Test report

Test report relating to a glass product according to European standard EN 1863-1, fragmentation and mechanical strength, concerning the product marked as: Lacobel T crisp white, manufactured by: AGC glass

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Contents

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 1863-1 [1].

1.2 Description of the samples

General

Name of the manufacturer	AGC Glass
Address of the manufacturer	166 Terhulpseweg 1170 Brussel Belgium
Production plant of the samples	166 Terhulpseweg 1170 Brussel Belgium
Line ID where the samples are made	Tempering line
Production date	26 may 2011
Sampling date	26 may 2011
The product was marked as	Lacobel T
Dimensions of the samples	1100 x 360 mm

Specific

Kind of glass	enemalled
Nominal thickness	6, 8 mm
Number of samples, fragmentaton	5 per thickness
Number of samples, 4-point bending	≥10 minimum thickness, in total minimum 10
Edge work according to EN 1863-1 § 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 sampling procedure.

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 1863-1 [1] and EN 1288-3 [2].

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).

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2 Test results

Test results after performing all applicable tests according to § 8, Fragmentation and § 9, Mechanical strength of the European standard EN 1863-1 [1] when tested according to EN 1863-1 [1] and EN 1288-3 [2].

Requirements:

EN 1863-1 [1] § 8.5, Evaluation of fragmentation	
At least four out of the 5 specimen tested shall meet the following requirements in order for the product to be classified as heat strengthened soda lime silicate glass. Each specimen:	
1. shall have no more than 2 "island" fragments	
2. shall not have any "island" fragments with area/mass equivalent exceeding 1000 mm²	
3. shall not have the area/mass equivalent of all "particles" exceeding 5000 mm²	
If only one of the five specimens fails to meet these requirements, then it shall meet the following requirements in order for the product to be classified as heat strengthened soda lime silicate glass	
1. It shall have no more than 3 "island" fragments	
2. The area/mass equivalent of all "islands" and "particles" shall not exceed 50 000 mm²	
EN 1863-1 [1] § 9, Mechanical strength, test according to EN 1288-3 [2]	
Type of glass	**Minimum Values (N/mm²)**
Float: Clear, Tinted and Coated	70
Enamelled float	45
Patterned glass and drawn sheet	55

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Test results Fragmentation test according to EN 1863-1 [1]:

Thickness [mm]	"4"	"5"	"6"	"8"
Real Thickness [mm]	0	0	5.84	7.83
Particle [100 mm2] in gr	0.00	0.00	1.27	1.70
Island [1000 mm2] in gr	0.00	0.00	12.71	17.05
Max. Sum Particles [5000 mm2] in gr	0.0	0.0	63.6	85.2
Max. All Particles /+ Islands [50000 mm2]+A22	0	0	636	852
Test Specimen 1	"4"	"5"	"6"	"8"
One edge of fragment shall reach the excluded area (red->green->red) [Y/N]	0	0	Y	Y
Loose particles produced outside the excluded area (green area) [Y/N]	0	0	N	N
Loose islands produced outside the excluded area (green area) [Y/N]	0	0	N	Y
Weight of all particles collected in the green area	0.000	0.000	0.000	0.000
Number of islands in the green area	0	0	0	2
Weight of island number 1	0.000	0.000	0.000	39.900
Weight of island number 2	0.000	0.000	0.000	19.100
Weight of island number 3	0.000	0.000	0.000	0.000
Assesment within 5 minutes after impact [Y/N]	0.000	0.000	Y	Y
Test Specimen 2	"4"	"5"	"6"	"8"
One edge of fragment shall reach the excluded area (red->green->red) [Y/N]	0	0	Y	Y
Loose particles produced outside the excluded area (green area) [Y/N]	0	0	N	N
Loose islands produced outside the excluded area (green area) [Y/N]	0	0	N	N
Weight of all particles collected in the green area	0.000	0.000	0.000	0.000
Number of islands in the green area	0	0	0	0
Weight of island number 1	0.000	0.000	0.000	0.000
Weight of island number 2	0.000	0.000	0.000	0.000
Weight of island number 3	0.000	0.000	0.000	0.000
Assesment within 5 minutes after impact [Y/N]	0.000	0.000	Y	Y
Test Specimen 3	"4"	"5"	"6"	"8"
One edge of fragment shall reach the excluded area (red->green->red) [Y/N]	0	0	Y	Y
Loose particles produced outside the excluded area (green area) [Y/N]	0	0	N	N
Loose islands produced outside the excluded area (green area) [Y/N]	0	0	N	N
Weight of all particles collected in the green area	0.000	0.000	0.000	0.000
Number of islands in the green area	0	0	0	0
Weight of island number 1	0.000	0.000	0.000	0.000
Weight of island number 2	0.000	0.000	0.000	0.000
Weight of island number 3	0.000	0.000	0.000	0.000
Assesment within 5 minutes after impact [Y/N]	0.000	0.000	Y	Y
Test Specimen 4	"4"	"5"	"6"	"8"
One edge of fragment shall reach the excluded area (red->green->red) [Y/N]	0	0	Y	Y
Loose particles produced outside the excluded area (green area) [Y/N]	0	0	N	N
Loose islands produced outside the excluded area (green area) [Y/N]	0	0	N	N
Weight of all particles collected in the green area	0.000	0.000	0.000	0.000
Number of islands in the green area	0	0	0	0
Weight of island number 1	0.000	0.000	0.000	0.000
Weight of island number 2	0.000	0.000	0.000	0.000
Weight of island number 3	0.000	0.000	0.000	0.000
Assesment within 5 minutes after impact [Y/N]	0.000	0.000	Y	Y
Test Specimen 5	"4"	"5"	"6"	"8"
One edge of fragment shall reach the excluded area (red->green->red) [Y/N]	0	0	Y	Y
Loose particles produced outside the excluded area (green area) [Y/N]	0	0	N	N
Loose islands produced outside the excluded area (green area) [Y/N]	0	0	N	N
Weight of all particles collected in the green area	0.000	0.000	0.000	0.000
Number of islands in the green area	0	0	0	0
Weight of island number 1	0.000	0.000	0.000	0.000
Weight of island number 2	0.000	0.000	0.000	0.000
Weight of island number 3	0.000	0.000	0.000	0.000
Assesment within 5 minutes after impact [Y/N]	0.000	0.000	Y	Y
Evaluation of Conformity	**"4"**	**"5"**	**"6"**	**"8"**
One edge of fragment shall reach the excluded area [Y/N]			OK	OK
At least four test specimens have no more than '2' island fragments			OK	OK
No more than 2 islands are present and the area is less than 1000 mm2 and/or the sample with three islands has more than 50000 mm2 of fragments.			OK	OK
Area of all particles are not exceeding 5000 mm2 and/or only one sample is outside limits but the total area is not exceeding 50000 mm2			OK	OK

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Test results Four point bending test according to EN 1288-3 [2]:

Sample number	facing upwards ↑ or downwards ↓	Thickness (mm)	Length (mm)	Width (mm)	Max. Force (N)	Mech.strength (N/mm^2)	Breakage between rollers [Yes/No]	Time to breakage (s)
1	↓	5.92	1100	360	835	82.5	Yes	43
2	↓	5.93	1100	360	725	71.8	Yes	38
3	↓	6.02	1100	360	729	70.2	Yes	38
4	↓	5.90	1100	360	721	72.2	Yes	37
5	↓	5.97	1100	360	801	78.0	Yes	41
6	↓	5.93	1100	360	680	67.7	Yes	35
7	↓	5.91	1100	360	781	77.7	Yes	40
8	↓	5.93	1100	360	661	65.8	Yes	34
9	↓	5.99	1100	360	692	67.3	Yes	36
10	↓	6.02	1100	360	658	63.7	Yes	34

3 Conclusion

The tested glass product, marked by the client or manufacturer as Lacobel T, crisp white, manufactured by: AGC Glass, meets the applicable requirements concerning § 8, Fragmentation and § 9,, Mechanical strength as stated in the European standard EN 1863-1 [1], when tested according to EN 1863-1 [1] and EN 1288-3 [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

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 1863-1:2000 (E),
Glass in building – Heat strengthened soda lime silicate glass – Part 1: Definition and description,
European Committee for Standardization, January 2000.

2 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..

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5 Signatures

Author	Signature
Mr. M.J.R. Luppens Specialist	
Peer review	Signature
Mr. T.R. Cruijff Specialist	
Approved by	Signature
Mr. A.J. Piers, B.Sc. Manager Industrial Services	

(This is the end of this report).