SBG

STANDART

YAPI LABORATUVARI

AB ONAYLANMIŞ KURULUŞ 2271 EU NOTIFIED BODY

TÜRKAK Test TS EN ISO/IEC 17025 AB-0411-T

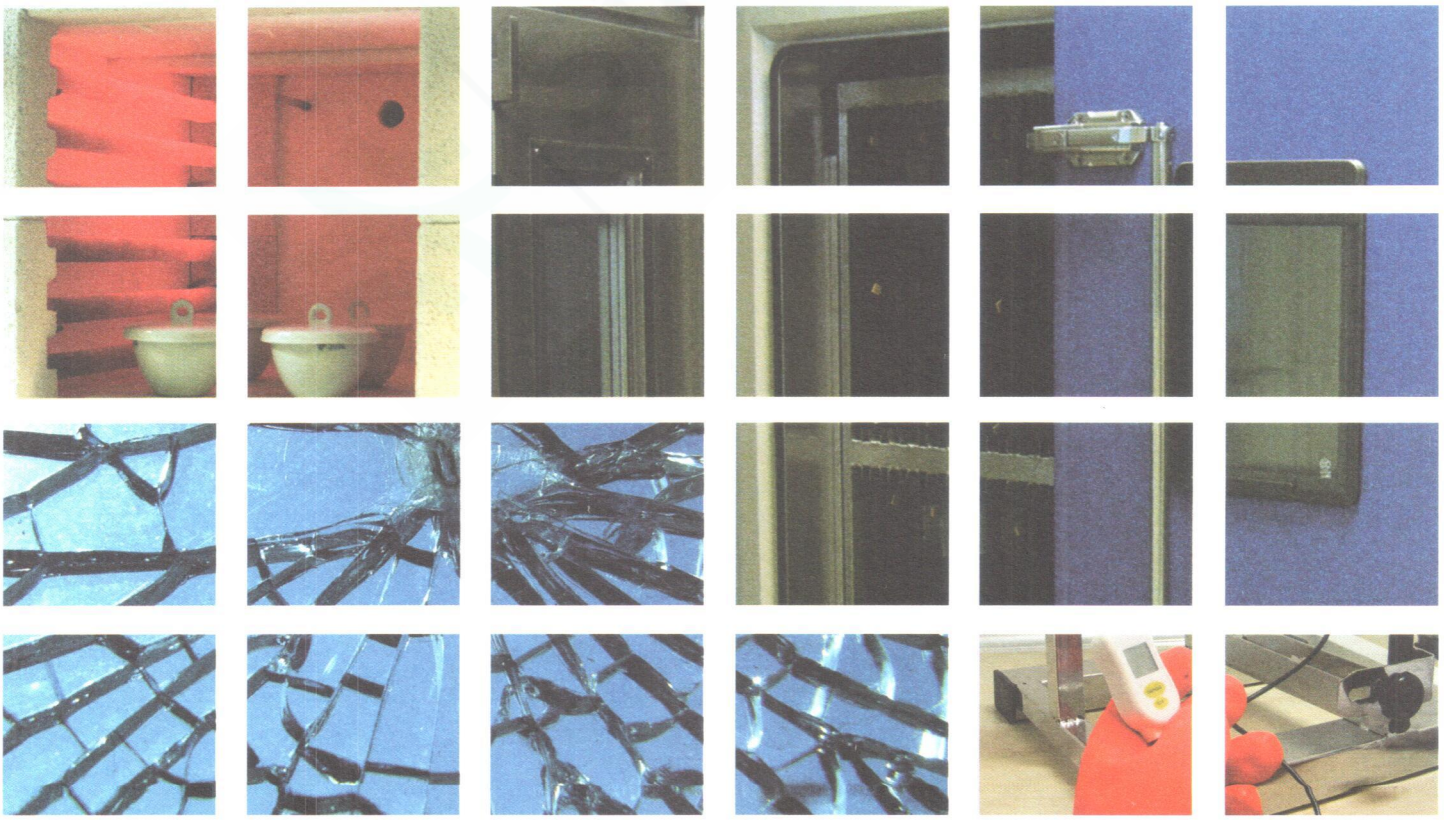
TEST REPORT

SİM CAM SANAYİ VE DIŞ TİCARET A.Ş.

TS EN 12150-1 Thermally Toughened Soda Lime Silicate Safety Glass

Test Report, No: DY05-63-0

...yapı kalitesi için çalışır



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Product Performance Assessment Certificate

This certificate is issued based on the Construction Products Regulation (305/2011/EU) published on the Official Gazette No. 28703 dated 10 July 2013 and on Paragraph 1.4 of Annex 5 of the amendment published on the Official Gazette dated 2 October 2014.

Manufacturer and Product Information

Client	*Sim Cam Sanayi ve Dış Ticaret A.Ş.*
Client Address	*Sanayi Yolu Cad. No:27 Kurtköy Pendik – İstanbul*
Plant Name	*Sim Cam Sanayi ve Dış Ticaret A.Ş.*
Plant Address	*Sanayi Yolu Cad. No:27 Kurtköy Pendik – İstanbul*
Product Name / Trade name	*Thermally Toughened Soda Lime Silicate Safety Glass*
Product Standard	*TS EN 12150-2*
System Description Reference No.	*System Description Report Dated 31.05.2016*
Date of Manufacture / Lot No.	*19.10.2016*
Type of Glass	*Float Soda Lime Silicate Glass*
Nominal Thicknesses of Specimens (mm)	*4-5-6-8-10-12*

Test Reference Values

Test Standard	Fragmentation test	Mechanical Strength Test
TS EN 12150-1: April 2016	Length of the biggest fragment (Max) : 100 mm No of fragments (Min): 40	4-Point Bending Strength (Min): 120 N/ mm^2

System Compliance	**Successful**

Notes:

(1) *These test results apply only to the particular specimens tested and to the specific tests carried out, as detailed in the test report no. DY05-63-0 dated 09 December 2016. This certificate contains only the summary of the test results given in the relevant test report.*

(2) *This certificate confirms that the fragmentation test and mechanical strength test were performed based on TS EN 12150-1: April 2016 for thermally toughened soda lime silicate safety glass specimens of which manufacturer and product information was given above.*

(3) *This certificate can only be used as the evidence of the test result and is an integral part of the relevant test report but it cannot be used on its own.*

(4) *This certificate has been issued to establish whether the product conforms to the definition/properties described in the relevant standard. The manufacturer can use these test results in CE marking for its products; however the other requirements of the standard shall be taken into consideration while CE marking of the products.*

Mehmet Yakut
Technical Manager

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AB ONAYLANMIŞ KURULUŞ 2271 EU NOTIFIED BODY

TÜRKAK Test TS EN ISO/IEC 17025 AB-0411-T

AB-0411-T	
DY05-63-0	
09.12.2016	

TEST REPORT

Laboratory Project No :	DY05-63
Client Contract No :	1
Date of Report :	09.12.2016

TEST REQUESTED BY :

Client No :	911
Client :	Sim Cam Sanayi ve Dış Ticaret A.Ş.
Address:	Sanayi Yolu Cad. No:27 Kurtköy Pendik / İstanbul
Telephone :	0 (216) 378 12 27
Telefax :	0 (216) 595 10 47

SPECIFICATION OF SPECIMENS :

Nominal Thicknesses of Specimens (mm) :	4 – 5 – 6 – 8 – 10 – 12
Type of Specimen :	Thermally toughened soda lime silicate safety glass
Date of Manufacture :	19.10.2016
System Description Reference No :	System description report dated 31.05.2016
Date of Delivery of Specimen :	20.10.2016
Number of Specimens :	42
Date of Completion of Tests :	01.12.2016
Specification (Test Standard) :	TS EN 12150-1: April 2016
Product Standard :	TS EN 12150-2
Total Number of Pages of Test Report	8 (Except cover page) + Annexes

System Compliance APPROVED

Ataşehir İSTANBUL 09 Aralık 2016	**Prepared by :** Gürcan ŞAHİN Laboratuvar Şefi	**Approved By:** Mehmet YAKUT Teknik Müdür

Standart Belgelendirme Denetim Deney Muayene ve Teknik Kontrol Ltd. Şti.
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TEST REPORT

CONDITIONS OF USE AND ISSUE OF TEST REPORT	
Standard used	TS EN 12150-1: April 2016
Conditions of issue and use	This test report is issued subject to the conditions stated in the Test Contract. The results contained herein apply only to the particular specimens tested and to the specific tests carried out, as detailed in this test report. The issuing of this test report does not indicate any measure of Approval, Certification, Supervision, Control and Surveillance by SBG of any product. No extract, abridgement or abstraction from this test report may be published or used to advertise a product without the written contest of the managing director, SBG. The test reports are invalid if not signed and stamped properly. SBG reserves the absolute right to agree or reject all or any of the details of any items or publicity for which consent may be sought.

INTRODUCTION

According to TS EN 12150-2 Standard, to establish if a product conforms to the definition of thermally toughened soda lime silicate safety glass, the product type testing shall be carried out and the product type testing shall consist of:

a) mechanical strength measurement in accordance with TS EN 12150-1;

b) fragmentation test in accordance with TS EN 12150-1.

Upon the request of the client, the thermally toughened soda lime silicate safety glass units detailed below and submitted by the client were tested and assessed according to the applicable requirements of TS EN 12150-1: April 2016. The test results were shown on the following pages of this test report. The test contract was mutually signed on 31.05.2016 between the client and SBG. Both parties agreed on the conditions of the test contract and approved the contract by signing.

This test report is related to the actual units that have been tested and do not relate to any ongoing production. SBG has not taken any responsibility and has not been involved in sampling the test items. All information taking place in this report regarding the identity of the product, sampling method and test specimens are based on the information provided by the manufacturer.

TEST SPECIMENS

The total number of test specimens is 35 pieces (5 pieces for each thickness for fragmentation test and 10 samples for all thicknesses for mechanical strength test) thermally toughened soda lime silicate safety glass units each nominally 1100 mm x 360 mm.

The test items were received on 20.10.2016 and identified under the laboratory project number DY05-63. Test specimens have the following properties as declared by the manufacturer:

TEST REPORT

Type of Specimen :	Glass in Building - Thermally toughened soda lime silicate safety glass
Type of Glass Used in Tempering :	Float soda lime silicate glass
Nominal Thicknesses of Specimens (mm) :	4 – 5 – 6 – 8 – 10 – 12
Number of Specimens for Fragmentation Test :	30
Number of Specimens for 4-Point Bending Test :	12
Surface of Glass:	Flat, non-enamelled, non-patterned, uncoated
Surface to Exert Force:	Flat surface
Type of Edge Work:	Smooth ground edge
Holes (If any, diameters and numbers)	None **Dia :** 0 **No :** 0
Notches	None

TEST PROCEDURE

1. Conditioning and Dimensional Measurements

The thermally toughened soda lime silicate safety glass units were received at SBG laboratory, kept in the special shelves and stored in the standard laboratory conditions of 23±2 °C and %50±5 relative humidity (The relative humidity required for the test is between 40% and 70%) for a period of not less than 4 hours. The test specimens were kept within ±1 °C temperature variation to have no thermal stress inside the glass units.

During this period each glass unit was measured for length, width and thickness. The test items were found to be appropriate for the further tests. The results are shown below:

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RESULTS OF DIMENSIONAL MEASUREMENT

					For patterned glass only		
Specimen code	**Nominal thickness (mm)**	**Length (mm)**	**Width (mm)**	**Thickness (mm)**	**Maximum thickness (mm)**	**Minimum thickness (mm)**	**Dimensions appropriate?**
4A	4,00	1100	360	3,83	0,00	0,00	APPROPRIATE
4B	4,00	1100	360	3,85	0,00	0,00	APPROPRIATE
4C	4,00	1101	360	3,83	0,00	0,00	APPROPRIATE
4D	4,00	1100	360	3,86	0,00	0,00	APPROPRIATE
4E	4,00	1100	360	3,86	0,00	0,00	APPROPRIATE
4F	4,00	1100	360	3,92	0,00	0,00	APPROPRIATE
4G	4,00	1100	360	3,84	0,00	0,00	APPROPRIATE
5A	5,00	1099	360	4,88	0,00	0,00	APPROPRIATE
5B	5,00	1100	360	4,88	0,00	0,00	APPROPRIATE

TEST REPORT

5C	5,00	1100	360	4,84	0,00	0,00	APPROPRIATE
5D	5,00	1100	360	4,87	0,00	0,00	APPROPRIATE
5E	5,00	1100	360	4,88	0,00	0,00	APPROPRIATE
5F	5,00	1100	360	4,91	0,00	0,00	APPROPRIATE
5G	5,00	1100	360	4,88	0,00	0,00	APPROPRIATE
6A	6,00	1100	360	5,92	0,00	0,00	APPROPRIATE
6B	6,00	1100	360	5,94	0,00	0,00	APPROPRIATE
6C	6,00	1100	360	5,92	0,00	0,00	APPROPRIATE
6D	6,00	1100	360	5,90	0,00	0,00	APPROPRIATE
6E	6,00	1100	360	5,92	0,00	0,00	APPROPRIATE
6F	6,00	1100	360	5,93	0,00	0,00	APPROPRIATE
6G	6,00	1100	360	5,86	0,00	0,00	APPROPRIATE
8A	8,00	1101	360	7,93	0,00	0,00	APPROPRIATE
8B	8,00	1101	360	7,76	0,00	0,00	APPROPRIATE
8C	8,00	1100	360	7,87	0,00	0,00	APPROPRIATE
8D	8,00	1100	360	7,92	0,00	0,00	APPROPRIATE
8E	8,00	1100	360	7,88	0,00	0,00	APPROPRIATE
8F	8,00	1100	360	7,92	0,00	0,00	APPROPRIATE
8G	8,00	1100	360	7,92	0,00	0,00	APPROPRIATE
10A	10,00	1100	360	9,76	0,00	0,00	APPROPRIATE
10B	10,00	1100	360	9,74	0,00	0,00	APPROPRIATE
10C	10,00	1100	360	9,89	0,00	0,00	APPROPRIATE
10D	10,00	1100	360	9,71	0,00	0,00	APPROPRIATE
10E	10,00	1100	360	9,81	0,00	0,00	APPROPRIATE
10F	10,00	1100	360	9,70	0,00	0,00	APPROPRIATE
10G	10,00	1100	360	9,76	0,00	0,00	APPROPRIATE
12A	12,00	1100	360	11,87	0,00	0,00	APPROPRIATE
12B	12,00	1100	360	12,01	0,00	0,00	APPROPRIATE
12C	12,00	1100	360	11,98	0,00	0,00	APPROPRIATE
12D	12,00	1100	360	11,78	0,00	0,00	APPROPRIATE
12E	12,00	1100	360	12,04	0,00	0,00	APPROPRIATE
12F	12,00	1101	360	11,80	0,00	0,00	APPROPRIATE
12G	12,00	1101	360	11,90	0,00	0,00	APPROPRIATE

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TEST REPORT

After measuring the dimensions, first the fragmentation tests and later 4-point bending tests were conducted according to the TS EN 12150-1: April 2016 Standard. These two tests are the product-type tests required for the evaluation of the conformity. The bending strength was determined according to TS EN 1288-3 test standard and assessed based on the values given in TS EN 12150-1: April 2016 Standard.

2. Requirements for TS EN 12150-1

2.1. The minimum number of fragments (Based on Paragraph 8.5 of the Standard)

According to the standard, to establish if a product conforms to the definition of thermally toughened soda lime silicate safety glass, the number of fragments shall meet or exceed the number of fragments given in the following table:

Type of Glass	Nominal Thickness, d (mm)	Minimum Number of Fragments	Shower enclosures (See EN 14428)
All glass types	2	15	Not applicable
	3	15	40
	4 to 12	40	40
	15 to 25	30	30

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2.2. Mechanical Strength (Based on Paragraph 9.4 of the Standard)

2.2.1. Minimum Mechanical Strength Values

The value of mechanical strength can only be given with a particular type of loading, i.e. four point bending test according to EN 1288-3.

The characteristic values for different types of glass are listed in the following table:

Type of Glass	Minimum Mechanical Strength Values (N/mm^2)
Float Glass: - Clear - Tinted - Coated	120

Enamelled Glass (Based on the enamelled surface in tension)	75
Others (according to Clause 4)	90
2.2.2. Calculation of bending strength and bending stress	
The bending strength (σ_{bB}) was calculated using the formula given in the Paragragh 8.1 of TS EN 1288-3 Standard:	$\sigma_{bB} = k\left[F_{en\ çok}\dfrac{3(L_s \quad L_b)}{2Bh^2} + \sigma_{bG}\right]$
The bending stress (σ_{bG}) due to its own weight of the test specimens was calculated using the formula given in the Paragragh 8.1 of TS EN 1288-3 Standard:	$\sigma_{bG} = \dfrac{3\rho g L_s^2}{4h}$

TEST RESULTS

1. Fragmentation test results based on TS EN 12150-1 Standard

Specimen code	Thickness (mm)	Assessed within 4 to 5 mins?	Number of fragments	Number of fragments appropriate?	Maximum length of fragment measured (mm)	Maximum fragment length below 100 mm?	Appropriate?
4A	3,83	YES	47	YES	20,95	YES	APPROPRIATE
4B	3,85	YES	46	YES	25,20	YES	APPROPRIATE
4C	3,83	YES	44	YES	22,45	YES	APPROPRIATE
4D	3,86	YES	44	YES	21,33	YES	APPROPRIATE
4E	3,86	YES	47	YES	22,90	YES	APPROPRIATE
5A	4,88	YES	49	YES	18,30	YES	APPROPRIATE
5B	4,88	YES	53	YES	16,10	YES	APPROPRIATE
5C	4,84	YES	52	YES	17,11	YES	APPROPRIATE
5D	4,87	YES	47	YES	21,12	YES	APPROPRIATE
5E	4,88	YES	44	YES	22,44	YES	APPROPRIATE
6A	5,92	YES	90	YES	12,15	YES	APPROPRIATE
6B	5,94	YES	85	YES	11,90	YES	APPROPRIATE
6C	5,92	YES	81	YES	14,20	YES	APPROPRIATE

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6D	5,90	YES	80	YES	14,53	YES	APPROPRIATE
6E	5,92	YES	81	YES	14,05	YES	APPROPRIATE
8A	7,93	YES	61	YES	12,70	YES	APPROPRIATE
8B	7,76	YES	57	YES	14,12	YES	APPROPRIATE
8C	7,87	YES	60	YES	13,60	YES	APPROPRIATE
8D	7,92	YES	55	YES	14,03	YES	APPROPRIATE
8E	7,88	YES	63	YES	12,70	YES	APPROPRIATE
10A	9,76	YES	67	YES	13,30	YES	APPROPRIATE
10B	9,74	YES	62	YES	12,86	YES	APPROPRIATE
10C	9,89	YES	58	YES	11,50	YES	APPROPRIATE
10D	9,71	YES	55	YES	14,60	YES	APPROPRIATE
10E	9,81	YES	59	YES	14,15	YES	APPROPRIATE
12A	11,87	YES	67	YES	12,50	YES	APPROPRIATE
12B	12,01	YES	60	YES	13,64	YES	APPROPRIATE
12C	11,98	YES	59	YES	15,70	YES	APPROPRIATE
12D	11,78	YES	64	YES	11,70	YES	APPROPRIATE
12E	12,04	YES	57	YES	13,40	YES	APPROPRIATE

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2. 4-Point bending test results based on TS EN 1288-3 and TS EN 12150-1 Standards

Specimen code	Thickness (mm)	Length (mm)	Width (mm)	Maximum force (N)	Mechanical strength (N/mm^2)	Fractured at the center (Yes / No)	Fracture time (s)	Appropriate?
4F	3,92	1100	360	1090	241,32	YES	143	APPROPRIATE
4G	3,84	1100	360	1040	240,08	YES	135	APPROPRIATE
5F	4,91	1100	360	1880	263,83	YES	116	APPROPRIATE
5G	4,88	1100	360	1440	205,48	YES	89	APPROPRIATE
6F	5,93	1100	360	2380	228,83	YES	82	APPROPRIATE
6G	5,86	1100	360	2310	227,49	YES	79	APPROPRIATE

TEST REPORT

8F	7,92	1100	360	3950	212,32	YES	61	APPROPRIATE
8G	7,92	1100	360	4080	219,23	YES	63	APPROPRIATE
10F	9,70	1100	360	6720	240,04	YES	55	APPROPRIATE
10G	9,76	1100	360	7090	250,06	YES	57	APPROPRIATE
12F	11,80	1101	360	10340	249,15	YES	46	APPROPRIATE
12G	11,90	1101	360	9180	217,69	YES	43	APPROPRIATE

CONCLUSIONS (SUMMARY OF TEST RESULTS)

The thermally toughened soda lime silicate safety glass products manufactured by **SİM CAM SANAYİ VE DIŞ TİCARET A.Ş.** have the following test results in meeting the requirements of the Paragraph 8.5 for the fragmentation test and the Paragraph 9.4 for the mechanical strength test:

Nominal thickness (mm)	Evaluation of Conformity According to the Fragmentaion Test	Evaluation of Conformity According to the Mechanical Strength Test	Conclusion (System Compliance)
4	SUCCESSFUL	SUCCESSFUL	SUCCESSFUL
5	SUCCESSFUL	SUCCESSFUL	SUCCESSFUL
6	SUCCESSFUL	SUCCESSFUL	SUCCESSFUL
8	SUCCESSFUL	SUCCESSFUL	SUCCESSFUL
10	SUCCESSFUL	SUCCESSFUL	SUCCESSFUL
12	SUCCESSFUL	SUCCESSFUL	SUCCESSFUL

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THE REASON OF THE REVISION

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