

Test report

Test report relating to a glass product according to European standard EN 1063, bullet attack resistance, concerning the product marked as: Simglass, laminated safety glass, manufactured by: Sim Cam San.Dış.Tic.A.Ş.

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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 1063 [1].

This report is based on the test report of TNO, Laboratory for Ballistics Research (LBR) [2]

Modification has been made to the original report. Client name has been mentioned and photographs has been added to the report.

1.2 Description of the samples

General

Name of the manufacturer	Sim Cam San.Dış.Tic.A.Ş.
Address of the manufacturer	SANAYI MH. SANAYI CAD. NO. 27 PENDIK/ISTANBUL, TURKYE
Production plant of the samples	Sim Cam San.Dış.Tic.A.Ş. PENDIK/ISTANBUL, TURKYE
Line ID where the samples are made	LAMINE #1
Production date	13 November 2015
Sampling date	13 November 2015
The product was marked as	Simglass
Dimensions of the samples	500 x 500 mm

Specific

Thickness	21.77mm
Configuration (from the attack side)	
Desired classification	BR1 NS
Attack face	as marked by the manufacturer

Thickness	21.77mm
Configuration (from the attack side)	
Desired classification	BR2 NS
Attack face	as marked by the manufacturer

Thickness	23.53mm
Configuration (from the attack side)	
Desired classification	BR3 NS
Attack face	as marked by the manufacturer

Thickness	26.53mm
Configuration (from the attack side)	
Desired classification	BR4 NS
Attack face	as marked by the manufacturer
Thickness	35.29mm
Configuration (from the attack side)	
Desired classification	BR5 NS
Attack face	as marked by the manufacturer

Thickness	46.05mm
Configuration (from the attack side)	
Desired classification	BR6 NS
Attack face	as marked by the manufacturer

Thickness	79.50mm
Configuration (from the attack side)	
Desired classification	BR7 NS
Attack face	as marked by the manufacturer

Thickness	41.29mm
Configuration (from the attack side)	
Desired classification	SG1 NS
Attack face	as marked by the manufacturer

Thickness	64.06mm
Configuration (from the attack side)	
Desired classification	SG2 NS
Attack face	as marked by the manufacturer

1.3 Sampling procedure

The test house, acting as notified test body, had no influence on the sampling procedure. As per regulations, the sampling should have been done under the responsibility of the involved notified certification body. The records of the sampling and material details should be available at the involved notified certification body. This is not automatically the case for the tested samples.

1.4 Application

The request for testing was submitted by the manufacturer on 16th September 2015, order or reference number or name: -. Assignment Form number: 15.A200.

1.5 Method of testing

All applicable tests have been performed according to the European standard EN 1063 [1].

1.6 Put out to contract

Tests were performed by TNO Defence, Security and Safety, Laboratory for Ballistic Research, Rijswijk, The Netherlands. RvA accreditation number L275.

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 Laboratory (number 1750) and Notified Product Certification Body (number 0336) for the European Construction Products Regulation EU No 305/2011.

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).

1.9 The standard EN 1063

This European Test Standard describes the classification of glass compositions with regard to bullet-resistant characteristics. Two groups are identified: hand weapons and shotguns. These two groups consist of various classes for variations in calibres and types of ammunition. Three glass samples measuring 500 mm x 500 mm are tested and all samples must satisfy the requirements of the class in question. Restraining the bullet is naturally the requirement but in certain cases attention is paid to whether potentially harmful glass splinters come loose at the back of the glass (fragmentation). The glass is shot at three points within a defined triangle. There are several classes possible, depending on the calibre, type of weapon and anti-fragmentation at the back side of the glass configuration. There are two groups, handguns and shotguns:

Classification type of gun/bullet, handguns/rifles

- BR1, rifle L/RN;
- BR2, hand gun, 9 mm Luger, type FJ/RN/SC;
- BR3, hand gun, 0.357 Magnum, type FJ/CB/SC;
- BR4, hand gun, 0.44 Rem. Magnum, type FJ/FN/SC;
- BR5, rifle, 5.56 x 45, type FJ/PB/SCP1;
- BR6, rifle, 7.62 x 51, type FJ/PB/SC;
- BR7, rifle, 7.62 x 51, type FJ/PB/HC1.

Classification type of gun/bullet, shot guns

- SG1, cal. 12/70, solid lead slug;
- SG2, cal. 12/70, solid lead slug.

Additional designation

- NS for no splinters, if no perforation of the witness foil by splinters from the back side;
- S for splinters, if perforation of the witness foil by splinters from the back side.



2 Test results

Test results after performing all applicable tests according to the European standard EN 1063 [1].

Classification type 21.77mm BR1 NS – .22 L/RN

Shot number	Impact velocity [m/s]	Stopped / Perforation	Splinters / No splinters	Test valid (Yes/No)
Sample 16SC00170				
KKW1 16SN00181	371	Stopped	NS	Yes
KKW1 16SN00182	356	Stopped	NS	Yes
KKW1 16SN00183	361	Stopped	NS	Yes
Sample 16SC00171				
KKW1 16SN00184	367	Stopped	NS	Yes
KKW1 16SN00185	363	Stopped	NS	Yes
KKW1 16SN00187	360	Stopped	NS	Yes
Sample 16SC00172				
KKW1 16SN00188	362	Stopped	NS	Yes
KKW1 16SN00189	373	Stopped	NS	Yes
KKW1 16SN00190	376	Stopped	NS	Yes

Classification type 21.77mm BR2 NS – .22 L/RN

Shot number	Impact velocity [m/s]	Stopped / Perforation	Splinters / No splinters	Test valid (Yes/No)
Sample 16SC00174				
KKW1 16SN00193	393	Stopped	NS	Yes
KKW1 16SN00194	395	Stopped	NS	Yes
KKW1 16SN00195	400	Stopped	NS	Yes
Sample 16SC00175				
KKW1 16SN00196	400	Stopped	NS	Yes
KKW1 16SN00197	397	Stopped	NS	Yes
KKW1 16SN00198	399	Stopped	NS	Yes
Sample 16SC00176				
KKW1 16SN00201	403	Stopped	NS	Yes
KKW1 16SN00202	403	Stopped	NS	Yes
KKW1 16SN00203	395	Stopped	NS	Yes

Classification type 23.53mm BR3 NS – .357 FMJ Coned Bullet (MP)

Shot number	Impact velocity [m/s]	Stopped / Perforation	Splinters / No splinters	Test valid (Yes/No)
Sample 16SC00178				
KKW1 16SN00205	440	Stopped	NS	Yes
KKW1 16SN00206	425	Stopped	NS	Yes
KKW1 16SN00207	423	Stopped	NS	Yes
Sample 16SC00179				
KKW1 16SN00209	425	Stopped	NS	Yes
KKW1 16SN00210	422	Stopped	NS	Yes
KKW1 16SN00211	406	Stopped	NS	Yes
Sample 16SC00181				
KKW1 16SN00216	421	Stopped	NS	Yes
KKW1 16SN00217	425	Stopped	NS	Yes
KKW1 16SN00218	427	Stopped	NS	Yes

Classification type 26.53mm BR4 NS – .44 FMJ FN

Shot number	Impact velocity [m/s]	Stopped / Perforation	Splinters / No splinters	Test valid (Yes/No)
Sample 16SC00182				
KKW1 16SN00221	453	Stopped	NS	Yes
KKW1 16SN00222	455	Stopped	NS	Yes
KKW1 16SN00223	450	Stopped	NS	Yes
Sample 16SC00183				
KKW1 16SN00224	452	Stopped	NS	Yes
KKW1 16SN00225	438	Stopped	NS	Yes
KKW1 16SN00226	444	Stopped	NS	Yes
Sample 16SC00184				
KKW1 16SN00227	452	Stopped	NS	Yes
KKW1 16SN00228	448	Stopped	NS	Yes
KKW1 16SN00229	439	Stopped	NS	Yes

Classification type 35.29mm BR5 NS – 5.56x45 SS109 LP (DM11) (MEN)

Shot number	Impact velocity [m/s]	Stopped / Perforation	Splinters / No splinters	Test valid (Yes/No)
Sample 16SC00186				
KKW1 16SN00246	957	Stopped	NS	Yes
KKW1 16SN00247	946	Stopped	NS	Yes
KKW1 16SN00248	954	Stopped	NS	Yes
Sample 16SC00187				
KKW1 16SN00249	951	Stopped	NS	Yes
KKW1 16SN00250	958	Stopped	NS	Yes
KKW1 16SN00251	953	Stopped	NS	Yes
Sample 16SC00188				
KKW1 16SN00252	958	Stopped	NS	Yes
KKW1 16SN00253	962	Stopped	NS	Yes
KKW1 16SN00254	948	Stopped	NS	Yes

Classification type 46.05mm BR6 NS – 7.62x51 Ball (Sintox)

Shot number	Impact velocity [m/s]	Stopped / Perforation	Splinters / No splinters	Test valid (Yes/No)
Sample 16SC00190				
KKW1 16SN00257	828	Stopped	NS	Yes
KKW1 16SN00258	836	Stopped	NS	Yes
KKW1 16SN00259	847	Stopped	NS	Yes
Sample 16SC00191				
KKW1 16SN00260	826	Stopped	NS	Yes
KKW1 16SN00261	839	Stopped	NS	Yes
KKW1 16SN00262	841	Stopped	NS	Yes
Sample 16SC00192				
KKW1 16SN00263	825	Stopped	NS	Yes
KKW1 16SN00264	827	Stopped	NS	Yes
KKW1 16SN00265	830	Stopped	NS	Yes

Classification type 79.50mm BR7 NS – 7.62x51 AP (P80/1)

Shot number	Impact velocity [m/s]	Stopped / Perforation	Splinters / No splinters	Test valid (Yes/No)
Sample 16SC00194				
KKW1 16SN00268	817	Stopped	NS	Yes
KKW1 16SN00269	816	Stopped	NS	Yes
KKW1 16SN00270	819	Stopped	NS	Yes
Sample 16SC00195				
KKW1 16SN00271	815	Stopped	NS	Yes
KKW1 16SN00272	815	Stopped	NS	Yes
KKW1 16SN00273	811	Stopped	NS	Yes
Sample 16SC00196				
KKW1 16SN00274	819	Stopped	NS	Yes
KKW1 16SN00275	820	Stopped	NS	Yes
KKW1 16SN00276	826	Stopped	NS	Yes

Classification type 41.29mm SG1 NS – Brenneke

Shot number	Impact velocity [m/s]	Stopped / Perforation	Splinters / No splinters	Test valid (Yes/No)
Sample 16SC00198				
KKW1 16SN00232	417	Stopped	NS	Yes
Sample 16SC00199				
KKW1 16SN00233	414	Stopped	NS	Yes
Sample 16SC00200				
KKW1 16SN00234	420	Stopped	NS	Yes

Classification type 64.06mm SG2 NS – Brenneke

Shot number	Impact velocity [m/s]	Stopped / Perforation	Splinters / No splinters	Test valid (Yes/No)
Sample 16SC00202				
KKW1 16SN00235	420	Stopped	NS	Yes
KKW1 16SN00236	410	Stopped	NS	Yes
KKW1 16SN00237	419	Stopped	NS	Yes
Sample 16SC00203				
KKW1 16SN00238	413	Stopped	NS	Yes
KKW1 16SN00239	416	Stopped	NS	Yes
KKW1 16SN00240	422	Stopped	NS	Yes
Sample 16SC00204				
KKW1 16SN00241	412	Stopped	NS	Yes
KKW1 16SN00242	420	Stopped	NS	Yes
KKW1 16SN00243	420	Stopped	NS	Yes

3 Conclusion

The tested glass product, marked by the client or manufacturer as: Simglass, laminated safety glass, manufactured by: Sim Cam San. Dış. Tic. A. Ş. meets the applicable requirements as stated in the European standard EN 1063 [1] for class EN 1063 ,

Thickness	21.77mm
Configuration (from the attack side)	
Classification	BR1 NS

Thickness	21.77mm
Configuration (from the attack side)	
Classification	BR2 NS

Thickness	23.53mm
Configuration (from the attack side)	
Classification	BR3 NS

Thickness	26.53mm
Configuration (from the attack side)	
Classification	BR4 NS

Thickness	35.29mm
Configuration (from the attack side)	
Classification	BR5 NS

Thickness	46.05mm
Configuration (from the attack side)	
Classification	BR6 NS

Thickness	79.50mm
Configuration (from the attack side)	
Classification	BR7 NS

Thickness	41.29mm
Configuration (from the attack side)	
Classification	SG1 NS

Thickness	64.06mm
Configuration (from the attack side)	
Classification	SG2 NS

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 made for the initial type test are representative to the production and deviations from perfection were included in the delivered test samples, the sampling was done under responsibility of the notified certification body and that the sampling records have been made available to the notified certification body.

4 References

- 1 European standard EN 1063:1999 (E),
Glass in building – Security glazing – Testing and classification of resistance against bullet attack,
European Committee for Standardization, November 1999.
- 2 TNO, Laboratory for Ballistics Research (LBR), Accreditation number RvA L275;
Test report number 16OD017, dated 22-01-2016,
21.77mm BR1 NS
21.77mm BR2 NS
23.53mm BR3 NS
26.53mm BR4 NS
35.29mm BR5 NS
46.05mm BR6 NS
79.50mm BR7 NS
41.29mm SG1 NS
64.06mm SG2 NS



5 Signatures

Author Mr. R. Brandhorst	Signature 
Specialist	
Peer review Mr. M.A.A.M. Schets, B.Sc.	Signature 
Specialist	
Approved by Mr. H. van Ginkel	Signature 
Business field manager	

Appendix A, Pictures of the test specimen



Shots 15SN00241 / -242 / -243, attack side



Shots 15SN00241 / -242 / -243, back side



Shots 15SN00238 / -239 / -240, attack side



Shots 15SN00238 / -239 / -240, back side



Shots 15SN00235 / -236 / -237, attack side



Shots 15SN00235 / -236 / -237, back side



Shot 15SN00234, attack side



Shots 15SN00234, back side



Shot 15SN00233, attack side



Shots 15SN00233, back side



Shot 15SN00232, attack side



Shots 15SN00232, back side



Shots 15SN00252 / -253 / -254, attack side



Shots 15SN00252 / -253 / -254, back side



Shots 15SN00249 / -250 / -251, attack side



Shots 15SN00249 / -250 / -251, back side



Shots 15SN00246 / -247 / -248, attack side



Shots 15SN00246 / -247 / -248, back side



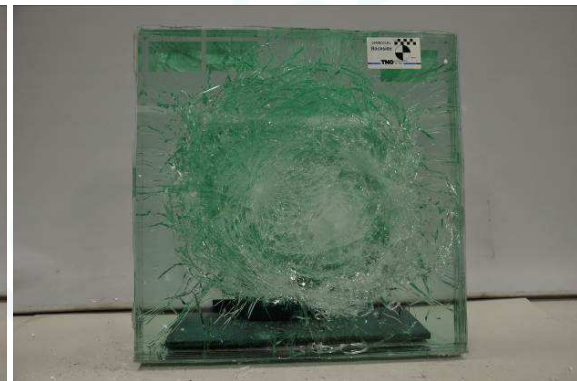
Shots 15SN00274 / -275 / -276, attack side



Shots 15SN00274 / -275 / -276, back side



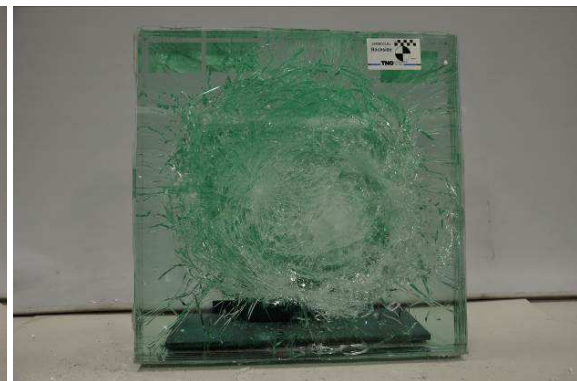
Shots 15SN00271 / -272 / -273, attack side



Shots 15SN00271 / -272 / -273, back side



Shots 15SN00268 / -269 / -270, attack side



Shots 15SN00268 / -269 / -270, back side



Shots 15SN00257 / -258 / -259, attack side



Shots 15SN00257 / -258 / -259, back side



Shots 15SN00260 / -261 / -262, attack side



Shots 15SN00260 / -261 / -262, back side



Shots 15SN00263 / -264 / -265, attack side



Shots 15SN00263 / -264 / -265, back side



Shots 16SN00216 / -217 / -218, attack side



Shots 16SN00216 / -217 / -218, back side



Shots 16SN00201 / -202 / -203, attack side



Shots 16SN00201 / -202 / -203, back side



Shots 16SN00196 / -197 / -198, attack side



Shots 16SN00196 / -197 / -198, back side



Shots 16SN00193 / -194 / -195, attack side



Shots 16SN00193 / -194 / -195, back side



Shots 16SN00212 / -213 / -214, attack side



Shots 16SN00212 / -213 / -214, back side



Shots 16SN00208 / -209 / -210, attack side



Shots 16SN00208 / -209 / -210, back side



Shots 16SN00205 / -206 / -207, attack side



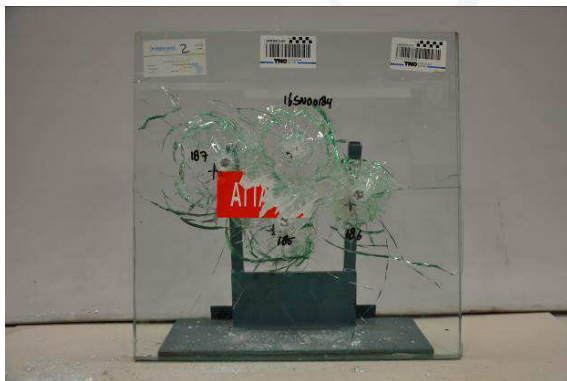
Shots 16SN00205 / -206 / -207, back side



Shots 16SN00188 / -189 / -190, attack side



Shots 16SN00188 / -189 / -190, back side



Shots 16SN00184 / -185 / -186, attack side



Shots 16SN00184 / -185 / -186, back side



Shots 16SN00181 / -182 / -183, attack side



Shots 16SN00181 / -182 / -183, back side



Shots 16SN00227 / -228 / -229, attack side



Shots 16SN00227 / -228 / -229, back side



Shots 16SN00221 / -222 / -223, attack side



Shots 16SN00221 / -222 / -223, back side



Shots 16SN00224 / -225 / -226, attack side



Shots 16SN00224 / -225 / -226, back side

(This is the end of this report).

