

Free-standing chimneys —

Part 2: Concrete chimneys

The European Standard EN 13084-2:2001 has the status of a British Standard

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National foreword

This British Standard is the official English language version of EN 13084-2:2001.

The UK participation in its preparation was entrusted by Technical Committee B/525, Building and civil engineering structures, to Subcommittee B/525/13, Structural chimneys and flues, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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Cross-references

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Contents

	page
1 Scope	5
2 Normative references	5
3 Terms and definitions.....	5
4 Materials.....	6
4.1 Concrete.....	6
4.1.1 Concrete for cast-in-situ chimneys.....	6
4.1.2 Concrete for prefabricated chimneys	6
4.2 Mortar for bedding of prefabricated elements	6
4.3 Reinforcing steel.....	6
5 Material properties.....	6
6 Structural design	8
6.1 General.....	8
6.2 Ultimate limit state	8
6.2.1 Partial safety factors.....	8
6.2.2 Ultimate limit steel strain	8
6.2.3 Moments of 2 nd order.....	8
6.2.4 Openings.....	11
6.2.5 Shear stresses in horizontal joints of prefabricated chimneys	13
6.2.6 Connections of the continuous vertical reinforcement	13
6.3 Serviceability limit state	13
6.3.1 Partial safety factors.....	13
6.3.2 Cracking.....	13
6.3.3 Deflection of the chimney	14
7 Detailing provisions.....	14
7.1 Cast-in-situ chimneys.....	14
7.1.1 Minimum vertical reinforcement.....	14
7.1.2 Minimum horizontal reinforcement.....	14
7.1.3 Minimum reinforcement around openings.....	14
7.1.4 Distance between bars	15
7.1.5 Minimum concrete cover.....	15
7.1.6 Minimum wall thickness.....	15
7.1.7 Splices.....	15
7.2 Prefabricated concrete chimneys	15
7.2.1 Minimum reinforcement for transportation of prefabricated elements.....	15
7.2.2 Minimum horizontal reinforcement.....	16
7.2.3 Minimum concrete cover.....	16
7.2.4 Minimum wall thickness.....	16
7.2.5 Vertical continuous bundles of bars.....	16
7.2.6 Openings.....	16
8 Workmanship	17
8.1 General.....	17
8.2 Bedding joints	17
8.3 Reinforcement ducts	17
9 Quality control.....	18
9.1 Cast-in-situ chimneys.....	18
9.2 Prefabricated chimneys	18
Annex A (normative) Analysis of stresses due to thermal and other actions.....	19

A.1	Moment-curvature-relation	19
A.2	Calculation procedure	21
Annex B (normative)	Limitations of crack widths	23

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 297 "Free-standing industrial chimneys", the secretariat of which is held by DIN.

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 June 2002, and conflicting national standards shall be withdrawn at the latest by November 2003.

In this standard the annexes A and B are normative.

This European Standard is one of a series of standards as listed below:

EN 13084-1, *Free-standing chimneys - Part 1: General requirements.*

EN 13084-2, *Free-standing chimneys - Part 2: Concrete chimneys.*

prEN 13084-4, *Free-standing chimneys - Part 4: Brick liners – Design and execution.*

prEN 13084-5, *Free-standing industrial chimneys - Part 5: Materials for brick liners - Product specifications.*

prEN 13084-6, *Free-standing industrial chimneys - Part 6: Steel liners - Design and execution.*

1 Scope

This Part of this European Standard specifies particular requirements and performance criteria for the design and construction of cast-in-situ concrete chimneys as well as prefabricated concrete chimneys. It identifies requirements to ensure the mechanical resistance and stability of concrete chimneys in accordance with the general requirements given in EN 13084-1.

As for chimneys attached to buildings the criteria given in clause 1 of EN 13084-1:2000 apply.

Unless otherwise stated in the following clauses the basic standard for the design of concrete structures, ENV 1992-1-1, applies.

2 Normative references

This European Standard 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 Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 206-1:2000, *Concrete – Part 1: Specification, performance, production and conformity*.

EN 13084-1:2000, *Free-standing chimneys - Part 1: General requirements*.

ENV 1992-1-1, *Eurocode 2: Design of concrete structures - Part 1: General rules and rules for buildings*.

ENV 1992-1-2, *Eurocode 2: Design of concrete structures – Part 1-2: General rules, Structural fire design*.

ENV 1992-1-4:1994, *Eurocode 2: Design of concrete structures - Part 1-4: General rules - Lightweight aggregate concrete with closed structure*.

prEN 1520, *Prefabricated reinforced components of light weight aggregate concrete with open structure*.

prEN 12446, *Chimneys - Components - Concrete outer wall elements*.

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 13084-1 and the following apply.

3.1

prefabricated element

precast member of normal-weight or light-weight concrete, reinforced or not, which completely encloses the flues of chimney stacks

3.2

reinforcement ducts

route for the continuous vertical reinforcement

4 Materials

4.1 Concrete

4.1.1 Concrete for cast-in-situ chimneys

The concrete strength classes as given in ENV 1992-1-1 but not less than C25/30 can be used for cast-in-situ chimneys. For environmental conditions EN 206-1 applies.

4.1.2 Concrete for prefabricated chimneys

4.1.2.1 Normal-weight concrete

For prefabricated chimneys all concrete qualities given in EN 206-1 may be used. For environmental conditions EN 206-1 applies.

4.1.2.2 Light-weight concrete

The light-weight concrete for prefabricated elements shall correspond to the density-class D 1,2 or higher in accordance with Table 9 of EN 206-1:2000.

The light-weight concrete for prefabricated elements shall correspond to the strength classes given in EN 206-1 or to a strength class of at least LAC 6 given in prEN 1520.

4.1.2.3 Reinforcement duct infill concrete

The reinforcement duct infill concrete shall have at least the same strength class as the prefabricated elements, but not more than the next higher strength class. The flow class for consistence shall not be less than F3 in accordance with Table 6 of EN 206-1:2000 and the maximum size of aggregate shall not be greater than 8 mm.

4.1.2.4 Outer wall elements

Prefabricated outer wall elements shall be in accordance with prEN 12446.

4.2 Mortar for bedding of prefabricated elements

The mortar of bedding joints between prefabricated elements shall have the same strength class as the concrete of the prefabricated elements.

4.3 Reinforcing steel

For reinforcing steel the specifications given in ENV 1992-1-1 apply.

5 Material properties

The material properties of concrete and reinforcing steel for normal temperature design shall be taken from ENV 1992-1-1 or ENV 1992-1-4:1994 with the exception of the mean tensile strength of concrete, f_{ctm} , which shall be calculated in accordance with equation (1). The influence of elevated temperatures on the mechanical and thermal properties of concrete and reinforcing steel shall be determined from ENV 1992-1-2.

$$f_{ctm} = C_c \cdot C_{\beta} \cdot C_V \cdot C_{\eta} \cdot f_{cm}^{0,67}, \text{ in N/mm}^2 \quad (1)$$