BS EN 772-16:2011

BSI Standards Publication

Methods of test for masonry units

Part 16: Determination of dimensions

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National foreword

This British Standard is the UK implementation of EN 772-16:2011. It supersedes BS EN 772-16:2000 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/519/1, Masonry units.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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English Version

Methods of test for masonry units - Part 16: Determination of dimensions

Méthodes d'essai des éléments de maçonnerie - Partie 16: Détermination des dimensions

Prüfverfahren für Mauersteine - Teil 16: Bestimmung der Maße

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Contents

Page

Foreword

This document (EN 772-16:2011) 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of an identical text or by endorsement, at the latest by November 2011, and conflicting national standards shall be withdrawn at the latest by November 2011.

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 document supersedes EN 772-16:2000.

Annex B provides details of significant technical changes between this European Standard and the previous edition.

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1 Scope

This European Standard specifies a method of determining the overall dimensions, thickness and combined thickness of shells and webs, depth of voids and plane parallelism of the bed faces of masonry units.

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 771-1, *Specification for masonry units — Part 1: Clay masonry units*

EN 771-2, *Specification for masonry units — Part 2: Calcium silicate masonry units*

EN 771-3, *Specification for masonry units — Part 3: Aggregate concrete masonry units (Dense and light-weight aggregates)*

EN 771-4, *Specification for masonry units — Part 4: Autoclaved aerated concrete masonry units*

EN 771-5, *Specification for masonry units — Part 5: Manufactured stone masonry units*

EN 771-6, *Specification for masonry units — Part 6: Natural stone masonry units*

3 Principle

After preparation, the length, width and height of the specimens, the thickness of shells and webs, depth of holes and plane parallelism of bed faces are measured with an appropriate device.

4 Symbols

l_u is the length of the masonry unit defined by its intended orientation in use, (mm);

w_u is the width of the masonry unit defined by its intended orientation in use, (mm);

h_u is the height of the masonry unit defined by its intended orientation in use, (mm).

5 Apparatus

An appropriate **measuring device or devices** conforming to the requirements for measuring precision given in Table 1.

Table 1 — Measurement precision

Tolerance on the dimension being measured mm	Maximum measuring error mm
< 1	0,1
1	0,2
> 1	0,5

If the tolerance class of the dimension being measured is not known then the maximum measuring error of the measuring device shall be not more than 0,1 mm.

The device used for measuring the thickness of webs and shells shall have a jaw of at least 10 mm in length.

6 Preparation of specimens

6.1 Sampling

The method of sampling shall be in accordance with the relevant part of EN 771. The minimum number of specimens shall be six except in the determination of combined thickness and plane parallelism, where it is three, but a larger minimum number may be specified in the product specification, in which case that larger number shall be used.

6.2 Surface treatment

Remove any superfluous material adhering to the unit as a result of the manufacturing process before measuring. Before measurement of the thickness of webs and shells the bed face of the unit should be ground to remove any such material.

7 Procedure

7.1 Length, width and height

For clay, aggregate concrete, autoclaved aerated concrete, manufactured stone and natural stone masonry units determine the length (l_u), the width (w_u) and the height (h_u) using procedure a), procedure b) or procedure c) as is relevant.

a) Two measurements taken near the edges of each specimen at the positions shown in Figure 1 a).

If two of the three following conditions are satisfied $l_u \leq 250$ mm, $w_u \leq 125$ mm, $h_u \leq 100$ mm, use procedure b).

b) One measurement at the mid point of the unit as shown in Figure 1 b) using a calliper with overlapping jaws aligned along the dotted line.

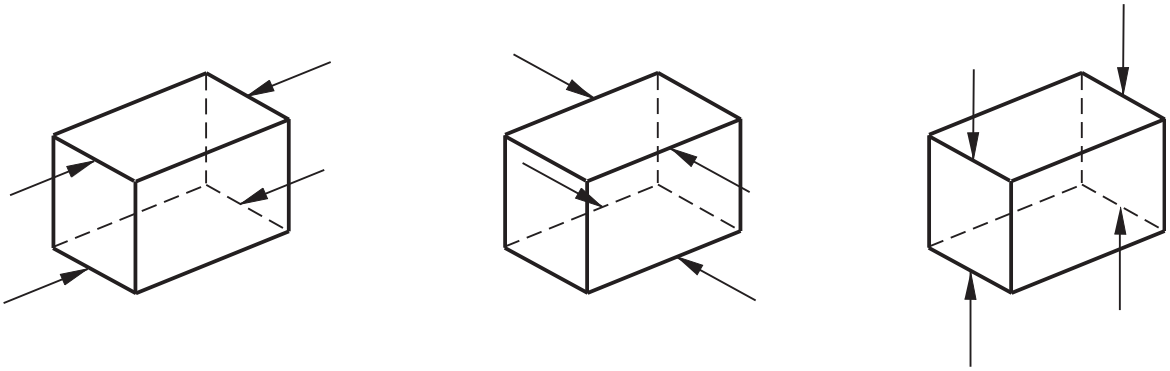
c) For specimens having irregular surfaces (tongues and grooves, grip holes, rendering keyways, etc.) determine the length, width and height at the positions shown in Figure 1 c).

For calcium silicate masonry units determine the length (l_u), the width (w_u) and the height (h_u) using

procedure (d) or procedure (e) as is relevant.

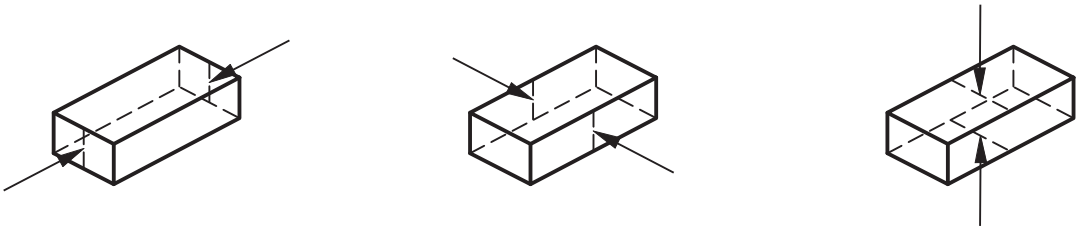
d) One measurement taken approximately at the centre of each specimen at the positions shown in Figure 1(d).

e) For specimens having irregular surfaces (tongues and grooves, grip holes, rendering keyways, etc. determine the length, width and height at the positions shown in Figure 1 e).



Length **Width** **Height**

Figure 1 a) - Measurement positions



Length **Width** **Height**

Figure 1b) - Measurement positions

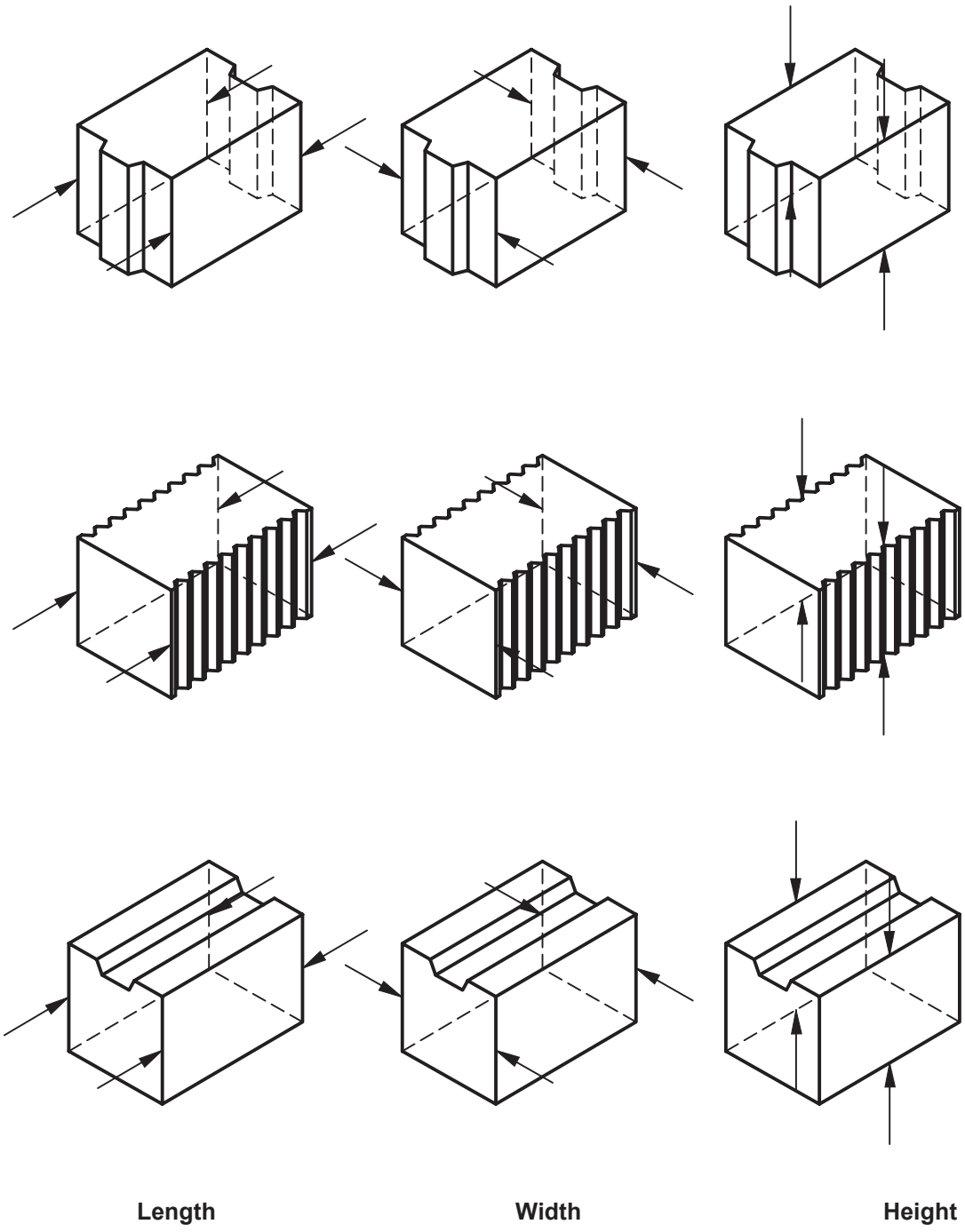


Figure 1 c) - Measurement positions

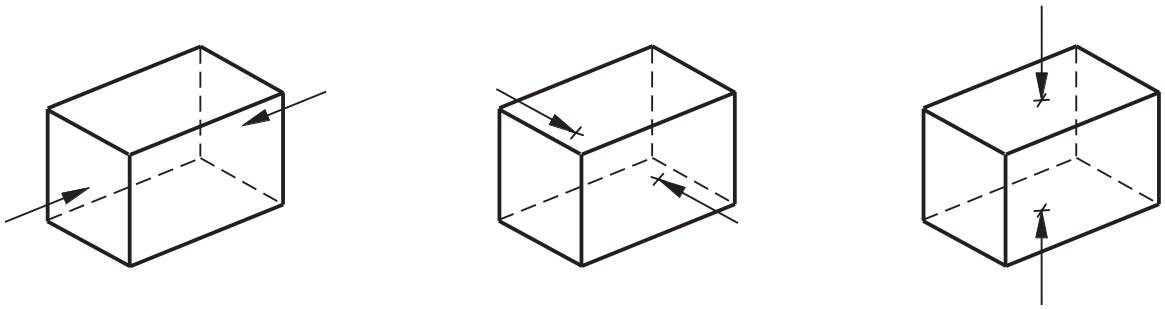


Figure 1 d) - Measurement Positions

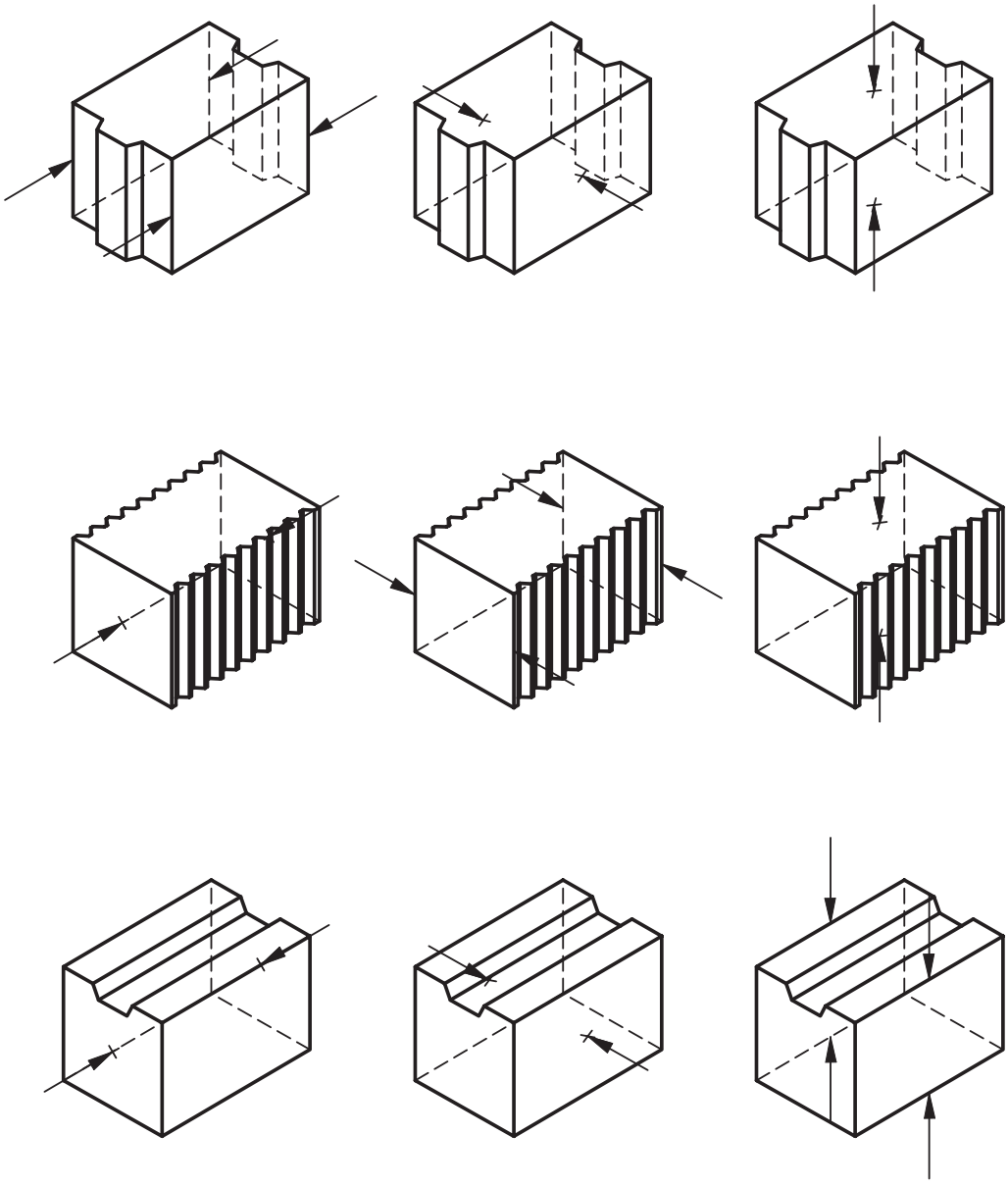


Figure 1 e) - Measurement Positions

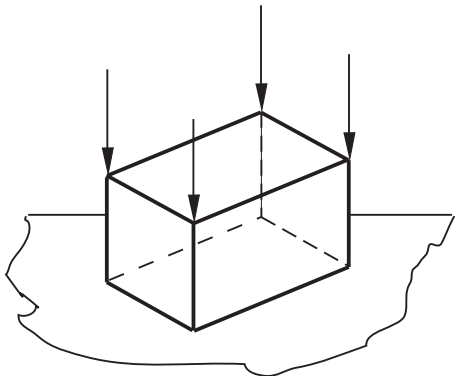


Figure 1 f) - Measurement positions

7.2 Thickness of shells and webs

Where required by the relevant part of EN 771, measure the thickness of the webs and shells of each specimen for each declared web and shell thickness. Measure at discrete points at three separate positions on the type of web or shell being measured. The positions should be chosen by visual inspection to be representative of the minimum thickness of the web or shell being measured. State the measured thickness of the webs and the shells of each specimen to the nearest 0,2 mm.

7.3 Depth of holes

Where required by the relevant part of EN 771, measure the depth of each hole which does not pass through the masonry unit at two different positions. State the result of each depth measurement to the nearest 0,5 mm.

7.4 Plane parallelism of the bed faces

Where required by the relevant part of EN 771, determine the plane parallelism of the bed faces of the unit using procedure f) and as shown in Figure 1 f).

Procedure f): Ensure that the masonry unit is positioned in a stable manner on a flat dimensionally stable surface prior to the measurement. Measure the distance from the flat surface to the top of the bed face on all four corners of the masonry unit. State the result of each measurement to the nearest 0,2 mm.

7.5 Combined thickness of webs and shells

Determine the combined thickness of webs and shells. This is the sum of the thicknesses of individual webs and shells on a path linking the formed voids and going from one face to the opposite face and/or one header to the opposite header. Determine the thickness of each individual web or shell on the chosen path.

NOTE The path which is chosen may not be a straight line, but is the one which gives the lowest combined thickness. Some examples are shown in Annex A.

8 Calculation and expression of results

If option a) or option c) or option e) of 7.1 is chosen, calculate the length (l_u), width (w_u) and height (h_u) of each specimen as the mean of the two measurements, where two are taken (option e) expressed to the nearest 0,1mm, 0,2 mm or 0,5 mm depending on the tolerance on the dimension being measured (see Table 1).

If option b) or option d) or option e) (where one measurement is taken) of 7.1 is chosen, express the length (l_u), width (w_u) and height (h_u) of each specimen to the nearest 0,1 mm, 0,2 mm or 0,5 mm depending on the tolerance on the dimension being measured (see Table 1).

Calculate the length, width and height for the sample as the mean of the values of the individual specimens. Express the result to the nearest 0,1 mm when the measuring error is 0,1 mm, 0,5 mm when the maximum measuring error is 0,2 mm and to the nearest 1 mm when the maximum measuring error is 0,5 mm.

Calculate the mean web and shell thickness for each specimen to the nearest 0,2 mm. Calculate the thickness of webs and shells as the mean of the values of the individual specimens for the sample and express the result to the nearest 0,5 mm.

Calculate the mean depth of each hole, where necessary, and state this to the nearest 0,5 mm. Calculate the depth of the holes for the sample as the mean values of the individual specimens to the nearest 1 mm.

Calculate the deviation from the plane parallelism as the difference between the maximum and minimum measured distance from the corner of the top bed face of the masonry unit to the flat surface and express it to the nearest 0,2 mm. The deviation from plane parallelism is taken to be the largest value from all of the units expressed to the nearest 0,2 mm.

Calculate the sum of the thicknesses of the longitudinal webs and shells along the imaginary path from one face to the opposite face of the unit to the nearest 0,5 mm. Express the result as a percentage of the width of the unit to the nearest percent.

Calculate the sum of the thicknesses of the transverse webs and shells along an imaginary path from one header to the opposite header of the unit to the nearest 0,5 mm. Express the result as a percentage of the length of the unit to the nearest percent.

9 Test report

The test report shall contain the following information:

a) number, title and date of issue of this European Standard;

b) a description of the specimens to the relevant part of EN 771;

c) method of sampling and by which organization;

d) date of receipt of the specimens by the test laboratory;

e) date of testing the specimens;

f) number of specimens in sample;

g) a description of the measuring device;

h) way of measuring [see 7.1 a), b), c), d) or e)];

i) length (l_u), width (w_u) and height (h_u) of each specimen expressed to the nearest 0,1 mm, 0,2 mm or 0,5 mm (see Clause 8), the mean values of length, width and height for the sample being expressed to the nearest 0,1 mm, 0,5 mm or 1 mm (see Clause 8) and the precision of the measuring device;

j) thickness of shells and webs, when required by the relevant part of EN 771, stated to the nearest 0,2 mm for each individual specimen and the value for the sample which is the mean of the individual thicknesses stated to the nearest 0,5 mm;

k) mean depth of each hole, where required by the relevant part of EN 771, stated to the nearest 0,5 mm and the mean value for the sample expressed to the nearest 1 mm;

l) maximum deviation from plane parallelism for each unit to the nearest 0,2 mm;

m) combined thickness of longitudinal webs and shells, which is the mean of the values for the individual units expressed to the nearest percent;

n) combined thickness of transverse webs and shells, which is the mean of the values for the individual units expressed to the nearest percent;

o) remarks, if any.

Annex A
(informative)

Examples of paths chosen for the measurement of combined thickness

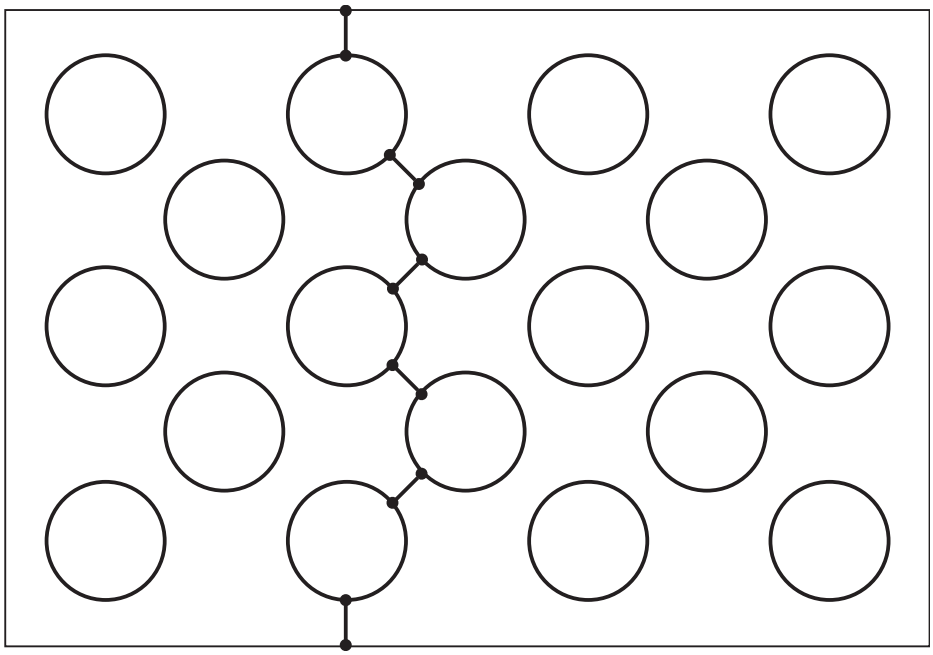


Figure A.1 — Example of the shortest path from face to face for the determination of the minimum sum of the thickness of longitudinal webs and shells

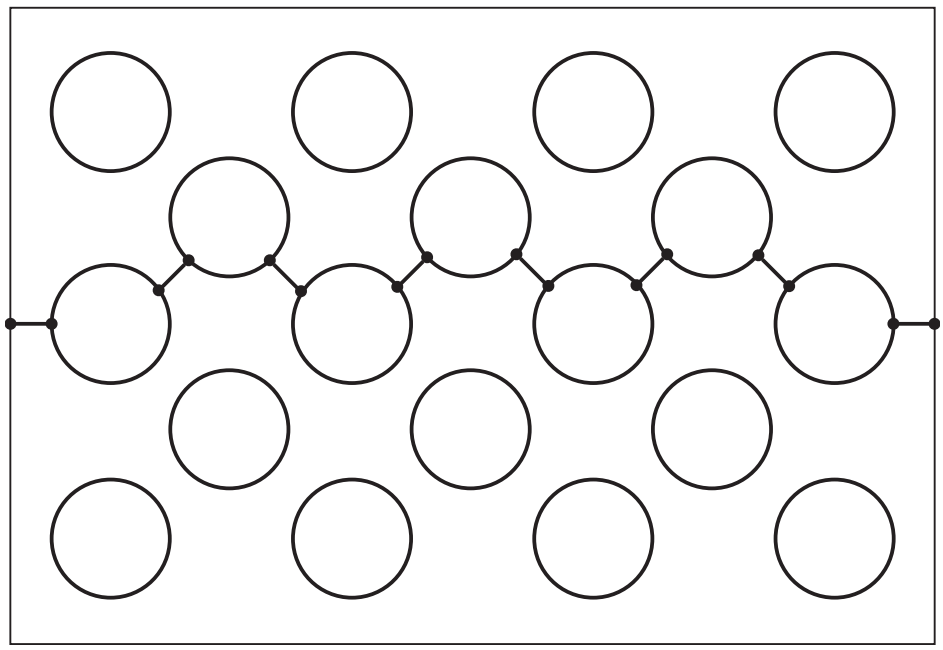


Figure A.2 — Example of the shortest path from header to header for the determination of the minimum sum of the thickness of transverse webs and shells

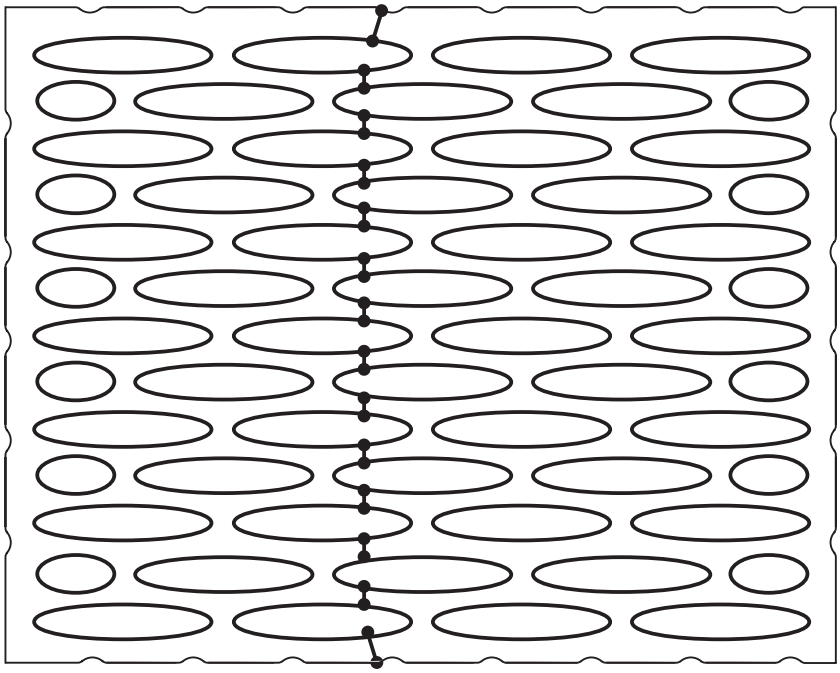


Figure A.3 — Example of the shortest path from face to face for the determination of the minimum sum of the thickness of longitudinal webs and shells

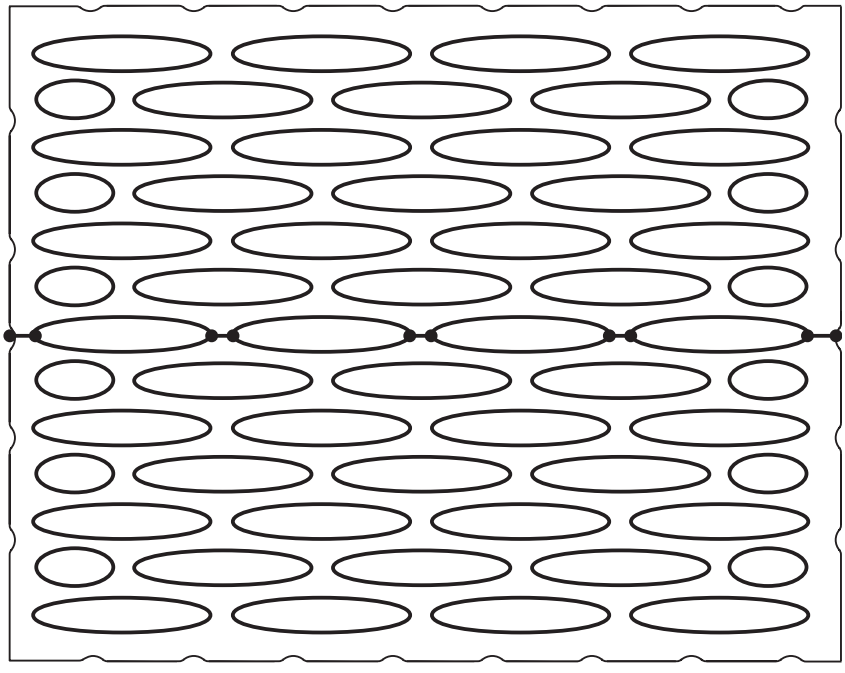


Figure A.4 — Example of the shortest path from header to header for the determination of the minimum sum of the thickness of transverse webs and shells

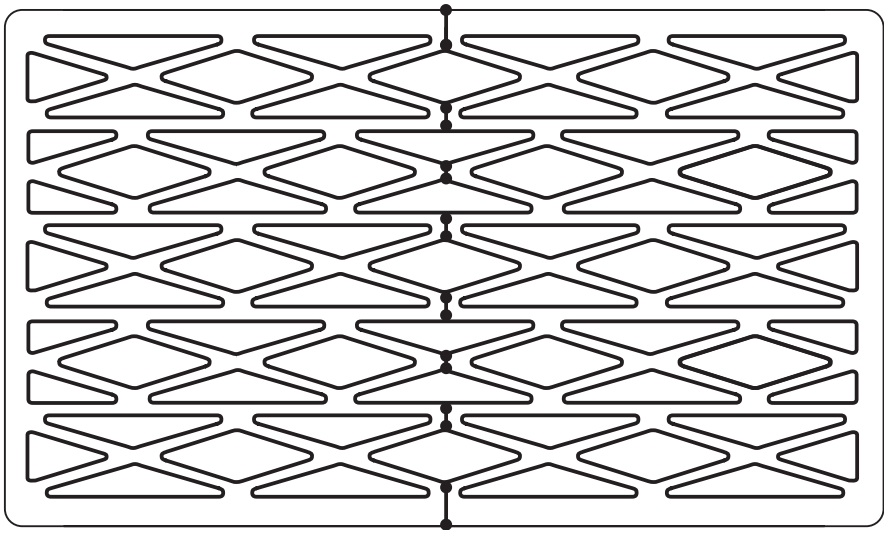


Figure A.5 — Example of the shortest path from face to face for the determination of the minimum sum of the thickness of longitudinal webs and shells

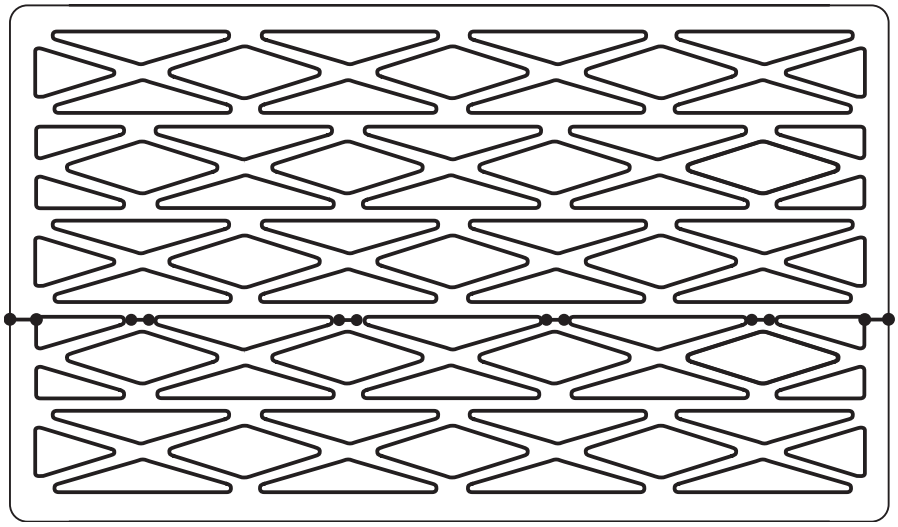


Figure A.6 — Example of the shortest path from header to header for the determination of the minimum sum of the thickness of transverse webs and shells

Annex B
(informative)

Significant technical changes between this European standard and the previous edition

7.1 now specifies that for clay, aggregate concrete, autoclaved aerated concrete and natural stone masonry units dimensions are to be measured using two measurements for each dimension. In the case of small units (which are defined in 7.1) the measurement may be taken once for each dimension. Previously the choice of the number of measuring positions had been given in EN 771. Guidance is given on the measurement positions to be used on units with irregular faces and this reduces the number from four previously to two. This can no longer be specified as otherwise in EN 771.

Separate provisions are provided for Calcium Silicate units which have irregularities on some of their faces to allow single measurements on those faces that do not. The guidance for such units where measurements are to be taken on faces which have irregularities is as for other unit types.

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