

## **Falsework - Performance requirements and general design**

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design

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 12812:2004 sisaldab Euroopa standardi EN 12812:2004 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 23.09.2004 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 12812:2004 consists of the English text of the European standard EN 12812:2004.</p> <p>This document is endorsed on 23.09.2004 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b> This European Standard specifies performance requirements and limit state design methods for two design classes of falsework. It sets out the rules that a designer has to take into account to produce a safe falsework structure. It also provides information for the person who requires falsework to support a "permanent structure" and who needs to commission its design or supply. This European Standard also gives information on foundations.</p>	<p><b>Scope:</b> This European Standard specifies performance requirements and limit state design methods for two design classes of falsework. It sets out the rules that a designer has to take into account to produce a safe falsework structure. It also provides information for the person who requires falsework to support a "permanent structure" and who needs to commission its design or supply. This European Standard also gives information on foundations.</p>
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English version

## Falsetwork - Performance requirements and general design

Etaisements - Exigences de performance et méthodes de  
conception et calculs

Traggerüste - Anforderungen, Bemessung und Entwurf

This European Standard was approved by CEN on 10 December 2003.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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



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## Foreword

This document (EN 12812:2004) has been prepared by Technical Committee CEN/TC 53 "Temporary works equipment", 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 December 2004, and conflicting national standards shall be withdrawn at the latest by December 2004.

No other international organisation has been involved.

This European Standard is one of a package of standards that includes also EN 12810-1, EN 12810-2, EN 12811-1, EN 12811-2, EN 12811-3, EN 12813.

This European Standard does not replace any other European Standard.

This European Standard was prepared as part of a group, see above. It gives some information about products covered by:

- scaffold tube in accordance with EN 39;
- scaffold couplers in accordance with EN 74;
- adjustable telescopic props in accordance with EN 1065.

The standard is not mandated. However cognisance of two European Directives should be taken. These are:

*Council Directives 89/391/EEC and 92/57/EEC.*

The Annexes A and B are informative.

This document includes a bibliography

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

## Introduction

Most falsework is used:

- to carry the loads due to freshly poured concrete for structures until these structures have reached a sufficient load bearing capacity;
- to absorb the loads from structural members, plant and equipment which arise during the erection, maintenance, alteration or removal of buildings or other structures;
- additionally, to provide support for the temporary storage of building materials, structural members and equipment.

This European Standard gives performance requirements for those who specify and use falsework and gives methods to design falsework to meet those requirements. Clause 9 provides design methods. It legitimizes simplified design methods for falsework made of tube and couplers already successfully in use. The information on structural design is supplementary to the relevant structural Eurocodes.

The standard describes different design classes. This allows the designer to choose between more or less complex design methods, while achieving the same level of structural safety.

Because European Standards for materials do not exist to support the standard fully, it has been prepared permitting equivalent national standards to be used. Publication of a European Standard always results in the withdrawal of equivalent national standards.

Provision for specific personal safety matters is dealt with in EN 12811-1:2003 and other documents.

## 1 Scope

This European Standard specifies performance requirements and limit state design methods for two design classes of falsework.

It sets out the rules that a designer has to take into account to produce a safe falsework structure.

It also provides information for the person who requires falsework to support a "permanent structure" and who needs to commission its design or supply.

This European Standard also gives information on foundations.

This European Standard does not specify requirements for formwork, although formwork may be a part of the falsework construction. Nor does it provide information on access and working scaffolds, which is given in EN 12811-1:2003.

This European Standard does not provide information about site activities. It does not provide information about the use of some standardized products, including beams conforming to EN 13377 and props conforming to EN 1065.

## 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 74, *Couplers, loose spigots and base-plates for use in working scaffolds and falsework made of steel tubes — Requirements and test procedures.*

EN 1065:1998, *Adjustable telescopic steel props — Product specifications, design and assessment by calculation and tests.*

EN 1990, *Eurocode — Basis of structural design.*

ENV 1991 (all parts including EN 1991-1-1, EN 1991-1-2, prEN 1991-1-3 and prEN 1991-2), *Eurocode 1 — Basis of design and actions on structures.*

ENV 1992 (all parts), *Eurocode 2 — Design of concrete structures.*

ENV 1993 (all parts), *Eurocode 3 — Design of steel structures.*

ENV 1994 (all parts), *Eurocode 4 — Design of composite steel and concrete structures.*

ENV 1995 (all parts), *Eurocode 5 — Design of timber structures.*

ENV 1996 (all parts), *Eurocode 6 — Design of masonry structures.*

ENV 1997 (all parts), *Eurocode 7 — Geotechnical design.*

ENV 1998 (all parts), *Eurocode 8 — Design provisions for earthquake resistance of structures.*

ENV 1999 (all parts), *Eurocode 9 — Design of aluminium structures.*

rEN 12811-1:2003, *Scaffolds — Performance requirements and general design.*

EN 12811-3:2002, *Temporary works equipment — Part 3: Load testing.*

EN 12813, *Load bearing towers of prefabricated elements — Methods of particular design and assessment.*

EN 12810-1:2003, *Facade scaffolds made of prefabricated components — Part 1: Product specification.*

DIN 18218, *Pressure of fresh concrete on vertical formwork.*

C E Clear and T A Harrison. *Concrete pressure on formwork.* CIRIA Report No. 108. London Construction Industry Research and Information Association

Manual de Technologie: Coffrage; CIB-FIB-CEB 27-98-83.

### **3 Terms and definitions**

For the purposes of this European Standard, the terms and definitions in ENV 1993-1 and the following apply.

#### **3.1**

##### **brace**

component connecting two points of a structure to help stiffen it

#### **3.2**

##### **design class**

class that defines the extent of design for falsework

#### **3.3**

##### **falsework**

temporary support for a part of a structure while it is not self-supporting and for associated service loads

#### **3.4**

##### **formwork**

part of temporary works used to give the required shape and support to in-situ concrete

#### **3.5**

##### **foundation**

sub-structure needed to transmit loads into the ground

#### **3.6**

##### **kentledge**

material placed on a structure to provide stability by the action of its dead weight

#### **3.7 imperfections**

##### **3.7.1**

##### **imperfection**

divergence from the theoretical when erected ready for use

##### **3.7.2**

##### **bow imperfection**

initial out of true before loading

NOTE A bow imperfection can occur both in an individual member and in the complete tower or modular beam assembly. It arises because the member is not straight, is manufactured not straight or members are assembled out of alignment.