

## Test report

**Test report relating to a glass product according to European standard EN 14179-1, fragmentation and mechanical strength, concerning the product marked as: Lacobel T deep white, manufactured by: AGC Glass**

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Author(s)	M.J.R. Luppens
Client	AGC Glass 166 Terhulpsweg 1170 Brussel Belgium
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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 14179-1 [1].

### 1.2 Description of the samples

#### General

Name of the manufacturer	AGC Glass
Address of the manufacturer	166 Terhulpsweg 1170 Brussel Belgium
Production plant of the samples	AGC Westland Aartsdijk 23 2676 LE Maasdijk Netherlands
Line ID where the samples are made	Tempering line
Production date	April 2011
Sampling date	April 2011
The product was marked as	Lacobel T deep white
Dimensions of the samples	1100 x 360 mm

#### Specific

Kind of glass	Heat soaked thermally toughened safety glass
Nominal thickness	4, 6, 8, 10 mm
Number of samples, fragmentation	5 per thickness
Number of samples, 4-point bending	≥10 minimum thickness, in total minimum 10
Edge work according to EN 12150-1 § 7.2	Ground edge (with blank spots)

### 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 7 July 2010. Assignment Form number: 10.A257.

### 1.5 Method of testing

All applicable tests have been performed according to the European standards EN 14179-1 [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 VROM 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 C058).

TÜV Rheinland Nederland B.V. has been accredited 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 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. (accreditation number RDW-99050043 00).

## 2 Test results

Test results after performing all applicable tests according to § 10, Fragmentation when tested according to EN 14179-1 [1] and § 11.4, Mechanical strength of the European standard EN 14179-1 [1] when tested according to EN 1288-3 [3].

### Requirements

EN 14179-1:2005 [1] § 10.5	prEN 14179-1:2007 [2] § 10.5
3mm float: minimal 15 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

EN 14179-1:2005 [1] § 11.4	
Type of glass	Minimum values mechanical strength (N/mm <sup>2</sup> )
Float: Clear, Tinted and Coated	120
Enamelled float	75
Patterned glass and drawn sheet	90

### Remark

The published and official version of standard EN 14179-1 is from June 2000 but the Group of Notified Bodies has decided to regard the prEN version of 2007 also as a valid document. If the product also fulfils the requirements of the prEN version of EN 14179-1, than the client knows that his product also is in conformity with that possible future standard.

Test results Fragmentation test according to EN 14179-1 [1]:

EN 14179 FRAGMENTATION TEST					
<b>Limit values table: Fragmentation test EN14179</b>		<b>Projectnumber:</b>	E10.28937		
		<b>Test date:</b>	18-07-2011		
<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.		46	88	77	57
Assesment between 4 and 5 minutes [Y/N]		31	19	17	17
		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.		50	74	51	59
Assesment between 4 and 5 minutes [Y/N]		25	19	27	20
		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.		47	79	76	69
Assesment between 4 and 5 minutes [Y/N]		32	16	19	18
		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.		56	76	61	71
Assesment between 4 and 5 minutes [Y/N]		22	17	20	22
		y	69	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.		63	68	62	72
Assesment between 4 and 5 minutes [Y/N]		30	18	18	19
		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	layer facing	Thicknes s (mm)	Length (mm)	Width (mm)	Max. Force (N)	Mech.stren gth (N/mm <sup>2</sup> )	Breakage between rollers [Yes/No]	Time to breakage (s)
	upwards ↑ or downwards ↓							
1	↓	3.85	1100	360	504	118.0	Yes	55
2	↓	3.85	1100	360	464	109.0	Yes	49
3	↓	3.86	1100	360	498	116.3	Yes	54
4	↓	3.85	1100	360	478	112.1	Yes	50
5	↓	3.85	1100	360	461	108.3	Yes	48
6	↓	3.85	1100	360	441	103.8	Yes	48
7	↓	3.85	1100	360	467	109.8	Yes	49
8	↓	3.86	1100	360	451	105.8	Yes	47
9	↓	3.86	1100	360	478	111.6	Yes	50
10	↓	3.88	1100	360	478	110.4	Yes	49

### 3 Conclusion

The tested glass product, marked by the client or manufacturer as Lacobel T deep white, manufactured by: AGC Glass, meets the applicable requirements concerning § 8, Fragmentation and § 9.4, Mechanical strength as stated in the European standard EN 14179-1 [1] when tested according to EN 14179-1 [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.

#### Remark 3


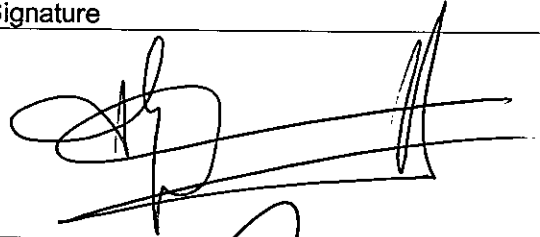
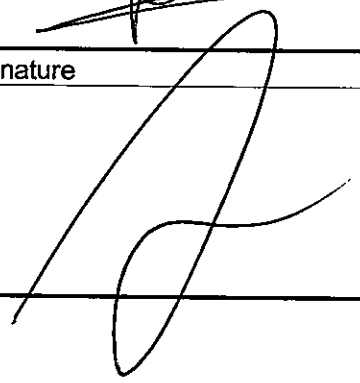
The tested glass product, marked by the client or manufacturer as Lacobel T deep white, manufactured by: AGC Glass, also meets the applicable requirements concerning § 9.4, Mechanical strength as stated in the draft European standard prEN 14179-1:2007 [2], when tested according to EN 14179-1 [1] and EN 1288-3 [3].

## 4 References

- 1 European standard EN 14179-1:2005 (E),  
Glass in building – Heat soaked thermally toughened soda lime silicate safety glass – Part 1: Definition and description,  
European Committee for Standardization, June 2000.
- 2 Provisional (draft) European standard prEN 14179-1:2007 (E),  
Glass in building – Heat soaked thermally toughened soda lime silicate safety glass – Part 1: Definition and description,  
European Committee of Standardization, 2007.
- 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. M.J.R. Luppens	<b>Signature</b> 
<b>Specialist</b>	
<b>Peer review</b> Mr. T.R. Cruijff	<b>Signature</b> 
<b>Specialist</b>	
<b>Approved by</b> Mr. A.J. Piers, B.Sc.	<b>Signature</b> 
<b>Manager Industrial Services</b>	

(This is the end of this report).