



SLOVENSKI STANDARD

SIST EN 12811-4:2014

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Oprema za začasne gradnje - 4. del: Varovalni nadstreški za odre - Zahtevane lastnosti in projektiranje

Temporary works equipment - Part 4: Protection fans for scaffolds - Performance requirements and product design

Temporäre Konstruktionen für Bauwerke - Teil 4: Schutzdächer für Arbeitsgerüste - Leistungsanforderungen, Entwurf, Konstruktion und Bemessung des Produkts

Équipements temporaires de chantiers - Partie 4: Pare-gravats pour échafaudages - Exigences de performance et conception du produit

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Temporary works equipment - Part 4: Protection fans for scaffolds - Performance requirements and product design

Équipements temporaires de chantiers - Partie 4: Pare-
gravats pour échafaudages - Exigences de performance et
conception du produit

Temporäre Konstruktionen für Bauwerke - Teil 4:
Schutzdächer für Arbeitsgerüste - Leistungsanforderungen,
Entwurf, Konstruktion und Bemessung des Produkts

This European Standard was approved by CEN on 28 September 2013.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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EN 12811-4:2013 (E)**Foreword**

This document (EN 12811-4:2013) 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of an identical text or by endorsement, at the latest by May 2014, and conflicting national standards shall be withdrawn at the latest by May 2014.

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 European Standard is part of a series of standards EN 12811, *Temporary works equipment*, which consists of the following parts:

- *Part 1: Scaffolds — Performance requirements and general design;*
- *Part 2: Information on materials;*
- *Part 3: Load testing;*
- *Part 4: Protection fans for scaffolds — Performance requirements and product design.*

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: 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 the United Kingdom.

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Introduction

Each year, many objects fall from a height and strike people. Often, this leads to serious injury, because the impact is on the head. This statistic does not take into account the many near misses.

The dangers associated with falling objects has been recognized by the European Commission, which dealt with the matter by writing an amendment to the Work Equipment Directive (89/655/EEC) that deals exclusively with work at height (2001/45/EEC) and requires the prevention of objects falling off scaffolds.

Usually the provision for preventing such dangerous occurrences takes the form of a “toe-board” attached to the edge of the platform. However, toe-boards according to EN 12811-1 should be at least 150 mm high and statistics indicate that they are not always effective. Therefore, additional protection is often specified, by local by-laws, especially for scaffolds erected above areas where members of the public cannot be prevented from entering, for example in city and town centres.

One way of satisfying these local regulations is to provide a protection fan attached to the main scaffold at some distance below the working platform.

Because these protection fans are required to arrest the fall of substantial objects such as bricks, blocks, scaffold boards and the like, they could be considered as a necessary safety-critical accessory for scaffolds. This, coupled with the fact that they have to arrest the fall of significant objects, i.e. subjected to significant dynamic loads, puts them in the category of complex structures. Yet, in many European countries, there are no rules to govern the design and installation of protection fans.

Across much of Europe, protection fans are:

- erected in configurations that are not verified; and
- attached arbitrarily to scaffolds.

That is to say, the information related to protection fans, such as it is, is very basic. Under the suite of standards drawn up by CEN TC 53, Temporary works equipment has had its design formalized across Europe. The current situation is that un-designed and unverified components are being attached to scaffolds. Therefore, it is necessary to formalize the design and erection of protection fans.

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EN 12811-4:2013 (E)**1 Scope**

This European Standard specifies product requirements, methods of structural and general design and tests for protection fans for scaffolds to protect workers as well as members of public from objects that may fall off the outside edge of scaffolds being used close to where they are working or passing by.

This European Standard only applies to protection fans while the scaffold is being used as a working place.

Protection fans attached to structures other than scaffolds as defined in EN 12811-1 are outside the scope of this European Standard.

This European Standard applies only to protection fan systems on to which construction debris may fall from 24 m or less.

This European Standard ensures resistance of protection fans for most blunt falling objects representing an impacting energy not exceeding 720 J.

NOTE This energy corresponds to a 3 kg object falling from 24 m.

This European Standard does not cover the requirements for the total area to be protected against falling items.

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 74 (all parts), *Couplers, spigots and baseplates for use in falsework and scaffolds*

EN 338, *Structural timber — Strength classes*

EN 1990, *Eurocode — Basis of structural design*

EN 1993-1-1, *Eurocode 3: Design of steel structures — Part 1-1: General rules and rules for buildings*

EN 1995-1-1, *Eurocode 5: Design of timber structures — Part 1-1: General rules and rules for buildings*

EN 1999-1-1, *Eurocode 9: Design of aluminium structures — Part 1-1: General structural rules*

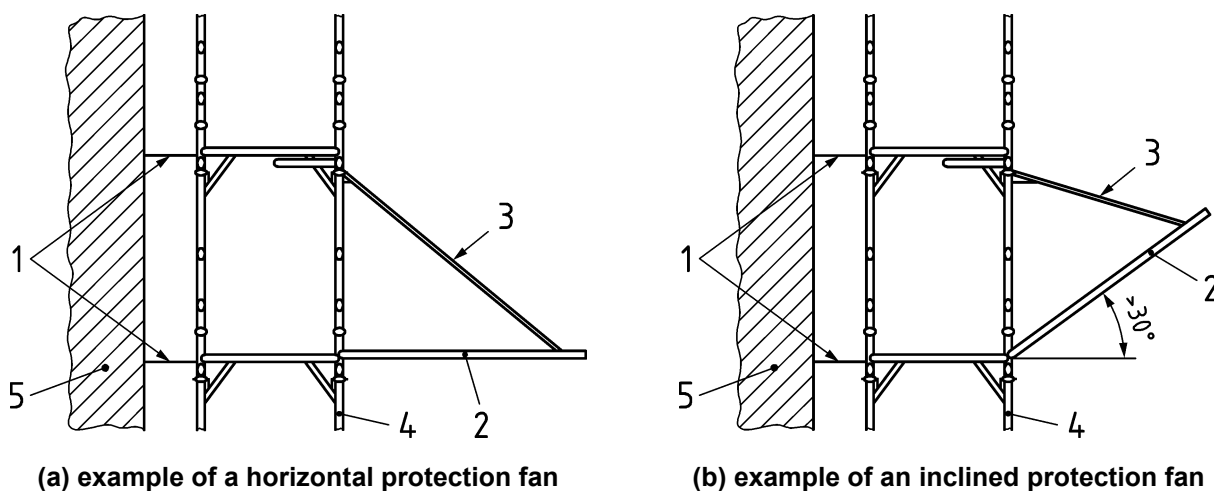
EN 12810-1:2003, *Façade scaffolds made of prefabricated components — Part 1: Products specifications*

EN 12811-1:2003, *Temporary works equipment — Part 1: Scaffolds — Performance requirements and general design*

EN 12811-2, *Temporary works equipment — Part 2: Information on materials*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12811-1:2003 and the following apply (see also Figure 1).

**Key**

- 1 ties
- 2 protection fan
- 3 fan tie
- 4 scaffold
- 5 stiff structure

Figure 1 — Examples of protection fan systems
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3.1**protection fan system**

set of interconnected components used for the purpose of arresting falling objects, which includes (a) an assessed set of configurations and (b) the product manual

3.2**component**

part of a protection fan system which cannot be dismantled further

Note 1 to entry: For example a support or a vertical frame.

3.3**element**

integral part of a component

Note 1 to entry: For example a welded connection.

3.4**connection device**

device for the connection of components

3.5**configuration**

particular arrangement of connected components

3.6**protection fan configuration**

configuration of the protection fan system comprising a complete scaffold or a representative section from it

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3.7

arresting surface

surface on which falling object is interrupted and prevented from falling any further

3.8

protection fan

complete assembly of the arresting surface and its immediate structural support members

3.9

scaffold bay

length of scaffold defined by two consecutive standards

Note 1 to entry: For example, two bays are defined by three consecutive standards.

4 Classification

4.1 Rules for classification

Protection fans shall be classified in accordance with the requirements of Table 1.

Table 1 — Classification of protection fans

Classification criteria	Classes
Snow Load	SL0 or SL1 in accordance with Table 2
Shape	V0 or V1 in accordance with Table 3
Width	B1 to B7 in accordance with Table 4

4.2 Snow loading classification

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The standard specifies two snow loading classes as shown in Table 2.

Table 2 — Snow loading classes of protection fans

Classification	Snow load
Class SL0	No snow load
Class SL1	With snow load

4.3 Shape classification

The standard specifies two shape classes as shown in Table 3.

Table 3 — Shape classes

Classification of protection fan	Shape characteristic
Class V0	With horizontal (or partial horizontal) surface or inclination $\leq 30^\circ$ – see Figure 1(a)
Class V1	With (uniform) inclined surface ($>30^\circ$) – see 7.2.2 – see Figure 1(b)

Class V0 shall only be chosen if the access onto the protection fan is prevented in the standard set of system configurations.

Class V0 shall have a vertical or inclined upstand at the edge which shall have a vertical height of not less than 50 cm.

4.4 Width classification

This European Standard specifies seven width classes as follows:

Table 4 — Width classes

Width classification	B1	B2	B3	B4	B5	B6	B7
Minimum width m	0,6	0,9	1,2	1,5	1,8	2,1	≥ 2,4

The width class chosen shall depend on a risk assessment, which demonstrates that it is adequate.

NOTE 1 In some EU member states national regulations or other requirements do not allow some of the width classes.

NOTE 2 B is defined in Figure 2.

5 Designation

The designation of a scaffold system shall consist of the following parts:



For example: EN 12811-4 V0 B5 means a protection fan system with a horizontal or partial horizontal surface designed for snow load and with a width corresponding to B5 taken from Table 4.

6 Materials

6.1 General

Materials shall be selected from European or international standards.

Materials shall fulfil the requirements given in the appropriate European Standards where design data is provided.

Materials shall be free from any impurities and defects which may affect their satisfactory use.

Materials used shall be sufficiently robust and durable to withstand normal working (and storage) conditions.

Information about the most commonly used materials is given in EN 12811-2.

6.2 Specific material requirements

6.2.1 Steel

Steels of de-oxidation type FU (rimming steels) shall not be used.