

Idioma: Inglés

TÍTULO

Proyecto y utilización de insertos para la elevación y la manipulación de elementos prefabricados de hormigón. (Ratificada por AENOR en septiembre de 2016.)

TÍTULO INGLÉS

Design and use of inserts for lifting and handling of precast concrete elements (Endorsed by AENOR in September of 2016.)

TÍTULO FRANCÉS

Conception et utilisation d'inserts pour le levage et la manutention du béton préfabriqué - Éléments (Entérinée par l'AENOR en septembre 2016.)

OBSERVACIONES

En cumplimiento del punto 11.2.6.4 de las Reglas Internas de CEN/CENELEC Parte 2, se ha otorgado el rango de documento normativo español UNE al documento normativo europeo CEN/TR 15728:2016 (Fecha de disponibilidad 2016-02-17)

Este documento está disponible en los idiomas oficiales de CEN/CENELEC/ETSI.

Este anuncio causará efecto a partir del primer día del mes siguiente al de su publicación en la revista AENOR.

La correspondiente versión oficial de este documento se encuentra disponible en AENOR (C/ Génova 6 28004 MADRID, www.aenor.es)

TECHNICAL REPORT

CEN/TR 15728

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

February 2016

ICS 91.100.30

Supersedes CEN/TR 15728:2008

English Version

Design and use of inserts for lifting and handling of precast concrete elements

Conception et utilisation d'inserts pour le levage et la manutention du béton préfabriqué - Éléments

Bemessung und Anwendung von Transportankern für Betonfertigteile - Elemente

This Technical Report was approved by CEN on 27 July 2015. It has been drawn up by the Technical Committee CEN/TC 229.

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

© 2016 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. CEN/TR 15728:2016 E

This is a preview. [Click here to purchase the full publication.](#)

Contents	Page
European foreword.....	4
1 Scope	5
1.1 General.....	5
1.2 Types of inserts for lifting and handling.....	5
1.3 Minimum dimensions.....	5
2 Normative references.....	5
3 Terms and definitions and symbols	6
3.1 Definitions	6
3.2 Symbols.....	8
3.2.1 Action and resistance	8
3.2.2 Concrete and steel.....	8
3.2.3 Inserts.....	9
4 Basis of design	9
4.1 General.....	9
4.2 Required verifications.....	9
4.3 Design Principles.....	9
4.3.1 Limit state design	9
4.3.2 Ultimate limit state.....	9
4.3.3 Admissible load design	10
4.4 Verification.....	11
4.4.1 General.....	11
4.4.2 Partial factor method (Ultimate limit state)	11
5 Actions on inserts.....	12
5.1 General.....	12
5.2 Effect of lifting procedures on load directions	13
5.3 Actions from adhesion and form friction	14
5.4 Dynamic actions.....	15
5.5 Combined actions.....	16
6 Design of lifting inserts and anchorage in concrete by calculation	16
6.1 General conditions.....	16
6.2 Types of inserts covered.....	17
6.2.1 Inserts independently placed on the market.....	17
6.2.2 Inserts made by the precaster.....	19
6.3 General design.....	19
6.3.1 Failure modes.....	19
6.3.2 Design procedures.....	20
6.3.3 Unreinforced concrete	20
6.3.4 Reinforced concrete	22
6.4 Lifting inserts.....	24
6.4.1 General design.....	24
6.4.2 Lifting loops of smooth bars.....	24
6.4.3 Lifting loops of strands.....	26
6.4.4 Lifting loops of steel wire ropes.....	26
6.5 Lifting of walls and linear elements	27

6.5.1	General	27
6.5.2	Minimum thickness of wall or element	28
6.5.3	Anchorage reinforcement.....	28
6.6	Lifting of slabs and pipes.....	30
6.6.1	Minimum edge distances	30
6.6.2	Anchorage reinforcement.....	30
7	Design of lifting inserts and anchorage in concrete by testing	31
7.1	General conditions	31
7.2	Specification of specimens	32
7.2.1	Areas of application	32
7.2.2	Design of test specimen	32
7.2.3	Age of concrete specimen at testing.....	34
7.2.4	Specification of inserts.....	34
7.3	Loading conditions	34
7.3.1	Load and support conditions.....	34
7.3.2	Loading history	35
7.3.3	Measurements	35
7.4	Test programs.....	35
7.4.1	General	35
7.4.2	Tests to verify prior knowledge	36
7.4.3	Tests utilizing no prior knowledge — Determination of properties for one insert used for specific applications.....	36
7.5	Assessment of the test results.....	36
7.6	Test report	36
7.6.1	General information	36
7.6.2	Test members	37
7.6.3	Installation of the insert.....	37
7.6.4	Measured values	37
7.6.5	Evaluation report.....	38
8	Lifting and handling instructions	38
Annex A (informative)	Information to be given by the insert supplier	39
A.1	Information on the content of an operational manual.....	39
Annex B (informative)	Use of Supplier's recommendations.....	42
Bibliography		43

This document (CEN/TR 15728:2016) has been prepared by Technical Committee CEN/TC 229 "Precast concrete products", the secretariat of which is held by AFNOR.

To ensure the performance of the precast concrete products, lifting and handling should be taken into account in the design of the product.

This Technical Report deals with lifting inserts cast into precast concrete elements. The intent of this document is to give information to precast product designers.

The failure of inserts for lifting and handling could cause risk to human life and/or lead to considerable economic consequences. Therefore inserts for lifting and handling should be selected and installed properly by skilled personnel according to the lifting and handling instructions.

This Technical Report based on current practices gives recommendations for correct choice and design of lifting inserts according to the lifting capacity of their part embedded in the concrete. It is based on EN 1992-1-1 (Eurocode 2), EN 1993-1-1 (Eurocode 3), CEN/TS 1992-4-1 and on published supplier's data.

Safety levels should be determined nationally. In the Technical Report numerical values for safety factors as used in different CEN member states are given for information and are recommended as basic values that provide an acceptable level of reliability. They have been selected assuming that an appropriate level of workmanship and of quality management (Factory Production Control) applies. They may be applied in the absence of national regulations.

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.