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English Version

**Design of fastenings for use in concrete - Part 4-5: Post-installed
fasteners - Chemical systems**

Conception-calcul pour les éléments de fixation pour béton
- Partie 4-5 : Chevilles de fixation - Systèmes chimiques

Bemessung von Befestigungen in Beton - Teil 4-5: Dübel -
chemische Systeme

This Technical Specification (CEN/TS) was approved by CEN on 20 October 2008 for provisional application.

The period of validity of this CEN/TS 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 CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

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Foreword

This Technical Specification (CEN/TS 1992-4-5:2009) has been prepared by Technical Committee CEN/TC 250 "Structural Eurocodes", the secretariat of which is held by BSI.

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 Technical Specification CEN/TS 1992-4-5 – Post-installed fasteners – Chemical systems, describes the principles and requirements for safety, serviceability and durability of post-installed fasteners with chemical anchorage systems for use in concrete.

This Technical Specification does not provide information about the use of National Determined Parameters (NDP).

CEN/TS 1992-4-5 is based on the limit state concept used in conjunction with a partial factor method.

CEN/TS 1992-4 'Design of fastenings for use in concrete' is subdivided into the following parts:

- *Part 1: General*
- *Part 2: Headed fasteners*
- *Part 3: Anchor channels*
- *Part 4: Post-installed fasteners – Mechanical systems*
- *Part 5: Post-installed fasteners – Chemical systems*

Connection to Part 1 of this Technical Specification TS

The principles and requirements of Part 5 of this CEN/TS are additional to those in Part 1, all the clauses and subclauses of which also apply to Part 5 unless varied in this Part. Additional information is presented under the relevant clauses/sub-clauses of Part 1 of the CEN/TS. The numbers for the clauses/sub-clauses of Part 5 continue from the number of the last relevant clauses/sub-clauses of Part 1.

The above principles also apply to Figures and Tables in Part 5.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: 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

1.1 General

1.1.6 This document relies on characteristic resistances and distances which are stated in a European Technical Specification. In general the design concept is valid in the product dimensions $6 \leq h_{ef}/d_{nom} \leq 20$. The actual range for a particular fastener may be taken from the relevant European Technical Specification. In minimum the following characteristics should be given in the relevant European Technical Specification as base for the design method of this CEN/TS.

- $N_{RK,s}, V_{RK,s}$
- $M_{RK,s}^0$
- τ_{RK}
- $c_{cr,N}, s_{cr,N}$
- $c_{cr,sp}, s_{cr,sp}$
- c_{min}, s_{min}
- h_{min}
- limitations on concrete strength classes of base material
- $k_{cr}, k_{ucr}, k_T, k_2, k_3, k_4, k_8$
- d_{nom}, h_{ef}, l_f , limitations on h_{ef}/d_{nom}
- γ_{Mi} , recommended partial factors see CEN/TS 1992-4-1:2009, clause 4

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.

NOTE The following references to Eurocodes are references to European Standards and European Prestandards. These are the only European documents available at the time of publication of this TS. National documents take precedence until Eurocodes are published as European Standards.

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

CEN/TS 1992-4-1:2009, *Design of fastenings for use in concrete — Part 4-1: General*

3 Definitions and symbols

Definitions and symbols are given in CEN/TS 1992-4-1.