

## **Grade A – Revised Version for Processing mirror and glass**

### **1. Scope**

This standard specifies the product sorts, technical requirements, durability tests, inspection regulations, labels, packing, transport and storage for decorative mirror and glass.

### **2. Normative references**

This standard incorporates the appropriate normative references of the listed publications hereafter. All these publication are valid when this standard is published. It is necessary to study the possibility of applying subsequent amendments to or revisions of any of these publications to this standard only when the latest editions of the publications are available.

PrEN 1036: 1998      Glass in building – Mirrors from silver-coated float glass for internal use

GB 1720 -79                      Lacquer Adhesive Attraction Test Method

GB 2828-87                      Batch-by-Batch Inspection, Accounting & Sampling Process and Sampling Form

GB 2829-87                      Periodical Inspection, Accounting & Sampling Process and Sampling Form

### **3. Definitions**

#### **3. 1. Bubble**

Faults caused by existing gas as spots or patches during glass-making.

#### **4. 2. Ripple**

Wavy and colorless lines in glass

#### **3. 3. Scratch**

Faults caused by careless knocking or scraping on glass surface and coatings.

#### **3. 4. Color Bottom**

Visible gray, yellow or blue color on reflective bottom layer through mirror face because of glass corrosion, black and yellow tin mark, sucker impress etc.

#### **3. 5. Smear**

Dirt, such as splashy oil, aluminum dust, black spot, fingerprint etc., left on glass plating layer because of imperfect cleaning or absorption.

#### **3. 6. Stain**

Qualitative changes on coatings because of Oxidation.

#### **3. 7. Offset on Corner**

Offset of joint line of two edges from corner peak after mirror grinding.

#### **3. 8. White Corner**

White trace left on mirror corner after grinding.

#### **3. 9. Shell**

Deformity on bevel edge caused during machining process.

#### **3. 10. Rough Particle**

Irregular particles on mirror edge after grinding

#### **3.11. Grinding Trace**

Left grinding wheel trace after polishing.

#### **3.12. Edge Loss**

Lacquer cast or revealed reflective coating (without Lacquer coating) on ground edge.

**4. Product Sorts**

4.1. Products can be classified as Grade A and Grade B according to quality.

4.2. Products can be classified as Small-sized (S), Middle-sized (M) and Big-sized (B) Mirror according to area.

- S:  $S < 0.25 \text{ m}^2$
- M:  $0.25 \text{ m}^2 \leq S \leq 0.75 \text{ m}^2$
- B:  $0.75 \text{ m}^2 < S$

4.3. Products can be classified as Rectangle Mirror (rectangle, squareness) and Model Mirror according to shape.

**5. Technical Requirements**

5.1. Dimension Tolerance (Table 1)

Table 1:

NO.	ITEM	Grade A
1	Offset on Corner	$\leq 3\text{mm}$
2	White Corner (Suppose bevel width=B)	Unobvious when straight eye-inspection
3	Bevel or Groove Width Tolerance	$\leq 1.0\text{mm/m}$
4	Straight on Corner (acc. to radian)	$\leq 0.3 \text{ mm}$
5	Diagonal Tolerance (measurement)	$\leq 2 \text{ mm}$
6	Thickness Tolerance	$\pm 0.2 \text{ mm}$
7	Groove Dimension Tolerance (acc. to drawings or customer's specifications)	$\leq \pm 3\text{mm}$
8	Size Tolerance (acc. to drawings or customer's specifications)	$\pm 1.0 \text{ mm}$

5. 2. Appearance Requirements on Mirror Face and Back (Table 2)

Table 2:

NO.	ITEM		Grade A	
1	Spot fault such as bubble or smear	$< 0.4 \text{ mm}$	Permissible	
		0.4 - 0.5 mm	Permissible up to B 2 M 1 S 0	
		$> 0.50\text{mm}$	Not Permissible	
2	Scratch	Width $\leq 0.1\text{mm}$ Length $\leq 50\text{mm}$	Same position above	Permissible up to B 4 M 2 S 1
3	Edge Loss		Not permissible	
4	Rough Particle		Not permissible	
5	Scalloping on Bore Edge (No effect on safety and installation)		$\leq 3 \text{ mm}$	
6	Missing grinding	5%Perimeter of Big-sized Mirror 2%Perimeter of Middle-sized Mirror Not permissible on Small-sized and Model Mirror	B 2 M 1 S 0	
7	Stain		Not permissible	

8	Ripple and Color Bottom	Not permissible when straight eye-inspection
9	Grinding Trace	Not permissible
10	Transparent Spot	Not permissible
11	Shell	≤0.3mm
12	Scratches in grooves	2lines width ≤0.3mm / 0,5 m

13	Irregular cloudy on etching structure surface	Not permissible when straight eye-inspection
14	Hanger Position Tolerance Note: Glue should be neutral and vertical strip on hanger	≤3 mm
15	Note: Forbid to clean lacquer with corrosive cleaner abluent. (e.g. acidic or alkaline liquid)	Not permissible

## 5.2. Physics and Chemistry Performance (Table 3)

Table 3:

NO.	ITEM	INDEX
		Grade A
1	Lacquer Adhesive Attraction	Grade 2
2	Reflectivity (Silver-coating mirrors)	≥85%
3	Total laquer-thickness	≥ 45 μm
4	Silber layer thickness	≥ 0,7 g/m <sup>2</sup>
5	Base Coat	Committed after release
6	Top Coat	Committed after release

## 6. Test Methods

### 6.1. Dimension Tolerance

Use steel ruler with 0.5mm precision and 150mm length and vernier caliper with 0.02mm precision to measure.

### 6. 2. Appearance

Under natural light, observe object by eyesight from 0.5m distance.

#### 6. 3. 1. Lacquer Adhesive Attraction

Execute Lacquer Adhesive Attraction Test Methods in GB1720 and the poise is 100g.

#### 6. 3. 2. Reflectivity

Use diaphanometer.

#### 6. 3. 3. Transparent Spot

Use chest within 60W incandescence light (one) as light source, posit object at 120mm from the chest and observe by eyesight.

#### 6. 3. 4. Corrosion-resistance Tests

##### 6.3.4.1. General

It is required to pass a series of tests in accordance with the following specifications.

- NSS Neural Salt Spray Test (see ISO09227)
- CASS Copper Accelerated Acetic Acid Sault Spray Test (see ISO9227)

##### 6.3.4.2. Test Specimens

Silvered mirrors which are to be tested shall be stored in suitable conditions and for a sufficient

period to allow backing materials to cure. Just prior to testing, the silvered mirror shall be cut to the specimen size of 100mm X 100mm.

**6.3.4.3. Position of Specimens**

The Specimens shall be placed in testing cabinets with protective coating (painted) side up at an angle as defined by the standards.

For the humidity and salt spray tests these specimens shall be turned through 90° every 120h, without stopping the testing.

**6.3.4.4. Evaluation**

The specimens shall be examined in diffused daylight (maximum 600 lux at the mirror) against a black background. A magnifying glass (7X) shall be used to measure the maximum edge corrosion and spot fault diameter(s).

The determination of edge corrosion shall be carried out on:

- two vertical edges for the CASS test
- all four edges for the humidity and the salt spray tests

**6.3.4.5. Acceptance criteria**

Silvered mirror when tested in accordance with 6.3.4.1 and 6.3.4.4 shall comply with the following:

- discoloration of the protective coating surface shall be allowed.
- colored or diffused areas shall not be allowed within the reflective layer.
- Bubble in the protective coating surface shall not be allowed.

The acceptance criteria for edge corrosion and spot faults in the reflective coating are given in Table 4: Acceptance levels for edge corrosion and spot faults in the reflective coating after durability testing

Test type	Acceptance criteria
Neutral salt spray test according to ISO 9227 - edge corrosion - number of spots	After 240h ≤1.5mm 2 of 0.3mm < diameter ≤ 3mm 5 of diameter ≤ 0.3mm
CASS test according to ISO 9227 - edge corrosion - number of spot	After 120 h ≤ 2,5 mm 2 of 0.3mm < diameter ≤ 3mm 3 of diameter ≤ 0.3mm

**7. Inspection Regulations**

**7.1. Inspection before Leaving Factory**

**7.1.1.** Execute Common Check-up Level II with Normal Check-up One-off Sample Project in GB 2828, AQL=10, for Inspection before leaving factory.

**7.1.2.** Check-up Items: Indicated in 5.1 and 5.2

**7.2.1.** If there is one of the following situations, it is necessary to make Design Inspection:

- i. If a new item is developed or old items will be produced on a new production line
- ii. After production, if big changes such as structure, materials or craftwork may influence product performance
- iii. Inspection for normal production every half a year.

iv. If any national quality supervision organization demands to do Design Inspection.

**7.2.2.** Execute Distinguishability Level I Sampling Process in GB 2829 for Model Inspection. Random sample 8 pieces mirrors and the item, specimen quantity, RQL and Determination Groups are indicated in Table 5.

Table 5:

ITEM	SEPCIMEN QUANTITY	RQL	DETERMINATION GRUOPS
Appearance	8	50	3 4
Dimension Tolerance			
Physics and Chemistry Performance	3		0 1

**7.2.3.** Result Evaluation: If existing one disqualification in Appearance but qualified in Physics and Chemistry Performance, Model Inspection is qualified.

## 8. Label, Packing, Transport, Storage

### 8.1. Label

Indicate **company, address, production date, dimension, quantity** and words of ‘**dampproof**’ and ‘**crispness**’ on each article carton. Labels should be **trimly** adhered on **stated position**.

### 8.2. Packing

Adopt wooden box or carton and design **logically box sizes** for difference items to considering **transport safety**. There should be **Quality Certificate and Setting Instruction**. Do not use **tape protective ends, unqualified cartons and dirty cartons** to pack products.

### 8.3. Transport

Load and unload carefully, lay vertically and avoid extrusion for transport.

### 8.4. Storage

Articles should be stored in dry and ventilated warehouse and could not be jumbled with corrosive such as acid and alkali.

### 8.5. Quality Guarantee

If articles are stored within indicated storage conditions in Point 8.4, Guarantee will be one year since the date of delivery.

For more information, pls contact [Service@novalglass.com](mailto:Service@novalglass.com) or refer to [www.novalglass.com](http://www.novalglass.com)