

## Test report

**Test report relating to a glass product according to European standard EN12150-1, fragmentation and mechanical strength, concerning the product marked as: Thermally toughened safety glass, manufactured by: Real glass**

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Project number	89203077
Project name	Thermally toughened safety glass
Number of pages	9

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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 12150-1 [1].

### 1.2 Description of the samples

#### General

Name of the manufacturer	Real Glass SRL
Address of the manufacturer	STRADA TRANSILVANIEI, Nr. 20, Bl. K1, Ap. 82, ORADEA, Județul BIHOR Cod postal: 410402
Production plant of the samples	STRADA TRANSILVANIEI, Nr. 20, Bl. K1, Ap. 82, ORADEA, Județul BIHOR Cod postal: 410402
Line ID where the samples are made	Not given
Production date	Not given
Sampling date	Not given
The product was marked as	Thermally <b>toughened safety glass</b> toughened safety glass
Dimensions of the samples	1100 x 360 mm

#### Specific

Kind of glass	Thermally toughened safety glass
Nominal thickness	4, 6, 8 and 10 mm
Number of samples, fragmentaton	5 per thickness
Number of samples, 4-point bending	≥ 2 per thickness, in total minimum 10
Edge work according to EN 12150-1 § 7.2	Arrissed edge

### 1.3 Sampling procedure

The test house, acting as notified test body, has had no influence on the selection of the samples.

### 1.4 Application

The request for testing was submitted by the manufacturer on 29.05.2012. Assignment Form number: 12.A155.

### 1.5 Method of testing

All applicable tests have been performed according to the European standards EN 12150-1 [1] and EN 1288-3 [3].

### 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 and accreditations**

TÜV Rheinland Nederland B.V. has been notified by the Dutch Ministry of Infrastructure and the Environment as Notified Test Body (number 1750) and Notified Certification Body (number 0336) for the European Construction Products Directive 89/106/EEC.

TÜV Rheinland Nederland B.V. has been accredited by the Dutch Accreditation Council (RvA) as ISO 17025 Test Laboratory (accreditation number L 484) and EN 45011 Certification Body (accreditation number C078). The RvA is signatory of the international ILAC-MRA arrangements for laboratory and inspection accreditation and IAF arrangements for management systems, products, services, personnel and other similar programmes of conformity assessment for Global recognition.

TÜV Rheinland Nederland B.V. has been designated as Technical Service (Laboratory) by RDW competent Administrative Department (Approval Authority) for the Netherlands to grant approvals as mentioned in Directive 70/156/etc. and in the 1958 Agreement of the Economic Commission for Europe of the United Nations (UN-ECE) for glass as used in the automotive sector: ECE Regulation 43, safety glazing; EC Directive 92/22, Safety glass; EC Directive 2009/144, Glazing cat. T. (designation number RDW-99050043-01).

## 2 Test results

Test results after performing all applicable tests according to § 8, Fragmentation when tested according to EN 12150-1 [1] and § 9.4, Mechanical strength of the European standard EN 12150-1 [1] when tested according to EN 1288-3 [3].

Requirements:

<b>EN 12150-1:2000 [1] § 8.5</b>	<b>prEN 12150-1:2012 [2] § 8.5</b>
3mm float: minimal 15 particles	3 mm patterned: minimal 30 particles
4 mm up to and including 12 mm float: minimal 40 particles	3 mm up to and including 12 mm float: minimal 40 particles
15 mm up to and including 19 mm float: minimal 30 particles	15 mm up to and including 25 mm float: minimal 30 particles

<b>EN 12150-1:2000 [1] § 9.4</b>	
<b>Type of glass</b>	<b>Minimum values mechanical strength (N/mm<sup>2</sup>)</b>
Float: Clear, Tinted and Coated	120
Enamelled float	75
Patterned glass and drawn sheet, others	90

### Remark

The published and official version of standard EN 12150-1 is from June 2000 but there is a provisional version of 2012 prEN 12150-1. If the product also fulfils the requirements of the prEN version of EN 12150-1, than the client knows that his product also is in conformity with that possible future standard.

Test results Fragmentation test according to EN 12150-1 [1]:

<b>Limit values table: Fragmentation test EN12150</b>		<b>Projectnumber:</b> 89203077				
		<b>Test date:</b> 29-1-2013				
<b>Thickness [mm]</b>		4	6	8	10	
Minimum allowed number of particle within the gauge (25 cm <sup>2</sup> )		40	40	40	40	
Maximum allowed length of het longest particle after fragmentation ( in mm )		100	100	100	100	
<b>Test Specimen 1</b>						
Number of fragments within the gauge (25 cm <sup>2</sup> )		"4"	"6"	"8"	"10"	
length of the longest particle in the body of the test specimen after fragm.		88	107	91	83	
Assesment between 4 and 5 minutes [Y/N]		15	14	12	15	
		Y	Y	Y	Y	
<b>Test Specimen 2</b>						
Number of fragments within the gauge (25 cm <sup>2</sup> )		"4"	"6"	"8"	"10"	
length of the longest particle in the body of the test specimen after fragm.		74	98	95	80	
Assesment between 4 and 5 minutes [Y/N]		15	13	14	14	
		Y	Y	Y	Y	
<b>Test Specimen 3</b>						
Number of fragments within the gauge (25 cm <sup>2</sup> )		"4"	"6"	"8"	"10"	
length of the longest particle in the body of the test specimen after fragm.		55	104	88	79	
Assesment between 4 and 5 minutes [Y/N]		18	14	12	17	
		Y	Y	Y	Y	
<b>Test Specimen 4</b>						
Number of fragments within the gauge (25 cm <sup>2</sup> )		"4"	"6"	"8"	"10"	
length of the longest particle in the body of the test specimen after fragm.		78	105	93	82	
Assesment between 4 and 5 minutes [Y/N]		17	16	11	16	
		Y	Y	Y	Y	
<b>Test Specimen 5</b>						
Number of fragments within the gauge (25 cm <sup>2</sup> )		"4"	"6"	"8"	"10"	
length of the longest particle in the body of the test specimen after fragm.		77	100	104	80	
Assesment between 4 and 5 minutes [Y/N]		18	12	12	15	
		Y	Y	Y	Y	
Evaluation of Conformity		"4"	"6"	"8"	"10"	
The minimum required number of fragments is not exceeded		OK	OK	OK	OK	
The maximum allowed length of het longest particle is not exceeded		OK	OK	OK	OK	

Test results Four point bending test according to EN 1288-3 [3]:

Sample number	facing upwards ↑ or downwards ↓	Thickness (mm)	Length (mm)	Width (mm)	Max. Force (N)	Mech.strength (N/mm <sup>2</sup> )	Breakage between rollers [Yes/No]	Time to breakage (s)
1	NA	3,84	1100	360	563	131,9	Yes	65
2	NA	3,83	1100	360	632	148,2	Yes	73
3	NA	3,84	1100	360	645	150,4	Yes	74
4	NA	5,85	1100	360	1538	152,9	Yes	72
5	NA	5,84	1100	360	1636	162,9	Yes	77
6	NA	7,80	1100	360	2664	148,5	Yes	71
7	NA	7,77	1100	360	2802	157,1	Yes	75
8	NA	9,85	1100	360	4536	157,8	Yes	76
9	NA	9,84	1100	360	4082	142,4	Yes	68
10	NA	9,84	1100	360	4546	158,4	Yes	76

Other thicknesses were not tested regarding the bending strength because the standard describes the specific sample distribution over a range of thicknesses. This implies that when more than 5 thicknesses, not all thicknesses need to be tested. Not-tested thicknesses can be regarded as complying with the requirements.

### 3 Conclusion

The tested glass product, marked by the client or manufacturer as Thermally toughened safety glass, manufactured by: Real glassReal Glass SRL, meets the applicable requirements concerning § 8, Fragmentation and § 9.4, Mechanical strength as stated in the European standard EN 12150-1 [1] when tested according to EN 12150-1 [1] and EN 1288-3 [3].

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**

If no reference of the product description was supplied by the manufacturer, than that document shall be added to this test report by the manufacturer. 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.

## 4 References

- 1 European standard EN 12150-1:2000 (E),  
Glass in building – Thermally toughened soda lime silicate safety glass – Part 1: Definition and description,  
European Committee for Standardization, June 2000.
- 2 Provisional (draft) European standard prEN 12150-1:2012 (E),  
Glass in building – Thermally toughened soda lime silicate safety glass – Part 1: Definition and description,  
European Committee of Standardization, 2012.
- 3 European standard EN 1288-3:2000 (E),  
Glass in building – Determination of the bending strength of glass – Part 3: Test with specimen supported at two points (four point bending),  
European Committee for Standardization, June 2000.



## 5 Signatures

<b>Author</b> Mr. R. Brandhorst  Specialist	Signature 
<b>Peer review</b> Mr. T.R. Cruijff  Specialist	Signature 
<b>Approved by</b> Mr. H. van Ginkel  Business field manager	Signature 

(This is the end of this report).