BRITISH STANDARD

BS EN
1036-2:2008

Glass in building — Mirrors from silver-coated float glass for internal use —

Part 2: Evaluation of conformity; product standard

ICS 81.040.20

BSI
British Standards

National foreword

This British Standard is the UK implementation of EN 1036-2:2008.

The UK participation in its preparation was entrusted by Technical Committee B/520, Glass and glazing in building, to Subcommittee B/520/1, Basic and transformed glass products.

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.

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 March 2008

ISBN 978 0 580 58587 6

Amendments/corrigenda issued since publication

Date	Comments

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1036-2

February 2008

ICS 81.040.20

English Version

Glass in building - Mirrors from silver-coated float glass for internal use - Part 2: Evaluation of conformity; product standard

Verre dans la construction - Miroirs en glace argentée pour l'intérieur - Partie 2: Evaluation de la conformité; norme de produit

Glas im Bauwesen - Spiegel aus silberbeschichtetem Floatglas für den Innenbereich - Teil 2: Konformitätsbewertung; Produktnorm

This European Standard was approved by CEN on 29 December 2007.

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Ref. No. EN 1036-2:2008: E

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Foreword

This document (EN 1036-2:2008) has been prepared by Technical Committee CEN/TC 129 “Glass in building”, the secretariat of which is held by NBN.

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of an identical text or by endorsement, at the latest by August 2008, and conflicting national standards shall be withdrawn at the latest by August 2008.

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 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA which is an integral part of this document.

EN 1036 *Glass in building — Mirrors from silver-coated float glass for internal use* consists of the following parts:

Part 1: Definition, requirements and test methods

Part 2: Evaluation of conformity; product standard

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

1 Scope

This European Standard specifies requirements, the evaluation of conformity and the factory production control of flat mirrors from silver-coated float glass for internal use in buildings.

NOTE For glass products with electrical wiring or connections for, e.g. alarm or heating purposes, other directives, e.g. Low Voltage Directive, may apply.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 356, *Glass in building — Security glazing — Testing and classification of resistance against manual attack*

EN 410, *Glass in building — Determination of luminous and solar characteristics of glazing*

EN 572-1, *Glass in building — Basic soda lime silicate glass products — Part 1: Definition and general physical and mechanical properties*

EN 572-2, *Glass in building — Basic soda lime silicate glass products — Part 2: Float glass*

EN 572-8, *Glass in building — Basic soda lime silicate glass products — Part 8: Supplied and final cut sizes*

EN 673, *Glass in building — Determination of thermal transmittance (U value) — Calculation method*

EN 1036-1:2007, *Glass in building — Mirrors from silver-coated float glass for internal use — Part 1: Definitions, requirements and test methods*

EN 1063, *Glass in building — Security glazing — Testing and classification of resistance against bullet attack*

EN 12600, *Glass in building — Pendulum test — Impact test method and classification for flat glass*

EN 12758, *Glass in building — Glazing and airborne sound insulation — Product descriptions and determination of properties*

EN 12898, *Glass in building — Determination of the emissivity*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13501-2, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services*

EN 13501-5, *Fire classification of construction products and building elements — Part 5: Classification using data from external fire exposure to roofs tests*

EN 13541, *Glass in building — Security glazing — Testing and classification of resistance against explosion pressure*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in EN 1036-1:2007 and the following apply.

3.1
Initial Type Testing (ITT)
determination of the performance of a product (characteristic, durability), on the basis of either actual tests or other procedures (such as conventional, standardised, tabulated or general accepted values, standardised or recognised calculation methods, test reports when made available,…), in accordance with this European Standard that demonstrates compliance with this European Standard

3.2
test report
document that covers the results of tests undertaken on a representative sample of the product from production or on a prototype design of the product

3.3
product description
document that details the relevant parameters, e.g. process conditions, structure, for defining a product that complies with the standard. It includes specific reference(s) to characteristics that are modified by the production process

3.4
significant change
variation in performance beyond the permitted tolerance for the characteristic

4 Requirements

4.1 Product description

For conformity purposes the mirror manufacturer is responsible for the preparation and maintenance of the product description. This description shall describe the product and/or product families.

Disclosure of the product description shall be at the discretion of the mirror manufacturer or his agent except in the case of regulatory requirements.

The description shall contain at least a normative part. The description may also contain an informative part, when the manufacturer foresees further development of the product.

The normative part of the description shall contain the following information:

— reference to EN 1036-1 and -2 and all other standards with which the manufacturer claims compliance;

— materials making up the layers of the mirror;

— glass substrates.

The layers may be listed either in full, i.e. chemical composition, or by manufacturers' code.

The substitution of materials shall maintain the conformity with the product description. The substituting material can be added to the product description when compliance has been demonstrated.

4.2 Conformity with the definition of mirror

Products shall conform to the definition and fulfil the requirements of mirror as defined in EN 1036-1.

4.3 Determination of the characteristic's performances

4.3.1 Characteristics of mirror

4.3.1.1 General

The characteristics of mirror are in general those of the glass substrate (see 4.3.1.2).

4.3.1.2 Characteristics of the soda lime silicate glass panes used for the production of mirrors

Panes shall be made of soda lime silicate float glass according to EN 572-1, EN 572-2, 572-8.

For the characteristics listed in Table 1, for the soda lime silicate glass panes, generally accepted values or calculated values shall be used.

Since the mirror production process does not change the majority of the characteristics of Table 1 significantly they shall be used for mirrors. The characteristics that are significantly changed are the light transmittance/reflectance and solar heat transmittance/reflectance.

Table 1 — Information on the characteristics of soda lime silicate glass panes, according to EN 572-1, used for the production of mirrors

Characteristic	Symbol	Unit
- density	ρ	kg/m³
- hardness	$HK_{0,1/20}$	GPa
- young's modulus	E	Pa
- poisson's ratio	μ	dimensionless
- characteristic bending strength	$f_{g,k}$	Pa
- resistance against sudden temperature changes and temperature differentials		K
- specific heat capacity	c	J/(kg·K)
- coefficient of linear expansion	α	K^{-1}
- thermal conductivity (for *U*-value)	λ	W/(m·K)
- mean refractive index to visible radiation	n	dimensionless
- emissivity	ε	dimensionless
- light transmittance	τ_v	dimensionless
- solar direct transmittance	τ_e	dimensionless
- total energy transmittance	g	dimensionless

4.3.2 Determination of characteristics of mirrors

4.3.2.1 General

If the mirror manufacturer wishes to claim that any performance characteristic is independent of the production equipment used then the factory production control system shall be in accordance with this European Standard including his specific process control conditions.

NOTE Products complying with the definition from EN 1036-1, are unlikely to be capable of being classified for the following characteristics: 4.3.2.2; 4.3.2.5; 4.3.2.6; 4.3.2.7; 4.3.2.8.

4.3.2.2 Safety in the case of fire - Resistance to fire

Fire resistance shall be determined and classified in accordance with EN 13501-2.

NOTE EN 357 can be used as a classification reference specific to fire resistant glazed elements.

4.3.2.3 Safety in the case of fire - Reaction to fire

Reaction to fire shall be determined and classified in accordance with EN 13501-1.

Mirrors, manufactured from silvered float glass, are products/materials that do not require to be tested for reaction to fire (e.g. products/materials of Classes A1 according to Commission Decision 96/603/EC, as amended 2000/605/EC).

4.3.2.4 Safety in the case of fire - External fire behaviour

Where the manufacturer wishes to declare external fire performance (e.g. when subject to regulatory requirements), the product shall be tested in accordance with EN 13501-5.

4.3.2.5 Safety in use - Bullet resistance: shatter properties and resistance to attack

Bullet resistance shall be determined and classified in accordance with EN 1063.

4.3.2.6 Safety in use - Explosion resistance: impact behaviour and resistance to impact

Explosion resistance shall be determined and classified in accordance with EN 13541.

4.3.2.7 Safety in use - Burglar resistance: shatter properties and resistance to attack

Burglar resistance shall be determined and classified in accordance with EN 356.

4.3.2.8 Safety in use - Pendulum body impact resistance: shatter properties (safe breakability) and resistance to impact

Pendulum body impact resistance shall be determined and classified in accordance with EN 12600.

4.3.2.9 Safety in use - Mechanical resistance: Resistance against sudden temperature changes and temperature differentials

The resistance against sudden temperature changes and temperature differentials is a generally accepted value that is given in EN 1036-1 and shall be ensured by compliance with this European Standard.

4.3.2.10 Safety in use - Mechanical resistance: Resistance against wind, snow, permanent load and/or imposed loads of the glass unit

The mechanical strength of mirror is a characteristic value that is given in EN 572-1 and shall be ensured by compliance with this European Standard.

As long as on the concerned construction or building site no part of the design standards[1)] is applicable then the current method available in the country of destination shall be applied.

The manufactured or supplied thickness of mirror shall conform to the ordered thickness.

4.3.2.11 Protection against noise - Direct airborne sound reduction

The sound reduction indexes shall be determined in accordance with EN 12758. However, the information supplied with the incoming glass can be used as the mirror production process does not alter the values.

4.3.2.12 Energy conservation and heat retention - Thermal properties

The thermal transmittance value (*U*-value) shall be determined by calculation in accordance with EN 673 with:

— emissivity ε: the declared value of the glass manufacturer. If the information is not available, the emissivity shall be determined in accordance with EN 12898;

— nominal thickness of the glass panes.

4.3.2.13 Energy conservation and heat retention - Radiation properties: Light transmittance and reflectance

The light transmittance and reflectance shall be determined in accordance with EN 410.

4.3.2.14 Energy conservation and heat retention - Radiation properties: Solar energy characteristics

The solar energy transmittance and reflectance shall be determined in accordance with EN 410.

4.4 Durability

When products conform to the definition of mirror as 4.2 then the characteristics' performances in 4.3.2 are ensured during an economically reasonable working life.

The durability of glass products, including their characteristics, is ensured by the following:

— compliance with this European Standard;

— compliance with instructions from the glass product manufacturer or supplier.

The manufacturer shall supply specific installation instructions or make reference to appropriate technical specifications.

NOTE Also the durability of glass products depends on:

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1) Series prEN 13474 is in preparation.

— building and construction movements due to various actions;

— building and construction vibrations due to various actions;

— deflection and racking of the glass support due to various actions;

— glass support design (e.g. drainage of infiltrated water in the rebate, prevention of direct contact between glass support members and glass);

— accuracy of glass support and glass support member dimensions;

— quality of the assembling of glass support members up to a glass support;

— quality of installation of the glass support into or onto the buildings or constructions;

— glass support expansion due to adsorbed moisture from the air or other sources;

— the quality of installation of the glass product into or onto its support.

4.5 Dangerous substances

Materials used in products shall not release any dangerous substances in excess of the maximum permitted levels specified in a relevant European Standard for the material or permitted in the national regulations of the Member State of destination.

5 Evaluation of conformity

5.1 General

Evaluation of conformity in accordance with this European Standard shall be as a result of FPC and ITT in accordance with this European Standard:

1) Factory production control.

This shall include the following:

a) inspection of samples taken at the factory in accordance with a prescribed test plan;

b) initial inspection of the factory and of factory production control;

c) continuous surveillance and assessment of the factory production control.

2) Initial type testing of the product.

NOTE There can be a need to involve a third party, with 1b, 1c, and/or 2, for the purpose of regulatory marking (see Annex ZA).

5.2 Initial type testing of the product (see 5.1, 2))

5.2.1 General

5.2.1.1 Introduction

The product's characteristics shall be initial type tested to verify they are in conformity with the requirements. Instead of performing any actual testing, initial type testing may make use of:

— generally accepted and/or conventional and/or standardised values, mentioned in the relevant standards, or in publications that are referred to in the relevant standards;

— standardised calculation methods and recognised calculation methods mentioned in the relevant standards, or in publications that are referred to in the relevant standards;

— test report(s) on the basis of 5.2.1.3 when made available;

— where components are used, whose characteristics have already been determined, by the component manufacturer, on the basis of conformity with other product standards, these characteristics need not be re-assessed providing they remain unchanged by the manufacturing process;

— release of dangerous substances maybe assessed indirectly by controlling the amount of the substance concerned;

— durability may be assessed indirectly by controlling the production processes according to this European Standard.

NOTE 1 Products CE marked in accordance with appropriate harmonised European specifications can be presumed to have the performances stated with the CE marking.

NOTE 2 There can be a need to involve a third party for the purpose of regulatory marking (see Annex ZA).

When actual testing is required then the Initial Type Testing (ITT) shall be undertaken on a sample representative of the product taken from direct production or a prototype, any plant and/or line.

Whenever a change occurs in the raw material or the production process (subject to the definition of the family), which would change significantly one or more of the characteristics, the type tests shall be repeated for the appropriate characteristics.

5.2.1.2 Multiple lines/sites

If a manufacturer operates one and/or more lines and/or sites, the following can reduce the requirement for multiple Initial Type Testing (ITT):

i) the manufacturers' technical file for a product shall specifically cover all sites and/or lines of the same manufacturer[2)];

ii) the manufacturer shall establish a direct relationship between production control, Initial Type Testing (ITT) and on-going internal audit testing;

iii) the manufacturer has a responsible individual designated to ensure product compliance based on:

— the operation of a consistent Factory Production Control (FPC) system on all applicable sites and/or lines;

— the manufacturer having obtained evidence that shows the product to be consistent, with respect to both product characteristics and intended use characteristics;

— the manufacturer has in place an internal auditing scheme, including product consistency.

[2)] The terms 'manufacturer' and 'producer' are understood as being synonyms (see CPD working document NB-CPD/02/019-issued 24 April 2002 – page1).

5.2.1.3 Historic data

(a) For all characteristics except those listed in 5.2.2 the following applies:

tests previously performed in accordance with the provisions of this standard (same product, same characteristic(s), same or more onerous test method, sampling method and attestation of conformity) may be taken into account.

(b) For characteristics listed in 5.2.2, the following applies:

tests previously performed in accordance with the provisions of this European Standard may be taken into account when all of the following conditions are met:

1) the results of tests conducted have been confirmed;

NOTE A Notified Body should confirm the results of tests conducted by a non-notified testing body and as far as he is satisfied with the competence of the testing body.

2) tests have been conducted in accordance with a prEN version that shall not be materially different from the EN with regard to the impact on testing;

3) the test work has been completed before the end of the transition period, i.e. within 21 months of the date of availability of this European Standard.

5.2.2 Initial type testing of mirror

5.2.2.1 General

Initial Type Testing (ITT) if a product conforms to the definition of mirror, shall consist of:

a) light reflectance measurement in accordance with EN 1036-1;

b) neutral salt spray test (NSS) in accordance with EN ISO 9227;

NOTE Not applicable to copper-free mirror.

c) copper accelerated acetic acid salt spray test (CASS) in accordance with EN ISO 9227;

d) condensation water test at constant temperature in accordance with EN 1036-1;

e) protective coating adhesion test in accordance with EN ISO 9227.

5.2.2.2 Test specimens

The test specimens needed for the initial type test shall be processed from mirror in accordance with this European Standard.

The number and dimensions of test specimens are given in Table 2.

Table 2 — Details of sample number and dimension for initial type testing

Test	Number of tests pieces	Dimensions of tests pieces
Light reflectance	One sample for 6 mm thickness or the maximum thickness produced not exceeding 6 mm	Depends on spectrophotometer
NNS	3 test pieces over the width *B* of the ribbon, one on the centre, 2 at 300 mm from the edge	100 mm × 100 mm
CASS	3 test pieces over the width *B* of the ribbon, one on the centre, 2 at 300 mm from the edge	100 mm × 100 mm
Water condensation	3 test pieces over the width *B* of the ribbon, one on the centre, 2 at 300 mm from the edge	100 mm × 100 mm
Protective coating adhesion	3 test pieces over the width *B* of the ribbon, one on the centre, 2 at 300 mm from the edge	100 mm × 100 mm

5.2.2.3 Test results

The test specimens shall be assessed for acceptance using the criteria in 8.1.5 of EN 1036-1:2007.

5.2.3 Initial type testing of characteristic's performances

For Initial Type Testing, (see 5.2.1), of the characteristics refer to 4.3.2.

5.3 Factory production control and inspection of samples in accordance with a prescribed test plan (see 5.1, 1) a))

Factory production control means the permanent internal control of production exercised by the manufacturer.

All elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures. This production control system documentation shall ensure a common understanding of quality assurance and enable the achievement of the required product characteristics and the effective operation of the production control system to be checked.

A factory production control according to Annex A of this standard satisfies to this definition.

NOTE 1 A factory production control system similar to EN ISO 9001 made product specific to this European Standard is deemed to satisfy the requirements of this clause.

NOTE 2 There can be a need to involve a third party for the purpose of regulatory marking (see Annex ZA).

Annex A also summarizes the tests to be carried out by the manufacturer as part of the production control in the factory, and as further testing of samples taken at the factory in accordance with a prescribed test plan.

5.4 Initial inspection of factory and of factory production control (see 5.1, 1) b))

The initial inspection of the factory and of the factory production control shall cover the parameters listed in Table 3.

NOTE There can be a need to involve a third party for the purpose of regulatory marking (see Annex ZA).

Table 3 — Characteristics of interest for the Factory Production Control (FPC)

Nr	Characteristic	Interested parameter related to the characteristic	For details, refer to
A	Resistance to fire Reaction to fire External fire behaviour	- checking incoming materials - product control after mirror production (not required for reaction to fire) - labelling outgoing glass product	Annex A
B	Release of dangerous substances	- checking incoming materials	Annex A
C	Bullet resistance Explosion resistance Burglar resistance Pendulum body impact resistance Resistance against sudden temperature Changes and temperature differentials Wind, snow, permanent and imposed load resistance of the glass unit	- labelling incoming glass - labelling outgoing glass product	Annex A
D	Direct airborne sound reduction Thermal properties Radiation properties: – light transmittance and reflection – solar energy characteristic	- checking incoming glass - product control after mirror production (not required for sound reduction) - labelling outgoing product	Annex A

5.5 Continuous surveillance and assessment of the factory production control (see 5.1, 1) c))

The continuous surveillance, assessment and approval of the factory production control shall cover the parameters listed in Table 3.

NOTE There can be a need to involve a third party for the purpose of regulatory marking (see Annex ZA).

The frequency of production surveillance shall be twice per year for new production facilities or for facilities that do not already have an established factory production control system in accordance with this standard. When assessment of FPC fails to identify major non-conformances during four successive assessments, the frequency can be reduced to once a year.

When a negative result is recorded, the inspection shall be repeated within two months. The frequency of production surveillance shall return to, or remain at twice a year. When the repeated inspection also results in a negative record, then the production shall be subject within two months to a repeated initial inspection of the factory and of the factory production control together with a surveillance inspection. When this repeated initial inspection and surveillance inspection also results in a negative record then the products are considered as no longer conforming to this European Standard.

6 Marking and/or labelling

6.1 General

All voluntary marking and/or labelling shall comply with Annex C.3.

Care shall be taken to ensure that any voluntary marking and/or labelling does not cause confusion with respect to the mandatory requirements.

NOTE All marking and/or labelling of product to demonstrate compliance with the regulatory requirement is detailed in Annex ZA.

6.2 Product marking

There is no requirement to mark mirrors.

6.3 Product characteristics

The manufacturer or his agent shall organise a system of references that allows for the following:

— the identification of exactly which characteristics have to be assessed (see 4.3.2);

— those characteristics that will be assessed;

— the values, classes, categories, etc. that have been determined for those characteristics.

This system shall be documented as part of the evaluation of conformity.

6.4 “Characteristics/performance identification paper”

The manufacturer shall prepare a “characteristics/performance identification paper” based on the information collected on the product characteristics (see 6.3). This document shall be part of the manufacturer's technical file and is the basis for the accompanying information as required for regulatory purposes.

The "characteristics/performance identification paper" can be a catalogue in any media format (paper, disk, website etc.), always identifiable by the reference that accompanies the marking with the product. The catalogue shall contain the values or classes of the characteristics for which a performance is declared. If no performance is declared, an indication of no performance determined (NPD) shall be made.

NOTE The catalogue should not contain any information other than that relevant to the “characteristics/performance identification paper”.

Annex A
(normative)

Factory Production Control (FPC)

A.1 Factory Production Control (FPC) requirements

A.1.1 General

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.1.2 Organisation

A.1.2.1 Responsibility and authority

The responsibility, authority and the interrelation of all personnel who manage, perform and verify work affecting conformity shall be defined, particularly for personnel who have the organizational freedom and authority to:

a) initiate action to prevent the occurrence of product non-conformity;

b) identify and record any product non-conformances.

A.1.2.2 Management representative for factory production control

The manufacturer shall appoint a management representative who, irrespective of other responsibilities, shall have defined authority and responsibility for ensuring that the requirements of this European Standard are implemented and maintained.

A.1.2.3 Management review

The production control system shall be reviewed by the manufacturer's management at appropriate intervals in accordance with the manufacturer's control to ensure its continuing suitability and effectiveness. Records of such reviews shall be maintained for a minimum of 5 years.

A.1.3 Control system

A.1.3.1 General

The manufacturer shall establish and maintain a documented system as a means of ensuring that the product conforms to EN 1036-1. The following requirements shall be fulfilled.

A.1.3.2 Personnel

The manufacturer shall use appropriately trained personnel for the operation and inspections of all production and inspection equipment.

A.1.3.3 Documentation

The manufacturer's documentation and procedures shall be relevant to the production and process control of mirror, and shall be adequately described in a manual which shall include:

a) the organizational structure, responsibilities and authorities of the management with regard to product conformity;

b) the procedures for specifying and verifying the incoming materials;

c) the manufacturing, production control and other techniques, processes and systematic actions that will be used;

d) the inspections that will be carried out before production, the inspections and tests during and after production, and the frequency at which they will be carried out;

e) required records of the inspections, test and assessments;

f) non-conformity situations requiring corrective action and the action taken;

g) unless otherwise indicated in national regulation, records shall be kept for a minimum of one year after manufacturing the product.

A.1.3.4 Test equipment

Calibration of test equipment necessary for factory production control shall be documented.

NOTE The precision of calibration required is implied by the accuracy of the test method and tolerances specified.

A.1.3.5 Inspection and testing

Clause A.3 designates the inspections and tests by means of tables. The requirements and records are normative. Test methods are recommended and therefore only given as information. The frequencies are also recommended and therefore given as information, except when otherwise designated.

NOTE The recommended frequencies should be regarded as a minimum frequency.

A.2 Marking

The manufacturer shall establish, document and maintain procedures for marking of the products. The product shall be marked in accordance with the established documents.

For tracing purposes, the manufacturer shall establish and maintain the records required in A.3.

A.3 Inspection and testing tables of mirror production

A.3.1 Information in Table A.1

Table A.1 consists of three parts:

— section 1: material control;

— section 2: production control;

— section 3: product control.

When a manufacturing process is such that one or more of the listed inspections or tests are not applicable or physically not practical, the concerned inspection or test shall be ignored.

The inspections and/or tests on incoming materials shall be carried out before use.

In case of non-conforming materials, action shall be taken so that:

— non-conforming raw materials are not used;

— non-conforming products are not to be delivered.

The required records in Table A.1 can be any document, e.g. order documents, production documents, logbook etc., as described in the quality procedures and associated documentation.

For those criteria where no record is required this situation only applies until a complaint regarding that criteria is received. Records shall subsequently be kept to show that corrective action has been successful.

A.3.2 Production control

The machinery and equipment used for manufacturing the products are checked at periods consistent with the manufacturers' documented process control against defined parameters, maintained and adjusted for optimal results.

A.3.3 Product control

The inspection and testing of mirror shall be undertaken after the completion of the manufacturing process.

A.3.4 Use of proxy testing

A manufacturer may employ a test method/method of evaluation other than those referred to in Table A.1. However, it is the manufacturer's responsibility to prepare suitable documentation describing such tests and their correlation with the recommended method to ensure that the appropriate characteristic is as claimed.

Table A.1 — Inspection and test table for mirror

Section 1: Incoming material					
Ref.	Material, inspection or test	Recommended method (decision to be made by manufacturer)	Requirement	Recommended frequency (decision to be made by manufacturer)	Record
1.1	Incoming material glass				
1.1.1	Identification, including packaging and label	Visual	See purchase specification	Each delivery	Yes
1.1.2	CE Mark labelling inc accompanying documentation	Visual	See purchase specification	Each delivery	Yes
1.2	Incoming materials for mirror production, e.g. silvering solutions, paint				
1.2.1	Delivery documentation (including identification, packaging, labelling and batch number)	Visual	See purchase specification	Each delivery	Yes
1.2.2	Analysis certificate	Visual	See purchase specification	Each delivery	Yes
Section 2: Production control					
Ref.	Material, inspection or test	Recommended method (decision to be made by manufacturer)	Requirement	Recommended frequency (decision to be made by manufacturer)	Record
2.1	Process control				
2.1.1	Process conditions	See standard operating procedure	See standard operating procedure	See standard operating procedure	Yes

Table A.1 (*concluded*)

Section 3: Product control					
Ref.	Inspection or test	Recommended method (decision to be made by manufacturer)	Requirement	Frequency (normative)	Record
3.1	Reflectance properties				
3.1.1	Light reflectance	Measurement	See EN 1036-1	1 per month	Yes
3.1.2	Silver thickness	Measurement	See EN 1036-1	1 per day	Yes
3.2	Dimensions				
3.2.1	Dimensions as cut finished sizes	Measurement	See EN 1036-1	1 per day [a]	Yes
3.3	Visual aspects				
3.3.1	Appearance of mirror	Visual	See product specification	1 sheet per day	Yes
3.4	Protective coating				
3.4.1	Thickness, adhesion	Measurement	See product specifications	1 sheet per day	Yes
3.5	Further testing				
3.5.1	Tests for ensuring conformity	See Annex B	See product specification	See product specification	Yes

[a] Assuming that as cut finished sizes are being produced.

Annex B
(informative)

Tests for ensuring conformity during factory production control

B.1 Information on ensuring durability conformity

Conformity of the durability of the mirror will be ensured as long as it conforms to the product subjected to the Initial Type Test (ITT). The mirror should conform to its product description.

The check on continuing conformity during production will be by tests that can be either:

— the Initial Type Test (ITT) on durability for verifying the mirror, all in accordance to EN 1036-1, or

— proxy testing, e.g. see dip test in B.2.

Proxy tests are developed by manufacturers themselves on the basis of experience collected from the feed back circuit from measuring deviations to re-adjustment of the process conditions. Those tests and the related optimal frequencies gained from the same experiences depend on the mirror and are the property of the manufacturer.

Proxy tests can also be standardized tests where the material or the requirements (frequency, numbers of cycles etc.) are changed.

B.2 Dip test

B.2.1 General

As an alternative to the Neutral Salt Spray (NSS) test, as per EN 1036-1, a dip test may be used in order to assess the resistance of the mirror to neutral salt.

B.2.2 Test method

After dipping about one half of the specimen in a 3 % NaCl solution at ordinary temperature for 24 h, the presence of corroded or coloured or diffused areas within reflective coating and bubbles in protective coatings is examined by visual observation.

B.2.3 Acceptance criteria

The manufacturer shall set appropriate criteria so as to ensure that the manufactured product is equivalent to that subjected to the ITT.

Annex C
(informative)

Provisions for voluntary involvement of third party(ies)

C.1 General

A manufacturer may employ third party(ies) for conformity assessment, which may involve a combination of initial type testing, inspection of factory production control, continuous surveillance and auditing of the product. The results of the conformity assessment may be used by the bodies acting for regulators in carrying out their assigned tasks.

C.2 Voluntary tasks for third parties

A third party may be voluntarily contracted to perform the initial type testing, inspection of Factory Production Control, continuous surveillance and auditing of the product.

Where a third party is voluntarily involved in the evaluation of conformity of the mirror covered by this European Standard then the assessment shall be in accordance with Clause 5.

A manufacturer may also voluntarily involve a third party in the control of characteristics, e.g. visual aspects, colour, that are over and above the characteristics that are required for regulatory purposes.

C.3 Marking and labelling

The format of the label and position should be agreed between the body involved and the manufacturer.

All marks and/or labels of a voluntary nature should be so affixed as not to be confused with those marks and/or labels that are required for regulatory purposes.

In order to prevent confusion with any regulatory marking and/or labelling then any marking and/or labelling associated with the involvement of third party(ies) on a voluntary basis should be accompanied with the following warning: "This marking/labelling has no relationship with any product characteristic covered by any legal marking and/or labelling".

Annex ZA
(informative)

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

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under a mandate M/135 “Flat glass, profiled glass and glass block products” given to CEN by the European Commission and the European Free Trade Association.

The clauses of this European Standard shown in this annex meet the requirements of mandate M/135 given under the EU Construction Products Directive (89/106/EEC).

Compliance with these clauses confers a presumption of fitness of the mirror characteristics covered by this annex for the intended uses herein; reference should be made to the information accompanying the CE marking.

WARNING: Other requirements and other EU Directives, not affecting the fitness for intended uses, can be applicable to mirror falling within the scope of this European Standard.

NOTE 1 In addition to any specific clauses relating to dangerous substances contained in this European Standard, there may be other requirements applicable to products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

NOTE 2 An informative database of European and national provisions on dangerous substances is available at the Construction web site on EUROPA (accessed through http://ec.europa.eu/enterprise/construction/internal/dangsub/dangmain_en.htm).

This annex has the same scope as Clause 1 of this standard with regard to the products covered. It establishes the conditions for the CE marking of mirror intended for the use indicated below and shows the relevant clauses applicable (see Table ZA.1).

Construction Product: Mirror for internal use

Intended uses: In buildings and construction works

Table ZA.1 — Relevant clauses for mirror and intended use in buildings and construction works

Product: mirror as covered under the scope of this standard **Intended use**: **in buildings and construction works**			
Essential Characteristics	**Requirements in this and other European Standard(s)**	**Mandated Levels and/or classes**	**Notes**
Safety in the case of fire –			
Resistance to fire (for glass for use in a glazed assembly intended specifically for fire resistance)	4.2, 4.3.1 and 4.3.2.2	Any	Minutes
Reaction to fire	4.2, 4.3.1 and 4.3.2.3	Any	Euroclasses
External fire performance (for roof coverings only)	4.2, 4.3.1 and 4.3.2.4	Any	Euroclasses
Safety in Use –			
Bullet resistance: shatter properties and resistance to attack	4.2, 4.3.1 and 4.3.2.5	-	Classes of convenience
Explosion resistance: impact behaviour and resistance to attack	4.2, 4.3.1 and 4.3.2.6	-	Classes of convenience
Burglar resistance: shatter properties and resistance to attack	4.2, 4.3.1 and 4.3.2.7	-	Classes of convenience
Pendulum body impact resistance: Shatter properties(safe breakability) and resistance to impact	4.2, 4.3.1 and 4.3.2.8	-	Classes of convenience
Mechanical resistance: Resistance against sudden temperature changes and temperature differentials	4.2, 4.3.1 and 4.3.2.9	-	K and/or °C
Mechanical resistance: resistance against wind, snow, permanent and imposed load and/or imposed loads of the glass unit	4.2, 4.3.1 and 4.3.2.10	-	mm

Table ZA.1 (*concluded*)

Protection against noise: direct airborne sound reduction	4.2, 4.3.1 and 4.3.2.11	-	dB
Energy conservation and heat retention:			
thermal properties	4.2, 4.3.1 and 4.3.2.12	-	W/(m²·K)
radiation properties:			
- light transmittance and reflectance	4.2, 4.3.1 and 4.3.2.13	-	Fractions or %
- solar energy characteristics	4.2, 4.3.1 and 4.3.2.14	-	Fractions or %

The requirement on a certain characteristic is not applicable in those Member States where there are no regulatory requirements on that characteristic for the intended end use of the product. In this case, manufacturers placing their products on the market of these Member States are not obliged to determine nor declare the performance of their products with regard to this characteristic and the option “No performance determined” (NPD) in the information accompanying the CE marking (see ZA.3) may be used. The NPD option may not be used, however, where the characteristic is subject to a threshold level.

ZA.2 Procedure(s) for the attestation of conformity of mirror products

ZA.2.1 System(s) of attestation of conformity

The systems of conformity for mirror indicated in Table ZA.1 are in accordance with the Decision of the Commission 2000/245/EC of 2000-02-02 as amended by the EC decision 01/596/EC and as given in Annex III of the mandate for “Flat glass, profiled glass and glass block products”, is shown in Table ZA.2 for the indicated intended use(s) and relevant level(s) or classes:

Table ZA.2 — System(s) of attestation of conformity

Product(s)	Intended use(s)	Level(s) or class(es)	Attestation of conformity system(s)
mirror	For used in a glazed assembly intended specifically to provide fire resistance	Any	1
	For uses subject to reaction to fire regulations	Euroclass A1*	4
	For uses subject to external fire performance regulations	Products requiring testing ---------- Products "deemed to satisfy" without testing	3 ---------- 4
	For use as anti-bullet, or anti-explosion glazing ---------- For other uses liable to present "safety-in-use" risks and subject to such regulations	- ---------- -	1 ---------- 3
	For uses relating to energy conservation and/or noise reduction	-	3
	For uses other than those specified above	-	4
System 1: see Directive 89/106/EEC (CPD) Annex III.2.(i), without audit-testing of samples. System 3: see Directive 89/106/EEC (CPD) Annex III.2.(ii), Second possibility. System 4: see Directive 89/106/EEC (CPD) Annex III.2.(ii), Third possibility			
* Products/materials that do not require to be tested for reaction to fire (e.g. products/materials of Classes A1 according to Commission Decision 96/603/EC, as amended 2000/605/EC)			

The attestation of conformity of the mirror in Table ZA.1 shall be based on the evaluation of conformity procedures indicated in Tables ZA.3.1 to ZA.3.3 resulting from the application of the clauses of this or other European Standard indicated therein.

Where more than one table applies for the product, i.e. because its intended use makes different characteristics relevant, Table ZA.3.1 has to be read in conjunction with subsequent tables in order to determine which characteristics assigned by the manufacturer in Table ZA.3.1 are type tested by a notified test lab (system 3) and which by the manufacturer (system 4).

Table ZA.3.1 — Assignment of evaluation of conformity tasks for mirror under system 1

Tasks		Content of the task	Evaluation of conformity clauses to apply
Tasks for the Manufacturer	Factory Production Control (FPC)	Parameters related to all relevant characteristics of Table ZA.1	5.3
	Further testing of samples taken at factory	All relevant characteristics of Table ZA.1	Annex A
	Initial Type Testing (ITT)	All relevant characteristics of Table ZA.1, except: - resistance to fire; - anti-bullet; - anti-explosion	5.2
Tasks for the notified body	Initial Type Testing (ITT)	Resistance to fire; anti-bullet; anti-explosion	5.2
	Initial inspection of factory and FPC	Parameters related to all relevant characteristics of Table ZA.1, in particular: - resistance to fire; - anti-bullet; - anti-explosion	5.4
	Continuous surveillance, assessment and approval of FPC	Parameters related to all relevant characteristics of Table ZA.1, in particular: - resistance to fire; - anti-bullet; - anti-explosion	5.5

Table ZA.3.2 — Assignment of evaluation of conformity tasks for mirror under system 3

Tasks		Content of the task	Evaluation of conformity clauses to apply
Tasks for the Manufacturer	Factory Production Control (FPC.)	Parameters related to all relevant characteristics of Table ZA.1	5.3
	Initial Type Testing (ITT)	All other relevant characteristics of Table ZA.1 other than those shown below	5.2
Tasks for the notified body	Initial Type Testing (ITT)	External fire performance Burglar resistance Pendulum body impact resistance Direct airborne sound insulation Thermal properties Radiation properties: – light transmittance and reflection; – solar energy characteristics	5.2

Table ZA.3.3 — Assignment of evaluation of conformity tasks for mirror under system 4

Tasks		Content of the task	Evaluation of conformity clauses to apply
Tasks for the Manufacturer	Factory Production Control (FPC)	Parameters related to all relevant characteristics of table ZA.1	5.3
	Initial Type Testing (ITT)	All relevant characteristics of Table ZA.1, i.e. external fire performance	5.2

ZA.2.2 EC Certificate and Declaration of conformity

In case of products with system 1: When compliance with the conditions of this annex is achieved, the certification body shall draw up a certificate of conformity (EC Certificate of conformity), which entitles the manufacturer to affix the CE marking. This certificate shall include:

— name, address and identification number of the certification body;

— name and address of the manufacturer, or his authorised representative established in the EEA, and place of production;

NOTE 1 The manufacturer may also be the person responsible for placing the product onto the EEA market, if he takes responsibility for CE marking.

— description of the product (type, identification, use,…),

NOTE 2 Where some of the information required for the Declaration is already given in the CE marking information, it does not need to be repeated.

— provisions to which the product conforms (i.e. Annex ZA of this EN 1036-2);

— particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions);

— the number of the certificate;

— conditions and period of validity of the certificate, where applicable;

— name of, and position held by, the person empowered to sign the certificate.

In addition, the manufacturer shall draw up a declaration of conformity (EC Declaration of conformity) including the following:

— name and address of the manufacturer, or his authorised representative established in the EEA;

— name and address of the certification body;

— description of the product (type, identification, use, ...), and a copy of the information accompanying the CE marking;

— provisions to which the product conforms (i.e. Annex ZA of this EN 1036-2);

— particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions);

— number of the accompanying EC Certificate of conformity;

— name of, and position held by, the person empowered to sign the declaration on behalf of the manufacturer or of his authorised representative.

In case of products under system 3: When compliance with the conditions of this Annex is achieved, the manufacturer or his agent established in the EEA shall prepare and retain a declaration of conformity (EC Declaration of conformity), which entitles the manufacturer to affix the CE marking. This declaration shall include:

— name and address of the manufacturer, or his authorised representative established in the EEA, and place of production;

NOTE 3 The manufacturer may also be the person responsible for placing the product onto the EEA market, if he takes responsibility for CE marking.

— description of the product (type, identification, use,...), and a copy of the information accompanying the CE marking;

NOTE 4 Where some of the information required for the Declaration is already given in the CE marking information, it does not need to be repeated.

— provisions to which the product conforms (i.e. Annex ZA of this EN 1036-2);

— particular conditions applicable to the use of the product, (e.g. provisions for use under certain conditions);

— name and address of the notified laboratory(ies);

— name of, and position held by, the person empowered to sign the declaration on behalf of the manufacturer or his authorised representative.

In case of products under system 4: When compliance with this Annex is achieved, the manufacturer or his agent established in the EEA shall prepare and retain a declaration of conformity (EC Declaration of conformity), which entitles the manufacturer to affix the CE marking. This declaration shall include:

— name and address of the manufacturer, or his authorised representative established in the EEA, and place of production;

NOTE 5 The manufacturer may also be the person responsible for placing the product onto the EEA market, if he takes responsibility for CE marking.

— description of the product (type, identification, use,...), and a copy of the information accompanying the CE marking;

NOTE 6 Where some of the information required for the Declaration is already given in the CE marking information, it does not need to be repeated.

— provisions to which the product conforms (i.e. Annex ZA of this EN 1036-2);

— particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions);

— name of, and position held by, the person empowered to sign the declaration on behalf of the manufacturer or of his authorised representative.

NOTE 7 Duplication of information between the declaration and certificate should be avoided. To avoid duplication of information, cross-reference between documents may be made when one contains more information than the other.

The above mentioned declaration and certificate shall be presented in the official language or languages of the Member State in which the product is to be used.

ZA.3 CE marking and labelling

The manufacturer or his authorised representative established within the EEA is responsible for the affixing of the CE marking. The CE marking symbol to affix shall be in accordance with Directive 93/68/EC and shall be shown on mirror (or when not possible it may be on the accompanying label, the packaging or on the accompanying commercial documents e.g. a delivery note). The following information shall accompany the CE marking symbol:

- identification number of the certification body (only for products under system 1);
- name or identifying mark and registered address of the producer;
- the last two digits of the year in which the marking is affixed;
- number of the EC Certificate of conformity or factory production control certificate (if relevant);
- reference to this European Standard;
- description of the product: generic name, material, dimensions, …and intended use;
- information on those relevant essential characteristics listed in Table ZA.1 which are to be declared presented as:
  - declared values and, where relevant, level or class (including “pass” for pass/fail requirements, where necessary) to declare for each essential characteristic as indicated in "Notes" in Table ZA.1,
  - as an alternative, standard designation(s) alone or in combination with declared values as above and
  - “No performance determined” for characteristics where this is relevant.

The “No performance determined” (NPD) option may not be used where the characteristic is subject to a threshold level. Otherwise, the NPD option may be used when and where the characteristic, for a given intended use, is not subject to regulatory requirements in the Member State of destination.

Figure ZA.1 gives an example of the information to be given on the product, label, packaging and/or commercial documents.

CE	*CE conformity marking, consisting of the "CE"-symbol given in directive 93/68/EEC.*
AnyCo Ltd, PO Box 21, B-1050	*Name or identifying mark and registered address of the producer*
08	*Last two digits of the year in which the marking was*
EN 1036-2	*No. of European Standard*
Mirror for internal use intended to be used in buildings and construction works	*Description of product and information on regulated characteristics*
Characteristics	
Resistance to fire	**NPD**
Reaction to fire	**A1**
External fire performance	**NPD**
Bullet resistance	**NPD**
Explosion resistance	**NPD**
Burglar resistance	**NPD**
Pendulum body impact resistance	**NPD**
Resistance against sudden temperature changes and temperature differentials	**40 K**
Wind, snow, permanent and imposed load resistance	**6 mm**
Direct airborne sound insulation	**31 –2 –3 dB**
Thermal properties	**5,6W/(m^2K)**
Radiation properties:	
Light transmission:	**NPD**
Light reflection	**0,86**
Solar energy characteristics	**NPD**

Figure ZA.1 — Example CE marking information

In addition to any specific information relating to dangerous substances shown above, the product should also be accompanied, when and where required and in the appropriate form, by documentation listing any other legislation on dangerous substances for which compliance is claimed, together with any information required by that legislation.

NOTE 1 European legislation without national derogations need not be mentioned.

NOTE 2 Affixing the CE marking symbol means, if a product is subject to more than one directive that it complies with all applicable directives.

Bibliography

[1] EN 357, *Glass in building — Fire resistant glazed elements with transparent or translucent glass products — Classification of fire resistance*

[2] prEN 13474 (all parts), *Glass in building — Design of glass panes*

[3] EN ISO 9001, *Quality management systems — Requirements (ISO 9001:2000)*

[4] EN ISO 9227, *Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227:2006)*

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