TÜVRheinland®

Produkte
Products

Prüfbericht - Nr.: *Test Report No.:*	**16028105 001**		**Seite 1 von** 32 *Page 1 of 32*
Gegenstand der Prüfung: *Test item:*	**Shower Enclosure**		
Bezeichnung: *Identification:*	Refer to page 2 of this report	**Serien-Nr.:** *Serial No.:*	Engineering sample
Wareneingangs-Nr.: *Receipt No.:*	173058277	**Eingangsdatum:** *Date of receipt:*	April 14, 2011
Prüfort: *Testing location:*	**TÜV Rheinland**		
Prüfgrundlage: *Test specification:*	**EN 14428:2004 + A1** Shower enclosures – Functional requirements and test methods		
Prüfergebnis: *Test Result:*	**Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).** *The test item passed the test specification(s).*		
Prüflaboratorium: *Testing Laboratory:*	**TÜV Rheinland**		

Sonstiges/ *Other Aspects:*

Abkürzungen:	*P(ass)*	=	*entspricht Prüfgrundlage*	*Abbreviations:*	*P(ass)*	=	*passed*
	F(ail)	=	*entspricht nicht Prüfgrundlage*		*F(ail)*	=	*failed*
	N/A	=	*nicht anwendbar*		*N/A*	=	*not applicable*
	N/T	=	*nicht getestet*		*N/T*	=	*not tested*

Model list:

MSNS312L	FHP2-120
MSND310	CPHP1-100
MSNF410	FIP-30
MSS312L	FSP-90
OWS-F4(MSSF410)	FHP1-100
FF412L(FFS4)	FBF1-90
FS312L	FROBSH1-80
FT410	FROBSH2-100
MSS412L	VSWS310
VF410	VOBSS-60
VS410	VOBSD-80-6MM
FF312L	VOBST-140
FHS210	VOBSDSW-80
FHS312L	IWIS-120
FBFS312L	VF310
FP4/410	IWIS-120D
CPT410	IWISQSP-1695
FP2-120	IWISQ-120
CPP2-120	VP3-160
VS312L	MSST410
CPF410	MSSP3-160
VP2-120	MSNP2-160
VP4-160	MSSP2-160
FBFS208	MSNP3-160
	MSLP2-160-10MM

Verwendete Meßgeräte/Prüfmittel / *Measuring Equipment List*

Gerät *Equipment*	Inventar-Nr. *Inventory no.*	nächste Kalibrierung *next calibration*
Electric Balance	1.041C	23.05.2012
Stopwatch	1.077	23.12.2011
Tape	1.123	Initial calibration only
Callipers	1.102A	29.11.2012
High Temperature Testing Machine	1.269	7.29.2012
Thermometer	1.101	Initial calibration only
Feeler gauge	1.187	Initial calibration only
Emergency hammer	3.265A	Initial calibration only
Sand bag	3.189	Initial calibration only
Resistance to penetration by rain	1.278	8.19.2012

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
1	**Scope** This document specifies requirements for shower enclosure 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 document does not apply to shower cabinet 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.	All models: Shower enclosure for domestic purpose, made of tempered glass.	**P**
2	**Normative references**	Informative.	**P**
3	**Terms and definitions**	Informative.	**P**
4	**Requirements**	Pass.	**P**
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.	Instruction provided describing the installation and care. OK. OK.	**P**
4.2	**Cleanability** When tested 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.	All models: No defect.	**P**

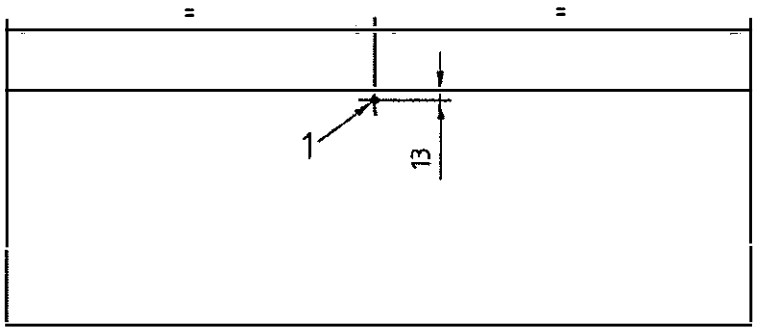
EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
4.3	**Impact resistance/shatter properties**	Pass	**P**
4.3.1	**General** Shower enclosures may be glazed with various materials. Where glass is used, this shall meet the requirements of 4.3.2, and where plastics materials are used, they shall meet the requirements of 4.3.3.	All models: Shower enclosures made of tempered glass OK No plastics sheet.	**P**
4.3.2	**Thermally toughened safety glass** Thermally toughened safety glass shall meet the requirements of EN 12150-1:2000, except in respect of Clause 8 which is replaced by 5.1 of this document. When tested in accordance with 5.1, the minimum particle count shall be 40.	All models: Nominal thickness of tempered glass:4mm, 5mm, 6mm, 8mm. The dimension tolerance of glass panel meets the requirement of EN12150-1. Minimum particle count: 5mm flat glass: 90pieces 6mm flat glass: 63 pieces. 8mm flat glass: 87 pieces 10mm flat glass: 76pieces	**P**
4.3.3	**Plastics materials** When tested in accordance with 5.2, sheets shall not break or they shall break safely.	All models: No plastics sheet.	**N/A**
4.4	**Durability**	All models: Pass	**P**
4.4.1	**General** Products conforming with the requirements of 4.2 and 4.3 and the following are deemed to be durable.	All models: Pass	**P**

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
4.4.2	**Corrosion resistance** All components shall consist of corrosion-proof materials or shall be corrosion-protected. All corrosion protection shall conform with the relevant requirements specified in European and International Standards. For example: - the minimum paint adhesion performance for powder-coated or wet-painted surfaces shall comply with a cross-cut value ≤ 2 when tested in accordance with EN ISO 2409; - the minimum average thickness of coating on aluminium shall be of grade AA 8 when tested in accordance with one of the methods given in ISO 7599. In no cases shall the minimum local thickness be less than 80 % of the minimum average thickness.	All models: Components: - Frame: aluminium profile with coatings. - Wheel: brass + plastic. - All screws: stainless steel All models: No paint coating. All models: Aluminum frame with oxide coating. Test result shows coating thickness grade AA8 lean to ISO 7599.	**P**
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.	All models: No permanent staining and deterioration.	**P**
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.	All models: No defect.	**P**
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.	All models: After 20,000 cycles test, no function deterioration was found.	**P**
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.	All models: No any functional deterioration which result in injury to the user after impact test.	**P**

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
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.	All models: A few drops of water leakage or reflect out from the area covered by glasses.	**P**
4.5	**Dangerous substances** NOTE See ZA.1 and ZA.3.	Informative	**P**
5	**Test methods**	Pass	**P**
5.1	**Impact resistance/shatter properties**	Pass	**P**
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.	All models: Meet this requirement after test.	**P**
5.1.2	**Test specimens**	All models: 5mm and 6mm,8mm,10mm thickness of glass.	**P**
5.1.2.1	**FI** The test specimen shall have an area of (1,7 ± 0,17) m^2 with a minimum length to width ration of 2:1 without holes, notches or cut-outs.	Standard samples were provided.	**P**
5.1.2.2	**Curved glass** The test specimen shall be as designed for the product.	Curved glass was used on product.	**P**

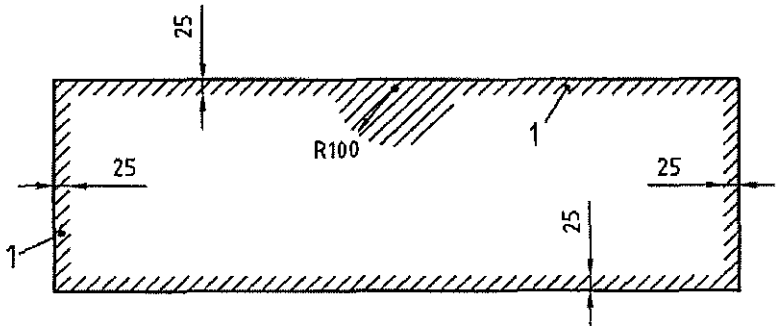
EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
5.1.3	**Procedure**	All models:	**P**
	The test specimen shall be impacted, using a pointed steel tool, at a position 13 mm from the longest edge of the specimen at the mid-point of that edge, until breakage occurs (see Figure 1).	OK	
	NOTE The fragmentation characteristics of glass are unaffected by temperatures between - 50 °C and + 100 °C.	Environment temperature: 10°C - 25°C.	
	Examples of steel tools are a hammer of approximately 75 g mass, a spring loaded center punch, or other similar appliance with a hardened point. The radius of curvature of the point should be approximately 0,2	Standard hammer was used.	
	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 flat specimen shall be held at the edges, e. g. by a small frame, adhesive tape etc., 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.	Plastic film was used in order to prevent scattering of fragments.	
	For thermally toughened soda lime silicate safety glass manufactured by vertical toughening, the impact point shall not be on the tong mark edge.	Not vertical toughening glass.	

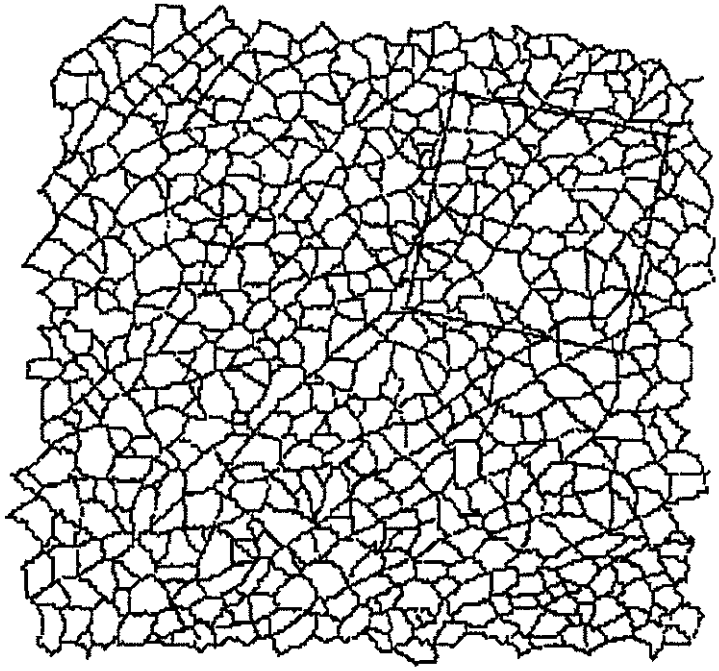
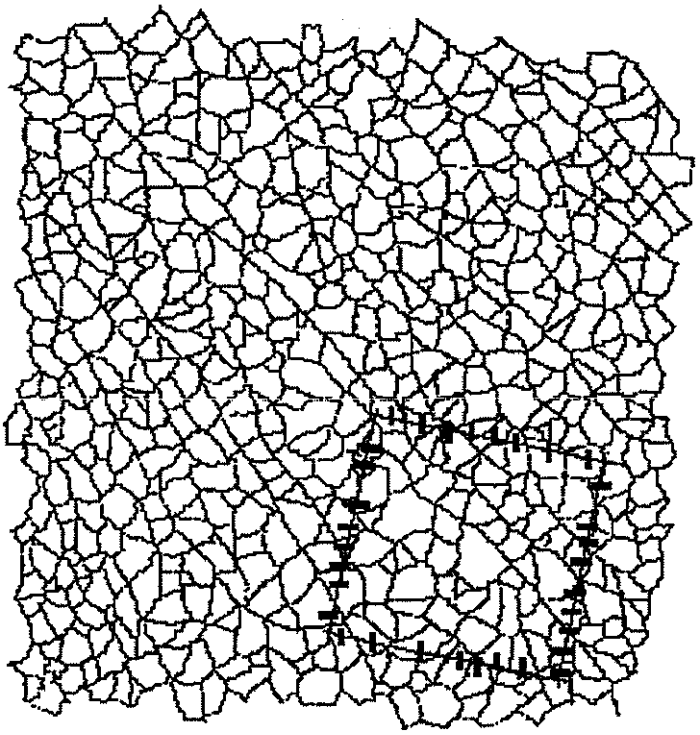
Dimensions in millimetres

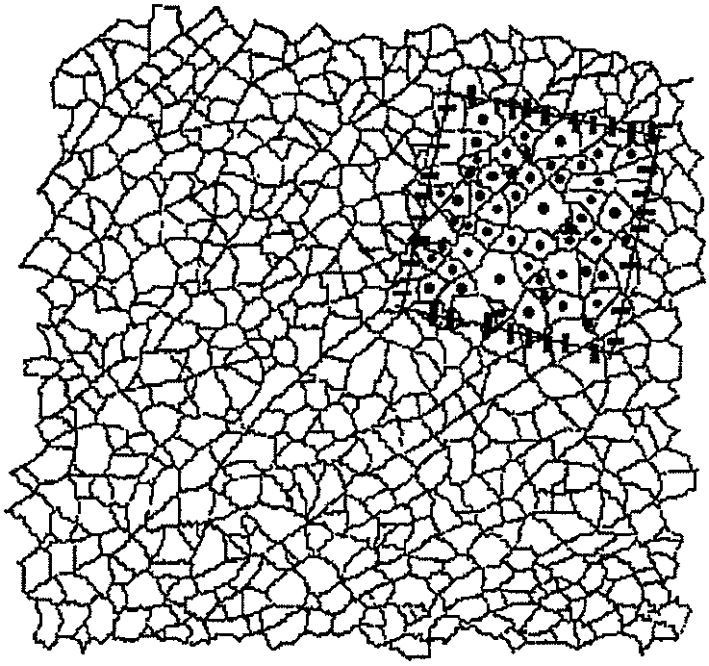
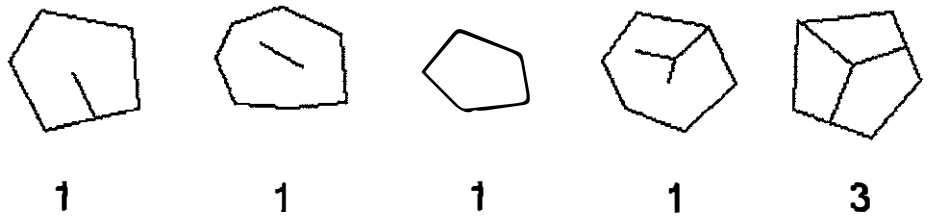


Key
1 Impact point

Figure 1 — Position of impact point

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
5.1.4	**Assessment of fragmentation** The particle count and measuring of the dimensions of the largest particle shall be made between 4 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), the assessment.	All models: Perform this test according standard method.	**P**
	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).	All models: Template of 50 x 50mm was used. Assess the particle according to standard method.	

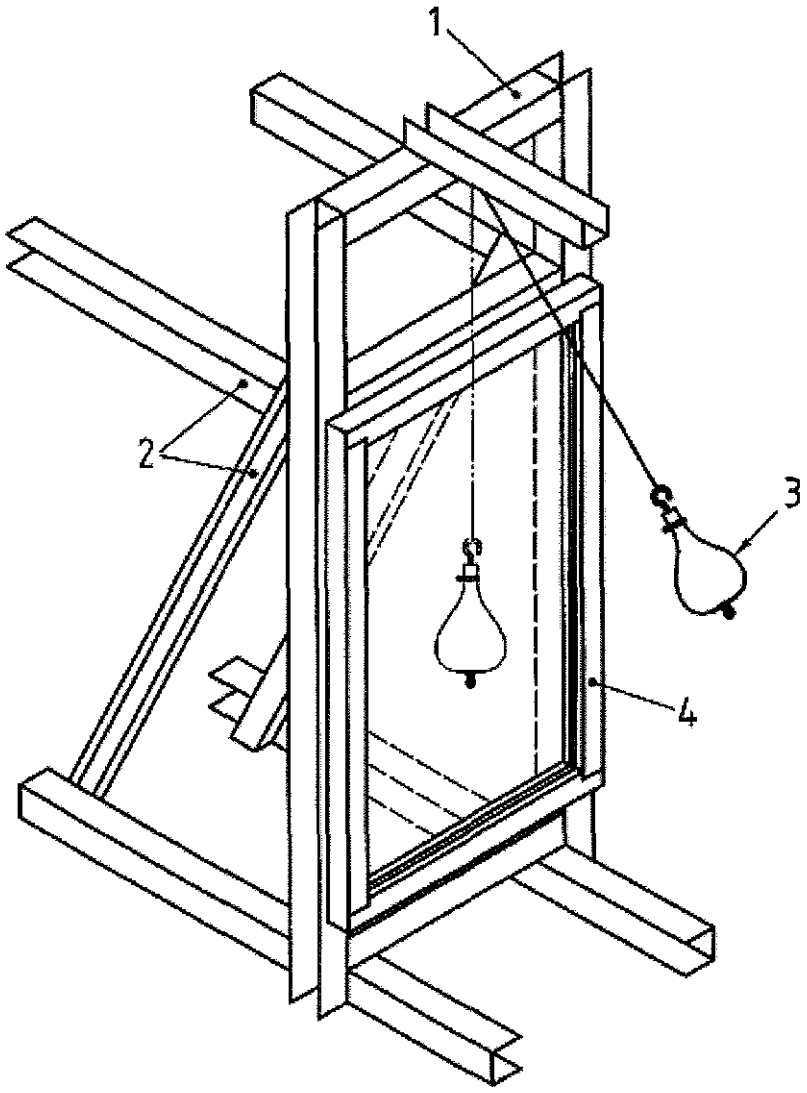
EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
-	 **Figure 3 — Select the area of coarsest fracture, place the template on the test specimen and draw round the template**		**P**
	 NOTE Number of perimeter particles = 32/2 = 16 **Figure 4 — Mark and count the perimeter fragments as 1/2 particle each**		

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
-	 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**		**P**
	 1 1 1 1 3 **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).	OK	**P**

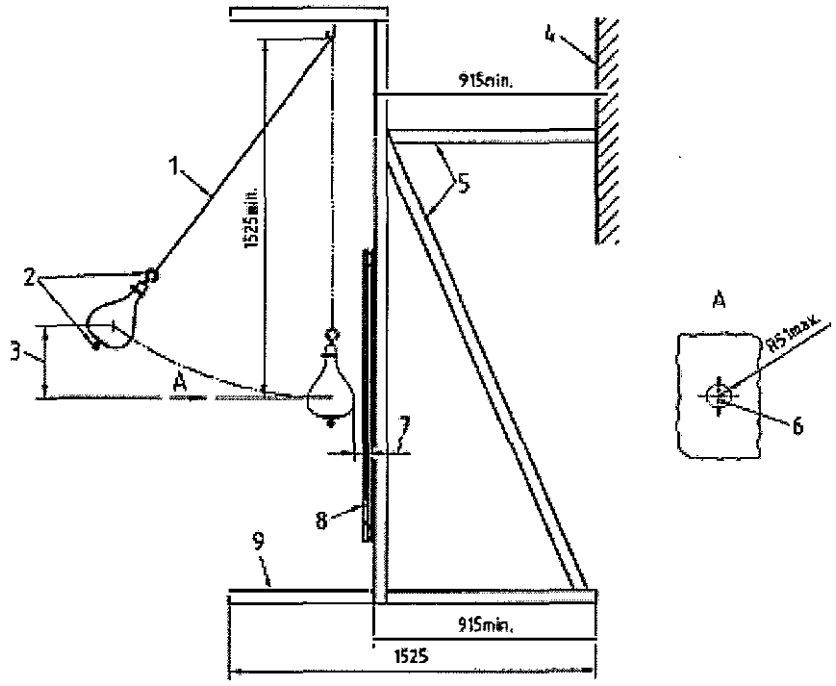
EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
5.2	**Impact behaviour of plastic sheets**	All models: No plastic sheets on product. Not applicable.	**N/A**
5.2.1	**Apparatus** a) test frame, constructed of securely welded or bolted sections, designed to present a flat face 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. b) 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. NOTE 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.	All models: Not applicable.	**N/A**

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
-	c) 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, 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.	All models: Not applicable.	**N/A**

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
5.2.2	**Procedure** - 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. - Immediately preceding the test, condition the test pieces as follows: - temperature: (23 ± 5) °C - 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). - Raise the impactor to a drop height of 305 mm and steady it. - Release the impactor so that it swings in a pendulum arc and strikes the test piece. - 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).	All models: Not applicable.	**N/A**

EN 14428 :2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
-	 **Key** 1 Impact test frame 2 Alternative frame braces 3 Impactor 4 Sub-frame with test piece **Figure 7 — General arrangement of apparatus**		N/A

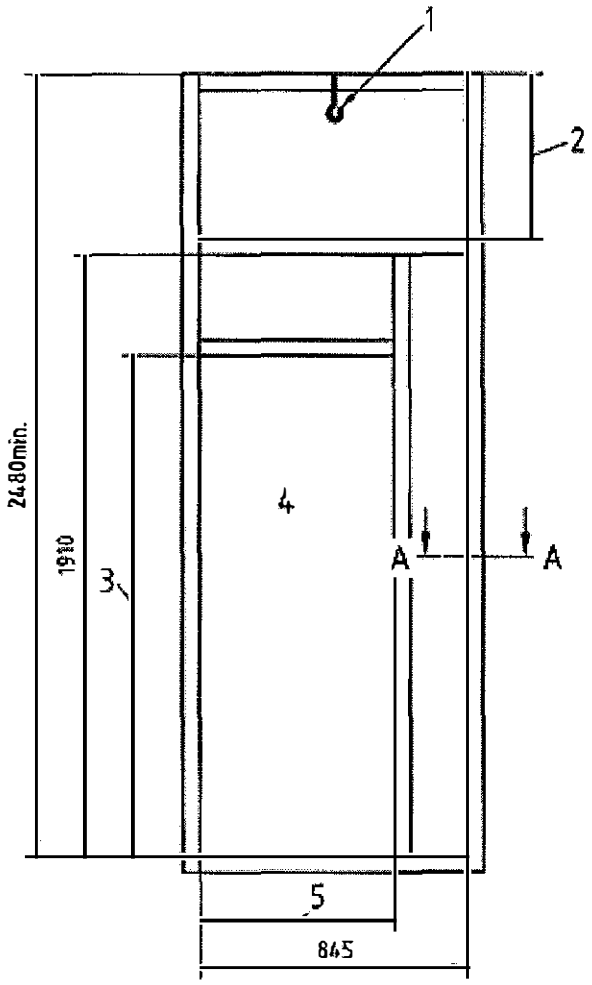
EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
	Dimensions in millimetres		**N/A**



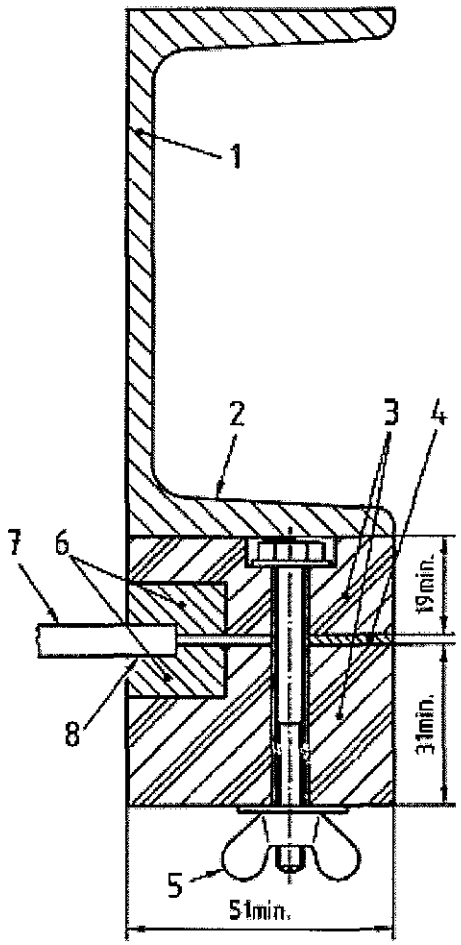
Key

1 Stranded steel cable ≈ Ø 3 mm
2 Bridle for lifting shot bag
3 Drop height 385 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)

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
	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 6) 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)**		**N/A**

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
	Dimensions in millimetres		**N/A**

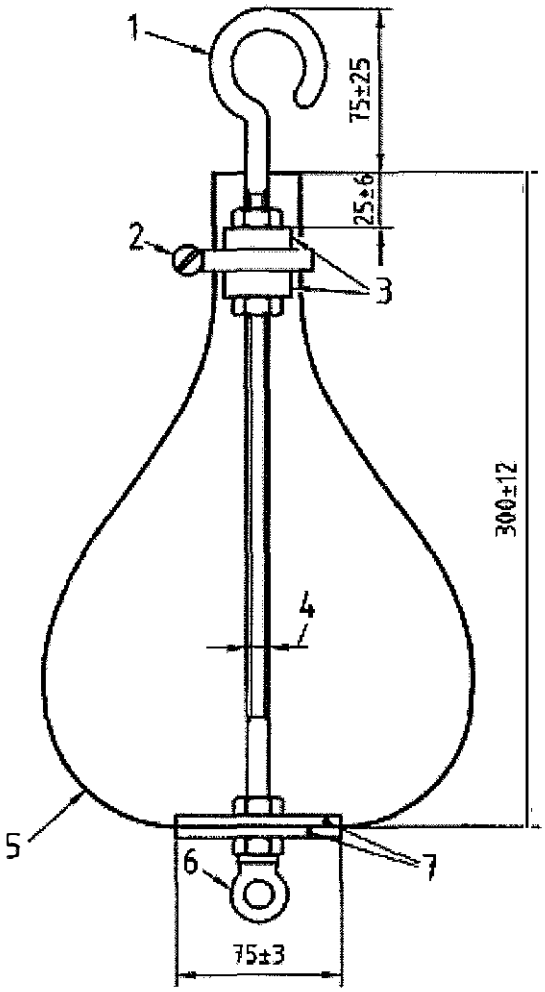


Key

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 b))
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)

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
	Dimensions in millimetres		**N/A**



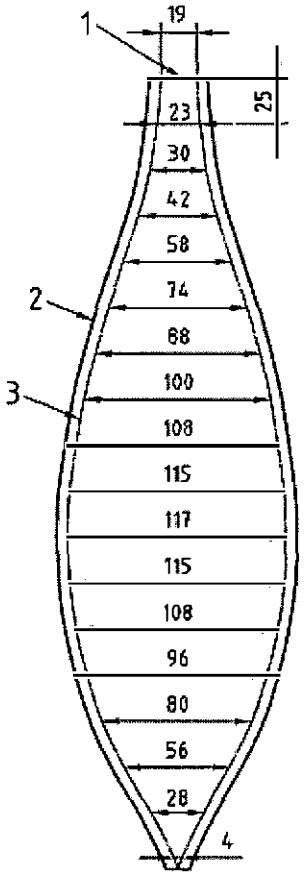
Key

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 M8 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

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**

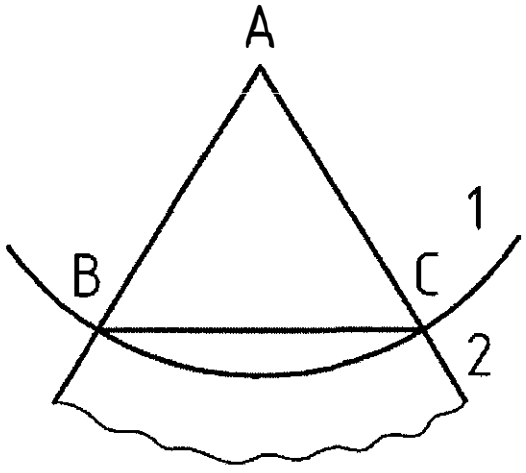
Dimensions in millimetres



Key
1 Width of panel at intervals of 26 mm
2 Surplus leather ≈ 6 mm
3 Stitch line

Figure 12 — One panel of six panelled impactor case

N/A



Key
1 Arc of circle with radius AB = AC = 25 mm
2 Chord BC ≥ 25 mm

Figure 13 — Test result

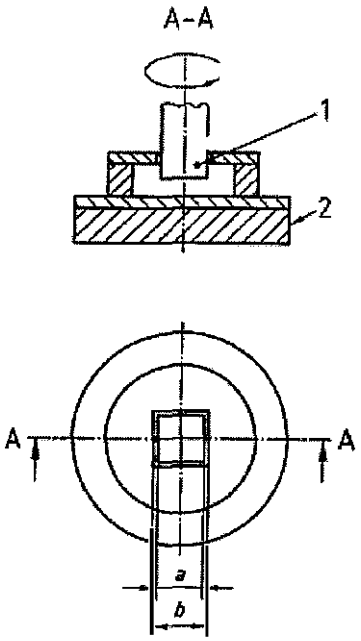
EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
5.3	**Resistance to chemicals and stains**	All models: Pass	**P**
5.3.1	**Reagents** a) reagents The list of reagents is given in Table 1. solution shall be prepared immediately before use with de-ionised water, and applied at a temperature of (23 ± 5) °C.	All models: Reagents in table 1 were used.	**P**

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 ($2\ Na_2CO_3 \cdot 3\ H_2O_2$) 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 deionised water at room temperature.

	b) Abrasive comprising 12 h-alumina (suspension of aluminium oxide in water)[1)]. 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.	All models: Not used.
5.3.2	**Apparatus** a) Borosilicate watch glasses, nominal diameter 40 mm; b) pipettes; c) 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.	All models: OK OK Not used, because only water can remove the stains after testing.	**P**

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
-	 **Key** 1 Square axle 2 Foam *a* Inner dimension *b* outer dimension *a* = *b* – 1 mm **Figure 14 — Cleaning device**		**N/A**
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.	All models: OK	**P**
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.	All models: Tested as the requirement.	**P**

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
-	- Thoroughly rinse the test specimen with deionised water and check for adverse changes in appearance by visual examination. If deterioration exists, dip the foam disc of the cleaning device into deionised water and place it on the surface to be cleaned. Rotate the device at 60 min-1. Clean for 30 revolutions. - Rinse with de-ionised water and visually examine the test area. If deterioration persists repeat the cleaning with the 12 h-alumina and re-examine the test specimen.	OK. No defect. Cleaning device is not used. Not used.	**P**
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.	No defect.	**P**
5.4	**Resistance to wet and dry cycling**	All models: Pass	**P**
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.	All models: 6mm,8mm 200 x 200 mm because of the production characteristics(the manufactory can not temper a glass small than 200x200mm).	**P**
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 whilst 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.	All models: OK 8L of water because of bigger sample. OK OK	**P**

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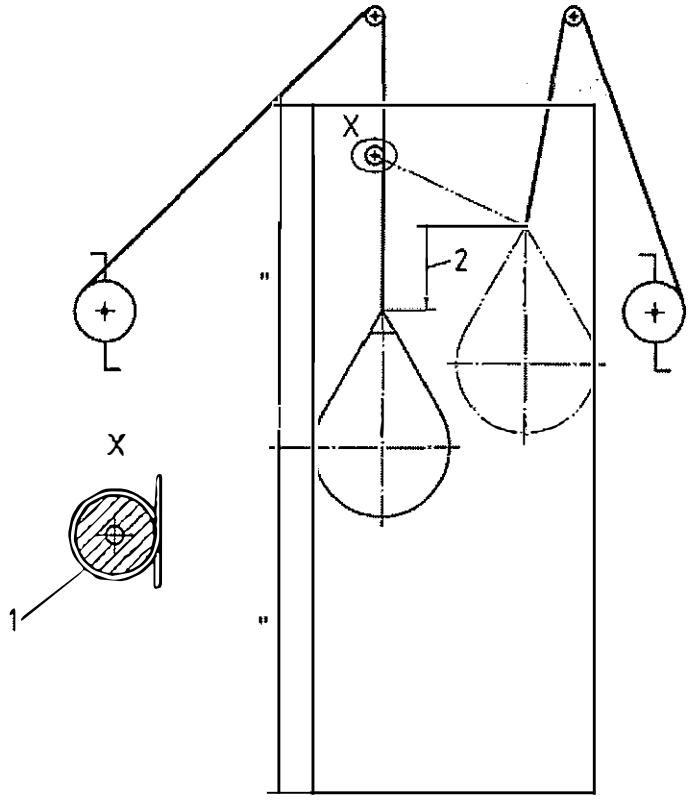
Clause	**Test Description**	**Remark**	**Result**
-	- Repeat this cycle 20 times using the same test specimens. In the event of an interruption of the test procedure, e.g. over the weekend, leave the test specimens in the oven at a temperature of (50 ± 2) °C. - After 20 cycles brush over the show face 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.	OK OK	P
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.	All models: No any adverse change on the surface of glass.	P
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. NOTE It is permissible to lubricate any guide or roll facilities in accordance with the manufacturer's maintenance instructions.	All models: OK OK 20 000 cycles. All models have normal function after endurance test.	P
5.6	**Stability** - Install the shower enclosure in accordance with the manufacturers installation instructions.	All models: OK	P

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
-	- 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°.	OK. Testing lean to ISO 7892 Fig. 4. Load = 50 kg All models: Drop height according to table 2 is 28cm and perform the test with the maximum drop height excursion angle of 65°.	**P**
	- Check for any functional deterioration which could result in injury to the user.	OK. No any functional deterioration which could result in injury to the use.	

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

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Clause	**Test Description**	**Remark**	**Result**
5.7	**Water retention**		**P**
	- Install the shower enclosure in accordance with the manufacturer's installation instructions.	All models: OK.	
	- Tests A and B shall be run consecutively using the test shower head in accordance with Figure 18 and water at a temperature not exceeding 38 °C.	OK.	
	- Adjust the flow rate to (11 ± 1) l/min.	OK.	
	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).	OK.	
	- Note the appearance of any leaks from the water retaining area.	OK.	
	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.	OK.	
	- Mount the test shower head at a height of 1900 mm and set back at a distance of 300 mm from the center of the door opening (see Figures 16 and 17).	OK.	
	- Direct the shower head vertically downwards and with the door closed spray the shower place floor for a period of 3 (0, +1) min.	Ok	
	- Note the appearance of any leaks from the water retaining area.	Please refer to clause 4.4.7.	

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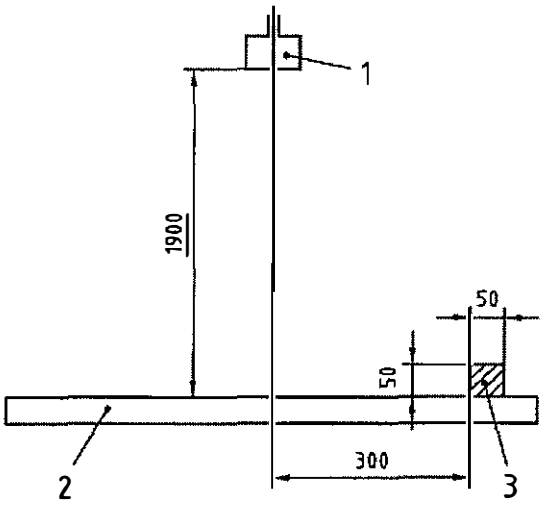
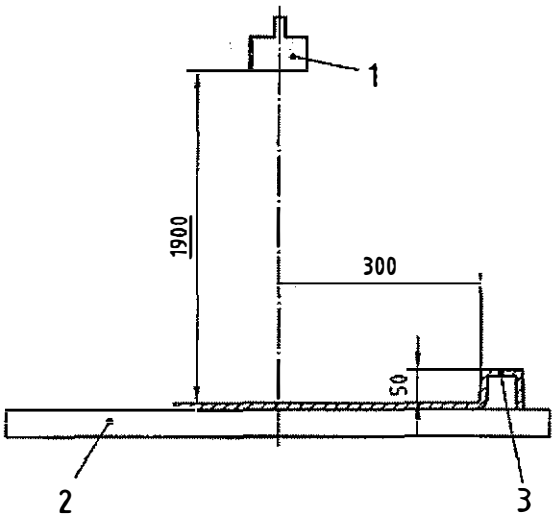
Clause	**Test Description**	**Remark**	**Result**
-			P



Key
1 Test shower head
2 Shower place
3 Balk

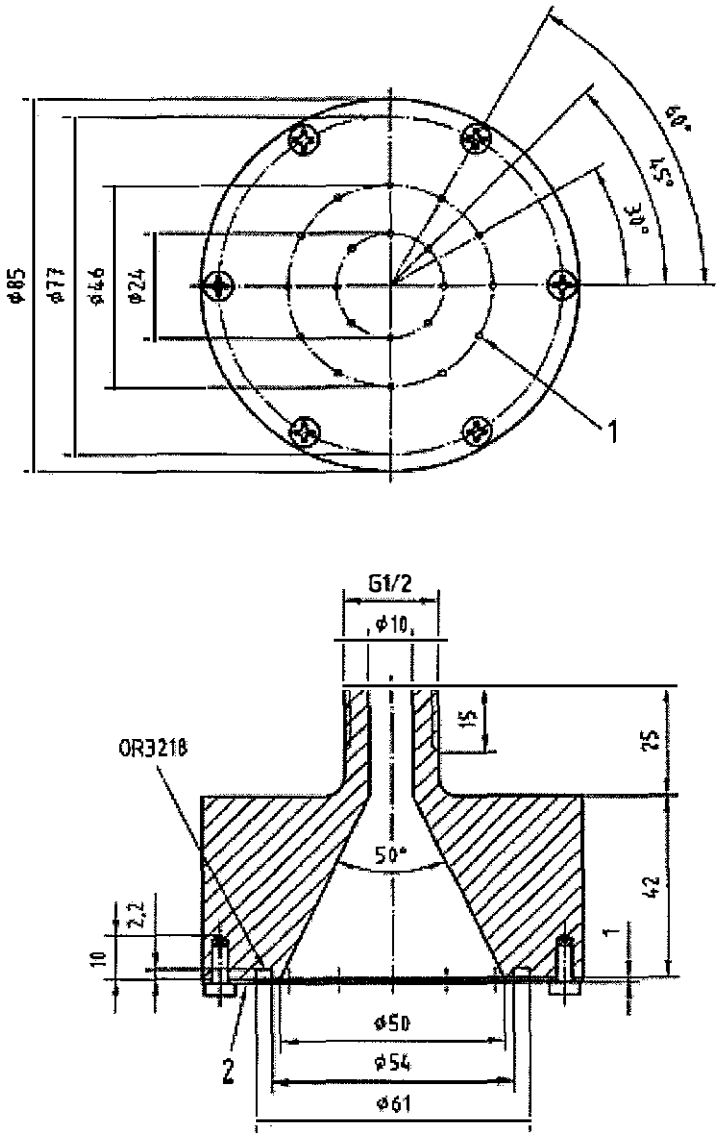
Figure 16 — Test on shower place

Dimensions in millimetres



Key
1 Test shower head
2 Support for shower tray
3 Shower tray

Figure 17 — Test on shower tray

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
-	Dimensions in millimetres  Key 1 Twenty holes Ø 1,5 mm 2 Metal plate of thickness 1 mm fixed on the test shower head body **Figure 18 — Test shower head**		P

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**

6 **Marking,**

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

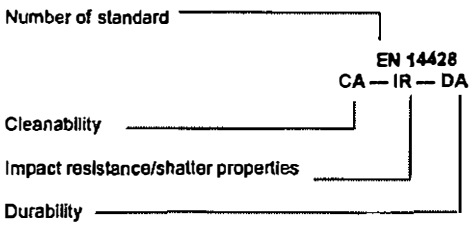
All models:
Marking on the product. Including:

X CE marking
X Supplier name and address
X Manufacturer year (11)
X Standard (EN 14428:2004+A1:2008)

Table 3 — Characteristics and abbreviations

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

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



OK

The second line of the designation code can be omitted when those characteristics are fulfilled.

EXAMPLE 1 For a shower enclosure where all Essential Characteristics specified in accordance with Annex ZA are satisfied.

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EXAMPLE 2 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 For CE marking, see Annex ZA.

All models:
Essential characteristics are omitted because those characteristics are fulfilled.

Lean to Figure ZA.1.

P

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
7	**Evaluation of conformity**	Pass	**P**
7.1	**General** The compliance of a shower enclosure with this standard shall be demonstrated by: - initial type testing (see 7.2); - factory production control by the manufacturer (FPC), including product assessment (see 7.3).	 For this part, the factory is responsible for ITT and FPC during production. TUV performed the initial type testing and passed. This belongs to factory's responsibility.	**P**
7.2	**Initial type testing**	Pass	**N/T**
7.2.1	**General** Type testing shall be performed before the product is put on the market for the first time and each time when its characteristics are changed. When characteristics are determined on the basis of conformity with other product standards, the manufacturer shall ensure that the products themselves have undergone appropriate type testing to ensure the adequacy of the stated performance. NOTE All characteristics given in Annex ZA are subject to type testing, with the following exceptions: release of dangerous substances, which may be assessed indirectly by controlling the content of the substance concerned.	 TUV tested samples as ITT and passed. This belongs to factory's responsibility. Informative for Annex ZA.	**N/T**
7.2.2	**Samples,** The shower enclosure shall be subjected to and pass the relevant tests in Table 4.	 TUV performed the relevant tests in table 4 and passed.	**N/T**

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
-	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		P
7.3	**Factory production control**	TUV's factory inspection included the Factory production control. For CE marking, under AoC 4, the manufacturer has the obligation to carry out its factory production control.	N/T
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. A FPC system conforming with the requirements of the relevant part(s) of EN ISO 9000 series, and made specific to the requirements of this document, is considered to satisfy the above requirements. 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.	For CE marking, depend on manufacturer.	N/T
7.3.2	**Test equipment** All weighing, measuring and testing equipment shall be calibrated and regularly inspected according to low documented procedures, frequencies and criteria.	For CE marking, depend on manufacturer.	N/T

EN 14428:2004 +A1:2008			
Clause	**Test Description**	**Remark**	**Result**
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.	For CE marking, depend on manufacturer.	**N/T**
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.	For CE marking, depend on manufacturer.	**N/T**
7.3.5	**Non-conforming products** If during the factory production control non-conforming products are detected, there shall be immediately implemented measures for correction of failure(s) and handling defective products.	For CE marking, depend on manufacturer.	**N/T**
ZA	**Annex ZA** (informative) **Relationship between this European Standard and the essential Requirements of EU Directive 89/106/EEC, EU Construction Products Directive**	Pass.	**P**
ZA.1	**Scope and relevant characteristics**	Passed relevant characteristics listed in Table ZA.1 according to requirement clauses in this standard.	**P**
ZA.2	**Procedure for attestation of conformity of shower enclosures**	Attestation of conformity system: 4 Directive 89/106/EEC, Annex III.2 (ii), third possibility.	**P**
ZA.2.1	**System of attestation of conformity**	Attestation of conformity system: 4 Directive 89/106/EEC, Annex III.2 (ii), third possibility.	**P**
ZA.2.2	**Declaration of conformity**	EC declaration of conformity provided.	**P**
ZA.3	**CE marking**	Marking design of the shower enclosure provided.	**P**

- END -