
Metode preskušanja dodatnih komponent zidovine - 14. del: Ugotavljanje začetne strižne trdnosti med vnaprej izdelanim delom kompozitne preklade in zidavo nad njo

Methods of test for ancillary components for masonry - Part 14: Determination of the initial shear strength between the prefabricated part of a composite lintel and the masonry above it

Prüfverfahren für Ergänzungsbauteile für Mauerwerk - Teil 14: Bestimmung der Anfangsscherfestigkeit des Verbunds zwischen dem vorgefertigten Teil eines teilweise vorgefertigten, bauseits ergänzten Sturzes und dem über dem Sturz befindlichen Mauerwerk

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Méthodes d'essai des composants accessoires de maçonnerie - Partie 14: Détermination de la résistance initiale au cisaillement entre la partie préfabriquée d'un linteau composite et de la maçonnerie placée au-dessus

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Methods of test for ancillary components for masonry - Part 14:
Determination of the initial shear strength between the
prefabricated part of a composite lintel and the masonry above it

Méthodes d'essai des composants accessoires de
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zwischen dem vorgefertigten Teil eines teilweise
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dem Sturz befindlichen Mauerwerk

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SIST EN 846-14:2012

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Foreword

This document (EN 846-14:2012) has been prepared by Technical Committee CEN/TC 125 "Masonry", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by March 2013, and conflicting national standards shall be withdrawn at the latest by March 2013.

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EN 846-14:2012 (E)**1 Scope**

This European Standard specifies a method for determining the in plane initial shear strength of the horizontal bed joint between the prefabricated part of a composite lintel and the masonry above it, using a specimen tested in shear.

Guidance is given on the preparation of the specimens, the conditioning required before testing, the testing machine, the method of test, the method of calculation and the contents of the test report.

The method corresponds with the method described in EN 1052-3:2003+A1:2006. Guidance is given where the method deviates from EN 1052-3. Therefore, each section of EN 1052-3 is repeated given the necessary changes.

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 772-1, *Methods of test for masonry units — Part 1: Determination of compressive strength*

EN 772-10, *Methods of test for masonry units — Part 10: Determination of moisture content of calcium silicate and autoclaved aerated concrete units*

EN 772-16, *Methods of test for masonry units — Part 16: Determination of dimensions*

EN 998-2, *Specification for mortar for masonry — Part 2: Masonry mortar*

EN 1015-3, *Methods of test for mortar for masonry — Part 3: Determination of consistence of fresh mortars (by flow table)*

EN 1015-7, *Methods of test for mortar for masonry — Part 7: Determination of air content of fresh mortar*

EN 1015-11, *Methods of test for mortar for masonry — Part 11: Determination of flexural and compressive strength of hardened mortar*

3 Principle

The initial shear strength of the horizontal bed joint between the prefabricated part of a composite lintel and the masonry above it is derived from the strength of small specimens tested to destruction. The specimens are tested in shear under four-point load.

Four different failure modes are considered to give valid results.

Two procedures, A and B are included. Procedure A involves testing specimens at different precompressions and the initial shear strength is defined by a linear regression curve to zero prestress. Procedure B involves testing specimens at zero precompression and determining a characteristic initial shear strength from a simple or a statistical consideration of the results.

4 Terms, definitions and symbols

4.1 Terms and definitions

For the purpose of this European Standard, the following terms and definitions apply.

4.1.1

masonry

assemblage of masonry units laid in a specified pattern and jointed together with mortar

4.1.2

shear strength of masonry

strength of masonry subjected to shear forces

4.2 Symbols

A_i	is the gross cross-sectional area of a specimen parallel to the bed joints, in mm^2
E	distance between centre lines of the mortar bed and the loading roller, in mm
f_{v0i}	is the shear strength of an individual sample, in N/mm^2
f_{pi}	is the precompressive stress of an individual sample, in N/mm^2
f_{v0}	is the mean initial shear strength, in N/mm^2
$f_{vk0,cl}$	is the characteristic initial shear strength, in N/mm^2
F	is the representation of the force applied to the specimen, in N
$F_{i,max}$	is the maximum shear load, in N
F_{pi}	is the precompressive force, in N
h_1 and h_2	are the heights of cut units, in mm
h_u	is the height of the units according to EN 772-16, in mm
h_{ppcl}	is the height of the part of the prefabricated composite lintel according to EN 772-16, in mm
k	is a function of n given in Table 3
l_s	is the length of specimen, in mm
l_u	is the length of the units according to EN 772-16, in mm
n	is the number of samples
s	is the standard deviation of the n log values
t_{bj}	is the thickness of the bed joint, in mm
t_s	is the thickness of the steel loading plates, in mm
Y	is \log_{10} of the initial shear strength, f_{v0}
Y_c	is the characteristic value of the \log_{10} of the individual samples
Y_i	is \log_{10} of the shear strength of the individual samples
Y_{mean}	is the mean of the \log_{10} of the shear strength of the individual samples

EN 846-14:2012 (E)**5 Materials****5.1 Masonry units****5.1.1 Conditioning of the units**

The conditioning of masonry units shall be as specified:

Record the method of conditioning the masonry units prior to laying. Measure the moisture content by mass of autoclaved aerated concrete and calcium silicate units in accordance with EN 772-10. Record the age of non-autoclaved concrete units at the time of testing the masonry specimens.

5.1.2 Testing

Determine the compressive strength of a sample of masonry units, using the test method given in EN 772-1. For non-autoclaved concrete units determine the compressive strength at the time of testing the masonry specimens.

5.2 Mortar

The mortar, its mixing procedure and its flow value shall conform with the requirements of EN 998-2, unless otherwise specified, and these shall be reported in the test report.

Take representative samples of fresh mortar from the mason's board to make mortar prism specimens, to determine the flow value in accordance with EN 1015-3 and to determine the air content in accordance with EN 1015-7. Use the prism specimens to determine the mean compressive strength at the time of testing the masonry specimens in accordance with EN 1015-11.

5.3 Prefabricated part of the composite lintel — Conditioning of the prefabricated part of the composite lintels

The conditioning of the lintel shall be as specified after cutting.

Record the method of conditioning the prefabricated part of the composite lintels prior to laying.

6 Apparatus

The testing machines used to apply the shear loads and precompression shall comply with the requirements given in Table 1.

The testing machine to apply the shear loads shall have adequate capacity but the scale used shall be such that the ultimate load on the specimen exceeds one fifth of the full scale reading. The machine shall be provided with a load pacer or equivalent means to enable the load to be applied at the rate specified.

Table 1 — Requirements for testing machines

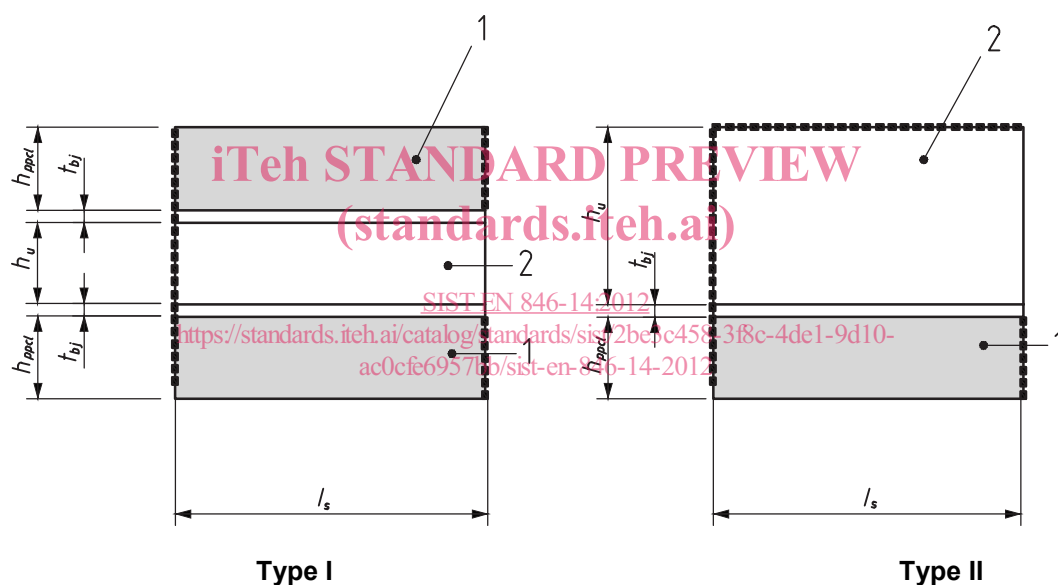
Maximum permissible repeatability of forces as percentage of indicated force	Maximum permissible mean error of forces as percentage of indicated force	Maximum permissible error of zero force as percentage of maximum force of range
2,0	± 2,0	± 0,4

6.1 Apparatus capable of measuring the cross sectional area of the specimens to an accuracy of 1 %.

7 Preparation and curing of specimens

7.1 Preparation of masonry specimen

Prepare specimens, according Table 2 and Figure 1. If $h_U < 200$ mm, type I specimens shall be used. The top and bottom parts consist of two pieces of the prefabricated part of the composite lintels with the intended upper bed face towards the respective mortar joints. The middle part of the specimen consists out of a masonry unit. If the upper bed face of the piece of the prefabricated part of the composite lintel is not obvious or declared then the top and bottom part shall have the same orientation. If $h_U > 200$ mm, type II specimens may be used. The bottom parts consist of a piece of the prefabricated part of the composite lintels with the intended upper bed face towards the mortar joints. Where for practical purposes it is necessary to cut units, ensure that the faces of the unit to be mortared are representative of the unit as a whole. The length l_s of the piece of the prefabricated part of the composite lintel shall correspond with the length of the masonry unit $l_u \leq 300$ mm.



Key

- 1 Piece of prefabricated part of composite lintel
- 2 Masonry unit

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Possible saw cuts

Figure 1 — Dimensions of shear test specimens