
International Standard



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Asbestos-cement ventilation ducts and fittings — Dimensions and characteristics

Conduits aérauliques et accessoires en amiante-ciment — Dimensions et caractéristiques

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4486 was prepared by Technical Committee ISO/TC 77, *Products in fibre reinforced cement*.

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Asbestos-cement ventilation ducts and fittings — Dimensions and characteristics

1 Scope and field of application¹⁾

This International Standard applies to asbestos-cement straight ducts and their fittings used for ventilation purposes, with cross-sections up to 300 mm. It also specifies methods for checking the dimensions and defining the principal characteristics and acceptance tests applicable to these products.

2 References

ISO 390, *Asbestos-cement products — Sampling and inspection*.

ISO 1182, *Fire tests — Building materials — Non-combustibility test*.

3 Composition

Ducts and fittings to which this International Standard relates consist essentially of an inorganic hydraulic binder²⁾ reinforced by asbestos fibres, to which other fibres may be added.

Fillers and pigments may be added.

4 Types

Ducts and fittings may be either of the following types:

- with spigot and socket ends;
- with plain ends.

Fittings shall have angles of 45° and 90°.³⁾

5 General appearance and finish

The internal surface shall be regular and smooth.

The ducts and fittings may be considered sound, provided no cracks penetrate the wall. If necessary, ducts and fittings may be coated internally and/or externally with a suitable coating.

6 Characteristics

6.1 Geometrical characteristics

6.1.1 Shapes and sizes⁴⁾

The nominal sizes of circular, square and rectangular ducts and fittings (see figures 1, 2 and 3) correspond to the internal dimensions in millimetres, ignoring tolerances.

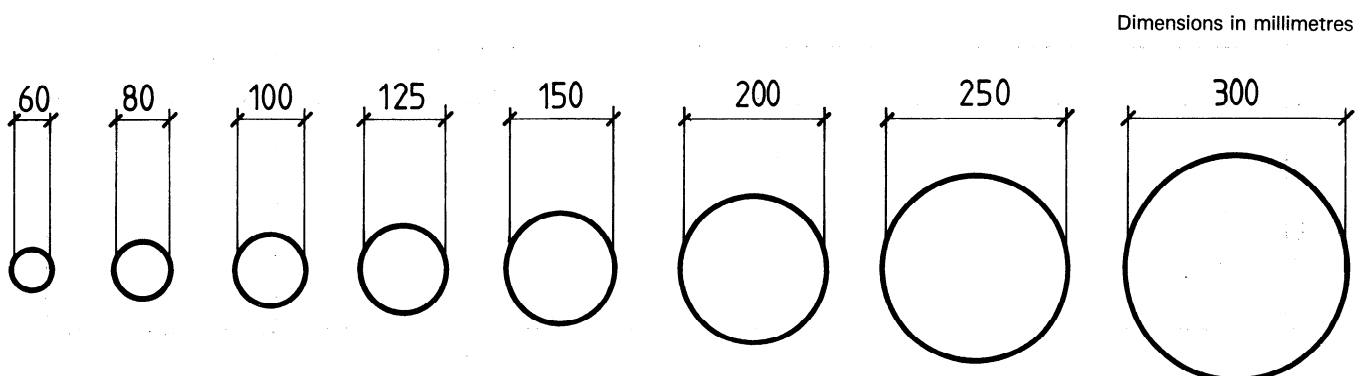


Figure 1

1) Where ducts and fittings are to be used for other applications, national standards shall apply.

2) National standards may specify the binder to be used.

3) Fittings with other angles shall correspond to national standards or to manufacturer's specifications.

4) The sizes indicated are preferred. National standards may specify other sizes.

Dimensions in millimetres

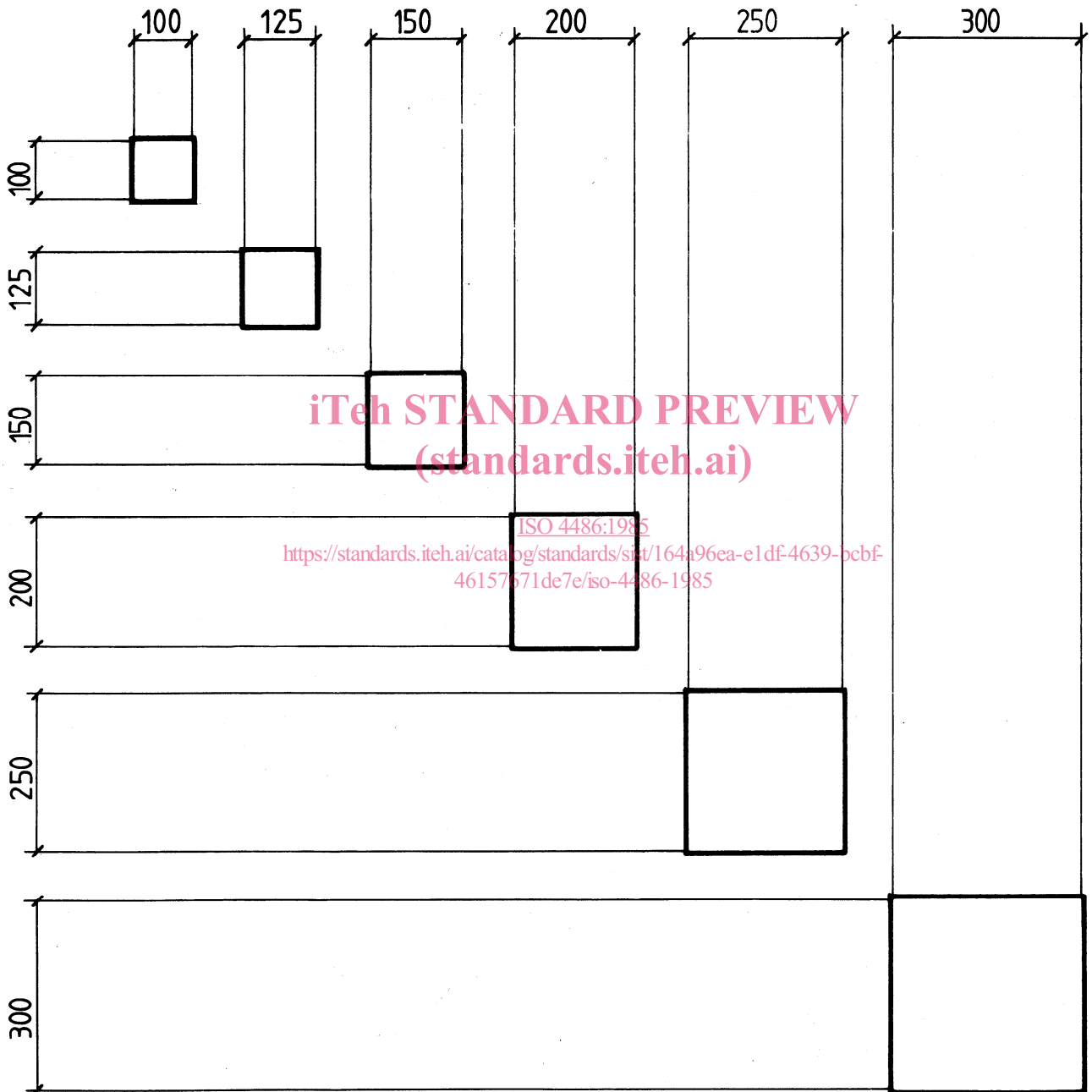


Figure 2

6.1.2 Nominal length of ducts

The nominal length of the ducts, expressed in metres, corresponds to the length measured between the ends for ducts with plain ends. For ducts with applied socket, see figure 4.

For monolithic ducts, the nominal length, expressed in metres, shall be defined in the manufacturers' catalogues (see figure 5).

The series of nominal lengths is

2,00 – 2,50 – 3,00 – 4,00 – 5,00

6.1.3 Dimension of socket and spigot for ducts and fittings

For ducts and fittings with socket, the following two conditions shall apply (see figure 6) :

$$a \geq 55 \text{ mm}$$

$$b \geq a + 5 \text{ mm}$$

For ducts and fittings without socket, the length of the spigot shall be at least equal to the depth of the corresponding socket plus 5 mm. 1)

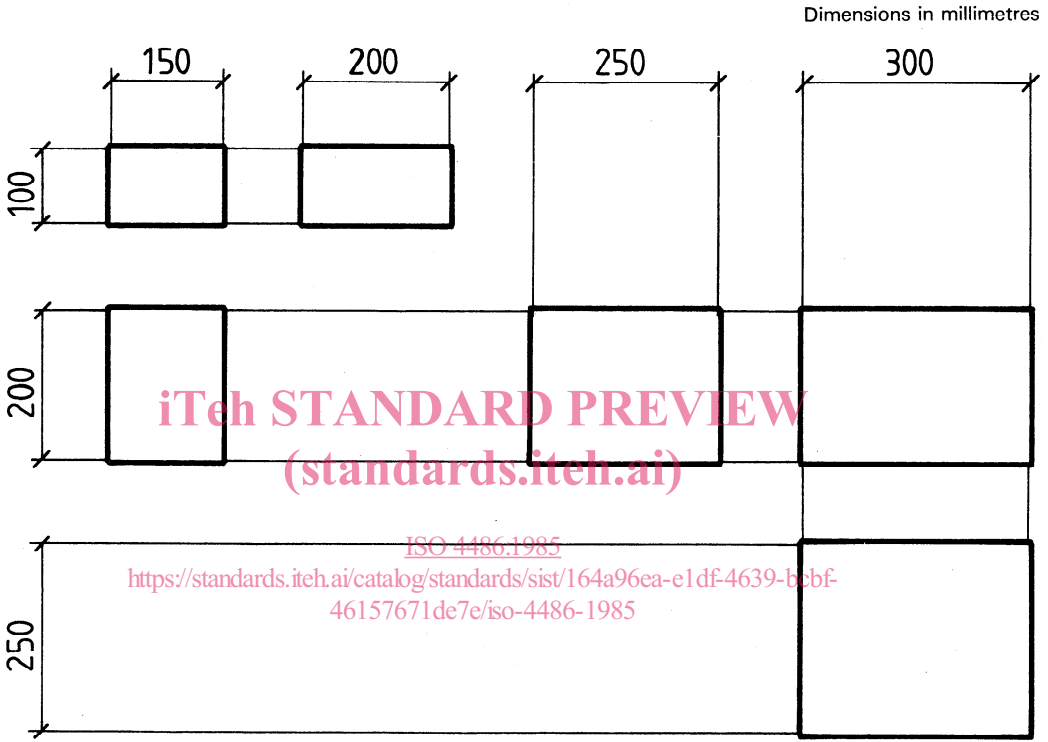


Figure 3

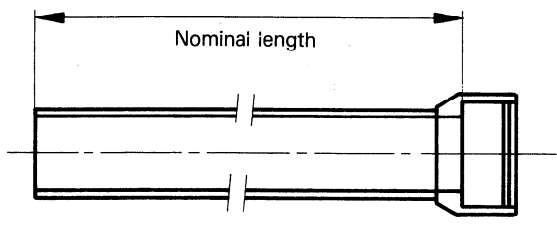


Figure 4

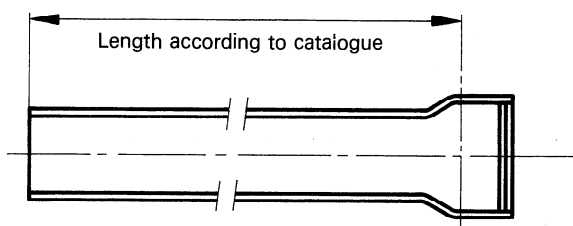


Figure 5

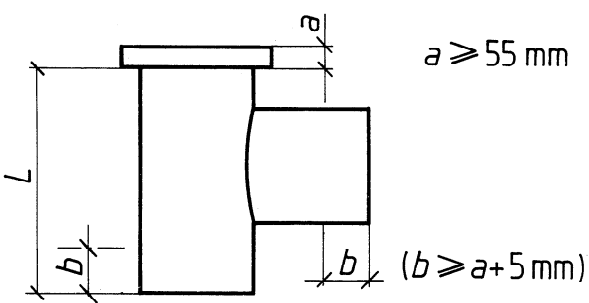


Figure 6

1) The dimensions of sockets shall correspond to national standards or manufacturer's specifications.

6.1.4 Nominal wall thickness of ducts and fittings

The nominal thicknesses correspond to the thicknesses of the pipes, expressed in millimetres. They are

5 – 6 – 7 – 8 – 9

6.1.5 Tolerances

6.1.5.1 Cross-sections of circular, square and rectangular ducts and fittings

The minimum inside dimensions and the maximum outside dimensions are given in table 1.

It is recommended that corners on square and rectangular ducts have a maximum inner radius of:

20 mm for sizes 100 to 150 mm,

30 mm for sizes 200 to 300 mm,

the maximum corner rounding being dictated by the smallest dimension of the cross-section.

The inner radii of fittings shall be the same as those of the corresponding ducts.

6.1.5.2 Lengths

Tolerance on nominal lengths of ducts:

Upper tolerance: + 5 mm

Lower tolerance: – 20 mm

6.1.5.3 Wall thickness of ducts and fittings

The tolerances on wall thickness are given in table 2.

6.2 Physical characteristics

6.2.1 Non-combustibility

Ducts and fittings are in principle classified as non-combustible in accordance with ISO 1182. The producer shall otherwise specify with which national standard the material complies.

6.2.2 Density

Tested as specified in 7.2.2, the density of ducts and fittings in a dry condition shall not be less than 1,20 g/cm³.

Table 1 – Minimum inside and maximum outside dimensions
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Values in millimetres

Nominal wall thickness	Nominal size							
	60	80	100	125	150	200	250	300
5	min. 56 max. 75	min. 76 max. 96	min. 95 max. 116	min. 120 max. 142				
6	min. 56 max. 78	min. 76 max. 98	min. 95 max. 119	min. 120 max. 144	min. 144 max. 170	min. 193 max. 221	min. 242 max. 272	min. 291 max. 323
7	min. 56 max. 80	min. 76 max. 101	min. 95 max. 121	min. 120 max. 146	min. 144 max. 172	min. 193 max. 223	min. 242 max. 274	min. 291 max. 325
8			min. 95 max. 123	min. 120 max. 149	min. 144 max. 174	min. 193 max. 225	min. 242 max. 276	min. 291 max. 327
9						min. 193 max. 228	min. 242 max. 279	min. 291 max. 330

NOTE – The preferred sizes are framed in the table.

Table 2 – Tolerances on wall thickness

Values in millimetres

Nominal wall thickness	Tolerance	Maximum wall thickness at seam
5	± 0,8	7,5
6	± 1,0	9,0
7	± 1,2	10,5
8	± 1,4	12,0
9	± 1,6	13,5

NOTE – In the case of seamless ducts, the tolerances on the wall thickness are as follows:

Nominal thickness	5	6	7	8	9
Tolerance	{ - 0,8 + 1,6	{ - 1,0 + 2,0	{ - 1,2 + 2,4	{ - 1,4 + 2,8	{ - 1,6 + 3,2

6.2.3 Air-permeability

Tested as specified in 7.2.3, the ducts and fittings shall have no fissure, leakage or sweating.

7 Tests

a) Compulsory tests

- measurement of the density;
- control of the dimensions.

b) Optional tests

- non-combustibility;
- air-permeability.

7.1 Dimensional check

7.1.1 Cross-section

7.1.1.1 Equipment

The equipment includes templates of steel that shall have dimensions as indicated in table 1 with an accuracy of $\pm 0,2$ mm. The inside templates shall have rounded corners as given in 6.1.5.1. The outside templates shall have square corners.

7.1.1.2 Procedure

The cross-section shall be checked by passing the templates through and over the plain end or spigot of the ducts and fittings up to 60 mm keeping them perpendicular to the longitudinal axes.

7.1.1.3 Expression of results

Report the number of pieces through which the templates have passed freely and the number through which the templates have not passed.

7.1.2 Lengths

7.1.2.1 Equipment

The equipment includes a calibrated steel measuring tape, allowing measurements to an accuracy of 1,0 mm.

7.1.2.2 Procedure

Measure the duct parallel to its longitudinal axis to determine the maximum length. For ducts with socket, determine the useful length.

7.1.2.3 Expression of results

For each duct, report the length in millimetres, without decimals.

7.1.3 Wall thicknesses

7.1.3.1 Equipment

The equipment includes a micrometer with flat and parallel circular measuring surfaces of 5 mm, allowing measurements to an accuracy of 0,1 mm.

7.1.3.2 Procedure

Determine the greatest and smallest wall thicknesses by at least ten measurements approximately 50 mm from each plain end on pieces without socket, and at the spigot for pieces with socket. If the pieces have a longitudinal seam, measure the wall thickness at the seam separately.

7.1.3.3 Expression of results

For each piece, report the greatest and smallest thickness measured for each end, in millimetres, to one decimal place. Report the thickness of the seam separately, also in millimetres to one decimal place.

7.1.4 Depth of the sockets

7.1.4.1 Equipment

The equipment includes a template that shall have a cross-sectional outside dimension as given in table 1. The shape of the corner of the template shall be in accordance with the outside shape of the ducts and fittings.

7.1.4.2 Procedure

Measure the depth of the socket by pushing the template into them to check the required minimum depth.

7.1.4.3 Expression of results

For each piece, report the depth of the socket, in millimetres.

7.2 Physical tests

7.2.1 Non-combustibility

The requirements and methods of test shall correspond with those laid down in the relevant International Standards or national standards.

7.2.2 Density

7.2.2.1 Procedure

Determine the density by testing at least three test pieces, to be taken from straight, unmachined wall sections without socket. The length shall be 250 mm, and the width or developed width, 80 mm.

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