BS EN 14428:2015

BSI Standards Publication

Shower enclosures — Functional requirements and test methods

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National foreword

This British Standard is the UK implementation of EN 14428:2015. It supersedes BS EN 14428:2004+A1:2008 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/503, Sanitary appliances.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

ISBN 978 0 580 72956 0

ICS 91.140.70

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

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 May 2015.

Amendments issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14428

May 2015

ICS 91.140.70

Supersedes EN 14428:2004+A1:2008

English Version

Shower enclosures - Functional requirements and test methods

Parois de douche - Prescriptions fonctionnelles et méthodes d'essai

Duschabtrennungen - Funktionsanforderungen und Prüfverfahren

This European Standard was approved by CEN on 19 March 2015.

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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 14428:2015) has been prepared by Technical Committee CEN/TC 163 “Sanitary appliances”, the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by November 2015, and conflicting national standards shall be withdrawn at the latest by February 2017.

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 14428:2004+A1:2008.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of the EU Construction Products Regulation.

For relationship with EU Construction Products Regulation, see informative Annex ZA, which is an integral part of this document.

The main technical change is the deletion of the Impact resistance/shatter properties clause and its replacement by a reference to the new edition of EN 12150-1. The other significant change is the updating of the AVCP clause and Annex ZA to the new format.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies requirements for shower enclosures for domestic purposes which ensure that the product, when installed in accordance with the manufacturer's installation instructions, gives satisfactory performance when used as intended.

This European Standard does not apply to shower cabinets or curtains and does not specify aesthetic and dimensional requirements.

NOTE For the purposes of this document the term “domestic purposes” includes use in hotels, accommodation for students, hospitals and similar buildings, except when special medical provisions are required.

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.

prEN 12150-1:2013, *Glass in building — Thermally toughened soda lime silicate safety glass — Part 1: Definition and description*

EN 14449, *Glass in building - Laminated glass and laminated safety glass - Evaluation of conformity/Product standard*

EN ISO 2409, *Paints and varnishes - Cross-cut test (ISO 2409)*

EN ISO 7599, *Anodizing of aluminium and its alloys - General specifications for anodic oxidation coatings on aluminium (ISO 7599)*

EN ISO 9227, *Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227)*

EN ISO 12543-2, *Glass in building - Laminated glass and laminated safety glass - Part 2: Laminated safety glass (ISO 12543-2)*

ISO 7892:1988, *Vertical building elements — Impact resistance tests — Impact bodies and general test procedures*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
shower enclosure
arrangement of panel(s) and/or door(s) (i.e full or half-height access door(s)) erected on or around a drained shower place, shower tray or bath in conjunction with one or more walls of the main building structure to provide a water retaining area for the purpose of showering

3.2
shower cabinet
prefabricated but not necessarily preassembled unit for the purpose of showering comprising a shower tray or bath and rigid water resistant enclosing wall(s), with or without a roof and with an entry capable of being closed to provide a fully enclosed compartment

4 Requirements

4.1 General

The manufacturer shall provide with each shower enclosure detailed instructions on installation and use, to include at least the following information:

— description of installation with special consideration of building construction and necessary tools and sealant;

— instructions for appropriate maintenance and care, including guidance on cleaning.

4.2 Cleanability

When inspected visually, the surfaces of the components of the shower enclosures which are accessible during use and cleaning shall be free from sharp corners, edges and burrs.

When using recommended cleaning agents in accordance with the manufacturer's installation and care instructions, there shall be no reduction in safety or function of the shower enclosure.

4.3 Impact resistance/shatter properties

4.3.1 General

Shower enclosures may be glazed with various materials. Where glass is used, this shall meet the requirements of 4.3.2 or 4.3.3 and where plastics materials are used, they shall meet the requirements of 4.3.4.

4.3.2 Thermally toughened safety glass

4.3.2.1 Thermally toughened flat safety glass

Thermally toughened safety glass shall meet the requirements of prEN 12150-1:2013.

4.3.2.2 Thermally toughened curved safety glass

Test in accordance with 5.1 to ensure that under these test conditions the glass has a particle count of 40 or greater and the length of the longest particle shall not exceed 100 mm.

4.3.3 Laminated safety glass

Laminated safety glass shall conform to EN 14449 and EN ISO 12543-2. Laminated safety glass shall not have holes, for example for fixings, hinges, handles or any other fittings.

NOTE Laminated safety glass is susceptible to water penetration from the edges if they are not suitably protected.

4.3.4 Plastics materials

When tested in accordance with 5.2, sheets shall not break or they shall break safely.

4.4 Durability

4.4.1 General

Products conforming with the requirements of 4.2 and 4.3 and the following are deemed to be durable.

4.4.2 Corrosion resistance

All components shall consist of corrosion-proof materials or shall be corrosion-protected.

All corrosion protection performances shall be evaluated with test methods specified in an appropriate European or International Standard. The standard used and the results of the test shall be recorded.

Examples of minimum requirements:

— the minimum paint adhesion performance for powder-coated or wet-painted surfaces has a cross-cut value ≤ 2 when tested in accordance with EN ISO 2409;

— the minimum average thickness of coating on aluminium is of grade AA5 when tested in accordance with one of the methods given in EN ISO 7599. In no cases is minimum local thickness less than 80 % of the minimum average thickness.

— Compliance with the neutral salt spray (NSS) test e.g. as specified in EN ISO 9227 corrosion test in artificial atmospheres - salt spray tests with a minimum exposure time of 200 h; The defect surface area A is less than or equal to 0,1 % (A ≤ 0,1 %). The defects do not exceed a dimension of 0,3 mm.

This list is not exhaustive.

4.4.3 Resistance to chemicals and stains

When tested in accordance with 5.3 the glazing materials shall not show permanent staining or deterioration.

4.4.4 Resistance to wet and dry cycling

When tested in accordance with 5.4, the glazing materials shall not show any cracks, crazing or discoloration. Uncoated and unpainted thermally toughened safety glass is deemed to be resistant to wet and dry cycling and need not be tested.

4.4.5 Endurance

When tested in accordance with 5.5, shower enclosures shall not show any functional deterioration after 20 000 closing-opening cycles.

4.4.6 Stability

When tested in accordance with 5.6, shower enclosures shall withstand an energy representing the impact of a human body on a large impact area (e.g. blow from shoulder, fall) without any functional deterioration which could result in injury to the user.

4.4.7 Water retention

When tested in accordance with 5.7, shower enclosures shall retain water. A few small drops of water on the outside of the water retaining area are acceptable. Where shower enclosures are intended for installation in wet room environments (where watertightness is not required), water may temporarily pass outside the water retaining area as long as it is drained to the water retaining area.

4.5 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/.

5 Test methods

5.1 Impact resistance/shatter properties

5.1.1 General

The fragmentation test determines whether the glass breaks in a safe manner for a thermally toughened soda lime silicate safety glass.

5.1.2 Test specimens for curved glass

The test specimen shall be as designed for the product.

5.1.3 Procedure

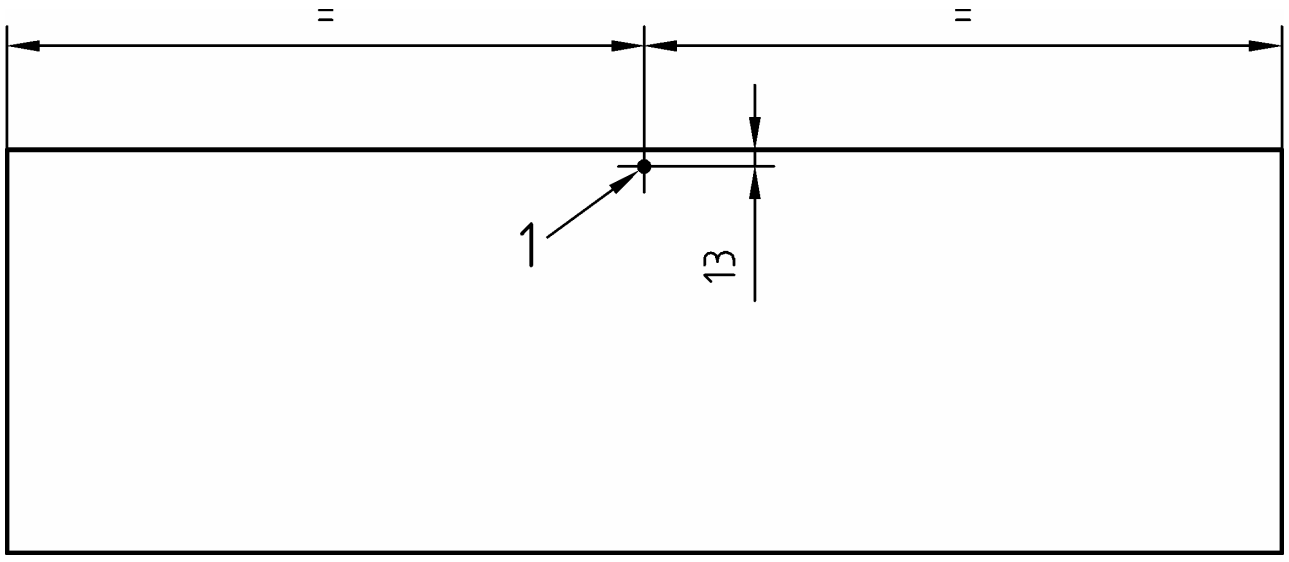
The test specimen shall be impacted, using a pointed steel tool, at a position 13 mm from the longest edge of the specimen at the mid-point of that edge, until breakage occurs (see Figure 1).

NOTE The fragmentation characteristics of glass are unaffected by temperatures between - 50 °C and + 100 °C.

Examples of steel tools are a hammer of approximately 75 g mass, a spring loaded centre punch, or other similar appliance with a hardened point. The radius of curvature of the point should be approximately 0,2 mm.

The test specimen shall be laid with the impact point flat on a table without any mechanical constraint. In order to prevent scattering of the fragments, the curved specimen shall be covered on its convex surface with an adhesive film so that the fragments remain interlocked after breakage yet extension of the specimen is not hindered.

Dimensions in millimetres



Key

1 impact point

Figure 1 — Position of impact point

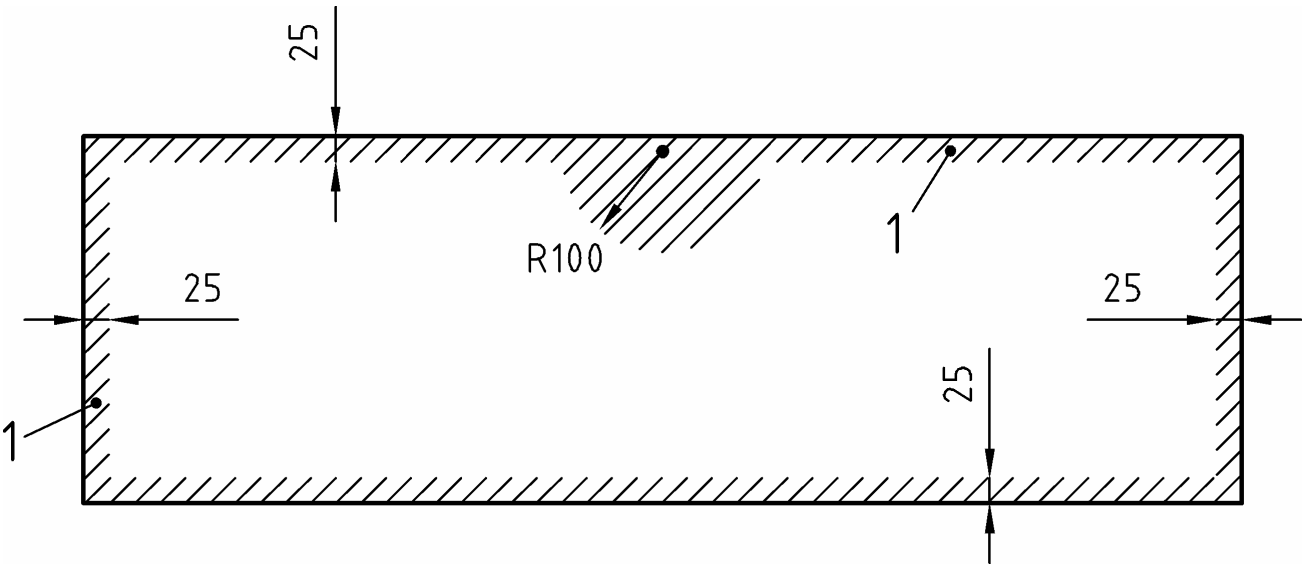
For thermally toughened soda lime silicate safety glass manufactured by vertical toughening, the impact point shall not be on the tong mark edge.

5.1.4 Assessment of fragmentation

5.1.4.1 Particle count and measuring the largest particle

The particle count and measuring of the dimensions of the largest particle shall be made between 3 min to 5 min after fracture. An area of radius 100 mm, centred on the impact point, and a border of 25 mm, round the edge of the test specimen (see Figure 2), shall be excluded from the assessment.

Dimensions in millimetres



Key

1 excluded area

Figure 2 — Area to be excluded from the particle count determination and largest particle measurement

The particle count shall be made in the region of coarsest fracture (the aim being to obtain the minimum value). The particle count shall be made by placing a mask of (50 ± 1) mm x (50 ± 1) mm on the test piece (see Figures 3, 4 and 5). The number of crack-free particles within the mask shall be counted. A particle is ‘crack-free’, if it does not contain any cracks which run from one edge to another (see Figure 6).

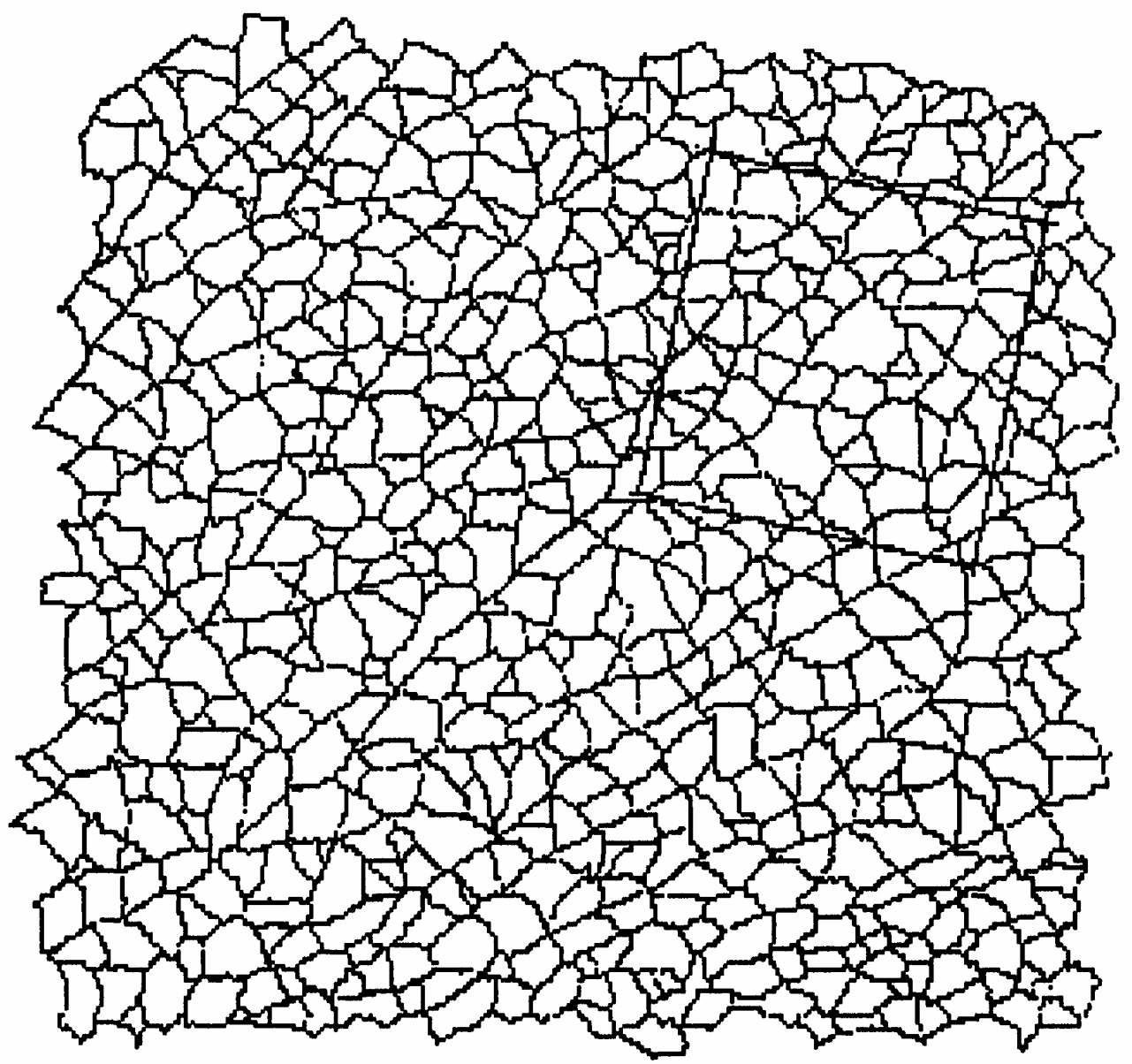
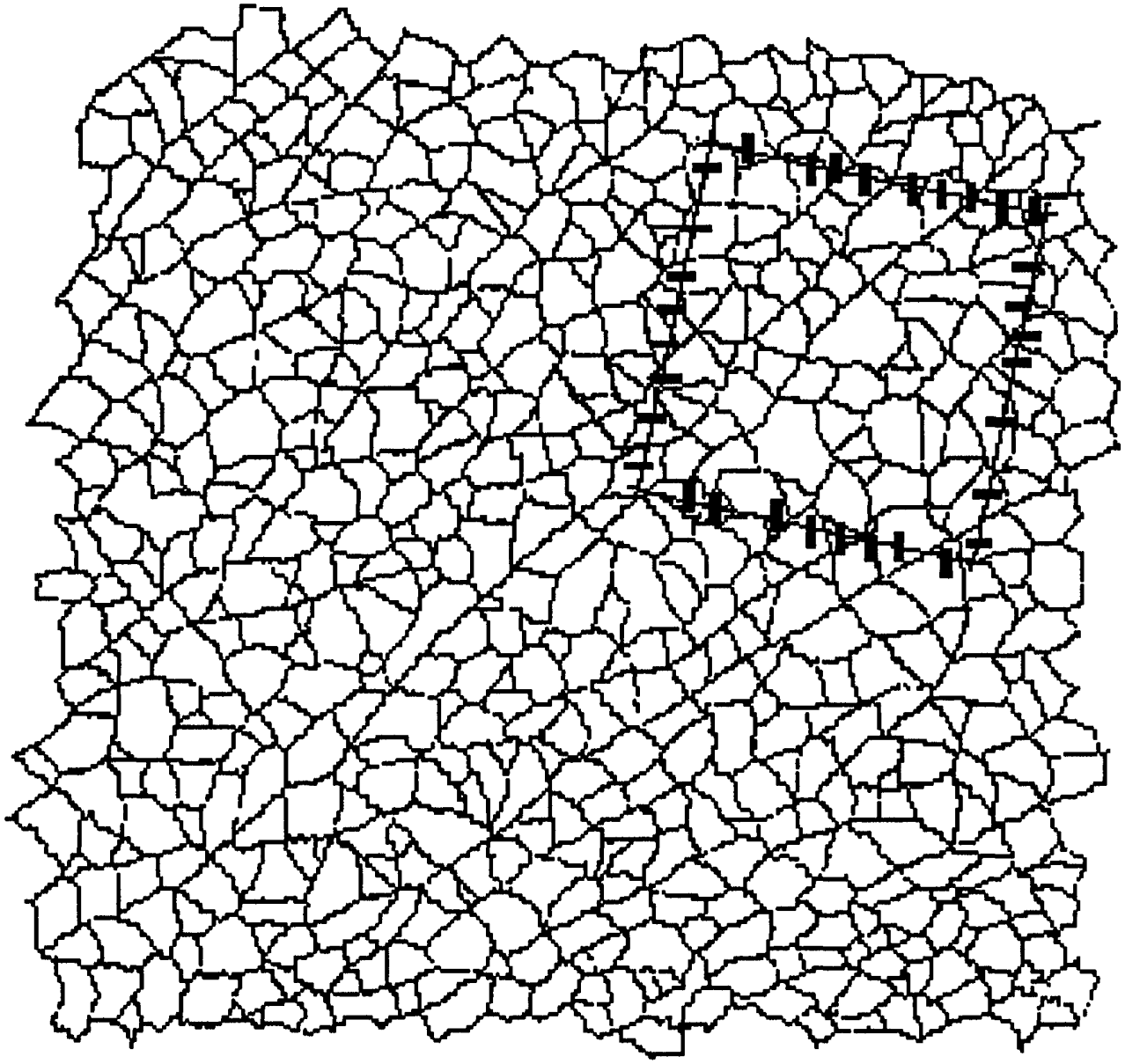
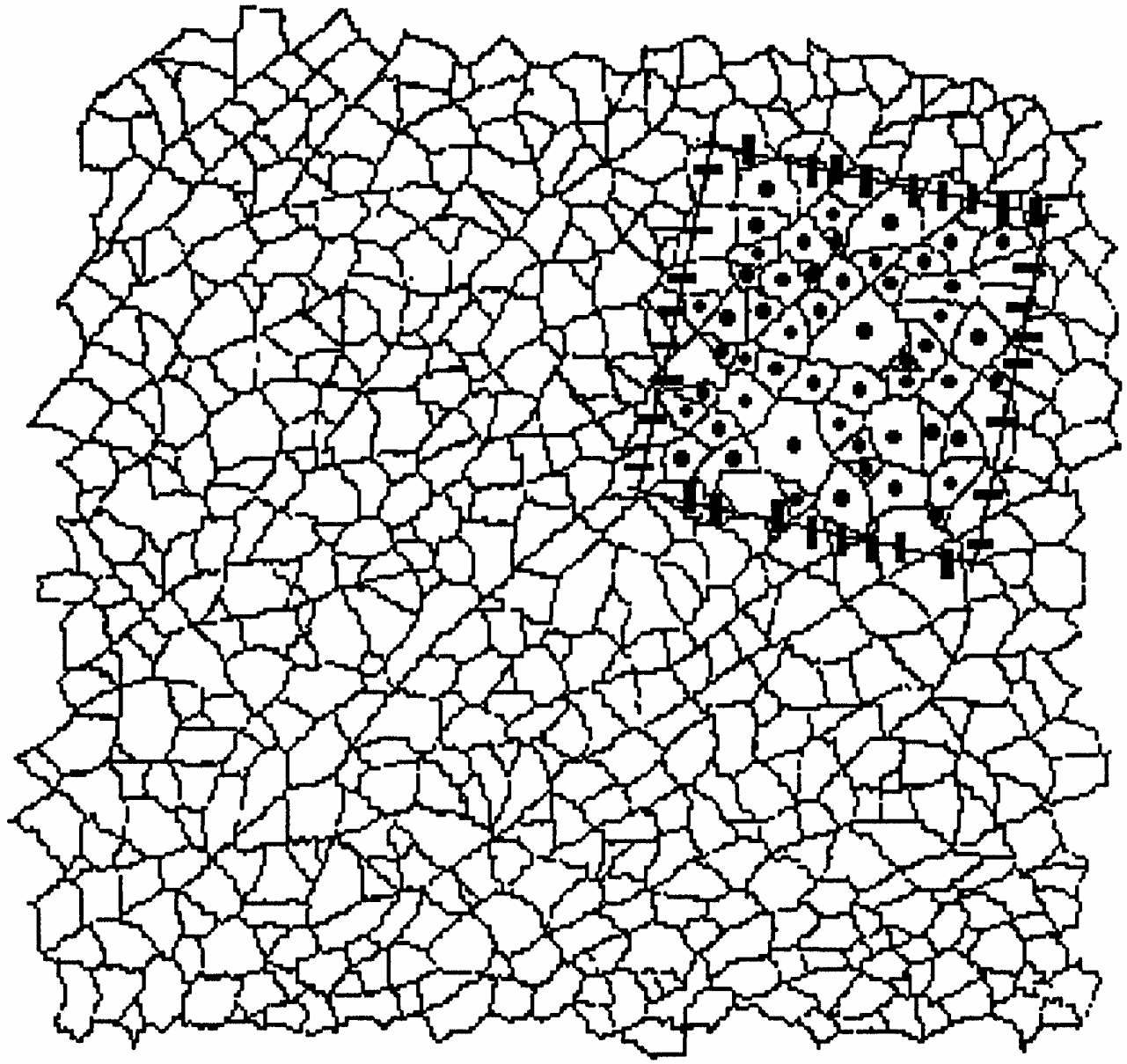


Figure 3 — Select the area of coarsest fracture, place the template on the test specimen and draw round the template



NOTE Number of perimeter particles = 32/2 = 16.

Figure 4 — Mark and count the perimeter fragments as 1/2 particle each



NOTE Number of central particles = 53;

Total number of particles = 16 + 53 = 69.

Figure 5 — Mark and count the central fragments and add these to the perimeter count to obtain the particle count for the specimen

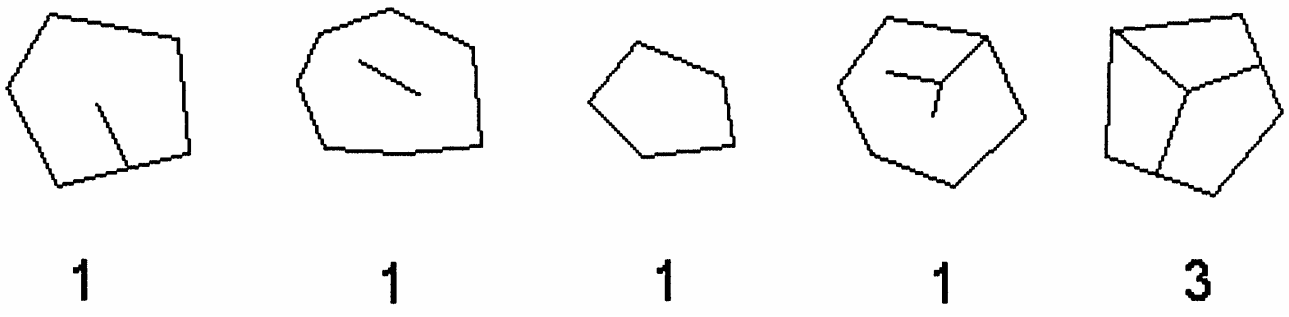


Figure 6 — Examples of crack-free particles and the assessment regarding their number

In the particle count, all particles wholly contained within the area of the mask shall be counted as one particle each and all the particles which are partially within the mask shall be counted as 1/2 particle each (see Figure 4).

5.1.4.2 Selection of the longest particle

The longest particle shall be chosen from the body of the test specimen. It shall not be in the excluded area.

5.2 Impact behaviour of plastic sheets

5.2.1 Apparatus

5.2.1.1 Test frame, constructed of securely welded or bolted sections, designed to present a flat face to the sub-frame.

The test frame sections and bracing members shall be steel channel 102 mm x 51 mm, or equivalent material of equal or greater strength and rigidity. This frame shall be securely bolted to the floor and securely braced as shown in Figures 7, 8 and 9.

5.2.1.2 Sub-frame, constructed of wood or other suitable material designed to hold the test piece as shown in Figure 10 so that the test piece can make contact only with the strips of chloroprene or similar material.

These strips shall be capable of being compressed by 10 % to 15 % of their original depth without a permanent set being introduced. The edge cover of the chloroprene on the test pieces shall be such that for the nominal 865 mm x 1 930 mm specimens the central area of (845 ± 3) mm x (1 910 ± 3) mm is unsupported.

In order to limit the compression of the chloroprene strips to within approximately 15 %, spacers of appropriate thickness and material are recommended (see Figure 10).

The components of the sub-frame shall be held together, and the sub-frame shall be held to the test frame, by bolts, toggle clamps or similar fixing devices as convenient, these being uniformly spaced no more than 450 mm apart and no fewer than two per side.

5.2.1.3 Impactor, consisting of a leather case of a punch bag type, modified with a central support rod and fitting system as shown in Figure 11, and filled with chilled lead shot.

The leather case shall be made from six panels, as shown in Figure 12, which shall be securely stitched together leaving a slit approximately 175 mm long to allow for filling with the lead shot. Lace holes shall be inserted on each side of the slit which is closed by a leather thong. The neck shall be taped separately to cover the worm-drive hose clamp.

The complete impactor shall weigh (45 ± 0,1) kg.

The impactor shall be supported as shown in Figures 7 and 8, and provision shall be made for raising the impactor to drop heights (see 5.2.2 and Figure 8) up to 1 219 mm. Prior to release it shall be supported so that the central metal rod is in line with the steel cable.

The impactor shall not wobble or oscillate after its release.

5.2.2 Procedure

a) Carry out the test on four test pieces. For curved sheets a sample of an unformed flat sheet of the same material shall be used.

b) Immediately preceding the test, condition the test pieces as follows:

1) temperature: -(23 ± 5) °C;

2) duration: 24 h.

Place the test piece in the frame and clamp it so that the chloroprene strips are compressed by no more than 10 % to 15 % of their original thickness. When the impactor is hanging at rest, suspended from the overhead support, check that it is, at its greatest diameter, not more than 13 mm from the surface of the test piece and within 51 mm radially from the centre of the test piece (see Figure 8).

c) Raise the impactor to a drop height of 305 mm and steady it.

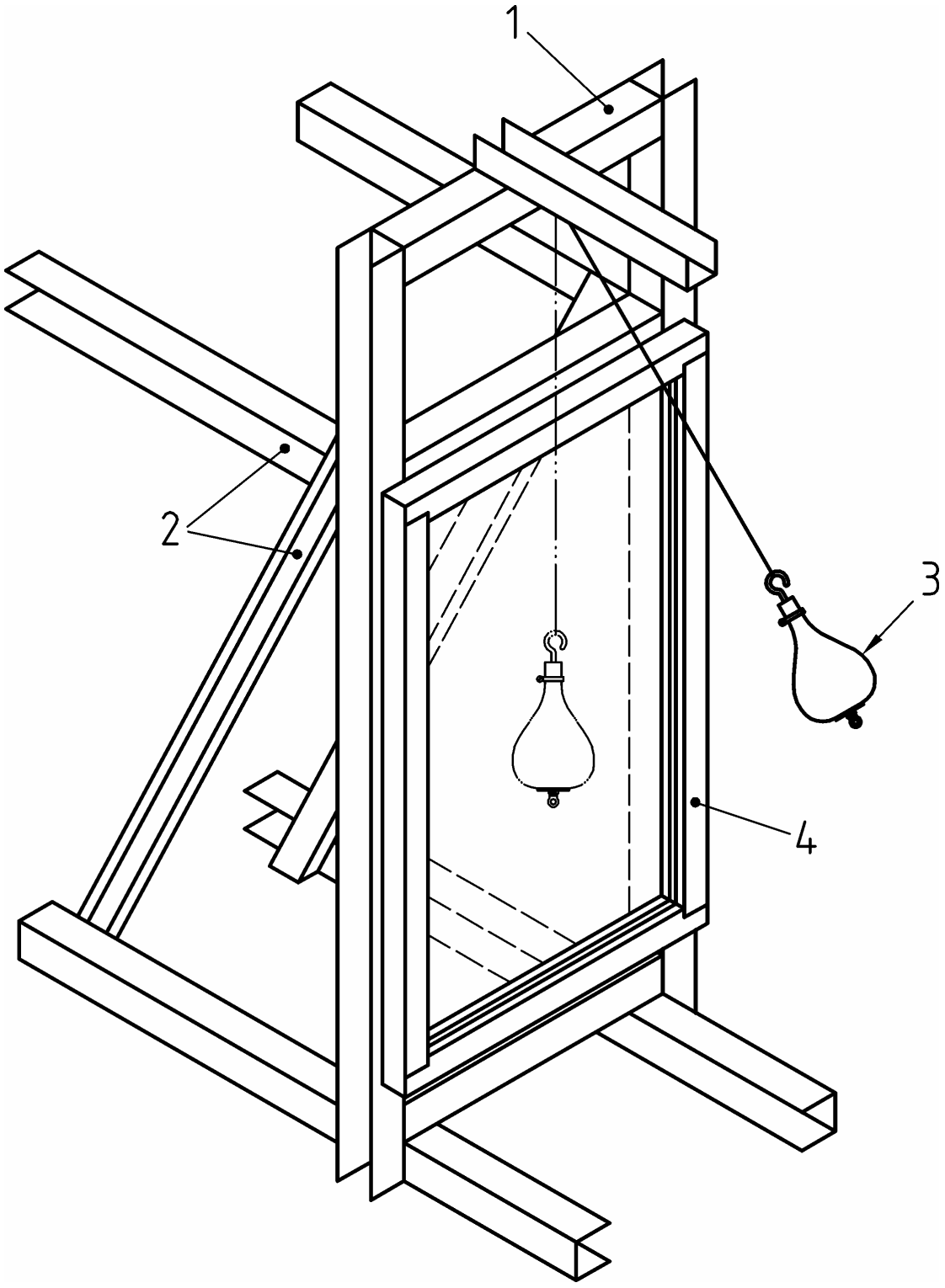
d) Release the impactor so that it swings in a pendulum arc and strikes the test piece.

e) Inspect the test piece after impact and report whether it has remained unbroken or it has broken safely as follows:

1) Numerous cracks or fissures appear in the test piece, but no opening develops through which a 76 mm diameter sphere can be passed freely.

2) When breakage occurs which results in the production of separate fragments containing pointed protrusions, then such fragments shall be permitted provided that any pointed protrusion satisfies the following:

The length of the chord between the two points which are established when an arc of radius 25 mm, whose centre is the apex of the protrusion, crosses the perimeter on each side of the apex shall be not less than 25 mm (see Figure 13).



Key

1 impact test frame

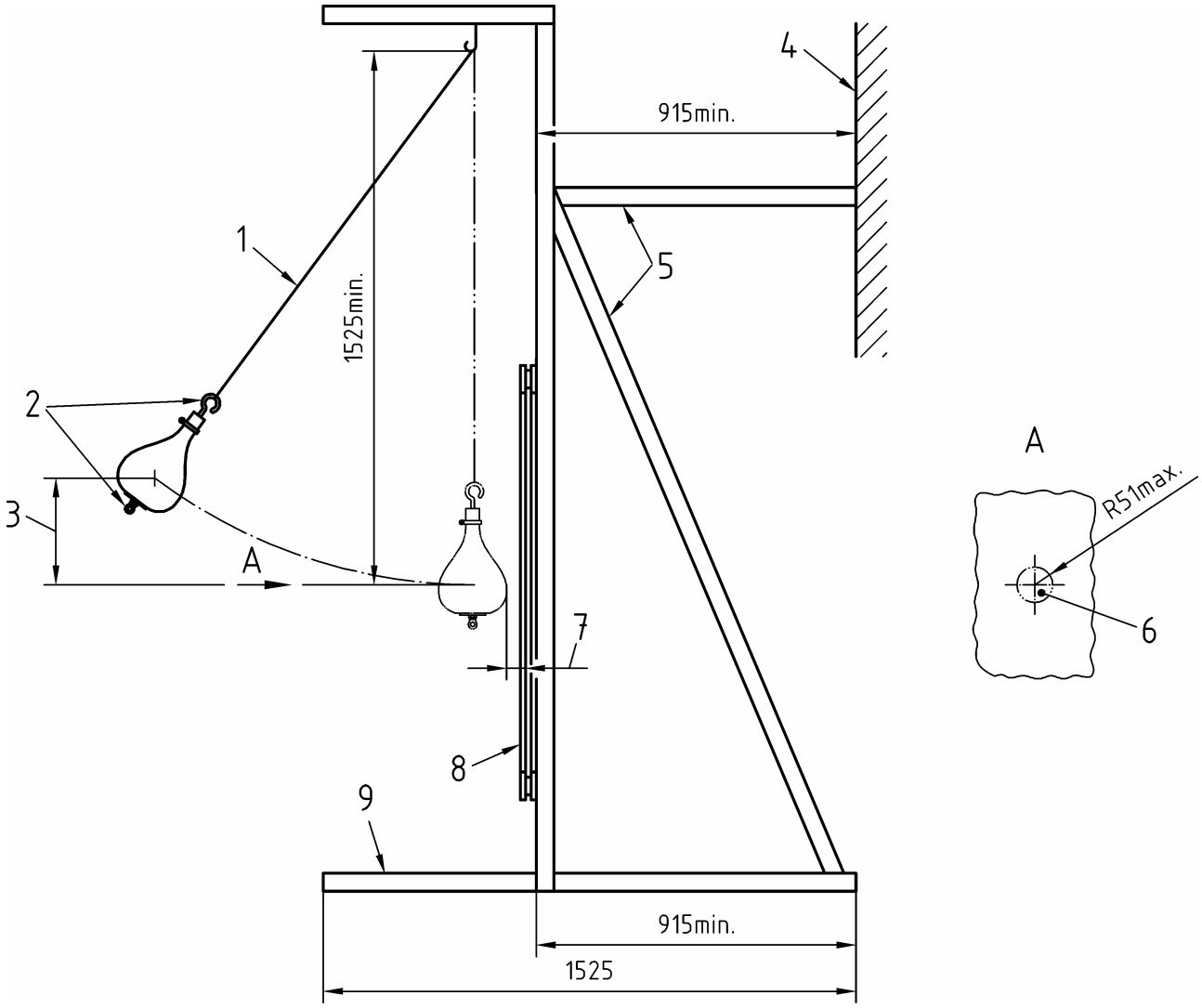
2 alternative frame braces

3 impactor

4 sub-frame with test piece

Figure 7 — General arrangement of apparatus

Dimensions in millimetres

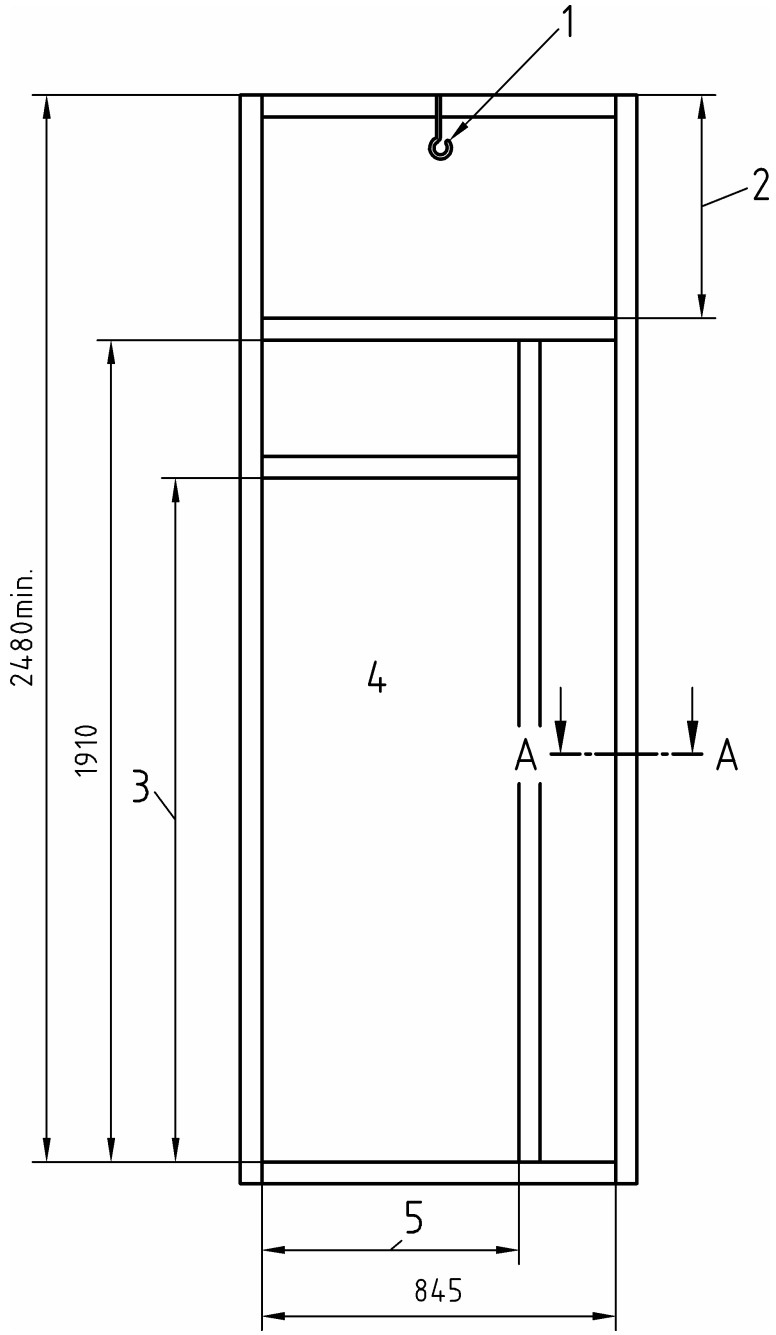


Key

1 stronded steel cable approximately Ø 3 mm
2 bridle for lifting shot bag
3 drop height 305 mm
4 concrete wall, steel beam or other sturdy construction
5 alternative means of bracing frame, use one brace at each vertical member
6 centre lines of test piece to be within these limits
7 max. 13 mm when bag is hanging free
8 test piece
9 bolt securely to floor

Figure 8 — Impact test structure (side elevation)

Dimensions in millimetres



Key

1 swivel attachment, locate at vertical centre line of test piece and a minimum of 1 525 mm above horizontal centre line of the impactor (see Figure 8)

2 This portion of frame is not required if swivel attachment is mounted on separate construction.

3 height of test piece minus 20 mm

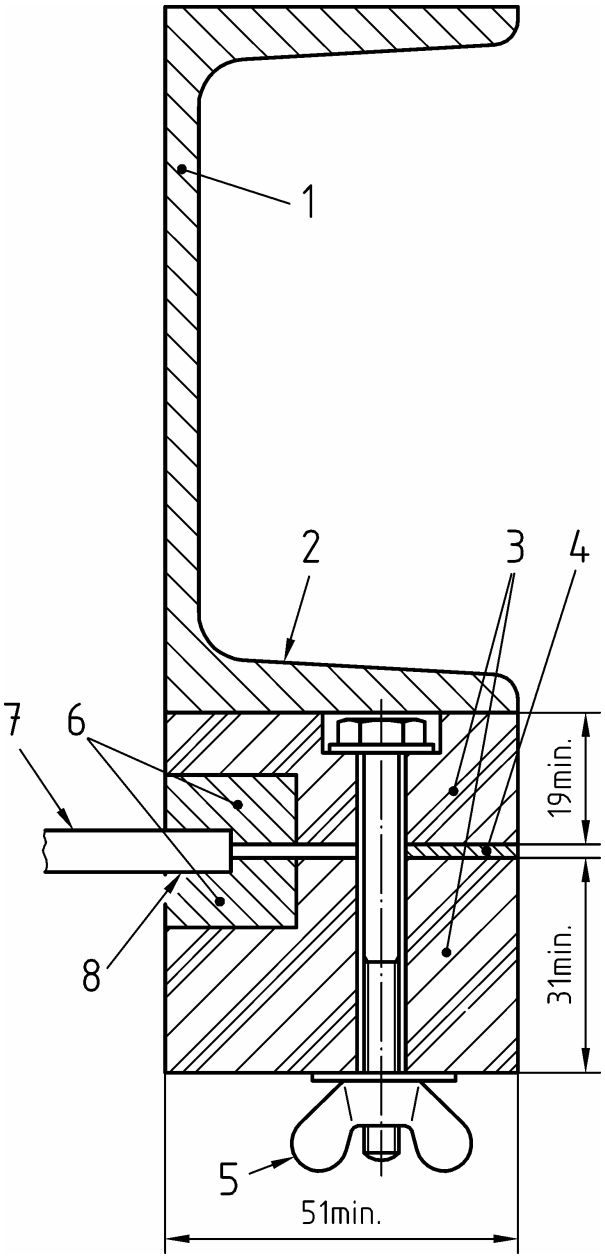
4 sub-frame members for test piece < 865 mm x 1 930 mm

5 width of test piece minus 20 mm

NOTE Sub-frame for holding test piece not shown.

Figure 9 — Impact test structure (front elevation)

Dimensions in millimetres



Key

1 test frame (102 mm x 51 mm steel channel or equivalent)

2 fixing of sub-frame to test frame not shown

3 sub-frame (wood or other suitable material)

4 spacer to limit compression of chloroprene strips (see 5.2.1.2)

5 bolts, toggle clamps or similar fixing devices to hold sub-frame together

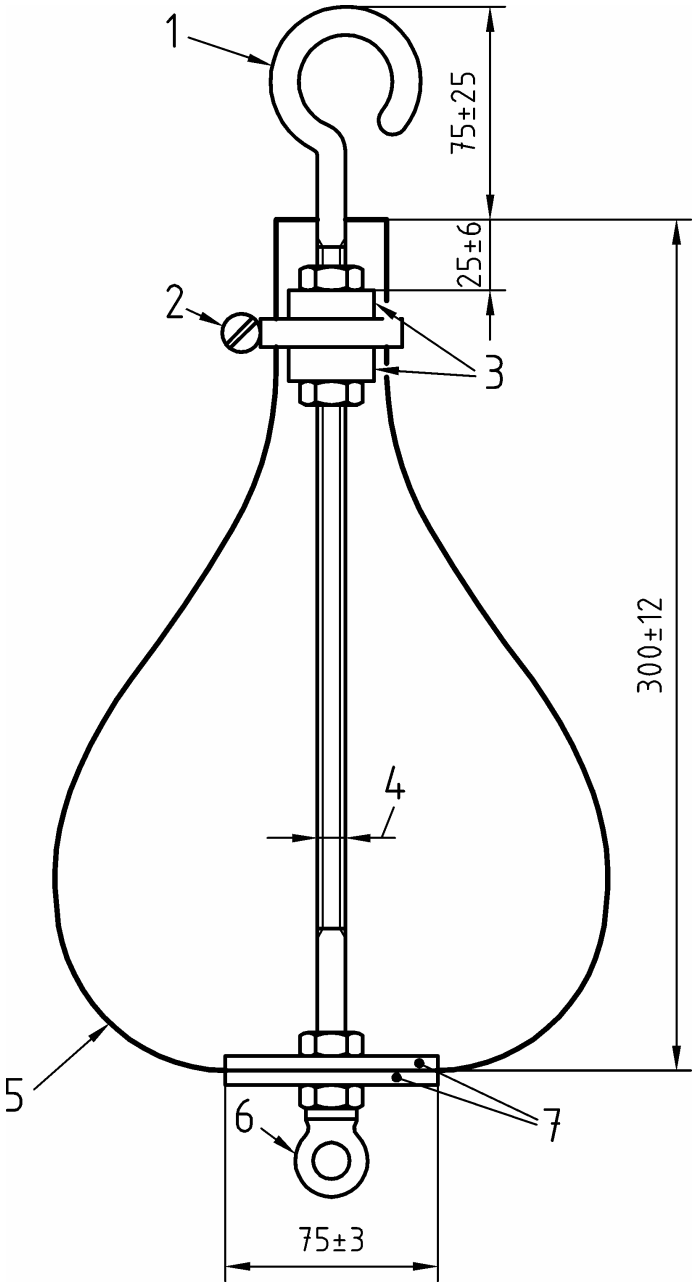
6 10 mm x 19 mm chloroprene or similar strips

7 test piece

8 clamping depth (10 ± 3) mm

Figure 10 — Clamping of test piece (section A - A of Figure 9)

Dimensions in millimetres



Key

1 rod may be bent as shown or eye nut may be threaded onto rod

2 worm-drive hose clamp

3 25 mm x Ø 30 mm metal sleeve (series of metal washers may be used)

4 M6 to M10 metal rod

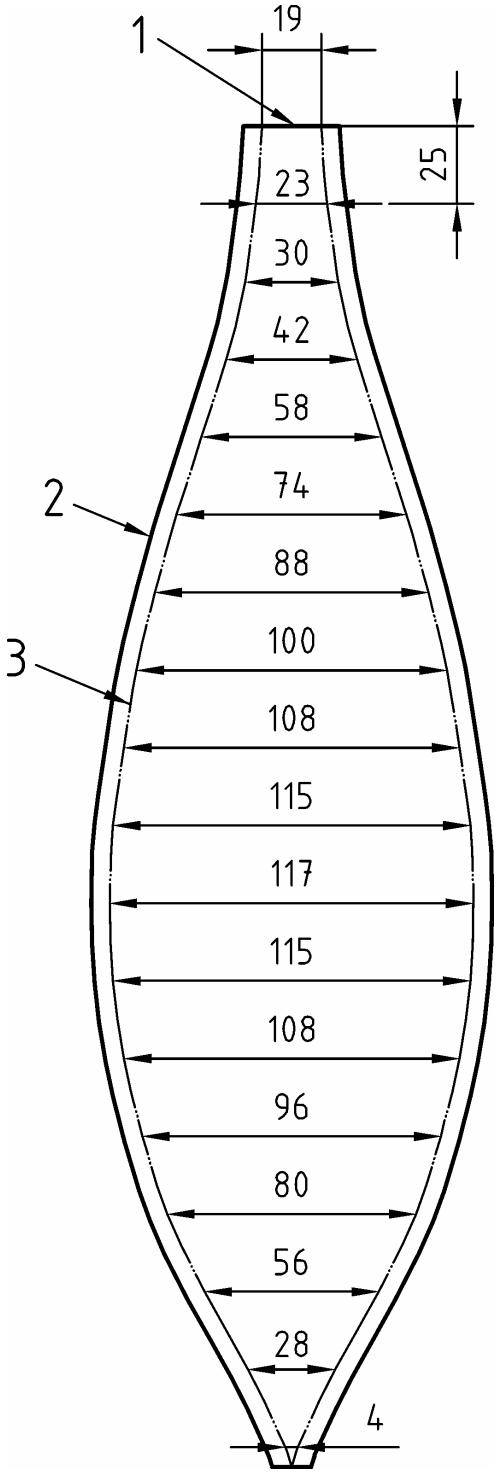
5 leather case (see Figure 12)

6 eye nut for lifting bridle

7 metal washers (5 ± 1) mm

Figure 11 — Impactor

Dimensions in millimetres



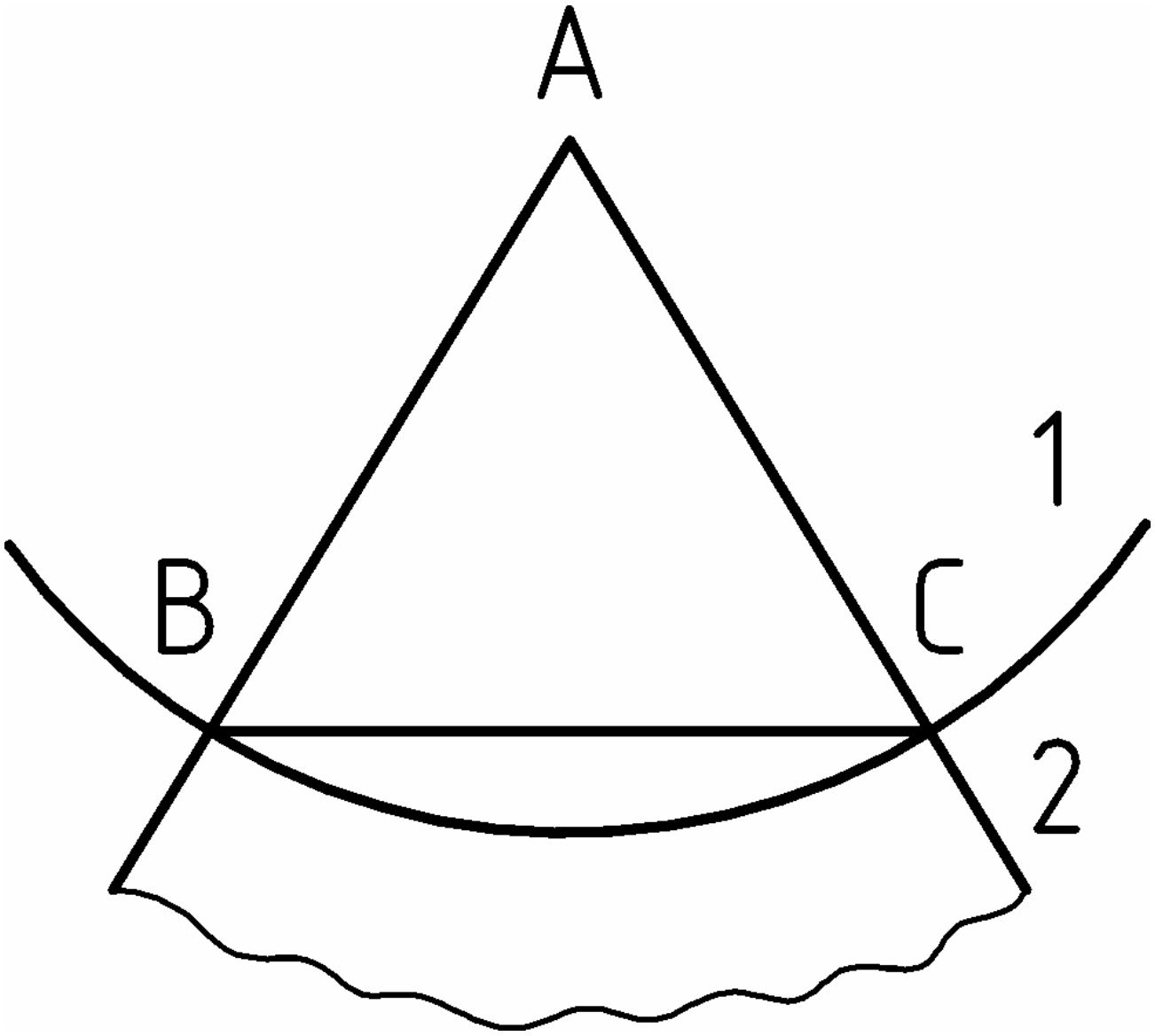
Key

1 width of panel at intervals of 25 mm

2 surplus leather approximately 6 mm

3 stitch line

Figure 12 — One panel of six panelled impactor case



Key

1 arc of circle with radius AB = AC = 25 mm

2 chord BC ≥ 25 mm

Figure 13 — Test result

5.3 Resistance to chemicals and stains

5.3.1 Reagents

5.3.1.1 Reagents.

The list of reagents is given in Table 1. Each solution shall be prepared immediately before use with deionized water, and applied at a temperature of (23 ± 5) °C.

Table 1 — Reagents

Family	Product	Concentration
Acids	Acetic acid (CH_3COOH)	10 % V/V
Alkalis	Sodium hydroxide (NaOH)	5 % m/m
Alcohols	Ethanol (C_2H_5OH)	70 % V/V
Bleaches	Sodium hypochlorite (NaOCl)	5 % active chlorine (Cl_2) [a]
Staining agents	Methylene Blue	1 % m/m
[a] The specified bleach may be replaced by sodium percarbonate ($2\ Na_2CO_3 \cdot 3\ H_20_2$) prepared as follows: dissolve 1 g of a commercial available powdery bleach based on sodium percarbonate containing 15 % to 30 % of the active component in 100 ml deionized water at room temperature.		

5.3.1.2 Abrasive comprising 12 h-alumina (suspension of aluminium oxide in water)[1)].

5.3.2 Apparatus

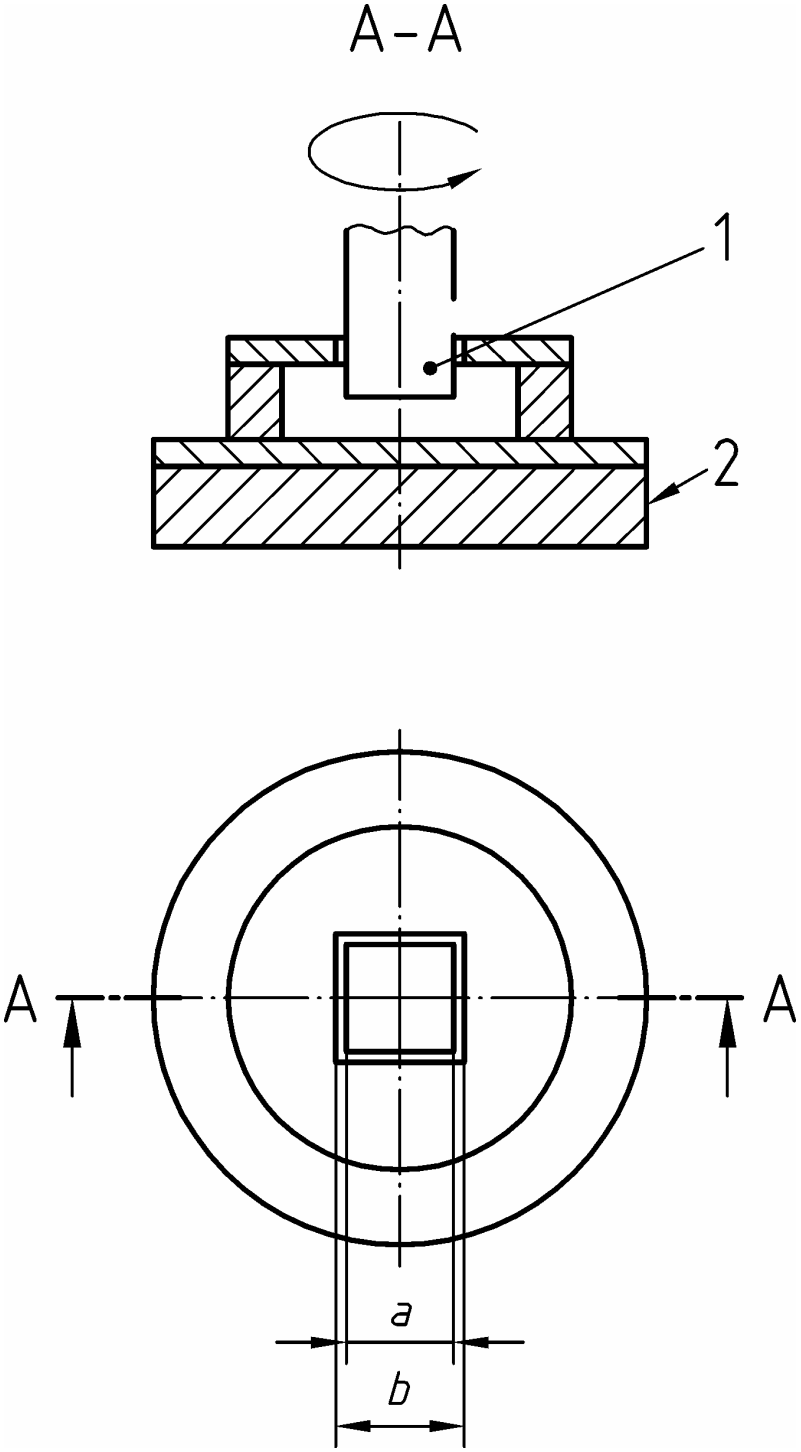
5.3.2.1 Borosilicate watch glasses, nominal diameter 40 mm.

5.3.2.2 Pipettes.

5.3.2.3 Cleaning device.

This device is shown in Figure 14, consisting of synthetic flexible open cell foam disc of 75 mm diameter and 15 mm thickness. This appliance is driven by means of a square axle which loosely fits into the device. Use any rotating device having a mass of (1 000 ± 50) g.

1) A suitable product is available from MERCK Eurolab-Prolabo, 54 rue Roger Salengro, 94126 Fontenay sous Bois CEDEX, France, as DURMAX™ under product description N° 20993. This information is given for the convenience of users of this standard and does not constitute an endorsement by CEN of this product.



Key

1 square axle

2 foam

a inner dimension

b outer dimension

a = *b* – 1 mm

Figure 14 — Cleaning device

5.3.3 Test specimens

Any flat surface from the glazing shall be taken. Test specimens shall measure at minimum (100 ± 5) mm x (100 ± 5) mm. For curved sheets, a sample of an unformed flat sheet of the same material shall be used.

5.3.4 Procedure

— Use a separate test area or test specimen for each reagent test.

— Clean the test area thoroughly with hot soapy water, rinse and dry with a clean dry cloth.

— On each test specimen deposit a drop of the test solution. Cover the drop thus formed with a watch glass, concave face downwards. The drop shall be completely covered by the watch glass. Allow to act for a time of (2 ± 0,25) h, at a temperature of (23 ± 5) °C with the test areas protected from sunlight.

— Thoroughly rinse the test specimen with deionized water and check for adverse changes in appearance by visual examination. If deterioration exists, dip the foam disc of the cleaning device into deionized water and place it on the surface to be cleaned. Rotate the device at 60 min^{-1}. Clean for 30 revolutions.

— Rinse with deionized water and visually examine the test area. If deterioration persists repeat the cleaning with the 12 h-alumina and re-examine the test specimen.

5.3.5 Expression of results

Note whether or not the reagent causes a stain or deterioration, and whether or not such stain or deterioration is removed with water or abrasive agent.

5.4 Resistance to wet and dry cycling

5.4.1 Test specimens

Test specimens shall be (100 ± 2) mm square. Prior to commencing the test examine the show faces of the test specimens and mark any surface defects.

5.4.2 Procedure

— Place a minimum of three test specimens vertically in a suitable carrier and place the carrier in a suitable open container. The carrier shall be arranged to avoid contact of one test specimen with another.

— Pour 2 l of water with a temperature of (85 ± 1) °C into the container. The test specimens shall be completely immersed.

— Leave the test specimens in the water for (8 ± 0,25) h while allowing cooling to room temperature.

— Remove the test specimens from the water, wipe the surfaces with a soft damp cloth and place the test specimens for drying into an oven for (16 ± 0,5) h at temperature of (50 ± 2) °C. Ensure that specimens do not touch the oven walls or each other.

— Repeat this cycle 20 times using the same test specimens. In the event of an interruption of the test procedure, e.g. over the weekend, leave the test specimens in the oven at a temperature of (50 ± 2) °C.

— After 20 cycles brush over the show face of each test specimen with a solution of eosine (100 g/l in water) to which is added 1 cm^3/l of liquid detergent using a soft sponge or a paint brush. Leave the solution for (5 ± 1) min, then remove from the surface by wiping with a clean soft dampened cloth.

5.4.3 Results

Verify and record any adverse changes in appearance (blisters, crazing, cracks etc.) by visual examination and by the presence of traces of eosine, ignoring the 3 mm width along each side to exclude any influence caused by the cut edge.

5.5 Endurance

— Install the shower enclosure in accordance with the manufacturer's installation instructions.

— Fix, at the opening edge of the door on a stable point, a means of automatically opening and closing the door. Ensure a steady velocity of (15 ± 5) cycles/min can be maintained with the door being opened/closed over a distance of (70 ± 10) % of the opening range of the door.

— Subject the door to 20 000 opening/closing cycles.

— On completion of test check that the door still functions correctly.

It is permissible to lubricate any guide or roll facilities in accordance with the manufacturer's maintenance instructions.

5.6 Stability

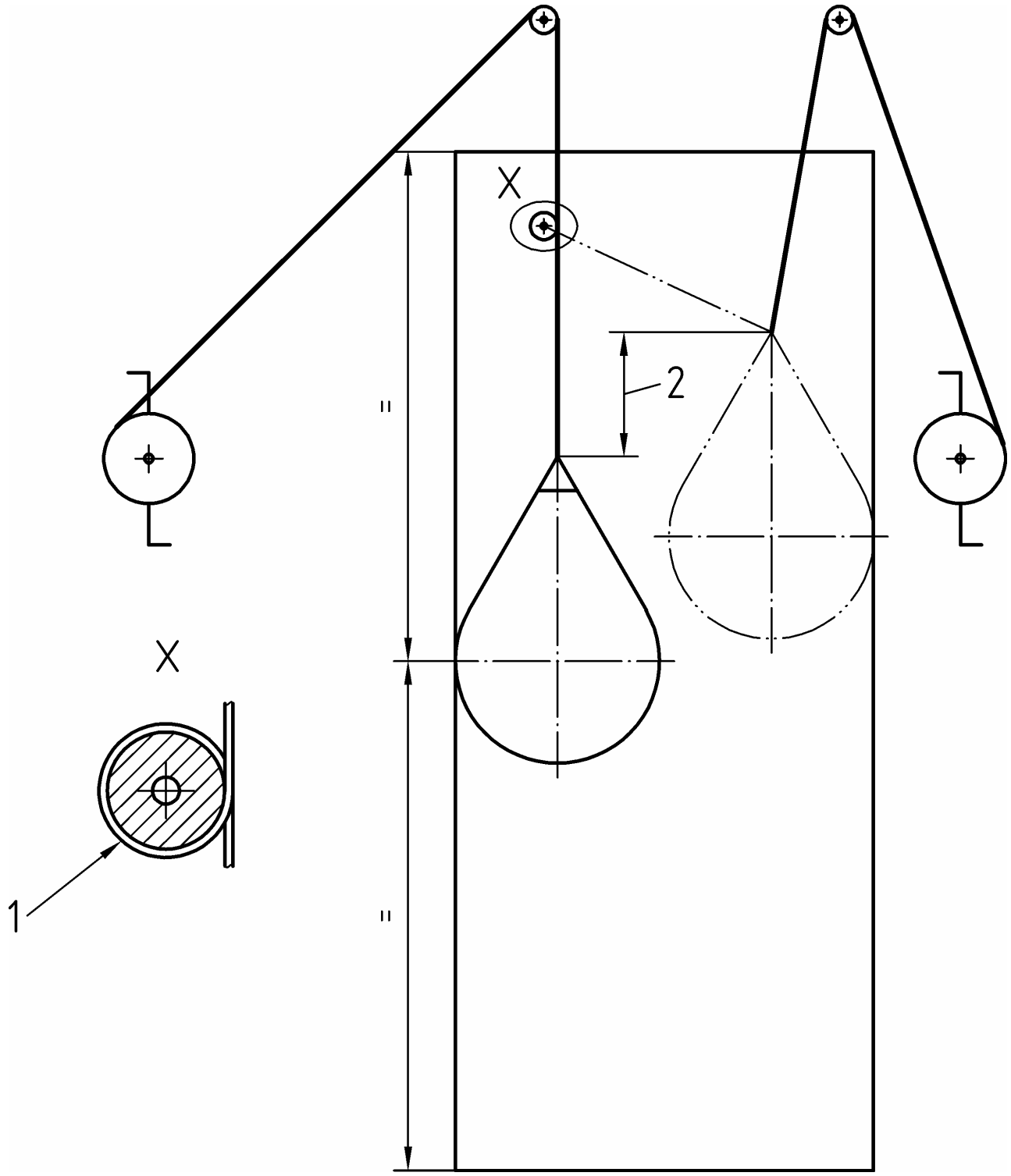
— Install the shower enclosure in accordance with the manufacturer's installation instructions.

— Carry out the test as described in ISO 7892:1988, 4.5 with the impact body falling inside the shower enclosure with an energy specified in Table 2. The impact body shall drop on each panel and/or door on its geometric centre (see Figure 15). If dimensions of shower enclosures do not allow the necessary drop height to reach the maximum energy given in Table 2, perform the test with the maximum drop height excursion angle of 65°.

— Check for any functional deterioration which could result in injury to the user.

Table 2 — Energy for stability test

Distance to the opposite wall/panel mm	**Energy to be applied,** J	**Falling height of impact body h** cm
≤ 600	63	13
≤ 700	94	19
≤ 800	125	25
> 800	135	28



Key

1 wound cable

2 falling height *h* according to Table 2

Figure 15 — Stability test arrangement

5.7 Water retention

— Install the shower enclosure in accordance with the manufacturer's installation instructions.

— Run tests A and B consecutively using the test shower head in accordance with Figure 18 and water at a temperature not exceeding 38 °C.

— Adjust the flow rate to (11 ± 1) l/min.

Test A:

— Spray for 1 min across the width and height of all door(s)/panel(s) of the shower enclosure at 90° to their surface from a distance of 30 cm using the test shower head. Restrict the spray to the area within 30 cm below the top of the door(s)/panel(s) and 30 cm above the bottom of the door(s)/panel(s) and 15cm from any vertical edges not intended to be in contact with a wall or panel or door.

  For split door panels the test shall be carried out with a) both panels closed and b) the lower panel only closed. When tested with both door sections closed The horizontal joint between the upper and lower sections of split door panels shall not leak.

— Note the appearance of any leaks from the water retaining area.

Test B:

— Install the shower enclosure in accordance with the manufacturer's installation instruction on a raised 50 mm *x* 50 mm wall or shower tray with a minimum bowl depth of 50 mm. If the shower enclosure is designed for a specific shower tray, that shower tray shall be used for test.

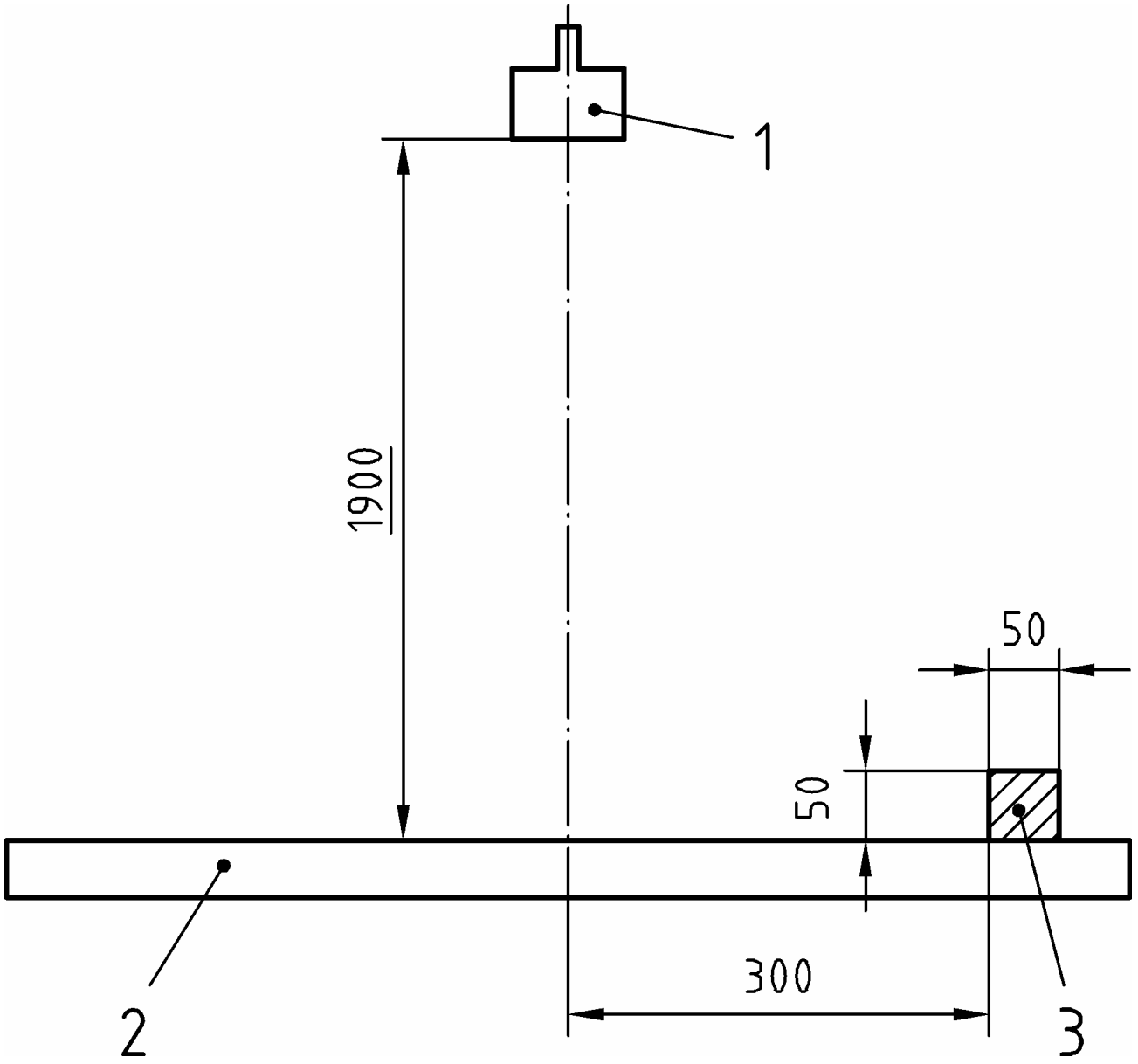
— Mount the test shower head at a height of 1900 mm and set back at a distance of 300 mm from the centre of the door opening (see Figures 16 and 17).

— In the case of a split panel door repeat the test with the top panel open and the test shower head mounted at a height of 700 mm above the top of the closed bottom panel door.

— Direct the shower head vertically downwards and with the door closed spray the shower place floor for a period of $3\,^{+1}_{0}$ min.

— Note the appearance of any leaks from the water retaining area.

Dimensions in millimetres



Key

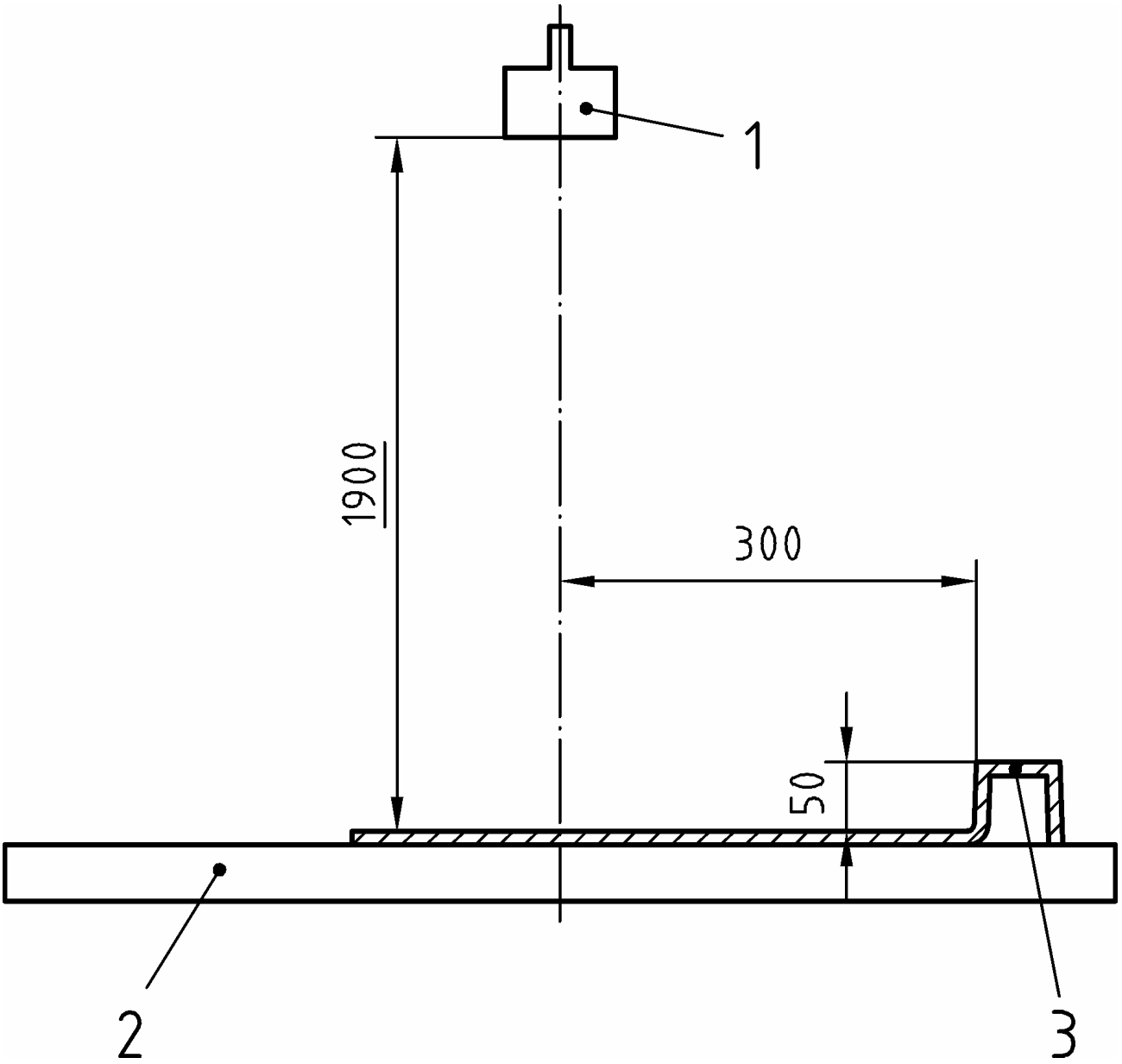
1 test shower head

2 shower place

3 balk

Figure 16 — Test on shower place

Dimensions in millimetres



Key

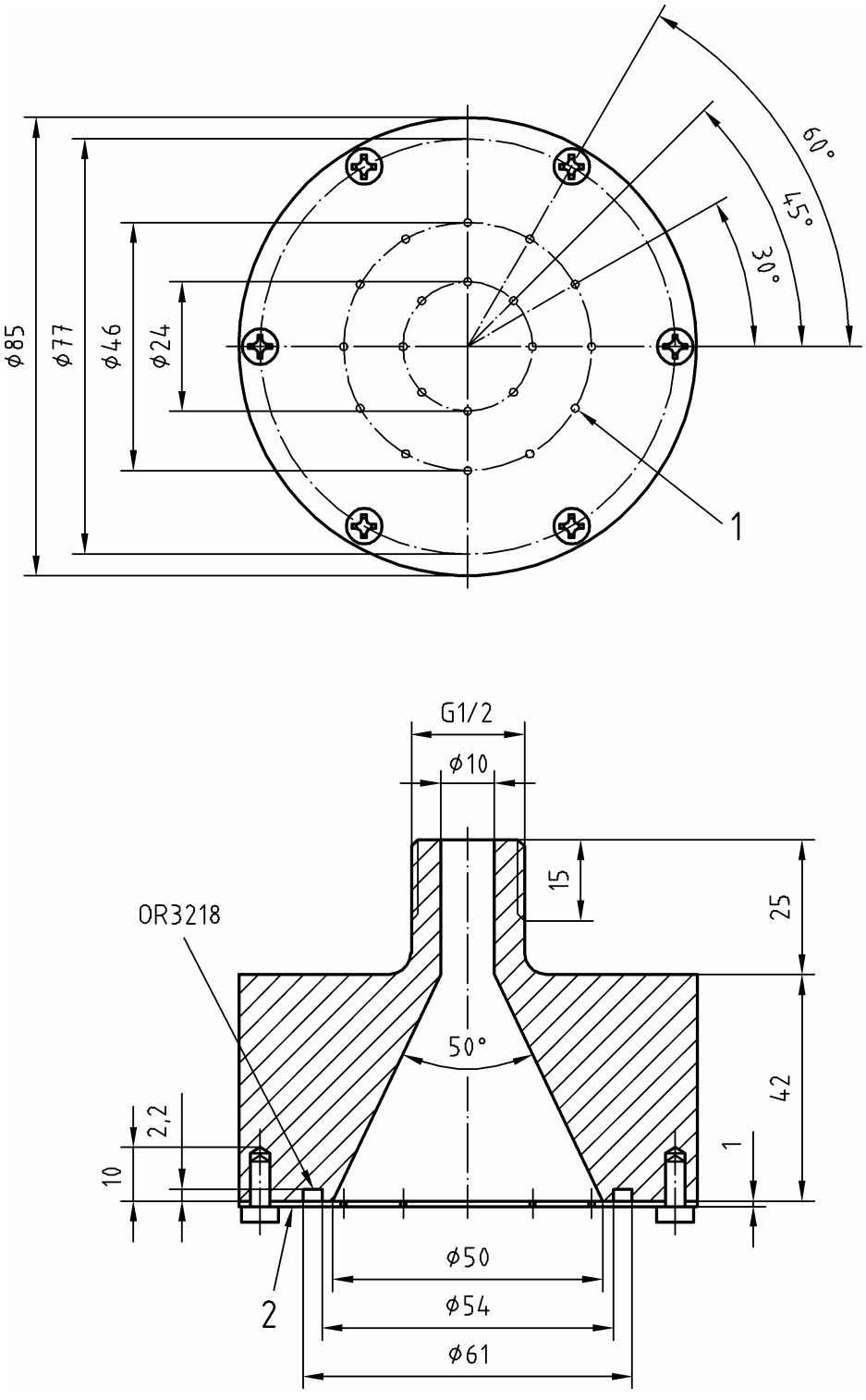
1 test shower head

2 support for shower tray

3 shower tray

Figure 17 — Test on shower tray

Dimensions in millimetres



Key

1 20 holes Ø 1,5 mm

2 metal plate of thickness 1 mm fixed on the test shower head body

Figure 18 — Test shower head

6 Marking

The intended use of a shower enclosure is personal hygiene in accordance with the scope of this standard.

NOTE 1 The intended use is also mentioned in Annex ZA, Table ZA.1. The abbreviation 'PH' for the intended use personal hygiene might be used for CE marking.

EXAMPLE 1 Use of full text Personal hygiene.

EXAMPLE 2 Use of abbreviation PH.

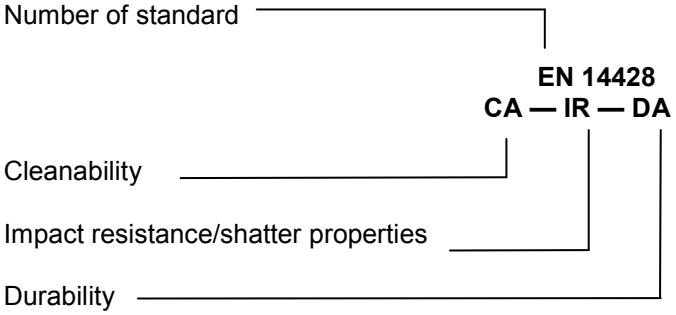
Shower enclosures can be described with a designation code which includes all the fulfilled essential requirements.

The relevant Essential Characteristics for shower enclosures including their abbreviations are given in Table 3.

Table 3 — Characteristics and abbreviations

Abbreviation	Characteristics
EN 14428	Number of European Standard for shower enclosures for product description
CA	Cleanability
IR	Impact resistance/shatter properties
DA	Durability

All shower enclosures shall be designated in accordance with the following system:



The second line of the designation code can be omitted when those characteristics are fulfilled. However, the characteristics should be listed when one of those characteristics is not declared.

EXAMPLE 3 For a shower enclosure where all Essential Characteristics specified in accordance with Annex ZA are satisfied.

EN 14428

EXAMPLE 4 For a shower enclosure where all Essential Characteristics specified in accordance with Annex ZA are satisfied except for cleanability for which the manufacturer has exercised the NPD option.

EN 14428 — CA/NPD

NOTE 2 For CE marking, see Annex ZA.

7 Assessment and verification of constancy of performance - AVCP

7.1 General

The compliance of a shower enclosure with the requirements of this standard and with the performances declared by the manufacturer in the Declaration of Performance (DoP) shall be demonstrated by:

— determination of the product type (see 7.2);

— factory production control by the manufacturer (FPC), including product assessment (see 7.3).

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).

7.2 Type testing

7.2.1 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.

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 shower enclosure (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 shower enclosure 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

of the shower enclosure manufacturer to ensure that the shower enclosure as a whole is correctly manufactured and its component products have the declared performance values.

7.2.2 Samples, testing and compliance criteria

The shower enclosure shall be subjected to and pass the relevant tests in Table 4.

Table 4 — Type testing

Characteristic to be tested	Assessment method according to clauses of this document	Number of samples	Compliance criteria
Cleanability	4.2	1	4.2
Impact resistance/shatter properties	5.1, 5.2	1	4.3
Corrosion resistance	4.4.2	1	4.4.2
Resistance to chemicals and stains	5.3	1	4.4.3
Resistance to wet and dry cycling	5.4	1	4.4.4
Endurance	5.5	1	4.4.5
Stability	5.6	1	4.4.6
Water retention	5.7	1	4.4.7

7.3 Factory production control

7.3.1 General

The manufacturer shall establish, document and maintain a factory production control (FPC) system to ensure that the products placed on the market conform with the stated performance 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.

The results of inspections, tests or assessments requiring action shall be recorded. The action to be taken when control values or criteria are not met shall be recorded.

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

7.3.2 Equipment

7.3.2.1 Testing

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

7.3.2.2 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.

7.3.3 Raw materials and components

The specifications of all incoming raw materials and components shall be documented, as shall the inspection scheme for ensuring their conformity. In cases where 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.

7.3.4 Product testing and assessment

The manufacturer shall establish and document procedures to ensure that the stated values of all of the characteristics are maintained.

7.3.5 Non-conforming products

The manufacturer shall have written procedures which specify how non-conforming 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-conforming products shall apply, the necessary corrective action(s) shall immediately be taken and the products or batches not conforming 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.

7.3.6 Corrective action

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

Annex ZA
(informative)

Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under Mandate M/110 Sanitary Appliances as amended by M/139 given to CEN by the European Commission and the European Free Trade Association.

If this European Standard is cited in the Official Journal of the European Union (OJEU), the clauses of this standard, shown in this annex, are considered to meet the provisions of the relevant mandate, under the Regulation (EU) No. 305/2011.

This annex deals with the CE marking of the shower enclosures intended for the use indicated in Table ZA.1 and shows the relevant clauses applicable.

This annex has the same scope as in Clause 1 of this standard related to the aspects covered by the mandate and is defined by Table ZA.1.

Table ZA.1 — Relevant clauses for shower enclosures and intended use

Product: Shower enclosures **Intended use:** Personal hygiene			
Essential Characteristics	**Clauses in this and other European Standard(s) related to essential characteristics**	**Regulatory classes**	**Notes**
Cleanability	4.2	-	Pass/fail
Impact resistance/shatter properties	4.3	-	Pass/fail
Durability	4.4	-	Pass/fail

The declaration of the product performance related to certain essential characteristics is not required in those Member States (MS) where there are no regulatory requirements on these essential characteristics for the intended use of the product.

In this case, manufacturers placing their products on the market of these MS are not obliged to determine nor declare the performance of their products with regard to these essential characteristics and the option “No performance determined” (NPD) in the information accompanying the CE marking and in the declaration of performance (see ZA.3) may be used for those essential characteristics.

ZA.2 Procedure for assessment and verification of constancy of performance (AVCP) of shower enclosures

ZA.2.1 System of AVCP

The AVCP system of shower enclosure indicated in Table ZA.1, established by EC Decision 96/578/EC (OJ L254 of 8.10.1996 p.49) amended by EC Decision(s) 2001/596/EC (OJ L 209 page 33 of 2.8.2001) and

2002/592/EC (OJ L 192 page 57 of 20.7.2002) is shown in Table ZA.2 for the indicated intended use(s) and relevant level(s) or class(es) of performance.

Table ZA.2 — System(s) of AVCP

Products	Intended uses	Level(s) or class(es) of performance	AVCP system(s)
Shower and bath screens and shower enclosures	Personal hygiene	-	4
System 4: See Regulation (EU) No. 305/2011 (CPR) Annex V, 1.5 [10].			

The AVCP of the shower enclosures in Table ZA.1 shall be according to the AVCP procedures indicated in Table ZA.3 resulting from application of the clauses of this or other European Standard indicated therein. The content of tasks of the notified body shall be limited to those essential characteristics as provided for, if any, in Annex III of the relevant mandate and to those that the manufacturer intends to declare.

Table ZA.3 — Assignment of AVCP tasks for shower enclosures under system 4

Tasks		Content of the task	AVCP clauses to apply
Tasks for the manufacturer	Factory production control (FPC)	Parameters related to essential characteristics of Table ZA.1 relevant for the intended use	7.2
	Determination of the product-type on the basis of type testing, type calculation, tabulated values or descriptive documentation of the product	Essential characteristics of Table ZA.1 relevant for the intended use which are declared	7.3

ZA.2.2 Declaration of performance (DoP)

ZA.2.2.1 General

The manufacturer draws up the DoP and affixes the CE marking on the basis of the different AVCP systems set out in Annex V of the Regulation (EU) No 305/2011:

- the factory production control carried out by the manufacturer;
- the determination by the manufacturer of the product type on the basis of type testing, type calculation, tabulated values or descriptive documentation of the product.

ZA.2.2.2 Content

The model of the DoP is provided in Annex III of the Regulation (EU) No 305/2011.

According to this Regulation, the DoP shall contain, in particular, the following information:

- the reference of the product-type for which the declaration of performance has been drawn up;
- the AVCP system or systems of the construction product, as set out in Annex V of the CPR;

- the reference number and date of issue of the harmonized standard which has been used for the assessment of each essential characteristic;

- where applicable, the reference number of the Specific Technical Documentation used and the requirements with which the manufacturer claims the product complies.

The DoP shall in addition contain:

(a) the intended use or uses for the construction product, in accordance with the applicable harmonized technical specification;

(b) the list of essential characteristics, as determined in the harmonized technical specification for the declared intended use or uses;

(c) the performance of at least one of the essential characteristics of the construction product, relevant for the declared intended use or uses;

(d) where applicable, the performance of the construction product, by levels or classes, or in a description, if necessary based on a calculation in relation to its essential characteristics determined in accordance with the Commission determination regarding those essential characteristics for which the manufacturer shall declare the performance of the product when it is placed on the market or the Commission determination regarding threshold levels for the performance in relation to the essential characteristics to be declared;

(e) the performance of those essential characteristics of the construction product which are related to the intended use or uses, taking into consideration the provisions in relation to the intended use or uses where the manufacturer intends the product to be made available on the market;

(f) for the listed essential characteristics for which no performance is declared, the letters “NPD” (No Performance Determined).

Regarding the supply of the DoP, Article 7 of the Regulation (EU) No 305/2011 applies.

The information referred to in Article 31 or, as the case may be, in Article 33 of Regulation (EC) No 1907/2006, (REACH) shall be provided together with the DoP.

ZA.2.2.3 Example of DoP

The following given examples of a filled-in DoP for shower enclosures.

EXAMPLE 1 Full text version of DoP with attached list of product numbers(identification codes) for this D0P:

DECLARATION OF PERFORMANCE

No. 001CPR2013-07-14

1. Unique identification code of the product-type:

For product number(s) see list attached.

2 Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4):

Shower enclosure

3. Intended use or uses of the construction product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:

Personal hygiene (PH)

4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 11(5):

AnyCo SA,

PO Box 21

B-1050 Brussels, Belgium

Tel. +32987654321

Fax: +32123456789

Email: anyco.sa@provider.be

5. Where applicable, name and contact address of the authorized representative whose mandate covers the tasks specified in Article 12(2):

Anyone Ltd

Flower St. 24

West Hamfordshire

AB1 2CD United Kingdom

Tel. +44987654321

Fax: +44123456789

e-mail: anyone.ltd@provider.uk

6. System or systems of assessment and verification of constancy of performance of the construction product as set out in CPR, Annex V:

System 4

7. In case of the declaration of performance concerning a construction product covered by a harmonized standard.

Determination of the product type on the basis of type testing, type calculation, tabulated values or descriptive documentation of the product;

8. Declared performance

Essential characteristics [a]	Performance	Harmonized technical specification
Cleanability	**Pass**	EN 14428:2015
Impact resistance/shatter properties properties	**Pass**	
Durability	**Pass**	
[a] Specific performance of essential requirements are given by the designation code as cited in the attachment.		

9. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8.

This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

……

(Name and function)

…… ……

(place and date of issue) (signature)

Attachment to Declaration of Performance

No. CPR-14228

Product code no.	**Product name (Optional)**	**Description (Optional)**	**CE marking (Optional)**	**Digits (Optional)**
A1234XYZ	Square 800 × 800	Rectangular shower enclosure	**CA — IR — DA**	
…..				

……

(Name and function)

…… ……

(place and date of issue) (signature)

EXAMPLE 2 Short-text version of DoP with attached list of product numbers (identification codes) for this DoP:

Declaration of Performance

No. CPR-14228

1. **For product number (identification code) see list attached.**

2. **Shower enclosure(s)**

3. **Personal hygiene (PH)**

4. **Any Co Ltd**

   Any Street 1

   12345 Example City

   Country

   Ph.: +49 987-8654-0

   Fax: +49 987-8654-1

   info@sanitary-plant.com

5. **n.a.**

6. **System 4**

7. **Determination of product type and factory production control by the manufacturer**

8. **Declared performance**

Essential Characteristics[a]	Performance	Harmonized technical specification
Cleanability	**Pass**	EN 14428:2015
Impact resistance/shatter properties	**Pass**	
Durability	**Pass**	
[a] Specific performance of Essential Characteristics are given by the designation code as cited in the attachment.		

9. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8.

   This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

   Signed for and on behalf of the manufacturer by:

……

(Name and function)

…… ……

(place and date of issue) (signature)

Attachment to Declaration of Performance

No. CPR-14228

Product code no.	**Product name (Optional)**	**Description (Optional)**	**CE marking (Optional)**	**Digits (Optional)**
A1234XYZ	Square 800 × 800	Rectangular shower enclosure	**CA — IR — DA**	
…..				

……

(Name and function)

…… ……

(place and date of issue) (signature)

ZA.3 CE marking and labelling

The CE marking symbol shall be in accordance with the general principles set out in Article 30 of Regulation (EC) No 765/2008 and shall be affixed visibly, legibly and indelibly:

— to the product

or

— to a label attached to it.

Where this is not possible or not warranted on account of the nature of the product, it shall be affixed:

— to the packaging

or

— to the accompanying documents.

The CE marking shall be followed by:

— the last two digits of the year in which it was first affixed;

— the name and the registered address of the manufacturer, or the identifying mark allowing identification of the name and address of the manufacturer easily and without any ambiguity,

— the unique identification code of the product-type,

— the reference number of the declaration of performance,

— the level or class of the performance declared,

— the reference to the harmonized technical specification applied,

— the intended use as laid down in the harmonized technical specification applied.

The CE marking shall be affixed before the construction product is placed on the market. It may be followed by a pictogram or any other mark notably indicating a special risk or use.

Figure ZA.1 gives an example of the information related to products subject to AVCP system 4 to be given on the product or to a label attached to it or to the packaging or to the accompanying documents.

CE	*CE marking, consisting of the "CE"-symbol*
AnyCo Ltd, PO Box 21, B-1050, Brussels, Belgium	*Name and the registered address of the manufacturer, or identifying mark*
15	*Last two digits of the year in which the marking was first affixed*
001CPR2013–07–14	*Reference number of the DoP*
A1234XYZ	*Unique identification code of the product-type*
PH	*Intended use of the product as laid down in the European standard applied*
EN 14428	*No. of European standard applied, as referenced in OJEU*
CA-IR-DA	*Level or class of the performance declared*

Figure ZA.1 — Example CE marking information of products under AVCP system 4 to be given on the product or to a label attached to it or to the packaging or to the accompanying documents

Bibliography

[1] EN ISO 9000, *Quality management systems - Fundamentals and vocabulary (ISO 9000)*

[2] EN ISO 9001, *Quality management systems - Requirements (ISO 9001)*

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