

## Test report

Test report relating to a glass product according to European standard EN 1036-2, Glass in buildings – Mirrors from silver-coated float glass for internal use, concerning the product marked as: MIROTECH MIRROR 3mm, 4mm and 6mm, manufactured by: Miro Tech Factory

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## **1** Introduction

### 1.1 Purpose

The tests have been performed in order to establish whether or not the product meets the requirements of the European standard EN 1036-2 [2].

### 1.2 Description of the test specimen

#### General

Name of the manufacturer	MIROTECH FACTORY
Address of the manufacturer	3rd INDUSTRIAL CITY – JEDDAH, SAOUDI-ARABIA
Production plant of the samples	3rd INDUSTRIAL CITY – JEDDAH, SAOUDI-ARABIA
Line ID where the samples are made	KLOPPER AUTOMATION 581691 11
Production date	30-09-2018
Sampling date	13-10-2018
The product was marked as	MIROTECH MIRROR 3mm, 4mm and 6mm
Dimensions of the samples	100x100mm

#### Specific

Substrate	Float glass
Nominal thickness	3mm, 4mm and 6mm

#### 1.3 Sampling procedure

TÜV Rheinland B.V., acting as Notified Test Laboratory, has had no influence on the selection of the sample. All test specimen within the sample were test-worthy and were received on 07-12-2019.

#### 1.4 Application

The request for testing was submitted by the manufacturer on 12-12-2019. Assignment Form number: 18.A199.

### 1.5 Method of testing

All applicable tests have been performed according to the European standard EN 1036-1 [1].

#### 1.6 Put out to contract

No tests were performed at third parties.

#### 1.7 Privacy statement

Due to privacy reasons, the names of involved personnel that executed the tests, are not disclosed in the report. However, this information is available on internal work sheets, test forms etc. in the project file.

#### 1.8 Notifications, accreditations, designations

TÜV Rheinland Nederland B.V. has been notified by the Dutch Minister for Housing and the Central Government Sector as Notified Laboratory (number 1750) and Notified (Factory Production Control) Certification Body (number 0336) for the European Construction Products Regulation 305/2011 (EU).

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TÜV Rheinland Nederland B.V. has been accredited by the Dutch Accreditation Council (RvA) as ISO 17025 Test Laboratory (nr. L 484) and ISO 17065 Certification Body (nr. C078).

TÜV Rheinland Nederland B.V. has been designated as Technical Service (Laboratory) by the Approval Authorities for Germany (KBA – E1) and the Netherlands (RDW – E4) for automotive safety glass (ECE R43, 92/22/EC, 2009/144/EC).

TÜV Rheinland Nederland B.V. has been recognised by the German Institute for building technics (DIBt) under number NL005 as test, control and certification body.

#### Remark

The reported tests were performed under ISO 17025 accreditation.

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## 2 Test results

Test results after performing all applicable tests according to European standard EN 1036-1 [1].

Description of	Required	Value of the test	Pass / fail	
the .				
requirement				
Requirements				
The silver-coated	d float glass complying with this E	uropean Standard shall respect the		
requirements rela	ated to the different characteristics g	given in table 4 of the Standard.		
Visual inspectio	n			
EN 1036-1 § 8.1.	5	<ul> <li>No discoloration</li> </ul>	pass	
Discolouration of	the protective coating surface			
shall be allowed;				
<ul> <li>coloured or diff</li> </ul>	used areas shall not be allowed	<ul> <li>No coloured or diffused areas</li> </ul>	pass	
within the reflecti	ve layer;			
<ul> <li>bubbles in the particular</li> </ul>	protective coating surface shall not	No bubbles	pass	
be allowed				
Neutral Salt	After 480 h.:		Initial	
Spray test	<ul> <li>Edge corrosion ≤ 1,5 mm</li> </ul>	<ul> <li>No defect &gt; 1,5 mm</li> </ul>	pass	
(NSS) according	<ul> <li>Number of spots : 2 of</li> </ul>	Number: 0		
to EN ISO 9227	0,3 mm < diameter ≤ 3 mm		Final	
[3]	5 of diameter of ≤ 0,3 mm		pass	
Copper	After 120 h.:		Initial	
Accelerated	<ul> <li>Edge corrosion ≤ 2,5 mm</li> </ul>	<ul> <li>No defect &gt; 2,5 mm</li> </ul>	pass	
Acetic Acid	<ul> <li>Number of spots : 2 of</li> </ul>	Number: 0		
(CASS) salt	0,3 mm < diameter ≤ 3 mm		Final	
spray test	3 of diameter of ≤ 0,3 mm		pass	
according to EN				
ISO 9227 [3]				
Condensation	After 480 h.:		Initial	
Water Test,	<ul> <li>Edge corrosion ≤ 0,2 mm</li> </ul>	<ul> <li>No defect &gt; 0,2 mm</li> </ul>	pass	
according to	Number of spots : 1 of diameter	• Number: 0	<b>F</b> inel	
EN1036-1 [1]	≤ 0,3 mm		Final	
			pass	
Pogular luminous coofficient (reflectance)				
measurements				
Condensation	Measurement of reflectance shall	The regular luminous coefficient	pass	
resistance	be undertaken in accordance with	shall be at least 86 % for float	F	
Acid	the principle of EN 410, but with	between 2 mm and 6 mm.	pass	
resistance	the angle of incidence of the light	The regular luminous coefficient	2000	
Neutral salt	within 8° of normal. Illuminant will	shall be at least 83 % for float	nass	
spray resistance	be D65 and observer 2.	with a thickness of 8 mm and	P400	
		10 mm.		



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Description of the requirement	Required	Value of the test	Pass / fail
Protective coat	ing adhesion		
Condensation resistance Acid resistance	The adhesion of the coating shall be assessed by means of the "Cross cut test" given in EN ISO 2409 [4]. The test shall be carried out manually, using the 6 blade cutter with a cut spacing of 1mm.	<ul> <li>The results shall comply with classification number (3) using tape according to EN ISO 2409 [4].</li> </ul>	pass Actual number (1) pass Actual number (1)
Neutral salt spray resistance			pass Actual number (1)

### 3mm Mirotech Mirror

regular luminous coefficient (%)	Condensation resistance	Acid resistance	Neutral Salt spray resistance
Unit #1	93.02	92.42	92.37
Unit #2	92.92	92.54	93.44
Unit #3	92.56	93.73	92.08

### 4mm Mirotech Mirror

regular luminous coefficient (%)	Condensation resistance	Acid resistance	Neutral Salt spray resistance
Unit #1	91.99	92.86	92.35
Unit #2	91.29	92.30	90.46
Unit #3	92.63	92.73	90.93

## 6mm Mirotech Mirror

regular luminous coefficient (%)	Condensation resistance	Acid resistance	Neutral Salt spray resistance
Unit #1	90.19	89.84	90.61
Unit #2	90.36	91.13	90.08
Unit #3	89.91	90.66	91.27

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### Information relating to the tests

Number of tested samples	Condensation resistance: 3
	CASS resistance: 3
	NSS resistance: 3
	Spectrophotometric measurements: 12
Condensation resistance test	<ul> <li>Total area of pieces tested at the same time: 300 cm<sup>2</sup></li> </ul>
	<ul> <li>Daily temperature: 40 °C</li> </ul>
	Observation of condensation on reference glass piece: yes
CASS resistance test	<ul> <li>Total area of pieces tested at the same time: 300 cm<sup>2</sup></li> </ul>
	<ul> <li>Daily temperature in high temp. phase of the test: 40 °C</li> </ul>
NSS resistance test	<ul> <li>Total area of pieces tested at the same time: 300 cm<sup>2</sup></li> </ul>
	<ul> <li>Daily temperature: 40 °C</li> </ul>
Cross cut test	Used tape : TESA Performance Grade UPVC Tape

## Period of testing

The tests took place on January 2019.

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## **3** Conclusion

The tested glass product, marked by the client or manufacturer as: MIROTECH MIRROR 3mm, 4mm and 6mm manufactured by: MIROTECH FACTORY, meets the applicable requirements as stated in the European standard EN 1036-2 [2].

The test results exclusively relate to the tested objects.

#### Remark 1

When and if changes are made in production method and/or equipment, assessment according to this standard shall be reconsidered and re-tests shall be performed when the changes can lead to different specifications of the glass. The decision and responsibility lies at the manufacturer.

#### Remark 2

It was to the manufacturer's responsibility that the samples delivered for initial type test are representative to the production and deviations from perfection were included in the delivered test samples.

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## **4** References

- European standard EN 1036-1:2007 (E), Glass in building – Mirrors for silver-coated glass for internal use – Part 1: Definitions, requirements and test methods, European Committee for Standardization, January 2008.
- 2 European standard EN 1036-2:2008 (E), Glass in building – Mirrors for silver-coated glass for internal use – Part 2: Evaluation of conformity, product standard, European Committee for Standardization, February 2008
- 3 European standard EN ISO 9227:2012 (E), Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227:2012), European Committee for Standardization, May 2012.
- 4 European standard EN ISO 2409:2013,(E), Cross-cut Test (ISO 2409:2013), European Committee for Standardization, February 2013.

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# 5 Signatures

Author	Signature
Mr. R. Brandhorst	Ague
	Ciana atoma
Peer review	Signature
Mr. M.A.A.M. Schets, B.Sc. Specialist	Matter
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LSM	

(This is the end of this report).