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BSI Standards Publication

Chimneys — Accessories

Part 7: Rain caps — Requirements and test methods

National foreword

This British Standard is the UK implementation of EN 16475-7:2016.

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

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European foreword

This document (EN 16475-7:2016) has been prepared by Technical Committee CEN/TC 166 “Chimneys”, the secretariat of which is held by ASI.

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of an identical text or by endorsement, at the latest by July 2016, and conflicting national standards shall be withdrawn at the latest by October 2017.

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Introduction

EN 16475-7 is a part of the series of standards for “Chimneys — Accessories” and consists of:

— *Part 1: Silencers*

— *Part 2: Chimney fans*

— *Part 3: Draught regulators, standstill opening devices and combined secondary air devices*

— *Part 4: Flue dampers*

— *Part 5: Explosion/implosion relief devices*

— *Part 6: Access components*

— *Part 7: Rain caps (this part)*

1 Scope

This European Standard specifies requirements and test methods for rain caps that are used as components, subject to flue gas, in order to protect against rain entry into the chimney flues.

Rain caps which are part of components of a system chimney or other components of a chimney such as terminals, are not covered by this European Standard.

It also specifies the requirements for marking, manufacturers' instruction, product information and attestation and verification of constancy of performance (AVCP).

NOTE Rain caps according to this standard are suitable for both dry and wet chimney applications.

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 206, *Concrete — Specification, performance, production and conformity*

EN 1443, *Chimneys — General requirements*

EN 1856-2:2009, *Chimneys — Requirements for metal chimneys — Part 2: Metal flue liners and connecting flue pipes*

EN 1857, *Chimneys — Components — Concrete flue liners*

EN 1858, *Chimneys — Components — Concrete flue blocks*

EN 14297, *Chimneys — Freeze-thaw resistance test method for chimney products*

EN 14471:2013+A1:2015, *Chimneys — System chimneys with plastic flue liners — Requirements and test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1443 and the following apply.

3.1
rain cap
product to protect against rain entry into the chimney flue

3.2
flow resistance of the rain cap
additional pressure loss due to the flow of the flue gas passing the rain cap

3.3
nominal flue size
numerical designation of flue size which the rain cap is protecting against rain ingress, which is a convenient round number equal to or approximately equal to either the internal diameter in millimetres of circular flue liners, the internal width in millimetres of square flue liners or the internal width and breadth in millimetres of the cross section of rectangular flue liners

3.4
rain cap size
outer dimension or dimensions of the projected horizontal surface of the rain cap, expressed in millimetres

3.5
free area
vertical dimension from the top of the flue outlet to the underside of the rain cap edge multiplied by the perimeter of the flue which the rain cap protects, reduced by the area of e.g. any support legs, bands, bird or spark guard mesh, expressed in square millimetres

4 Product characteristics

4.1 General

Recommended minimum material specifications for rain caps are the following (see Annex A):

a) Metal rain caps made of material quality 1.4401 with a wall thickness of the cap of at least 0,6 mm, at least three supports with a wall thickness of each at least 1,0 mm, method of fixings ww, wr, rr, b or st and a relation between dome/pyramid and height/size of at least 10 %.

b) Metal rain caps made of material quality 1.4301 with a wall thickness of the cap of at least 0,6 mm, at least three supports with a wall thickness of each at least 1,0 mm, method of fixings ww, wr, rr, b or st and a relation between dome/pyramid and height/size of at least 10 %.

c) Metal rain caps made of material quality EN AW – 4047A with a wall thickness of the cap of at least 1,5 mm, at least three supports with a wall thickness of each at least 1,5 mm, method of fixings rr, b or st and a relation between dome/pyramid and height/size of at least 10 %,

d) Concrete rain caps with a compressive strength of the concrete of at least C25/30 according to EN 206 (characteristic value ≥ 25 MPa on 150 × 300 cylinder), a relation between thickness and length of longest side of at least 20 % and fixings with tenon and mortise or similar assembly shape + mortar or jointing material.

NOTE Method of fixing ww = double weld, wr = weld and rivet, rr = double rivet, b = bolt and washer, st = single self-tapping screw.

Metal:

The material of a metal rain cap shall be in accordance with EN 1856-2.

Concrete:

The material of a concrete rain cap shall be in accordance with EN 1857 or EN 1858.

Plastic:

The material of a plastic rain cap in contact with combustion products shall be in accordance with the chimney requirements of EN 14471 with the durability against UV (location class) LE.

4.2 Dimensions and tolerances

The thickness of material of the individual components of the rain cap shall be not less than that declared by the manufacturer.

4.3 Mechanical resistance and stability

4.3.1 Compressive strength

When tested in accordance with the test method described in 5.1.2, the rain cap shall withstand a load of 2,9 kN/m^2 ± 5 % of the outer dimension of the horizontal surface of the rain cap without reducing the original free area of the rain cap by more than 10 % after the test.

NOTE 1 The value corresponds to the maximum snow load zone in accordance with EN 1991–1-3.

Metal and concrete rain caps as described in 4.1 a) to d) are considered to meet the requirement.

NOTE 2 Method of fixing ww = double weld, wr = weld and rivet, rr = double rivet, b = bolt and washer, st = single self-tapping screw.

4.3.2 Wind load

When the rain cap is tested according to the test method described in 5.1.3, the rain cap shall not show a reduction of the original free area of the rain cap by more than 10 % after the test when a minimum horizontal traction load of 1,5 kN/m^2 of the laterally projected surface area is applied (see Figure 2 a)), and when a vertical traction load of 0,75 kN/m^2 of the upward projected surface area is applied (see Figure 2 b)).

Metal and concrete rain caps as described in 4.1 a) to d) are considered to meet the requirement.

4.3.3 Resistance to freeze–thaw

Rain caps shall be tested for their freeze–thaw resistance in accordance with EN 14297.

Metal and plastic products are considered deemed to satisfy freeze–thaw resistance.

4.4 Thermal performance

4.4.1 Reaction to fire

For plastic materials the manufacturer shall declare the class of reaction to fire as defined in EN 14471:2013+A1:2015, 4.10, and test it in accordance with EN 14471:2013+A1:2015, 7.7.8.

4.4.2 Fire resistance

4.4.2.1 Heat stress

When the rain cap is tested in accordance with 5.2.2.1, the rain cap shall not show a reduction of the original free area of the rain cap by more than 10 % after the test.

Metal rain caps as described in 4.1 a) are deemed to satisfy the requirements of T600 and shall be designated as T600.

Metal rain caps as described in 4.1 b) are deemed to satisfy the requirements of T300 and shall be designated as T300.

Metal rain caps as described in 4.1 c) are deemed to satisfy the requirements of T200 and shall be designated as T200.

Concrete rain caps as described in 4.1 d) are deemed to satisfy the requirements of T450 and shall be designated as T450.

4.4.2.2 Resistance to sootfire

When the rain cap is tested in accordance with 5.2.2.2, the rain cap shall not show a reduction of the original free area of the rain cap by more than 10 % after the test.

Metal rain caps as described in 4.1 a) are considered to meet the requirement.

Concrete rain caps as described in 4.1 d) are considered to meet the requirement.

4.5 Hygiene, health and environment

4.5.1 Corrosion resistance

The corrosion resistance of the material of the rain cap shall be in accordance with the material quality of the equivalent flue liner material for that chimney designation as given in EN 1857, EN 1856-2 or EN 14471.

Metal rain caps as described in 4.1 a) are considered to be designated 3.

Metal rain caps as described in 4.1 b) are considered to be designated 2.

Metal rain caps made of material quality EN AW – 4047A and constructed as described in 4.1 are considered to be designated 1.

Concrete rain caps made of material according to EN 1857 (or EN 1858) are considered to be designated 3.

4.5.2 Dangerous substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this standard are placed on those markets.

In the absence of European harmonized test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

NOTE An informative database covering European and national provisions on dangerous substances is available at the Construction website on EUROPA accessed through: *http://ec.europa.eu/enterprise/construction/cpd-ds/*

4.6 Additional criteria for chimney operation

4.6.1 Cleaning of the chimney

If the cleaning of the chimney is intended to be made with the rain cap in position and the rain cap cannot be removed easily, the distance shall be sufficient to allow a cleaning brush of the size appropriate to the flue to be cleaned to exit the flue. A distance of at least 100 mm is recommended.

If the rain cap is removable for cleaning purposes, it shall be secured appropriately against falling.

4.6.2 Rainwater ingress

When the rain cap is tested according to the test method described in 5.3.1, the mass of the water collected in the flue shall not exceed 0,05 mm^3/s per millimetre of flue diameter.

Rain caps with the overall dimension providing an angle of at least 27° from the vertical of a line from the edge of the rain cap to the edge of flue are considered to meet the requirement under no wind conditions.

It is recommended that the size of the rain cap is at least of the same size as the exterior dimension of the top of the chimney in order to protect the top of the chimney from rain where it is otherwise not protected.

4.6.3 Flow resistance of the rain cap

The manufacturer shall declare the coefficient of flow resistance of the rain cap.

The declared value shall be determined according to the test method described in 5.3.2 or obtained from data given in Table B.1.

A zeta value of maximum 1.5 is recommended. A free area of at least 2 times the flue area satisfies this recommendation, without testing.

4.6.4 Ice formation

A rain cap subject to ice formation shall have an overlap of at least 50 mm greater than the chimney outer dimension in all directions.

5 Testing, assessment and sampling methods

5.1 Mechanical resistance and stability

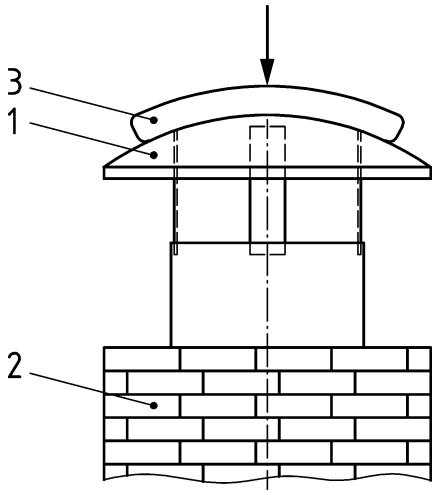
5.1.1 General

The rain cap shall be mounted according to the manufacturer's instructions on the top of a test assembly supported.

5.1.2 Compressive strength

5.1.2.1 Test assembly

The rain cap shall be mounted according to the manufacturer's instructions on a simulated chimney top supported (see Figure 1).



Key

1 rain cap

2 chimney

3 sand bag

Figure 1 — Example of a test assembly for compressive strength

5.1.2.2 Procedure

Measure the free area of the rain cap.

A vertical load of 2,9 kN/m^2 ± 5 % of the outer dimension of the horizontal surface of the rain cap shall be applied to the top of the unit, distributed as evenly as possible. Maintain this load for (5 ± 1) min.

Measure the free area.

NOTE A method for applying an evenly distributed load is done by covering the rain cap with a bag of sand sufficient to take up the shape of the terminal and allow the rest of the load to be applied by means of additional weight.

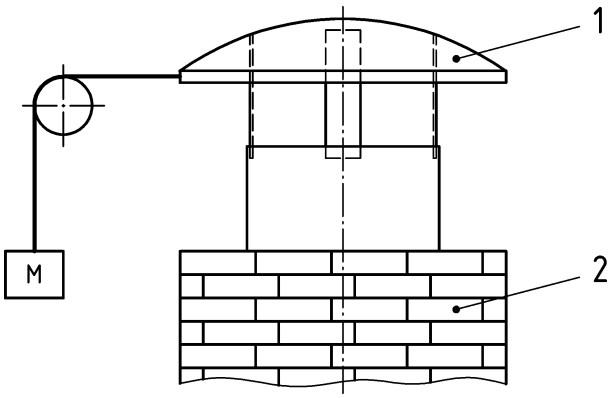
5.1.2.3 Test results

Record the free area before and after the test.

5.1.3 Wind load

5.1.3.1 Test assembly

The rain cap shall be mounted in a simulated chimney top supported according to the manufacturer's instructions (see Figure 2a) and Figure 2b)).



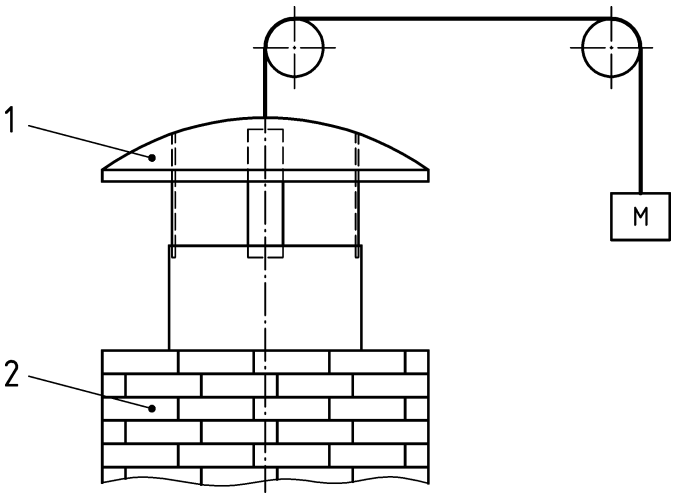
Key

1 terminal

2 brick stack

M tilt Load (kN)

a) Example of test assembly for wind load (horizontal traction)



Key

1 rain cap

2 chimney

M upward Load in kN

b) Example of test assembly for wind load (vertical traction)

Figure 2 — Example of test assembly for wind load

5.1.3.2 Procedure

Measure the free area.

Apply an evenly distributed test load for horizontal traction of 1,5 kN/m^2 of the laterally projected surface area (see Figure 2 a)), and for vertical traction of 0,75 kN/m^2 of the upward projected surface area (see Figure 2 b)).

Measure the free area.

A method for applying an evenly distributed load for the horizontal traction may be done by placing a leather collar around the top of the rain cap. The collar shall span the rain cap across an angle of 180°. For the vertical traction a hook may be attached to the centre of the rain cap surface.

5.1.3.3 Test Results

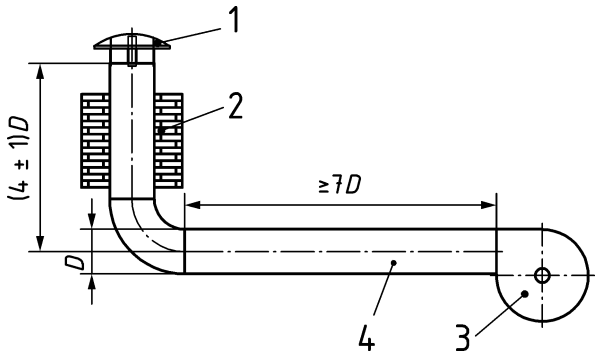
Record the free area before and after the test.

5.2 Thermal performance

5.2.1 Test assembly

5.2.1.1 General

The rain cap shall be mounted in a simulated chimney top supported according to the manufacturers' instructions (see Figure 3).



Key

1 rain cap

2 chimney

3 hot gas generator

4 hot gas connecting pipe

D Diameter of hot gas connecting pipe

Figure 3 — Example of test assembly for fire resistance

5.2.1.2 Vertical section of the chimney

The length of the vertical section of chimney from the centre line of the hot gas connecting pipe to the rain cap shall be (4 ± 1).*D*, and have a thermal resistance ≥ 0,12 m^2 K/W.

The flue size of the vertical section shall be equal to the cross sectional area of the maximum nominal flue size for which the rain cap is suitable

5.2.1.3 Hot gas connecting pipe

Construct a purpose-made insulated straight flue pipe having a diameter *D* equal to the cross sectional area of the maximum nominal flue size for which the rain cap is suitable, of a length of approximately seven diameters measured from the centre line of the flue gas generator to the entry to the test chimney, insulated to provide a thermal resistance value of not less than that equivalent to 50 mm

thickness of material having a thermal conductivity of (0,125 ± 0,005) W/mK at (750 ± 5) °C (see Figure 3).

5.2.1.4 Hot gas generator

The test apparatus shall consist of a hot gas generator, producing the hot gas as given in Table 1 at the rate and temperature according to the designation and flue diameter. The overall temperature distribution factor (OTDF) shall not be greater than 1,05 at the measuring point at the entry of the chimney, see Annex E.

When the hot gas is generated by the combustion of fuel, no flame shall enter the test sample. This is fulfilled when the hot gas has a CO/CO_2 ratio not greater than 0,01.

Alternatively, a test apparatus consisting of a fan and an electric heater, producing the hot gas as given in Table 1 at the rate and temperature according to the designation and flue diameter may be used up to a designated temperature of 250 °C.

5.2.2 Test Procedure

5.2.2.1 Heat stress test

Measure the free area.

Generate hot gas with the volume flow at $^{-0}_{+10}$ % of the value and the test temperature at $^{-0}_{+5}$ % of the values specified in Table 1 appropriate to the product designation and diameter. Regulate the rate of rise of the hot gas temperature to achieve the specified gas temperature (T_t) in time $T = (T_t \text{ x } 60/50)$ s ± 30 s.

Maintain the flue gas temperature at the specified test temperature at $^{-0}_{+5}$ % for 60 min.

Allow the assembly to cool to ambient temperature.

Measure the free area.

5.2.2.2 Sootfire resistance test

With the test assembly temperatures within 10 °C of the test room ambient conditions generate hot gas with the velocity and test temperature specified in Table 1 appropriate to the diameter. Regulate the rate of rise of the hot gas temperature to achieve 1 000 °C in (10 ± 1) min.

Maintain the hot gas temperature at 1 000 $^{-20}_{+50}$ °C for a period of (30 ± 1) min, then turn off the hot gas generator.

Allow the assembly to cool to ambient temperature.

Measure the free area.

5.2.2.3 Test results

Record the free area before and after the test.

Table 1 — Hot gas velocity as a function of test temperature T and diameter of the test chimney

		Hot gas velocity in m/s **at test temperature**											
		Temperature class											
		T080	T100	T120	T140	T160	T200	T250	T300	T400	T450	T600	Soot-fire
		Test temperature in °C											
Pressure class	D in mm	100	120	150	170	190	250	300	350	500	550	700	1000
Negative pressure	100	1,67	1,76	1,90	2,00	2,08	2,36	2,60	2,84	3,56	3,81	4,55	5,09
	120	1,68	1,77	1,91	2,00	2,10	2,38	2,62	2,86	3,59	3,83	4,58	5,58
	160	1,71	1,80	1,94	2,04	2,13	2,42	2,66	2,91	3,65	3,90	4,66	5,56
	200	1,74	1,84	1,99	2,08	2,18	2,48	2,72	2,97	3,73	3,98	4,76	5,41
Positive pressure	100	2,35	2,47	2,65	2,77	2,90	3,26	3,56	3,85	4,73	5,01	5,86	5,09
	120	2,39	2,52	2,71	2,83	2,95	3,32	3,62	3,93	4,82	5,11	5,98	5,58
	160	2,51	2,64	2,84	2,97	3,10	3,48	3,80	4,12	5,06	5,36	6,27	5,56
	200	2,66	2,8	3,01	3,15	3,29	3,70	4,03	4,37	5,36	5,69	6,65	5,41
High positive pressure	100	5,15	5,36	5,68	5,88	6,08	6,63	7,05	7,44	8,36	8,59	9,07	5,09
	120	5,28	5,50	5,83	6,04	6,24	6,81	7,24	7,63	8,58	8,82	9,39	5,58
	160	5,62	5,86	6,20	6,42	6,64	7,24	7,70	8,12	9,13	9,39	9,91	5,56
	200	6,06	6,32	6,69	6,92	7,16	7,81	8,30	8,75	9,84	10,12	10,69	5,41
NOTE The table refers to a maximum diameter of 200 mm. Hot gas velocities for other sizes are possible by calculating according to EN 13384–1.													

5.3 Additional criteria for chimney operation

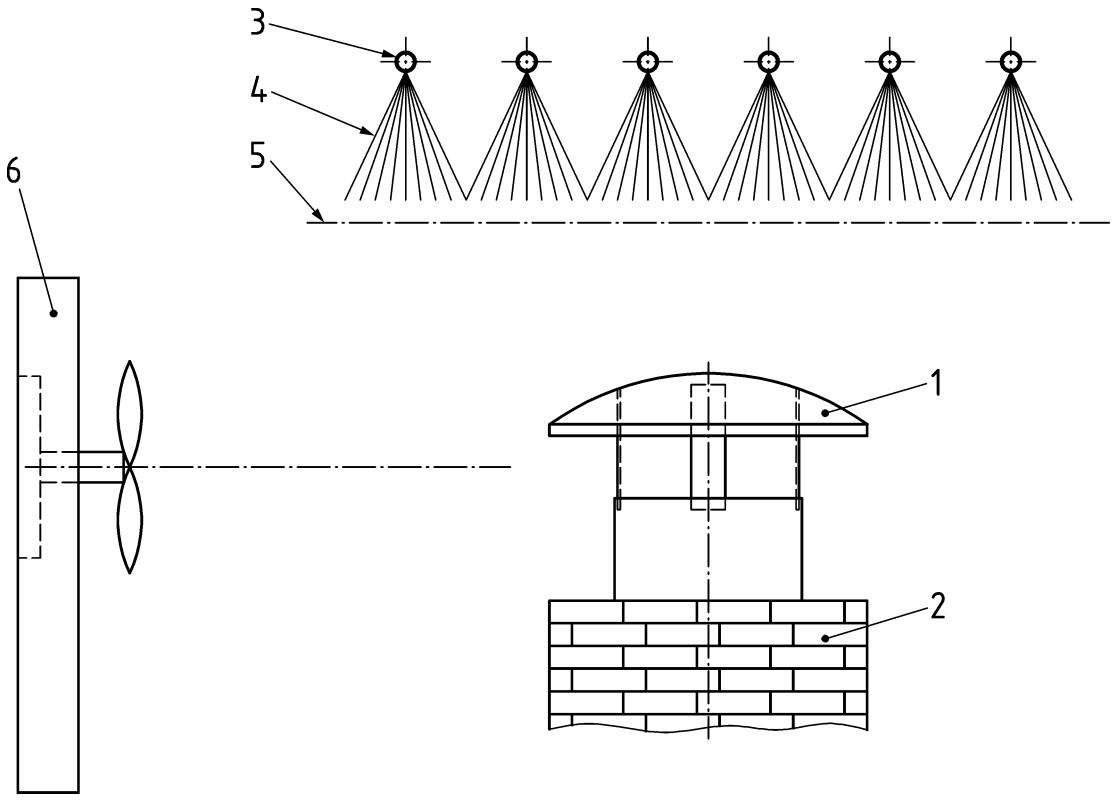
5.3.1 Rainwater ingress

5.3.1.1 Test assembly

The flue size of the test assembly shall be equal to the cross sectional area of the maximum nominal flue size for which the rain cap is suitable.

The rainmaking installation is made up of parallel pipes in a horizontal plane. The tubes have small spray holes (placed vertically downwards).

These spray holes are evenly distributed across the area above the wire mesh. The water from the spray holes shall be distributed through a web of fine (1,3 ± 0,1) mm wide wire mesh, after which the water will fall in the form of raindrops. A typical arrangement is shown in Figure 4.



Key

1	rain cap	4	rainwater
2	chimney	5	mesh screen
3	pipes with spray holes	6	wind generator

Figure 4 — Rainwater ingress test assembly

The rain intensity is (1,6 ± 0,2) mm per minute and shall be measured. During calibration an area in front of the wind generator is found where with wind the rain intensity is (1,6 ± 0,2) mm/min. The largest area of the top of the rain cap shall not be more than 20 % of the area found by calibration.

The wind generator supplies a horizontal airflow at a velocity of (12 ± 0,5) m/s at the position of the product under test. The outlet of the wind generator shall be square or circular.

5.3.1.2 Procedure

Before commencing the rain ingress tests, the test assembly has to be calibrated. For calibration 5 buckets of a diameter of 150 mm, one on each corner of a rectangular area and one in the middle, will be positioned at a level corresponding to the level of the centre of the flue gas outlet. Make sure that the largest area of the top of the rain cap is less than 20 % of the area within the line circumscribing the buckets. Start the calibration test during 10 min with wind and determine if the rain intensity is (1,6 ± 0,1) mm/min by weighing the 5 buckets.

Seal the outlet from the duct. With the rain cap under the rain system and in front of the wind generator in accordance to Figure 4 and in such a way that the flue outlet is in line with the centre of the wind generator outlet opening, operate the wind and rain system. Measure the amount of water entering the flue.

5.3.1.3 Test results

Record the amount of water entering the flue.

5.3.2 Flow resistance of the rain cap

5.3.2.1 Test apparatus

An apparatus for testing a rain cap shall have a fan. It shall have a range of throughputs variable according to the size of the test sample tested. A suitable method to measure the flow shall be sized accordingly.

The diameter of the straight measurement tube shall be equal to the cross sectional area of the maximum nominal flue size for which the rain cap is suitable. The length of straight measurement tube below the rain cap shall be at least six times the nominal internal diameter. Place pressure measurement tubes in the tube at a distance of approximately three times the nominal flue size from the rain cap. At least three pressure measurement tubes 1 mm diameter shall be evenly distributed around the circumference of the measurement tube in a plane perpendicular to the tube axis. The pressure measurement tubes shall have smooth openings into the inside of the tube. The pressure measurement tubes shall be used to determine the average static pressure within the measurement tube (see Figure 5).

5.3.2.2 Measurement parameters

The test shall specify the following parameters:

Table 2 — Measurement parameters

measurement parameters	tolerance
ambient air temperature in the test room in °C	±1 °C
atmospheric pressure values in Pa	±50 Pa
static pressure in Pa	±1 Pa
pressure difference in Pa	±0,2 Pa
velocities for the air flow in the measurement tube in m/s	±0,1 m/s
dimensions of the rain cap in mm	±1 mm

5.3.2.3 Test condition

The following parameters are required for an assessment of flow resistance of the rain cap:

— ambient air temperatures in the test room shall remain in a range between 20 °C and 30 °C;

— air velocity in the tube w_F = (2 ± 0,2) m/s.

5.3.2.4 Test procedure

Mount the rain cap above the measurement tube according to the manufacturer's instructions (see Figure 5).

Deliver air by means of the fan at a nominal velocity in the measurement tube of (2 ± 0,2) m/s.

Measure the pressure difference between the static pressure in the measurement tube and the pressure in the test room. The pressure difference shall be recorded.

The measurement shall be done twice, once without the rain cap and once with the rain cap. The flow resistance of the rain cap is the difference of the two measurements.

5.3.2.5 Test result

The results shall be presented for the rain cap as:

— pressure difference P_F;

— air velocity in the measuring tube w_F in m/s;

— coefficient of flow resistance ζ according to Formula 1;

— geometrical data of the rain cap;

— test room data.

— $$\zeta = \frac{P_F}{\frac{1}{2}\rho w_n^2} \quad (1)$$

where:

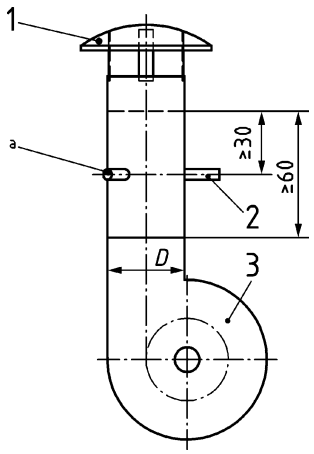
ζ is the coefficient of flow resistance;

P_F is the measured static pressure in the measuring tube, in Pascals;

ρ is the density of air at the test conditions;

w_n is the nominal velocity, in meters per second.

Dimensions in millimetres



Key

1 rain cap

2 pressure measurement point

3 fan

D diameter of measurement tube

a pressure measuring tube

Figure 5 — Flow resistance test assembly

6 Assessment and Verification of the Constancy of Performance (AVCP)

6.1 General

The compliance of a rain cap with the requirements of this standard and with the stated values (including classes) shall be demonstrated by:

— determination of the product type;

— factory production control by the manufacturer, including product assessment.

The manufacturer shall always retain the overall control and shall have the necessary means to take responsibility for the conformity of the product with its declared performance(s).

6.2 Type testing

6.2.1 General

All performances related to characteristics included in this standard shall be determined when the manufacturer intends to declare the respective performances unless the standard gives provisions for declaring them without performing tests. (e.g. use of previously existing data, CWFT and conventionally accepted performance).

Assessment previously performed in accordance with the provisions of this standard, may be taken into account provided that they were made to the same or a more rigorous test method, under the same AVCP system on the same product or products of similar design, construction and functionality, such that the results are applicable to the product in question.

For the purposes of assessment, the manufacturer's products may be grouped into families, where it is considered that the results for one or more characteristics from any one product within the family are representative for that same characteristics for all products within that same family

NOTE Products may be grouped in different families for different characteristics.

Reference to the assessment method standards should be made to allow the selection of a suitable representative sample.

In addition, the determination of the product type shall be performed for all characteristics included in the standard for which the manufacturer declares the performance:

— at the beginning of the production of a new or modified rain cap (unless a member of the same product range), or

— at the beginning of a new or modified method of production (where this may affect the stated properties); or

they shall be repeated for the appropriate characteristic(s), whenever a change occurs in the rain cap design, in the raw material or in the supplier of the components, or in the method of production (subject to the definition of a family), which would affect significantly one or more of the characteristics.

Where components are used whose characteristics have already been determined, by the component manufacturer, on the basis of assessment methods of other product standards, these characteristics need not be re-assessed. The specifications of these components shall be documented.

Products bearing regulatory marking in accordance with appropriate harmonized European specifications may be presumed to have the performances declared in the DoP, although this does not replace the responsibility on the rain caps manufacturer to ensure that the rain cap as a whole is correctly manufactured and its component products have the declared performance values.

6.2.2 Manufacturer's declaration for type test

The manufacturer shall provide the relevant information in Clause 7 and, in addition, shall provide/declare, for the rain cap:

a) the rain cap size and the maximum nominal flue size for which the rain cap can be used;

b) the raw materials and their minimum thicknesses;

c) the tolerances of manufacture;

d) the weight of rain cap (load on the chimney);

e) the method of fixing.

6.2.3 Test samples, testing and compliance criteria

The number of samples of rain caps to be tested/assessed shall be in accordance with Table 3.

Table 3 — Number of samples to be tested and compliance criteria

Characteristic	Requirement	Assessment method	No. of samples	Compliance criteria
Compressive strength	4.3.1	5.1.2	1	4.3.1
Flexural tensile strength	4.3.2	5.1.3	1	4.3.2
Fire resistance	4.4.2	5.2	1	4.4.2
Thermal shock resistance	4.4.2.1 4.4.2.2	5.2.2.1 5.2.2.2	1	5.2.2.1 5.2.2.2
Flow resistance	4.6.3	5.3.2	1	4.6.3
Durability against corrosion	4.5.1	4.5.1	1	4.5.1
Resistance to freeze–thaw	4.3.3	4.3.3	1	4.3.3
Dangerous substances	4.5.2	Relevant national regulations	1	4.5.2

6.2.4 Sampling for type testing

The size of products to be tested shall be according to Annex C.

The results of all type tests shall be recorded and held by the manufacturer, until superseded.

6.2.5 Further type testing

Whenever a change occurs in the product design, the raw material or supplier of the components, or the production process, which would change the tolerances or requirements of Clauses 4 and 5 for one or more of the characteristics, the type tests shall be repeated for the appropriate characteristic(s).

6.2.6 Test reports

The results of the determination of the product type shall be documented in test reports. All test reports shall be retained by the manufacturer for at least 10 years after the last date of production of the rain caps which they relate.

6.2.7 Shared other party results

A manufacturer may use the results of the product type determination obtained by someone else (e.g. by another manufacturer, as a common service to manufacturers, or by a product developer), to justify his own declaration of performance regarding a product that is manufactured according to the same design (e.g. dimensions) and with raw materials, constituents and manufacturing methods of the same kind, provided that:

- the results are known to be valid for products with the same essential characteristics relevant for the product performance;

- in addition to any information essential for confirming that the product has such same performances related to specific essential characteristics, the other party who has carried out the determination of the product type concerned or has had it carried out, has expressly accepted[1] to transmit to the manufacturer the results and the test report to be used for the latter's product type determination, as well as information regarding production facilities and the production control process that can be taken into account for FPC;

- the manufacturer using other party results accepts to remain responsible for the product having the declared performances and he also:

    - ensures that the product has the same characteristics relevant for performance as the one that has been subjected to the determination of the product type, and that there are no significant differences with regard to production facilities and the production control process compared to that used for the product that was subjected to the determination of the product type; and

    - keeps available a copy of the determination of the product type report that also contains the information needed for verifying that the product is manufactured according to the same design and with raw materials, constituents and manufacturing methods of the same kind.

6.2.8 Cascading determination of the product type results

For some construction products, there are companies (often called "system houses") which supply or ensure the supply of, on the basis of an agreement[2], some or all of the components (e.g. in case of windows: profiles, gaskets, weather strips)[3] to an assembler who then manufactures the finished product (referred to below as the "assembler") in his factory.

[1] The formulation of such an agreement can be done by licence, contract, or any other type of written consent.

[2] This can be, for instance, a contract, license or whatever kind of written agreement, which should also contain clear provisions with regard to responsibility and liability of the component producer (system house, on the one hand, and the assembler of the finished product, on the other hand.

[3] These companies may produce components but they are not required to do so.

Provided that the activities for which such a system house is legally established include manufacturing/assembling of products as the assembled one, the system house may take the responsibility for the determination of the product type regarding one or several essential characteristics of an end product which is subsequently manufactured and/or assembled by other firms in their own factory.

When doing so, the system house shall submit an "assembled product" using components manufactured by it or by others, to the determination of the product type and then make the determination of the product type report available to the assemblers, i.e. the actual manufacturer of the product placed on the market.

To take into account such a situation, the concept of cascading determination of the product type might be taken into consideration in the technical specification, provided that this concerns characteristics for which either a notified product certification body or a notified test laboratory intervene, as presented below.

The determination of the product type report that the system house has obtained with regard to tests carried out by a notified body, and which is supplied to the assemblers, may be used for the regulatory marking purposes without the assembler having to involve again a notified body to undertake the determination of the product type of the essential characteristic(s) that were already tested, provided that:

— the assembler manufactures a product which uses the same combination of components (components with the same characteristics), and in the same way, as that for which the system house has obtained the determination of the product type report. If this report is based on a combination of components not representing the final product as to be placed on the market, and/or is not assembled in accordance with the system house's instruction for assembling the components, the assembler needs to submit his finished product to the determination of the product type;

— the system house has notified to the manufacturer the instructions for manufacturing/assembling the product and installation guidance;

— the assembler (manufacturer) assumes the responsibility for the correct assembly of the product in accordance with the instructions for manufacturing/assembling the product and installation guidance notified to him by the system house;

— the instructions for manufacturing/assembling the product and installation guidance notified to the assembler (manufacturer) by the system house are an integral part of the assembler's Factory Production Control system and are referred to in the determination of the product type report;

— the assembler is able to provide documented evidence that the combination of components he is using, and his way of manufacturing, correspond to the one for which the system house has obtained the determination of the product type report (he needs to keep a copy of the system house's determination of the product type report);

— regardless the possibility of referring, on the basis of the agreement signed with the system house, to the latter's responsibility and liability under private law, the assembler remains responsible for the product being in compliance with the declared performances, including both the design and the manufacture of the product, which is given when he affixes the regulatory marking on his product.

6.3 Factory production control (FPC)

6.3.1 General

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market comply with the declared performance of the essential characteristics.

The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials or components, equipment, the production process and the product.

All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures.

This factory production control system documentation shall ensure a common understanding of the evaluation of the constancy of performance and enable the achievement of the required product performances and the effective operation of the production control system to be checked. Factory production control therefore brings together operational techniques and all measures allowing maintenance and control of the compliance of the product with the declared performances of the essential characteristics.

In case the manufacturer has used shared or cascading product type results, the FPC shall also include the appropriate documentation as foreseen in 6.2.7 and 6.2.8.

6.3.2 Sampling

For an example for sampling for FPC see Annex D.

6.4 Requirements

6.4.1 General

The manufacturer is responsible for organizing the effective implementation of the FPC system in line with the content of this product standard. Tasks and responsibilities in the production control organization shall be documented and this documentation shall be kept up-to-date.

The responsibility, authority and the relationship between personnel that manages, performs or verifies work affecting product constancy, shall be defined. This applies in particular to personnel that need to initiate actions preventing product non-constancies from occurring, actions in case of non-constancies and to identify and register product constancy problems.

Personnel performing work affecting the constancy of performance of the product shall be competent on the basis of appropriate education, training, skills and experience for which records shall be maintained.

In each factory the manufacturer may delegate the action to a person having the necessary authority to:

— identify procedures to demonstrate constancy of performance of the product at appropriate stages;

— identify and record any instance of non-constancy;

— identify procedures to correct instances of non-constancy.

The manufacturer shall draw up and keep up-to-date documents defining the factory production control. The manufacturer's documentation and procedures should be appropriate to the product and manufacturing process. The FPC system should achieve an appropriate level of confidence in the constancy of performance of the product. This involves:

a) the preparation of documented procedures and instructions relating to factory production control operations, in accordance with the requirements of the technical specification to which reference is made;

b) the effective implementation of these procedures and instructions;

c) the recording of these operations and their results;

d) the use of these results to correct any deviations, repair the effects of such deviations, treat any resulting instances of non-conformity and, if necessary, revise the FPC to rectify the cause of non-constancy of performance.

Where subcontracting takes place, the manufacturer shall retain the overall control of the product and ensure that he receives all the information that is necessary to fulfil his responsibilities according to this European standard.

If the manufacturer has part of the product designed, manufactured, assembled, packed, processed and/or labelled by subcontracting, the FPC of the subcontractor may be taken into account, where appropriate for the product in question.

The manufacturer who subcontracts all of his activities may in no circumstances pass the above responsibilities on to a subcontractor.

NOTE Manufacturers having an FPC system, which complies with EN ISO 9001 standard and which addresses the provisions of the present European standard are considered as satisfying the FPC requirements of the Regulation (EU) No 305/2011.

6.4.2 Equipment

6.4.2.1 Testing

All weighing, measuring and testing equipment shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

6.4.2.2 Manufacturing

All equipment used in the manufacturing process shall be regularly inspected and maintained to ensure use, wear or failure does not cause inconsistency in the manufacturing process. Inspections and maintenance shall be carried out and recorded in accordance with the manufacturer’s written procedures and the records retained for the period defined in the manufacturer's FPC procedures.

6.4.3 Raw materials and components

6.4.3.1 General

The specifications of all incoming raw materials and components shall be documented, as shall the inspection scheme for ensuring their compliance. In case supplied kit components are used, the constancy of performance system of the component shall be that given in the appropriate harmonized technical specification for that component.

The material shall be controlled in accordance with the relevant product standards for the material of the rain cap.

6.4.3.2 Supports

The following information shall be given:

a) Material type.

b) Structural section.

c) Additional components - nuts, bolts, fixings.

Supplier's declaration for material type and properties is allowed, provided that the supplier has an appropriate quality assurance system.

6.4.3.3 Seals and sealants

The following information shall be given:

a) Type - Including identification or composition, when the conformity certificate is not available.

b) Dimensions.

Supplier's declaration for material type and properties is allowed, provided that the supplier has an appropriate quality assurance system.

6.4.3.4 Traceability and marking

Individual products shall be identifiable and traceable with regard to their production origin. The manufacturer shall have written procedures ensuring that processes related to affixing traceability codes and/or markings are inspected regularly.

6.4.3.5 Controls during manufacturing process

6.4.3.5.1 General

The manufacturer shall plan and carry out production under controlled conditions.

6.4.3.5.2 Manufacturing checks - Dimensions

Dimensions of critical parts shall be confirmed during the manufacturing and/or on completion:

a) material thickness;

b) size

c) upstand/height;

d) construction characteristic (e.g. rivets).

6.4.3.5.3 Other checks

The free area of completed rain cap (e.g. taking account of support dimensions) shall be checked during the manufacturing process.

6.4.3.6 Product testing and evaluation

The manufacturer shall establish procedures to ensure that the stated values of the characteristics he declares are maintained. The characteristics, and the means of control, are:

— Compressive strength: shall be subject to the tests indicated in 5.1.2, at least once during the initial type test;

— Fire resistance: shall be subject to the tests indicated in 5.2, at least at least once during the initial type test;

— Flow resistance: shall be subject to the tests indicated in 5.3.2, at least once during the initial type test;

— Thermal shock resistance: shall be subject to the tests indicated in 5.2, at least once during the initial type test;

— Flexural tensile strength: shall be subject to the tests indicated in 5.1.3, at least at least once during the initial type test.

An example of sampling for FPC is given in Annex D.

6.4.3.7 Non-complying products

The manufacturer shall have written procedures which specify how non-complying products shall be dealt with. Any such events shall be recorded as they occur and these records shall be kept for the period defined in the manufacturer's written procedures.

Where the product fails to satisfy the acceptance criteria, the provisions for non-complying products shall apply, the necessary corrective action(s) shall immediately be taken and the products or batches not complying shall be isolated and properly identified.

Once the fault has been corrected, the test or verification in question shall be repeated.

The results of controls and tests shall be properly recorded. The product description, date of manufacture, test method adopted, test results and acceptance criteria shall be entered in the records under the signature of the person responsible for the control/test.

With regard to any control result not meeting the requirements of this European standard, the corrective measures taken to rectify the situation (e.g. a further test carried out, modification of manufacturing process, throwing away or putting right of product) shall be indicated in the records.

6.4.3.8 Corrective action

The manufacturer shall have documented procedures that instigate action to eliminate the cause of non-conformities in order to prevent recurrence. The manufacturer shall establish procedures for non-conforming products.

6.4.3.9 Handling, storage and packaging

The manufacturer shall have procedures providing methods of product handling and shall provide suitable storage areas preventing damage or deterioration.

6.4.4 Product specific requirements

The FPC system shall address this European Standard and ensure that the products placed on the market comply with the declaration of performance.

The FPC system shall include a product specific FPC, which identifies procedures to demonstrate compliance of the product at appropriate stages, i.e.:

a) the controls and tests to be carried out prior to and/or during manufacture according to a frequency laid down in the FPC test plan,

and/or

b) the verifications and tests to be carried out on finished products according to a frequency laid down in the FPC test plan

If the manufacturer uses only finished products, the operations under b) shall lead to an equivalent level of compliance of the product as if FPC had been carried out during the production.

If the manufacturer carries out parts of the production himself, the operations under b) may be reduced and partly replaced by operations under a). Generally, the more parts of the production that are carried out by the manufacturer, the more operations under b) may be replaced by operations under a).

In any case the operation shall lead to an equivalent level of compliance of the product as if FPC had been carried out during the production.

NOTE Depending on the specific case, it can be necessary to carry out the operations referred to under a) and b), only the operations under a) or only those under b).

The operations under a) refer to the intermediate states of the product as on manufacturing machines and their adjustment, and measuring equipment etc. These controls and tests and their frequency shall be chosen based on product type and composition, the manufacturing process and its complexity, the sensitivity of product features to variations in manufacturing parameters etc.

The manufacturer shall establish and maintain records that provide evidence that the production has been sampled and tested. These records shall show clearly whether the production has satisfied the defined acceptance criteria and shall be available for at least three years.

6.4.5 Procedure for modifications

If modifications are made to the product, production process or FPC system that could affect any of the product characteristics declared according to this standard, then all the characteristics for which the manufacturer declares performance, which may be affected by the modification, shall be subject to the determination of the product type, as described in 6.2.1.

Where relevant, a re-assessment of the factory and of the FPC system shall be performed for those aspects, which may be affected by the modification.

All assessments and their results shall be documented in a report.

7 Product information

7.1 Manufacturer's instructions

The manufacturer’s instructions shall be available in the language of the country of destination.

7.2 Minimum information to be included in the manufacturer's instructions

The information shall include at minimum:

a) manufacturer identification;

b) product designation;

c) the maximum nominal flue size within a range of sizes for which the rain cap size is suitable;

d) the maximum chimney outer dimensions for which the rain cap size is suitable where ice formation will occur;

e) weight;

f) typical installation drawing;

g) that the chimney plate shall be marked that a rain cap is fitted, and marked with its coefficient of flow resistance;

h) that the product shall be installed in accordance with local rules in force, e.g. requirements for lightning protection; combustible roof material;

i) the coefficient of flow ζ;

j) reaction to fire;

k) and where appropriate:

— storage instructions;

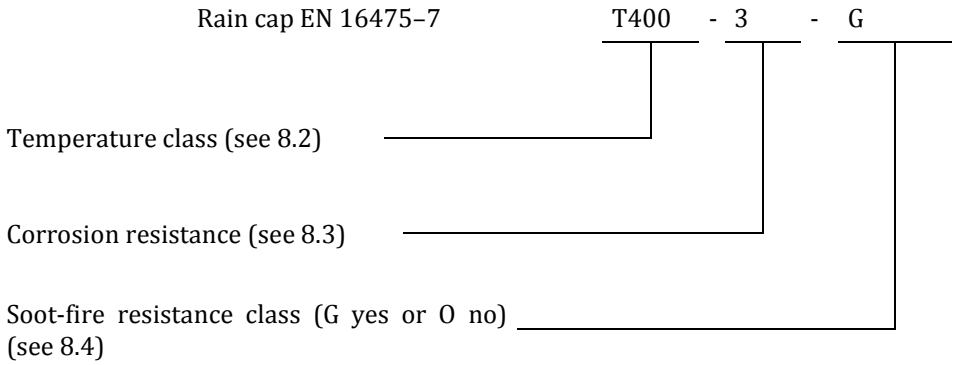
— specific methods or tools for cleaning.

8 Classification and designation

8.1 General

The rain cap shall be designated with the temperature class, corrosion class, and sootfire resistance, in accordance with the following designation system:

Example for a rain cap:



8.2 Temperature classes and test temperature

Table 4 identifies the temperature class for the rain cap working temperature, and gives the test temperature for the temperature level.

Table 4 — Temperature classes and test temperatures

Temperature class	Nominal working Temperature (T) in °C	Flue gas test temperature in °C
T 080	≤ 80	100
T 100	≤ 100	120
T 120	≤ 120	150
T 140	≤ 140	170
T 160	≤ 160	190
T 200	≤ 200	250
T 250	≤ 250	300
T 300	≤ 300	350
T 400	≤ 400	500
T 450	≤ 450	550
T 600	≤ 600	700

8.3 Corrosion resistance

Corrosion resistance classes for various fuels are given in Table 5.

Table 5 — Corrosion resistance classes

Corrosion resistance class	1 possible fuel types	2 possible fuel types	3 possible fuel types
- gas	gas: sulfur-content ≤ 50 mg/m³, natural gas L + H	gas natural gas L + H	gas natural gas L + H
- liquid	kerosene: sulfur-content ≤ 50 mg/m³	oil: sulfur-content ≤ 0,2 mass % kerosene: sulfur-content ≥ 50 mg/m³	oil: sulfur-content > 0,2 mass % kerosene: sulfur-content ≥ 50 mg/m³
- wood	–	wood in open fire places	wood in open fire places wood in closed stoves
- coal	–	–	coal
- peat	–	–	peat

8.4 Soot fire resistance

The rain cap shall be designated O if it is non-sootfire resistant, or G if it is sootfire resistant.

9 Marking, labelling and packaging

9.1 Rain cap

The rain cap shall be marked with the following information, where possible on the product otherwise on label/packaging:

a) product designation in accordance with Clause 8;

b) name or trade mark of the manufacturer;

c) manufacturing batch or product reference of manufacturer.

NOTE For CE marking and CE labelling, see Annex ZA.

9.2 Packaging

Each package within a consignment shall be legibly marked with the following information:

a) product designation in accordance with Clause 8;

b) name or trade mark of the manufacturer;

c) nominal flue sizes;

d) rain cap sizes.

Annex A
(informative)

Deemed to satisfy information

The following criteria for in the construction of the metal and concrete rain cap are considered suitable without test.

Table A.1 — Construction conditions

<table>
<tr><th rowspan="3">Characteristic</th><th colspan="4">Material</th></tr>
<tr><th colspan="3">Metal</th><th rowspan="2">Concrete</th></tr>
<tr><th>1.4401</th><th>1.4301</th><th>EN AW – 4047A</th></tr>
<tr><td rowspan="6">Construction</td><td colspan="2">wall thickness

rain cap ≥ 0,6 mm

Support ≥ 1,0 mm</td><td>wall thickness

rain cap ≥ 1,5 mm

support ≥ 1,5 mm</td><td rowspan="2">Compressive strength of the concrete at least C25/30 according to EN 206 (characteristic value ≥ 25 MPa on 150 x 300 cylinder)</td></tr>
<tr><td colspan="3">Shape of the cap:

Dome/pyramid height/size ≥ 10 %</td></tr>
<tr><td colspan="3">≥ three supports</td><td>Thickness/length of longest side ≥ 20</td></tr>
<tr><td colspan="2">Method of fixing:

ww, wr, rr, b, st[a]</td><td>Method of fixing:

rr, b, st[a]</td><td rowspan="3">Fixing with tenon and mortise or similar assembly shape + mortar or jointing material

Mortar / jointing according to EN 1858</td></tr>
<tr><td colspan="3">Band and strap fixing for chimneys with liner upstand</td></tr>
<tr><td colspan="3">Masonry screw fixing for masonry chimney top</td></tr>
<tr><td>Compressive strength

(see 4.3.1)</td><td colspan="4">Fulfilled</td></tr>
<tr><td>Wind load

(see 4.3.2)</td><td colspan="4">Fulfilled</td></tr>
<tr><td colspan="5"></td></tr>
</table>

Characteristic	**Material**			
	Metal			**Concrete**
	1.4401	1.4301	EN AW – 4047A	
Heat stress (see 4.4.2.1)	Designation T600	Designation T300	Designation T200	Designation T450 (according to EN 1857 or EN 1858)
Sootfire resistant (see 4.4.2.2)	Designation G	Designation O	Designation O	G designation according to EN 1857 or EN 1858
Corrosion resistance (see 4.5.1)	Designation 3	Designation 2	Designation 1	Designation 3
Rain water Ingress (see 4.6.2)	Fulfilled for overhang 27° from the vertical of a line from the edge of the rain cap to the edge of flue			
Flow resistance (see 4.6.3)	Fulfilled for a free area of at least 2 times the flue area			
Freeze/thaw (see 4.3.3)	Fulfilled			Concrete according to EN 1857 and declared "pass" for freeze/thaw or EN 1858 and declared "pass" for freeze/thaw or EN 206 class XF3
Ice formation (see 4.6.4)	Fulfilled for a free area of at least 2 times the flue area if the rain cap overlap is at least 50 mm greater than the chimney outer dimension in all directions.			

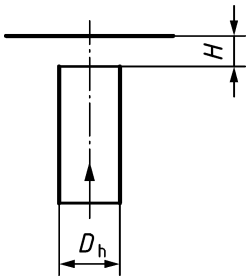
a ww = double weld, wr = weld and rivet, rr = double rivet, b = bolt and washer, st = single self-tapping screw

Annex B
(informative)

Coefficients of flow resistance

Interpolations between the cited parameters are admissible.

Table B.1 — Individual coefficients of flow resistance for rain caps

No.	Shapes		Geometric dimensions	ζ-values
1	Rain cap		H/D_h 0,5 1,0	 1,5 1,0

NOTE This is extracted from EN 13384–1:2015, B.8.

Annex C
(normative)

Choice of size for type test and sampling

C.1 General

All rain cap sizes within a range of products of the same design and designation shall be deemed to meet the requirements met by the tested samples.

C.2 Fire resistance

Thermal performance shall be undertaken on the smallest rain cap size that is suitable for the maximum nominal flue size up to and including 200 mm.

C.3 Mechanical resistance and stability

Mechanical resistance and stability shall be undertaken on rain cap sizes having the smallest, largest and one rain cap size in between.

C.4 Rainwater ingress

See thermal performance C.2.

C.5 Flow resistance

See thermal performance C.2.

C.6 Resistance to freeze–thaw

Only for concrete products, see fire resistance in C.2.

Annex D
(informative)

Example of sampling for factory production control

D.1 Sampling plans

D.1.1 General

Sampling plans should be selected from the tables published in ISO 2859-1.

D.1.2 Acceptable quality level (AQL)

The AQL should be decided in relation to the nature of the inspection feature being controlled. For defects classed as major, the sampling plan should be based on an AQL of 4,0. The classification of defects should be the responsibility of the manufacturer.

D.1.3 The inspection level

The inspection level defines the relationship between the batch size and the sample size, all incoming goods should be subjected to inspection level II.

D.1.4 Normal, tightened or reduce inspection

Normal inspection should be used initially on all incoming materials, after which, the following rules apply:

a) When 10 successive batches have been accepted on original there can be a switch to reduced inspection. This should remain in operation until one batch is rejected, at which point revert back to normal inspection.

b) When two out of any five successive batches have been rejected on original inspection, there can be a switch to tightened inspection. This should remain in operation until five successive batches have been accepted, at which point revert back to normal inspection.

D.1.5 Single, double, multiple or sequential sampling

Unless otherwise specified, all incoming material should be subjected to single sampling plans.

D.1.6 Batch quantity

Once the first four variables have been decided, the sampling plan tables should indicate the amount of samples to be inspected for any given batch quantity.

All information regarding levels of inspection should be indicated where appropriate on the inspection records.

D.2 Inspection levels and procedures

D.2.1 Incoming material

Sample inspected to ISO 2859-1 using an AQL = 2,5, general inspection level II, single sampling plan for normal inspection incorporating the switching rules to tightened or reduced inspection if necessary. All mill certification is checked against the relevant technical specification.

D.2.2 In-process inspection

The following inspections shall be done:

a) All dimensional aspects

   An inspection of the product shall be carried out following any change in manufacturing procedure. A first inspection is implemented and verified by either the setter or supervisor at each machine operation and from then on the operators will carry out each required dimensional check at a rate of four per batch - unrecorded, using go-no go gauges.

b) Joint leakage tests

   Uninsulated product

   Straight lengths test rate = 1 per week

   Adjustable elbows test rate = 1 per day

D.2.3 Volume and density checks

Over each 12 month period, volume and density checks are conducted on all insulated products of all length and diameter sizes. This is carried out to a formalized programme to ensure that a quantity of product is tested each month.

D.2.4 Finished goods checks

The following checks shall be done:

a) End of manufacturing process - Prior to packaging, each unit is visually inspected for damage. When boxed, the carton is stamped with the date of manufacture.

b) Warehouse - Once a week four samples from a particular product range should be randomly selected, and subject each item to full dimensional checks including joint leakage test and weight checks. This is also carried out to a formalized programme.

Annex E
(normative)

Method of measuring the hot gas temperature

Use a calibrated thermocouple. Its position is determined by a temperature traverse during the first thermal cycle as follows:

— Set the hot gas thermocouple in the centre of the flue pipe through one of two apertures provided at right angles to each other at a level (50 ± 2) mm from the entry to the test chimney.

— Fire the hot gas generator at the velocity specified in Table 1 and regulate it to produce the nominated hot gas temperature.

— After firing for not less than 10 min, take 10 equally spaced temperature measurements along two traverses at right angles across the flue pipe cross section (see Figure E.1).

— Determine the location of the highest temperature of these two traverses and position the thermocouple there for the test.

— Seal the redundant aperture.

— Re-adjust the hot gas generator to obtain the nominated hot gas temperature.

— Alternatively, a thermocouple grid may be used to determine the OTDF (Overall Temperature Distribution Factor).

Figure E.1 — Place for the measuring point for the hot gas

Annex ZA
(informative)

Relationship of this European Standard with Regulation (EU) No.305/2011

(When applying this standard as a harmonized standard under Regulation (EU) No. 305/2011, manufacturers and Member States are obliged by this regulation to use this annex)

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under standardization request M/105 "Chimneys, flues and specific products", the horizontal Mandate M/117 and its subsequent revisions given to CEN and CENELEC by the European Commission (EC) and the European Free Trade Association (EFTA).

When this European Standard is cited in the Official Journal of the European Union (OJEU), under Regulation (EU) No 305/2011, it shall be possible to use it as a basis for the establishment of the Declaration of Performance (DoP) and the CE marking, from the date of the beginning of the co-existence period as specified in the OJEU.

Regulation (EU) No 305/2011, as amended, contains provisions for the DoP and the CE marking.

Table ZA.1 — Relevant clauses for product [rain caps] and intended use [protection against rain entry into chimney flues]

Product:	rain caps		
Intended use:	Protection against rain entry into chimney flues		
Essential Characteristics	**Clauses of this European Standard related to essential characteristics**	**Classes and/or thresholds**	**Notes**
Flow resistance	4.6.3 Flow resistance	None	coefficient of flow resistance

ZA.2 System of Assessment and Verification of Constancy of Performance (AVCP)

The AVCP system of rain caps indicated in Table ZA.1, can be found in the EC legal act(s) adopted by the EC: EC Decision 95/467/EC of 27-09-95 amended by the Decision 01/596/EC and as given in Annex III of the mandate for "Chimneys, flues and specific products".

Micro-enterprises are allowed to treat products under AVCP system 3 covered by this standard in accordance with AVCP system 4, applying this simplified procedure with its conditions, as foreseen in Article 37 of Regulation (EU) No.305/2011.

ZA.3 Assignment of AVCP tasks

The AVCP system of rain caps as provided in Table ZA.1 is defined in Table ZA.3.1 resulting from application of the clauses of this or other European Standards indicated therein. The content of the tasks assigned to the notified body shall be limited to those essential characteristics, if any, as provided for in Annex III of the relevant standardization request and to those that the manufacturer intends to declare.

Taking into account the AVCP systems defined for the products and the intended uses the following tasks are to be undertaken by the manufacturer for the assessment and verification of the constancy of performance of the product.

Table ZA.3.1 — Assignment of AVCP tasks for rain caps under system 4

Tasks		Content of the task	AVCP clauses to apply
Tasks for the manufacturer	An assessment of the performance of the construction product on the basis of testing, calculation, tabulated values or descriptive documentation of that product	Flow resistance of Table ZA.1 relevant for the intended use which are declared.	6.2
	Factory production control (FPC)	Parameters related to flow resistance of Table ZA.1 relevant for the intended use.	6.3

Bibliography

[1] EN 1991-1-3, *Eurocode 1 — Actions on structures — Part 1-3: General actions — Snow loads*

[2] EN 13384-1:2015, *Chimneys — Thermal and fluid dynamic calculation methods — Part 1: Chimneys serving one heating appliance*

[3] EN ISO 9001, *Quality management systems — Requirements (ISO 9001)*

[4] ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

[5] EN 573-3, *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Part 3: Chemical composition and form of products*

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