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Metode preskušanja dodatnih komponent zidovine - 9. del: Ugotavljanje upogibne in strižne nosilnosti preklad

Methods of test for ancillary components for masonry - Part 9: Determination of flexural resistance and shear resistance of lintels

Prüfverfahren für Ergänzungsbauteile für Mauerwerk - Teil 9: Bestimmung der Biege- und Schubwiderstandsfähigkeit von Stürzen

Méthodes d'essai des composants accessoires de maçonnerie - Partie 9: Détermination de la résistance à la flexion et de la résistance au cisaillement des linteaux

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If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (FprEN 846-9:2015) has been prepared by Technical Committee CEN/TC 125 “Masonry”, the secretariat of which is held by BSI.

This document is currently submitted to the Unique Acceptance Procedure.

This document will replace EN 849-9:2000.

Provision has been made in this Standard for the restraint of ‘L’ shape lintels against excessive torsion during testing.

1 Scope

This European Standard specifies methods for determining the flexural and shear resistances and load deflection characteristics of single span, single or composite lintels used for supporting uniformly distributed loads over openings in masonry construction.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 845-2, *Specification for ancillary components for masonry — Part 2: Lintels*

3 Principle

Specimen lintels are simply supported and subjected to vertically applied loads in order to determine flexural strength, shear resistance and deflection.

4 Symbols

L_e is the effective length (or span), (mm)

W is the applied load, (N)

t is the thickness of supported wall, (mm)

B is the length of bearing, (mm)

D_c is the total height of a composite lintel over both tension and compression elements, (mm)

D_1 is the overall depth of a single or combined lintel

5 Materials

5.1 Structural shell casing units

Structural shell casing units shall be in accordance with EN 845-2.

5.2 Composite lintels

Materials for the compressive elements of composite lintels shall be in accordance with manufacturer's specifications.

6 Apparatus

6.1 Test rig capable of withstanding the applied loads without any distress or distortion that could affect the results of the test.

6.2 Loading system accurate to within ± 2 %.

Where the load is to be applied using weights this should be without shock, and each increment in load and the failure load shall be measured to an accuracy of ± 2 %.

6.3 Deflection monitoring equipment accurate to within ± 2 %.

7 Sampling

The method of sampling shall be in accordance with EN 845-2. The minimum number of specimens shall be three for flexure and a further three for shear.

All relevant dimensions and thicknesses shall be measured.

8 Procedure

8.1 General

Test loads shall be obtained from EN 845-2.

8.2 Method of support

Simply support the lintel at each end on a firm base and with a minimum end bearing of 100 mm and in accordance with the manufacturer's specifications.

The lintel may be bedded on mortar to EN 998-2.

8.3 Conditioning of lintels finished *in situ*

Build the specimens on a flat horizontal surface. If fresh concrete or mortar is used, take appropriate steps to prevent the test specimen from drying out during the first 3 d after construction, e.g. by covering it with a polyethylene sheet and then leave it uncovered in a laboratory environment until tested.

8.4 Lateral restraint or composite action

The use of lateral restraint or of composite action arising from a masonry leaf or other infill masonry specified by the manufacturer shall be permitted if included in the design of the lintel.

When testing asymmetric lintels, for example those with an ‘L’ shaped across section, it may be necessary to use composite action and/or clamping the flange to the support in order to avoid excessive and unrealistic torsional effects during loading.

8.5 Loading

8.5.1 General requirements

Apply load continuously or in not less than six increments up to the maximum expected test load. Use any convenient loading rate, such that failure occurs at between 15 min and 30 min after commencing the test.

Load lintels designed for use in double leaf walls under the load ratios specified by the manufacturer.

8.5.2 Flexural resistance

When testing flexural resistance, use a uniformly distributed load or alternatively, a series of point loads giving equivalent maximum shear and equivalent bending moment to that obtained from a uniformly distributed load.

Point loads should be applied through spreader plates of length between 50 mm and 200 mm. Suitable point loading arrangements are shown in Figures 1 and 2. Transversely across the section, the loads should be applied on the centre line of the position of the leaf or leaves as shown in Figures 1 and 2. The lintel should not be unduly stiffened by the loading arrangement.

8.5.3 Shear resistance

When testing shear resistance, use a shear load applied to the lintel at a distance from the edge of the support equal to the height of the lintel plus 75 mm (see Figures 1 and 2).

The load should be applied through a thick spreader plate of length between 50 mm and 200 mm.

8.5.4 Deflection monitoring

Monitor vertical and horizontal deflection at mid span. Vertical deflection shall be measured at the mid leaf position or in the case of double leaf walls, deflection shall be measured at the mid leaf position of both leaves, and the greater of the two readings shall be recorded.

The average vertical end deflection of the lintel (measured as closely as possible to the bearing) may be deducted from the vertical deflection at mid span.

Horizontal deflection shall be measured at the mid height of the lintel.

8.6 Test procedure for single, composite and combined lintels

8.6.1 Flexural resistance

a) Measure all the dimensions of the specimen.

b) Mount the lintel on the test apparatus and assemble the loading arrangement as in 8.5.2 and Figure 1 and Figure 2 (as appropriate).

c) Apply load to the lintel continuously or in increments as described in 8.5.1.

d) Monitor the deflection as described in 8.5.4 and plot the deflections after each increment of load to give a load deflection curve.

e) Increase load until either (I) flexural failure occurs, or (2) the load at which further net mid-span deflection occurs without increase in load or (3) the load at which web buckling or shear failure occurs.

f) Record the load reached in (e) as the failure load and the mode of failure as described by either e(l), e(2) or e(3) above. Record the failure load, to the nearest 10 N, and note any visible signs of distress in specimen, fixings or supporting member at all stages of the test.

8.6.2 Shear resistance

a) Mount the lintel on test apparatus and assemble loading arrangements as in 8.5.3 and Figure 1 or 2 (as appropriate). The lintel length shall exceed 5 times its height.

b) Apply load at the rate given in 8.5.1.

c) Record the failure load. to the nearest 10 N. and note any visible signs of distress in specimen, fixings or supporting member at all stages of the test.

9 Expression of result

Record the failure load. to the nearest 10 N. and note any visible signs of distress in specimen, fixings or supporting member at all stages of the test.