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Methods of test for masonry units — Determination of Dimensions

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Foreword

Rwanda Standardsarepreparedby Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by technical committees are ratified by members of RSB Board of Directors for publication and gazettment as Rwanda Standards.

RS536was prepared by Technical Committee RSB/TC 9, *Civil engineering and building materials.*

In the preparation of this standard, reference was made to the following standard (s):

BS EN 772-16:2011 Methods of test for masonry units - Part 16: Determination of dimensions

The assistance derived from the above source is hereby acknowledged with thanks.

RS536 consists of the following parts, under the general title *Methods of test for masonry units — Determination of Dimensions*

Committee membership

The following organizations were represented on the Technical Committee on *Civil engineering and building materials*(RSB/TC 9) in the preparation of this standard.

A+Construction Group Ltd

Africeramics Ltd

Consultants Engineers Group (CEG) Ltd

D&D Resources Ltd

Dutureheza Ltd

Enabel Rwanda

Greenpack Africa Ltd

Integrated Polytechnic Regional Centre (IPRC) - Musanze

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Methods of test for masonry — Determination of Dimensions

1 Scope

This Draft Rwanda 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 documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the editioncited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

DRS 546, Clay products for buildings — Vocabulary

3 Terms and definitions

For the purposes of this standard, the terms and definitions given in DRS 546 apply.

4 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.

5 Symbols (and abbreviated terms)

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). paragraph.

6 Apparatus

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

Table 1 — Measurement precision

Toleranceonthedimensionbeingmeasured	Maximummeasuringerror

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<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.

7 Preparation of specimens

7.1 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.

7.2 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.

8 Procedure

8.1 Length, width and height

For clay, aggregate concrete, autoclaved aerated concrete, manufactured stone and natural stone masonry units determine the length (lu), the width (wu) and the height (hu) 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).

b) If two of the three following conditions are satisfied lu ≤ 250 mm, wu ≤ 125 mm, hu ≤ 100 mm, use procedureb).

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

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d) 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).

e) For calcium silicate masonry units determine the length (lu), the width (wu) and the height (hu) usingprocedure(d)orprocedure(e)asis relevant.

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

g) 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)

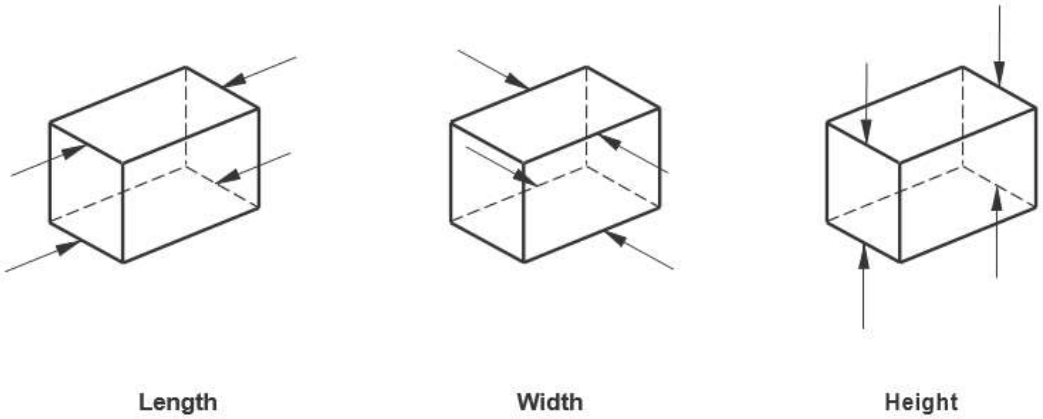

Figure 1 a) - Measurement positions

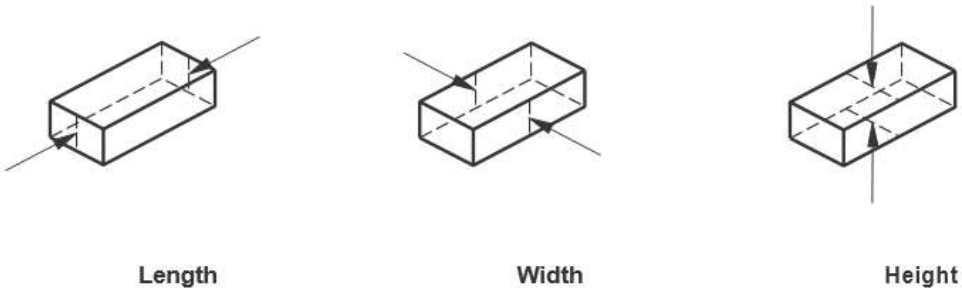

Figure 1b) - Measurement positions

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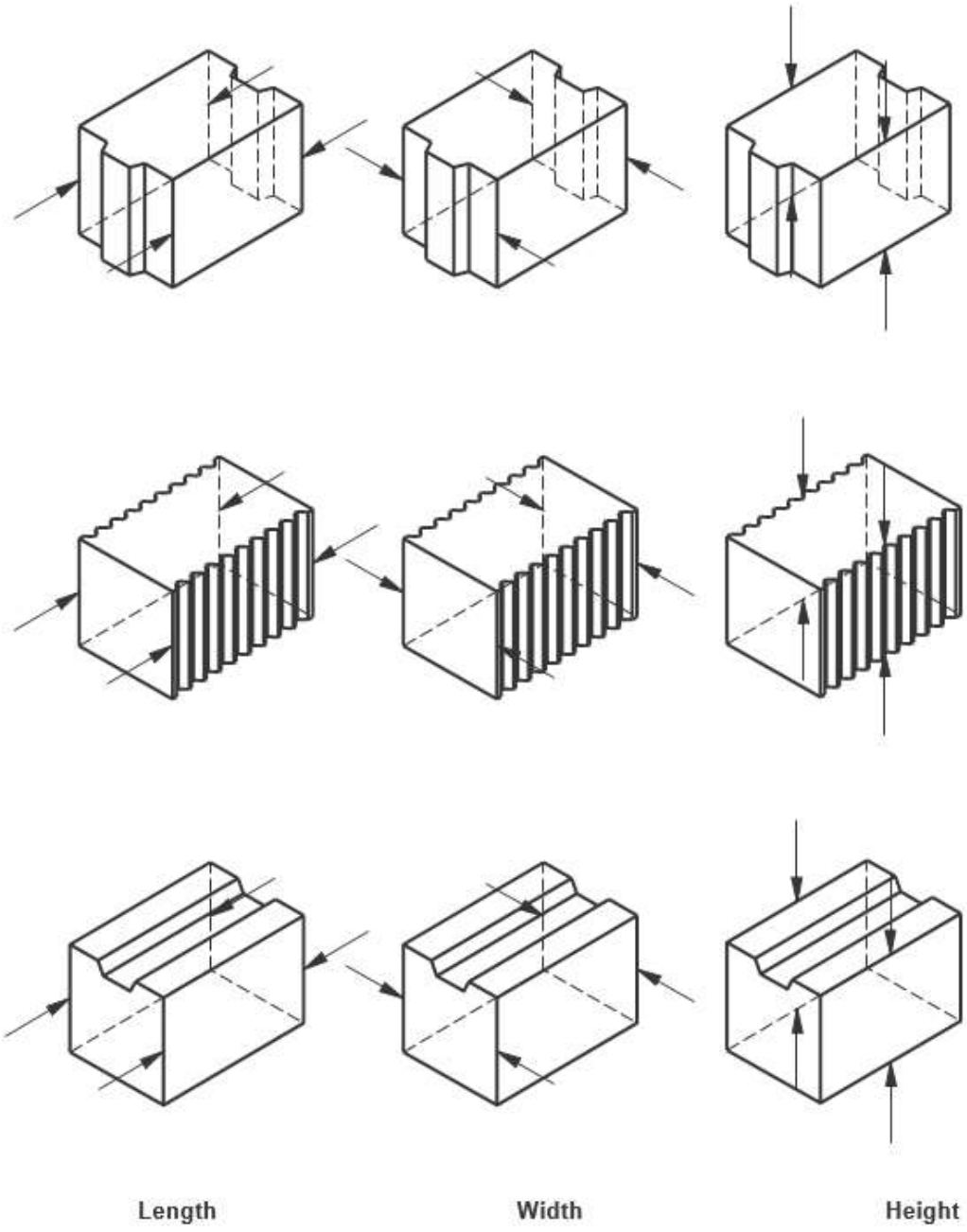

Figure 1 c) - Measurement positions

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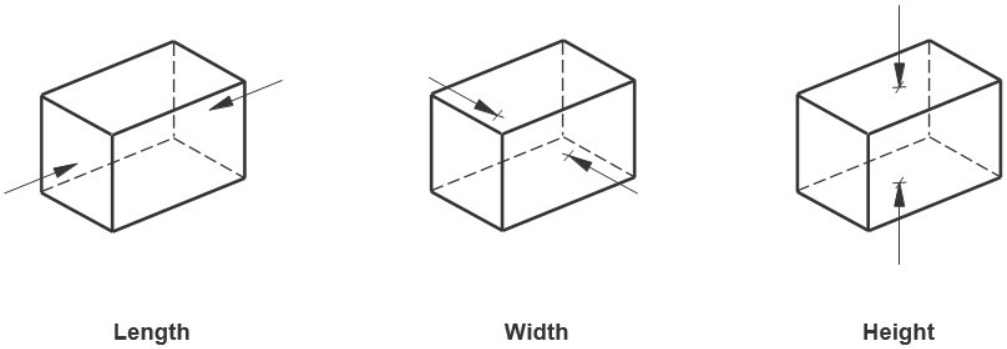

Figure 1 d) - Measurement Positions

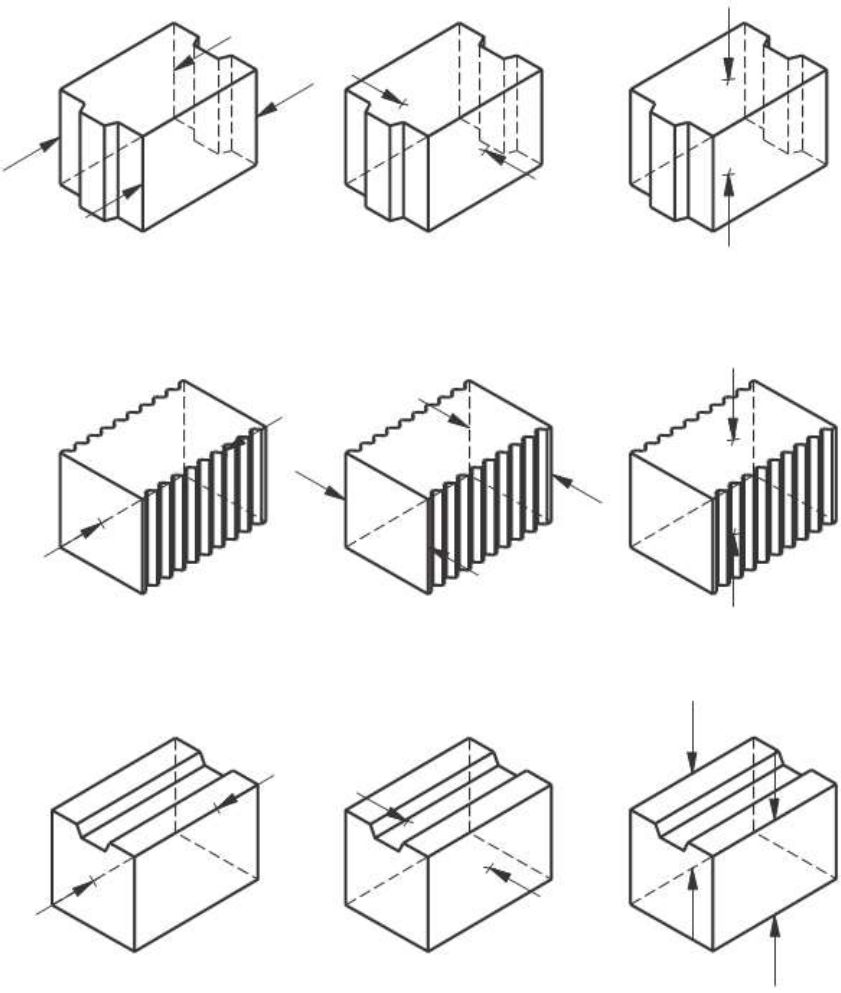

Figure 1 e) - Measurement Positions

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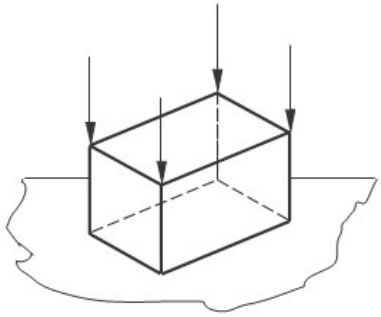

Figure 1 f) - Measurement positions

8.2 Thickness of shells and webs

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.

8.3 Depth of holes

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.

8.4 Plane parallelism of the bed faces

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.

8.5 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.

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9 Calculation and expression of results

If option a) or option c) or option e) of 7.1 is chosen, calculate the length (lu), width (wu) and height (hu) 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 (lu), width (wu) and height (hu) 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.

10 Test report

The test report shall contain the following information:

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

b) a description of the specimens

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;

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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 (lu), width (wu) and height (hu) of each specimen expressed to the nearest 0,1 mm, 0,2 mm or0,5 mm (see Clause 8), the mean values of length, width and height for the sample being expressed tothe 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, , 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, , 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.

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Annex A
(normative)

Examples of paths chosen for the measurement of combined thickness

A.1 General

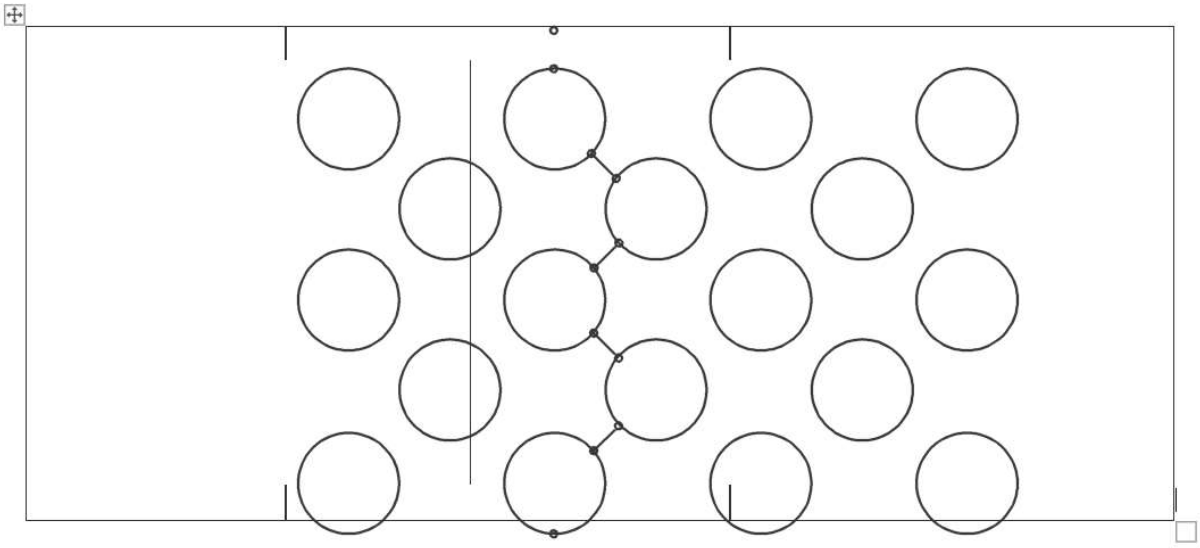

Figure A.1 — Example of the shortest path from face to face for the determination of the minimum sum of the thickness of longitudinal webs and shells

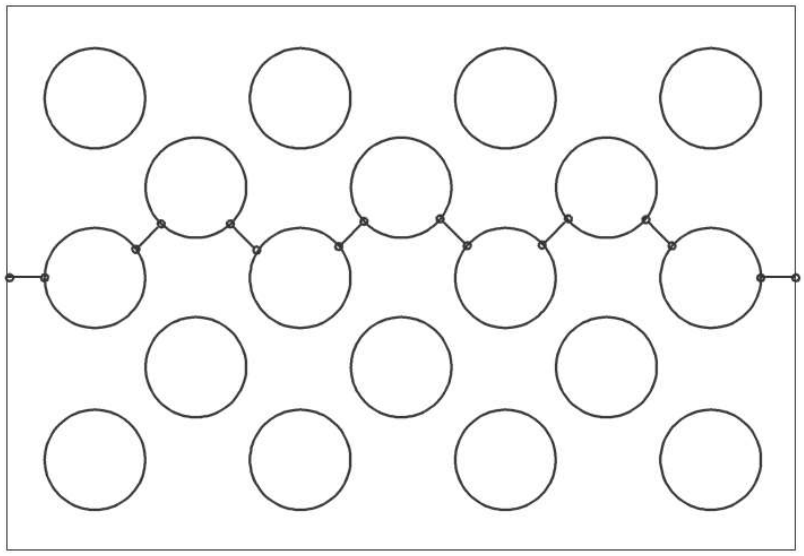

Figure A.2 — Example of the shortest path from header to header for the determination of the minimum sum of the thickness of transverse webs and shells

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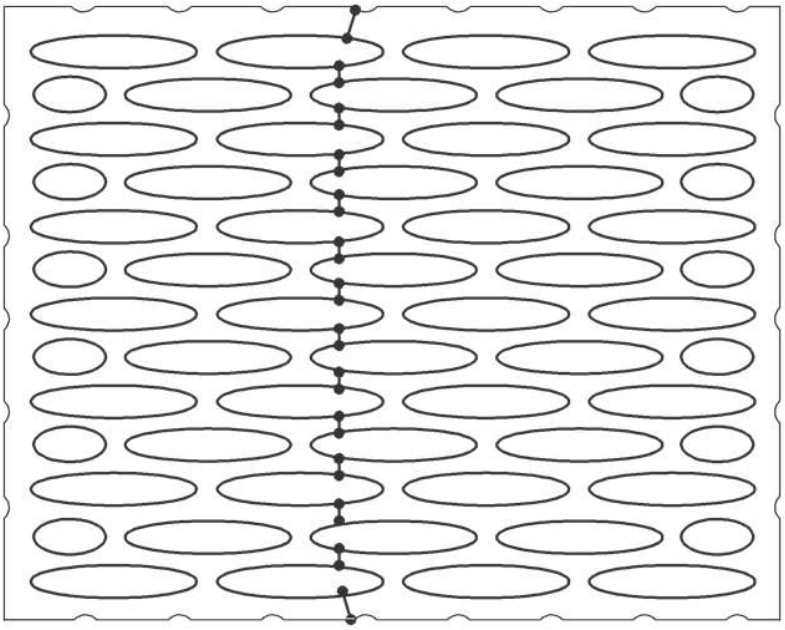

Figure A.3 — Example of the shortest path from face to face for the determination of the minimum sum of the thickness of longitudinal webs and shells

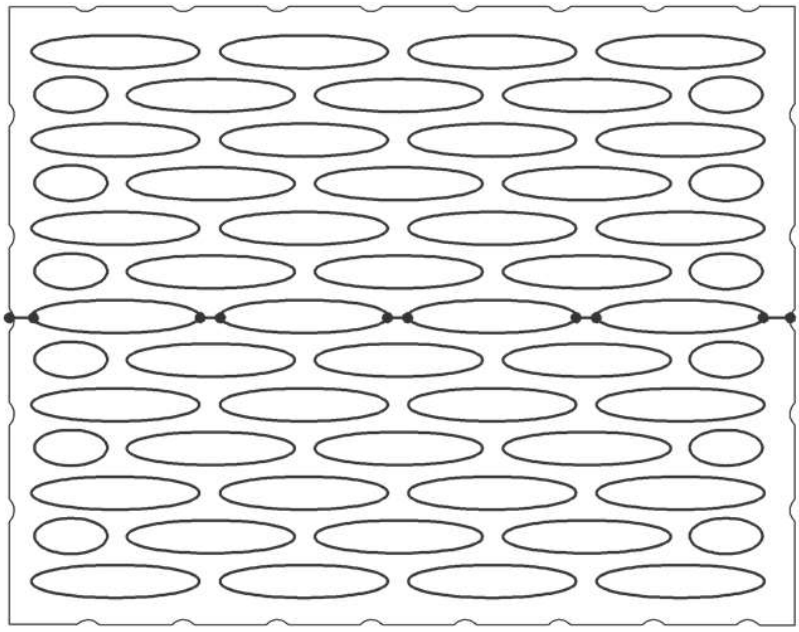

Figure A.4 — Example of the shortest path from header to header for the determination of the minimum sum of the thickness of transverse webs and shells

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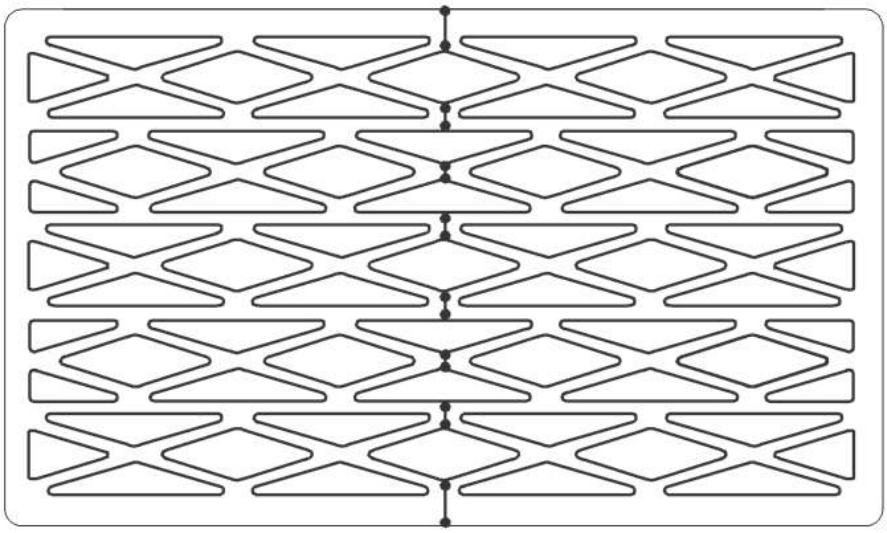

Figure A.5 — Example of the shortest path from face to face for the determination of the minimum sum of the thickness of longitudinal webs and shells

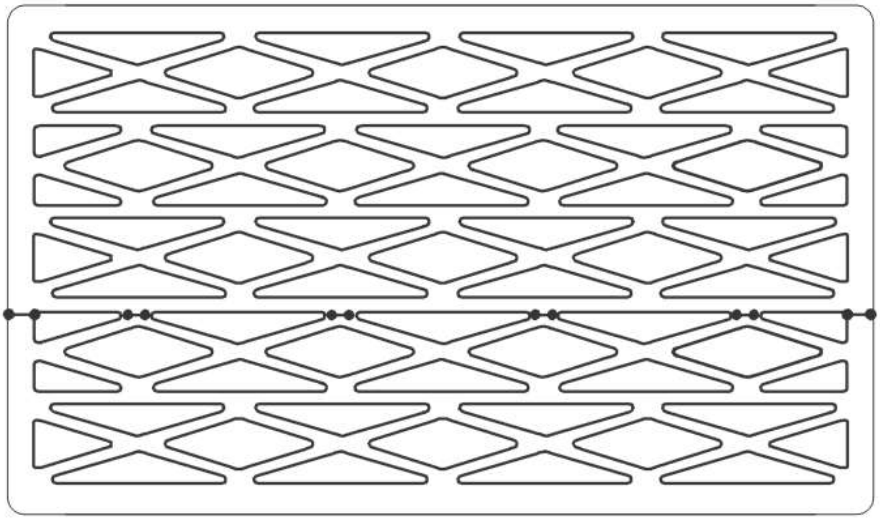

Figure A.6 — Example of the shortest path from header to header for the determination of the minimum sum of the thickness of transverse webs and shells

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