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RAW GLASS/MIRRORS

MIROX MNGE TEST REPORT: EVALUATION OF STANDARD EN 1036-1 AND EN 1036-2 ON MIROX MNGE INITIAL TYPE TEST FOR CE MARKING

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Author(s)

: R. Pieters

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I. Chevalier, J.-P. Perez

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MIROX MNGE TEST REPORT:

EVALUATION OF STANDARD EN 1036-1

and EN 1036-2 ON Mirox MNGE

INITIAL TYPE TEST FOR CE MARKING

0. Executive summary and conclusions

This report describes the evaluation of the standard EN 1036-1 and EN 1036-2 '*Glass in building – Mirrors from silver-coated float glass for internal use*' on regular Mirox MNGE mirrors:

- Mirox MNGE mirror 4mm on clear float glass (FCLO)
- Mirox MNGE mirror 6mm on clear float glass (FCLO)

The following features of the standard EN 1036-1 were tested:

- Reflection characteristics of silvered mirrors
- Testing of silvered mirror: Durability
- Testing of silvered mirror: Protective coating(s) adhesion

Test results:

Both MNGE productions, i.e. 4 mm Mirox MNGE and 6 mm Mirox MNGE complied with the '*reflection characteristics of silvered mirrors*' as described in standard EN 1036-1.

4 mm Mirox MNGE complied with the '*Testing of silvered mirror: Durability*' and '*Testing of silvered mirror: Protective coating(s) adhesion*'.

- '*Testing of silvered mirror: Durability*' as described in standard EN 1036-1:
4 mm Mirox MNGE complied
- '*Testing of silvered mirror: Protective coating(s) adhesion*' as described in standard EN 1036-1:
4mm Mirox MNGE complied

1. Introduction

This report describes the evaluation of the standard EN 1036-1 and EN 1036-2 '*Glass in building – Mirrors from silver-coated float glass for internal use*' on regular MNGE mirror productions:

- 4 mm Mirox MNGE
- 6 mm Mirox MNGE

The following features of the standard EN 1036-1 were tested:

- Reflection characteristics of silvered mirrors
- Testing of silvered mirror: Durability
- Testing of silvered mirror: Protective coating(s) adhesion

2. Evaluation of the standard EN 1036-1 and EN 1036-2 '*Glass in building – Mirrors from silver-coated float glass for internal use*' on Mirox MNGE

2.1. Test specimens

The test specimens were processed from the PLF mirror according to Table 1. The number and dimensions of test specimens that we used are also given in Table 1.

Table 1: Details for the test specimens used for this evaluation.

Test	Number of tests pieces	Dimensions of tests pieces
Light reflectance	3 samples for 6 mm thickness and 3 samples for 4 mm thickness	100 mm × 100 mm
NSS	3 test pieces for 4 mm thickness over the width 3.21m: 1 on the centre, 2 at 300 mm from the edge (1 left and 1 right)	100 mm × 100 mm
CASS	6 test pieces for 4 mm thickness over the width 3.21m: 2 on the centre, 4 at 300 mm from the edge (2 left and 2 right)	100 mm × 100 mm
Water condensation	3 test pieces for 4 mm thickness over the width 3.21m: 1 on the centre, 2 at 300 mm from the edge (1 left and 1 right)	100 mm × 100 mm
Protective coating adhesion	3 test pieces for 4 mm thickness over the width 3.21m: 1 on the centre, 2 at 300 mm from the edge (1 left and 1 right)	100 mm × 100 mm

2.2. Reflection characteristics of MNGE mirrors (paragraph 6 of standard EN 1036-1)

2.2.1. *Measurement*

Measurement of reflectance was undertaken in accordance with the principle of EN 410 with the angle of incidence of the light within 8° of normal. Illuminant was D65 and observer 2°.

2.2.2. *Test results*

The reflectance was measured and gave the following results:

- for 4 mm Mirox MNGE: 91.2%, 91.5% and 91.9%
- for 6 mm Mirox MNGE: 88.7%, 89.7% and 90.2%

2.2.3. *Silvered mirrors made from clear float glass*

The criteria of minimum 86 % of reflectance for mirrors of 4 and 6 mm is fulfilled by 4 mm Mirox MNGE and 6 mm Mirox MNGE.

2.3. Testing of MNGE mirror: Durability (paragraph 8.1 of standard EN 1036-1)

The durability of 4 mm Mirox MNGE samples was determined by a number of tests, in accordance with the following specifications:

- NSS: Neutral salt spray test according to EN ISO 9227
- CASS: Copper accelerated acetic acid salt spray test according to EN ISO 9227
- Condensation water test at constant atmosphere (see normative Annex A of EN 1036-1)
- All tested samples should also fulfill following acceptance criteria from standard EN 1036-1 (see paragraph 8.1.5 on page 13 of standard EN 1036-1):
 - discolouration of the protective coating surface shall be allowed
 - coloured or diffused areas shall not be allowed within the reflective layer
 - bubbles in the protective coating surface shall not be allowed

2.3.1. *NSS: Neutral salt spray test according to EN ISO 9227*

- Test duration: 480 h
- Number of samples: 3
- Cutting conditions: the samples were cut just before testing; cutting oils were not used.
- Dimensions: 100 mm × 100 mm
- Method: EN ISO 9227
- No rotation of the samples
- Results:
 - The tested samples all **fulfill** the specifications of the standard EN 1036-1 (see Table 4 on page 14 of standard EN 1036-1)
 - The tested samples all **fulfill** the acceptance criteria described in paragraph 8.1.5 on page 13 of standard EN 1036-1.

2.3.2. *CASS: Copper accelerated acetic acid salt spray test according to EN ISO 9227*

- Test duration: 120 h
- Number of samples: 6
- Cutting conditions: the samples were cut just before testing; cutting oils were not used.
- Dimensions: 100 mm × 100 mm
- Method: EN ISO 9227
- No rotation of the samples
- Results:
 - The tested samples all **fulfill** the specifications of the standard EN 1036-1 (see Table 4 on page 14 of standard EN 1036-1)
 - The tested samples all **fulfill** the acceptance criteria described in paragraph 8.1.5 on page 13 of standard EN 1036-1.

2.3.3. *Condensation water test at constant atmosphere (see normative Annex A of EN 1036-1)*

- Test duration: 480 h
- Number of samples: 3
- Cutting conditions: the samples were cut just before testing; cutting oils were not used.
- Dimensions: 100 mm × 100 mm
- Method: normative Annex A of EN 1036-1
- No rotation of the samples
- Results:
 - The tested samples all **fulfill** the specifications of the standard EN 1036-1 (see Table 4 on page 14 of standard EN 1036-1)
 - The tested samples all **fulfill** the acceptance criteria described in paragraph 8.1.5 on page 13 of standard EN 1036-1.

2.4. **Testing of Mirox MNGE: Protective coating adhesion (paragraph 8.2 of standard EN1036-1)**

- Number of samples: 3
- Cutting conditions: cutting oils were not used.
- Dimensions: 100 mm × 100 mm
- Method: 'Cross cut test' given in EN ISO 2409
- Results:
 - The tested samples are **classified in class 2**, both for Cross cut test with tape and brush