12350-5, *Testing fresh concrete — Part 5: Flow table test*

EN 12350-6, *Testing fresh concrete — Part 6: Density*

EN 12350-7, *Testing fresh concrete — Part 7: Air content — Pressure methods*

EN 12350-8, *Testing fresh concrete — Part 8: Self-compacting concrete — Slump-flow test*

EN 12350-9, *Testing fresh concrete — Part 9: Self-compacting concrete — V-funnel test*

- EN 12350-10, *Testing fresh concrete — Part 10: Self-compacting concrete — L box test*
- EN 12350-11, *Testing fresh concrete — Part 11: Self-compacting concrete — Sieve segregation test*
- EN 12350-12, *Testing fresh concrete — Part 12: Self-compacting concrete — J-ring test*
- EN 12390-1, *Testing hardened concrete — Part 1: Shape, dimensions and other requirements for specimens and moulds*
- EN 12390-2, *Testing hardened concrete — Part 2: Making and curing specimens for strength tests*
- EN 12390-3, *Testing hardened concrete — Part 3: Compressive strength of test specimens*
- EN 12390-6, *Testing hardened concrete — Part 6: Tensile splitting strength of test specimens*
- EN 12390-7, *Testing hardened concrete — Part 7: Density of hardened concrete*
- EN 12620:2002+A1:2008, *Aggregates for concrete*
- EN 12699, *Execution of special geotechnical work — Displacement piles*
- EN 12878, *Pigments for the colouring of building materials based on cement and/or lime — Specifications and methods of test*
- ☐A1
- EN 13055, *Lightweight aggregates* ☐A1
- EN 13263-1, *Silica fume for concrete — Part 1: Definitions, requirements and conformity criteria*
- EN 13577, *Chemical attack on concrete — Determination of aggressive carbon dioxide content in water*
- EN 14199, *Execution of special geotechnical works — Micropiles*
- EN 14216, *Cement — Composition, specifications and conformity criteria for very low heat special cements*
- EN 14488-7, *Testing sprayed concrete — Part 7: Fibre content of fibre reinforced concrete*
- EN 14721, *Test method for metallic fibre concrete — Measuring the fibre content in fresh and hardened concrete*
- EN 14889-1:2006, *Fibres for concrete — Part 1: Steel fibres — Definitions, specifications and conformity*
- EN 14889-2:2006, *Fibres for concrete — Part 2: Polymer fibres — Definitions, specifications and conformity*
- EN 15167-1, *Ground granulated blast furnace slag for use in concrete, mortar and grout — Part 1: Definitions, specifications and conformity criteria*
- prEN 16502, *Test method for the determination of the degree of soil acidity according to Baumann-Gully*
- EN ISO 7980, *Water quality — Determination of calcium and magnesium — Atomic absorption spectrometric method (ISO 7980)*

ISO 4316, *Surface active agents — Determination of pH of aqueous solutions — Potentiometric method*

ISO 7150-1, *Water quality — Determination of ammonium — Part 1: Manual spectrometric method*

ASTM C 173, *Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1 General

3.1.1.1

concrete

fr: béton

de: Beton

material formed by mixing cement, coarse and fine aggregate and water, with or without the incorporation of admixtures, additions or fibres, which develops its properties by hydration

3.1.1.2

concrete family

fr: famille de béton

de: Betonfamilie

group of concrete compositions for which a reliable relationship between relevant properties is established and documented

3.1.1.3

delivery

fr: livraison

de: Lieferung

process of handing over the fresh concrete by the producer

3.1.1.4

designed concrete

fr: béton à propriétés spécifiées

de: Beton nach Eigenschaften

concrete for which the required properties and additional characteristics if any are specified to the producer who is responsible for providing a concrete conforming to the required properties and additional characteristics

3.1.1.5

design working life

fr: durée de vie de projet

de: Bemessungslebensdauer

assumed period for which a structure or a part of it is to be used for its intended purpose with anticipated maintenance but without major repair being necessary