

REPORT No 11953

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Status: FINAL REPORT

EN 1063

GLASS IN BUILDING - SECURITY GLAZING TESTING AND CLASSIFICATION OF RESISTANCE AGAINST BULLET ATTACK

Program: SQ-6036.V8

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1. FOREWORD

This report summarizes the results of the **SQ-6036.V8** proficiency testing program on the verification of performance requirements of bullet-resistance glass and glass/plastic composites. This program is conducted in a bilateral format, following the “split-sample” design described in clause A.4.2 of ISO/IEC 17043: 2023 (Alternative interlaboratory comparisons).

South Quality conducted the testing program in June 2026 with the aim of assessing the laboratory's ability to competently perform the designated tests.

2. ORGANIZATION

Program Coordinator: Lic. Esther Casas
Assistant Technician: Berenice Ferrel
Statistics: Lic. Manuel Tozaki
Supervision: Eng. Emiliano Medina

3. OBJECTIVE

The objective of this proficiency testing program is to determine the test results on the BR7 (7,62 x 51 FJ/PB/HC1) method, in accordance with the following standard:

Standard
EN 1063: 1999

To verify this, batches of bullet resistant glazing have been chosen.

Participants in this program have not been previously informed about the expected values or value ranges of the samples they receive.

4. PARTICIPANT

Company: **ARDIC-HIT**
Laboratory: **Armour Ballistic and Blast Testing Facility**
Country: Pakistan
Client ID: S359
Contact person: Muhammad Nadeem Azam Warraich
Technical Manager
engr_nadeemchaudhary@yahoo.com

5. HOMOGENEITY

Several batches from different manufacturers were selected and prepared identically by the staff at South Quality.

Subsequently, a homogeneity study was conducted with an ISO 17025 accredited laboratory.

The control process followed ISO 33405: 2024, clauses 7.4.1.1 / 7.4.1.2. Stratified random sampling was applied, and samples were selected using random number generation software.

The results of these tests are presented below:

Size of each batch: **10 units**

Sample thickness: **50mm**

Tested samples from each batch: **4 units**

PARAMETER	HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES - BR7		
	MANUFACTURER: A	MANUFACTURER: B	MANUFACTURER: C
	BATCH: LMI3554	BATCH: LMI3555	BATCH: L3556
Specimen penetration	YES	NO	YES
Opening between back and front	YES	NO	YES
Glass splinters from rearface	YES	NO	YES
Witness plate integrity	YES	NO	YES

The samples for this program are taken from the selected batch identified as **LMI3554**.

For the indicated batch, the values determined in the homogeneity study are utilized as the assigned values.

The analysis of the test data indicated that the selected samples exhibited sufficient homogeneity for the program. Therefore, the results of participants identified as outliers cannot be attributed to sample variability

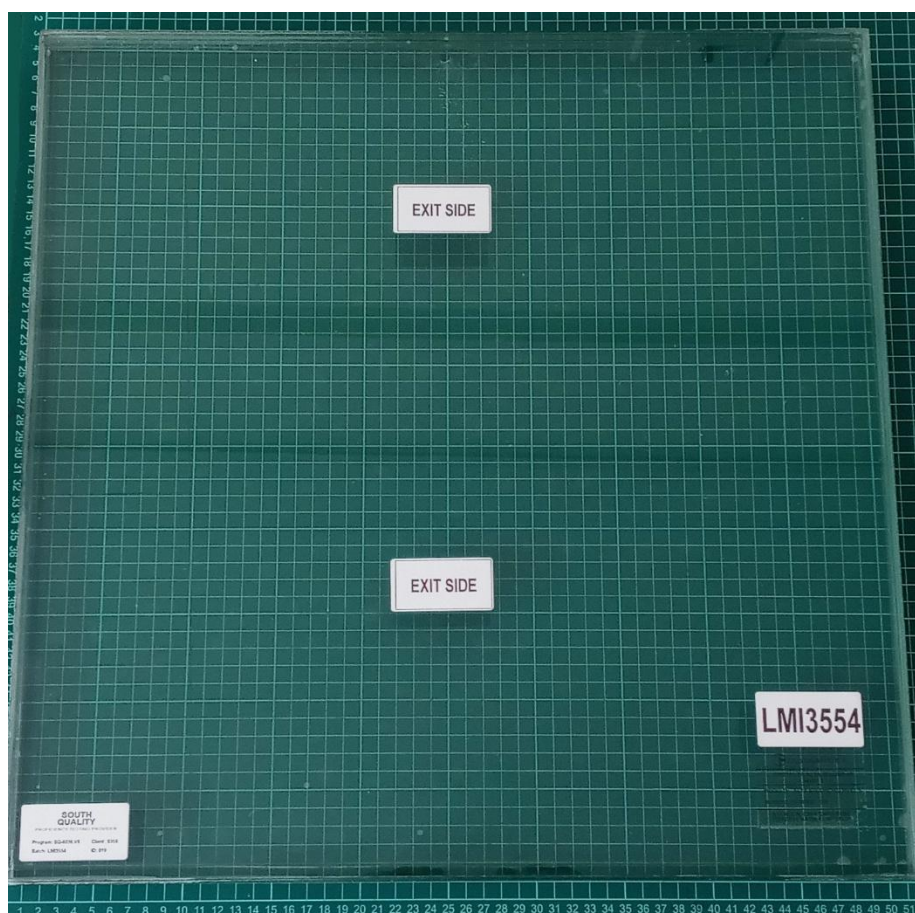
6. SAMPLE INFORMATION

The following sample was sent for testing:

Batch:	LMI3554
Sample ID:	019
Characteristics:	Bullet resistant glazing - 500 x 500 x 50 mm

7. IMAGES

SAMPLE



8. ASSIGNED VALUES

BATCH	SPECIMEN PENETRATION (% - IMPACT #) *	OPENING BETWEEN BACK AND FRONT (% - IMPACT #) *	GLASS SPLINTERS FROM REARFACE (% - IMPACT #) *	WITNESS PLATE INTEGRITY (% - IMPACT #) **	BALLISTIC RESISTANCE - ARMOR TYPE BR7 - (PASS / FAIL)
LMI3554	100% - #1	100% - #1	100% - #1	100% - #1	FAIL

* (%) - PERCENTAGE OF POSITIVE SITUATIONS (YES)

** (%) - PERCENTAGE OF "AFFECTED"

9. PARTICIPANT RESULTS (SEE APPENDIX)

CODE	SPECIMEN PENETRATION (% - IMPACT #) *	OPENING BETWEEN BACK AND FRONT (% - IMPACT #) *	GLASS SPLINTERS FROM REARFACE (% - IMPACT #) *	WITNESS PLATE INTEGRITY (% - IMPACT #) **	BALLISTIC RESISTANCE - ARMOR TYPE BR7 - (PASS / FAIL)
LMI3554 - 019 -	100% - #1	100% - #1	100% - #1	100% - #1	FAIL

* (%) - PERCENTAGE OF POSITIVE SITUATIONS (YES)

** (%) - PERCENTAGE OF "AFFECTED"

10. STATISTICS

The results must be treated as qualitative (Ballistic resistance and all parameters for test method BR7) as quantitative (Specimen penetration, opening between back front, glass splinters from rearface and witness plate integrity).

For qualitative results, the comparison will be made directly against the assigned values, so any difference will be evaluated as **Unsatisfactory**.

For quantitative results the comparison is made according to B.4.1.3 of ISO 17043 and the appropriate technique is to compare participant results with the assigned values. The results can be compared using difference **D**.

$$D = (x - X)$$

x is the participant's result

X is the assigned value

The performance evaluation is carried out with the following criteria according to the expert for the different parameters:

a) For impact count:

$|D| = 0$ indicates "satisfactory" performance and generates no signal;

$|D| = 1$ indicates "questionable" performance and generates a warning signal;

$|D| = 2$ indicates "unsatisfactory" performance and generates an action signal;

b) For the percentage values of the different variables:

- $|D| = 0 \%$ indicates “satisfactory” performance and generates no signal;
- $|D| = 33 \%$ indicates “questionable” performance and generates a warning signal;
- $|D| \geq 67 \%$ indicates “unsatisfactory” performance and generates an action signal;

11. EVALUATION OF PERFORMANCE

PROPERTY	PARAMETER	BATCH: LMI3554		$ D $	$ D \text{ [%]}$	PERFORMANCE RESULT
		PARTICIPANT RESULT	ASSIGNED VALUE			
SPECIMEN PENETRATION	%	100	100	-	0	SATISFACTORY
	Impact #	1	1	0	-	SATISFACTORY
OPENING BETWEEN BACK AND FRONT	%	100	100	-	0	SATISFACTORY
	Impact #	1	1	0	-	SATISFACTORY
GLASS SPLINTERS FROM REARFACE	%	100	100	-	0	SATISFACTORY
	Impact #	1	1	0	-	SATISFACTORY
WITNESS PLATE INTEGRITY	%	100	100	-	0	SATISFACTORY
	Impact #	1	1	0	-	SATISFACTORY

PROPERTY	BATCH: LMI3554		PERFORMANCE RESULT
	PARTICIPANT RESULT	ASSIGNED VALUE	
BALLISTIC RESISTANCE - ARMOR TYPE BR7 - (PASS/FAIL)	FAIL	FAIL	SATISFACTORY

12. CONCLUSIONS

The overall performance of this **SQ-6036.V8** program from the participant laboratory **ARDIC-HIT - Armour Ballistic and Blast Testing Facility**, is **SUFFICIENT** based on expected results.

The criteria used for evaluating the overall performance are as follows:

- **SUFFICIENT** performance: No unsatisfactory/questionable results were obtained.
- **ALMOST SUFFICIENT** performance: No unsatisfactory results were obtained, but one questionable result was found.
- **INSUFFICIENT** performance: An unsatisfactory result or two questionable results were obtained.

APPENDIX A

PARTICIPANT RESULTS

(Result form)



INSTRUCTIONS & RESULTS FORM

PROGRAM:	Glass in building - Security glazing Testing and classification of resistance against bullet attack
CODE:	SQ-6036
VERSION:	8
STANDARD:	EN 1063
COORDINATOR:	Lic. Esther Casas (ecasas@ptsouthquality.com)

1 - General

This document serves as a guide for managing the results of the **SQ-6036.V8** program.

Results must be typed, not handwritten.

2 - Standard

EN 1063: 1999

3 - Tests involved

TEST
Verification of performance for classification of the bullet-resistant of glass

4 - Samples

CODE	SAMPLE	QUANTITY
LMI3554-019	Bullet resistant glazing - 500x500x50 mm	1 unit

5 - Notes

- a) Being a bilateral program, there is no deadline for submitting results.
- b) The tables in this document may be modified by the participant, if desired, to include data or observations.
- c) The samples are to be handled as routine lab samples, with all testing, documentation, and reporting adhering to **EN 1063**.
- d) The samples include an identification marking on the inner face (EXIT SIDE). Verify that all shots are carried out on the external face.
- e) To review the results, test images would be appreciated. Images can be attached at the end of this document or sent by email.
- f) Once this document is completed, it must be converted into a PDF file and sent to the program coordinator.

6 - Test results

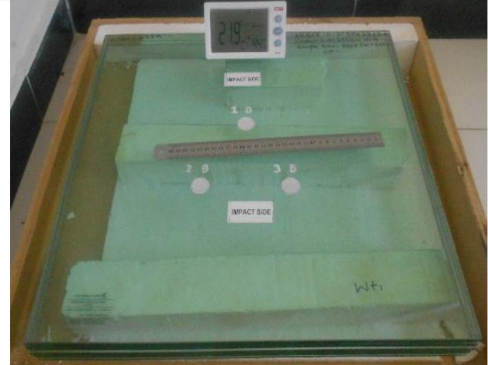
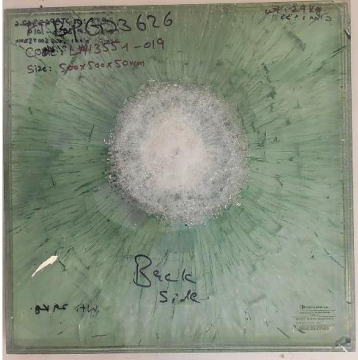
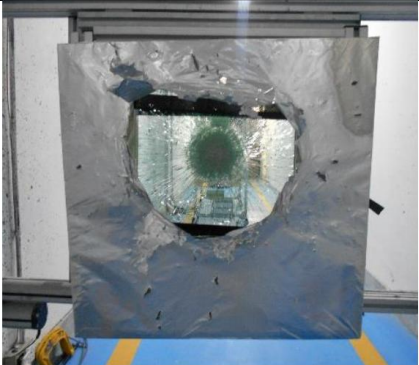
Method:	EN1063-1999
Test date/s:	23 June 2026

Specimen conditioning		Witness plate		Mechanism for measuring velocity	
Temperature (°C):	18± 5	Material:	Aluminum Foil	Accuracy m/s	±1 m/s
Time (h):	12h	Thickness (mm):	0.02mm	414 Infra-Red Velocity Screen	
		Density (g/m²):	54 g/m²		

CODE	Test method		Impact #	Test range (m)	Velocity (m/s)
	Type	Test ammunition			
LMI3554-019	BR7	7,62 x 51mm FJ/PB/HC1	1	10	822
			2		
			3		

Observations after impacts				
Impact #	Specimen penetration (YES/NO)	Opening between back and front (YES/NO)	Glass splinters from rearface (YES/NO)	Witness plate integrity (Affected / No affected)
1	Yes	Yes	Yes	Affected

CLASS OF BULLET RESISTANCE - ARMOR TYPE BR7 (PASS / FAIL)	
LMI3554-019	Fail

OBSERVATIONS	
- PT has been conducted as per standard EN1063-1999 / BR7 level for conformance. - Conditioning was carried out as per standard parameter for 12 hours - The Bullet got perforated on first shot.	
PHOTOGRAPHS	
	
BPG 12 hrs Condition in 18±5 °C	Specimen Install on Stand
	
Front	Back Side
	
Aluminum foil Before Test	Aluminum foil After Test

APPENDIX B

PARTICIPANT RESULTS

(Test report)



HEAVY INDUSTRY TAXILA

Ministry of Defense Production

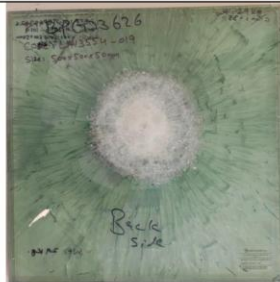
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Armour Ballistic and Blast Testing Facility

(ABBTF) ARDIC

Bullet Proof Glass Test Report



General Information						
Work Order / Letter No	PT Sample		Report ID	PTBPG23626		
Sample Code	LMI3554-019		Size	500x500x50mm		
Company Name	CRISTALBANG S.A. Argentina		Weight	29kg		
Description	Verification of performance for classification of the bullet-resistance of glass					
Proficiency Test Provider	PT SOUTH QUALITY SAS		Job No	01		
Sample Received Date	27 Nov 2025		Test Conduct Date	23 June 2026		
Standard / Method	EN-1063 B7 Lvl					
Set-Up						
Range used	01	Distance	10 Meters	Barrel ID	4867	
Velocity Screen ID	1151,1152	Accuracy m/s	± 1m/s	Velocity Screen Type	414 Infra-Red Velocity Screen	
Witness Material	Aluminum Foil	Thickness	0.02mm	Density (g/m ²)	54g/m ²	
Specimen Conditioning						
Temp (°C)	18±5 (Specimen Maintain)			Time (H)	12h	
Ammunition Details						
Ammo Type	Type	Tip Mass		Specified Vel (m/sec)		
7.62 X 51 mm FJ/PB/HC1	BR7	9.83g		820±10		
Shot Test Results						
Shot No	Ammo Type	Velocity (m/s)	Specimen Penetration (Yes/No)	Glass Splinters From Rearface (Yes/No)	Witness Foil (Affected/ No affected)	Opening Between Back & Front (Yes/No)
01	7.62x51mm FJ/PB/HC1	822	Yes	Yes	Affected	Yes
CLASS OF BULLET RESISTANCE – ARMOR TYPE BR7 (PASS / FAIL)						
LMI3554-019	Fail					
						
Front Side			Back Side			

Summary of Findings: Based on above results PT sample is not resistant to B7 level Protection

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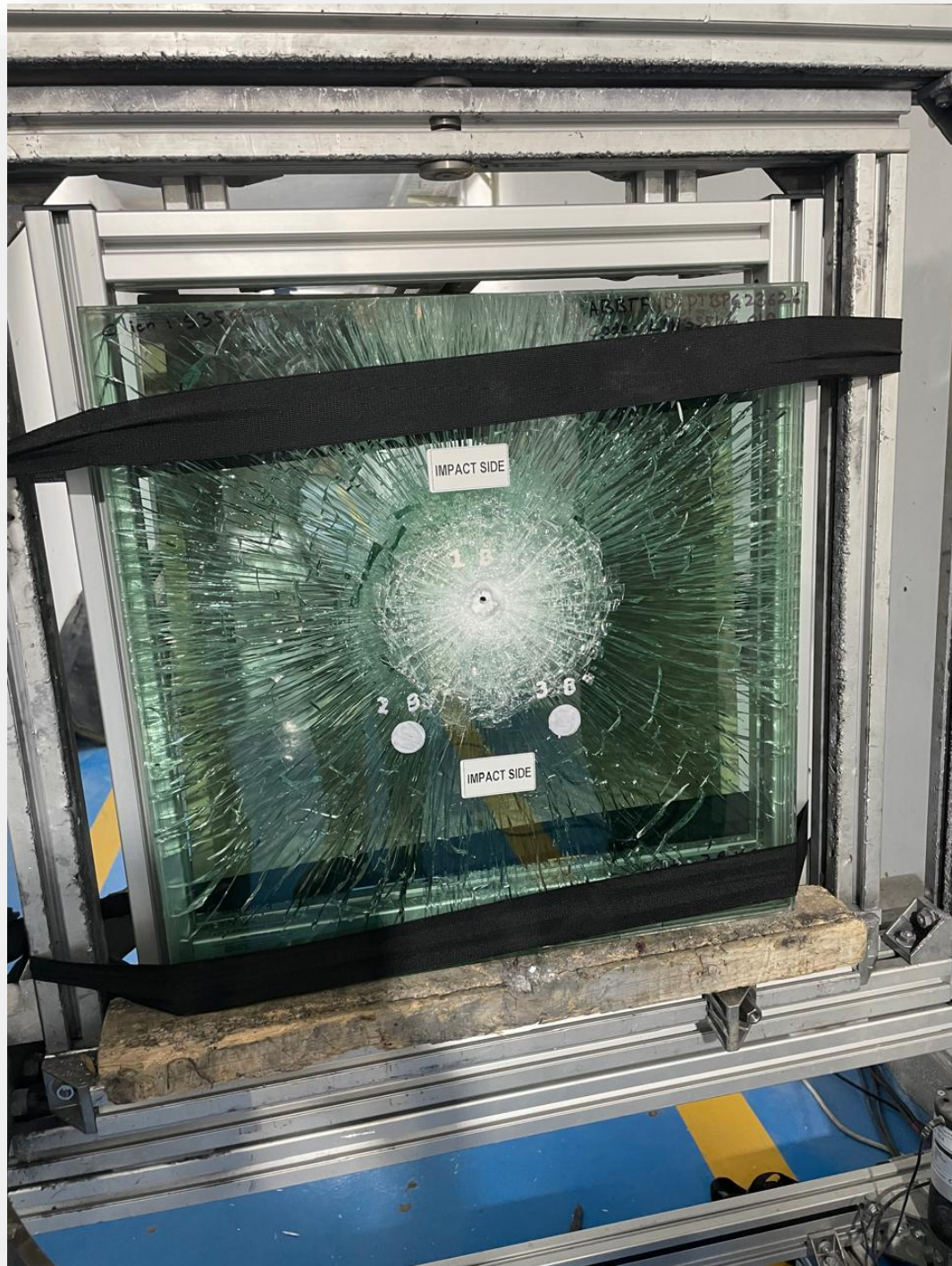
This report is valid only for specific samples tested and the conditions stated herein. The result solely on the samples provided by the client. The report doesn't represent any bulk/series.



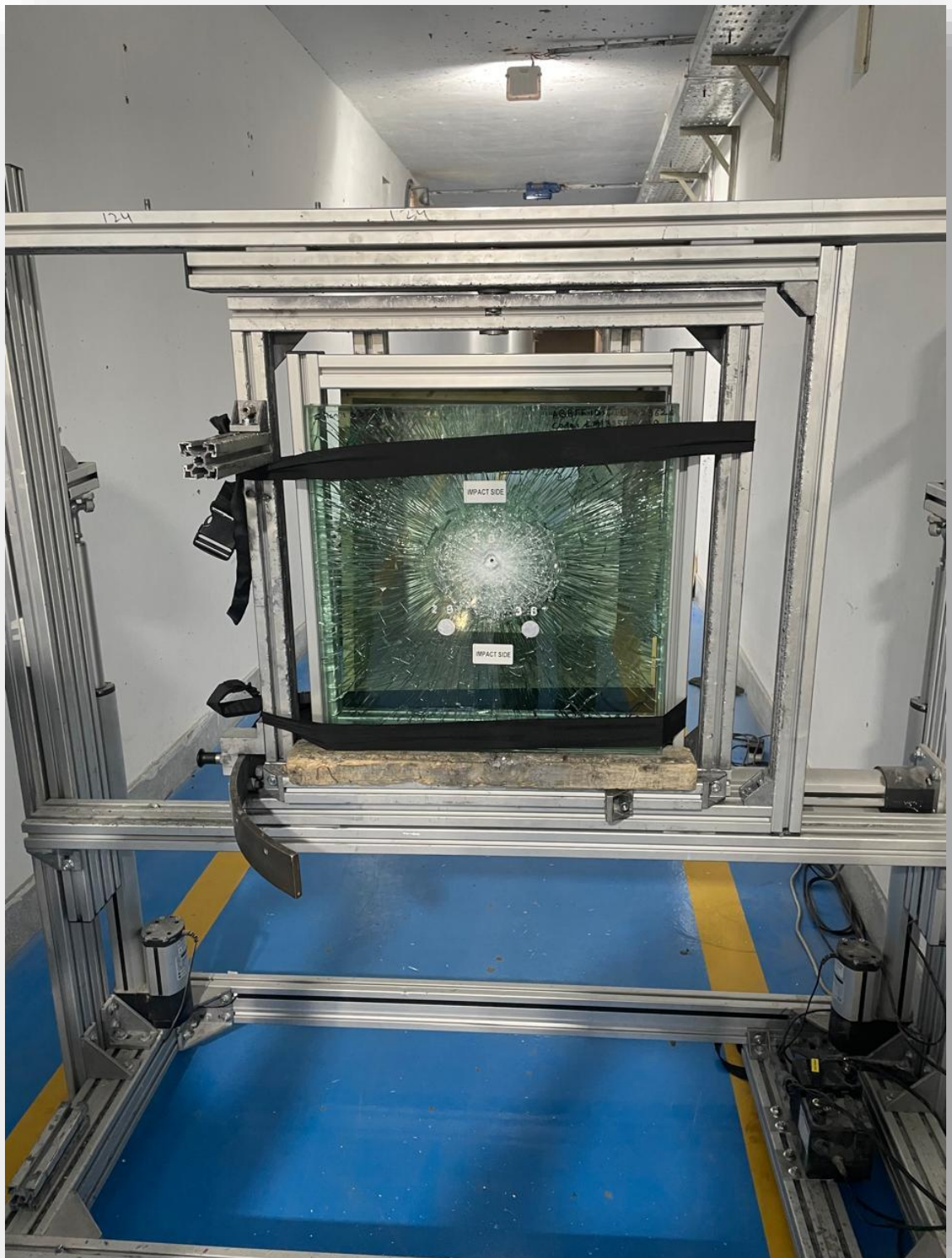
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23rd June 2026

APPENDIX C

PARTICIPANT IMAGES







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