

REPORT No 11355

Date of issue: September 17, 2025

Status: FINAL REPORT

NIJ 0108.01 BALLISTIC RESISTANT PROTECTIVE MATERIALS

Program: SQ-6011.V5

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1. FOREWORD

This report summarizes the results of the **SQ-6011.V5** proficiency testing program on the verification of performance requirements of test for ballistic resistant protective materials. This program is conducted in a bilateral format, following the A.3.3 classification of the ISO 17043 standard ("Split-sample testing schemes").

South Quality conducted the testing program from August 2025 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
Statistic:	Lic. Manuel Tozaki
Supervision:	Eng. Emiliano Medina

3. OBJECTIVE

The objective of this proficiency testing program is to determine the test results on the method III (7.62mm) in accordance with the following standard:

Standard
NIJ 0108.01 - 1985

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:	INDUSTRIA MILITAR - INDUMIL COLOMBIA
Laboratory:	LABORATORIO BALISTICA
Country:	Colombia
Client ID:	C079
Contact person:	Ing. Omar Alberto Pinzón Garavito Responsable Técnico - Laboratorio Balístico omar.pinzon@indumil.gov.co

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 Guide 35: 2017, clause 7.4.1.2. Stratified random sampling was employed, and samples were chosen using random number generation software.

The results of these tests are presented below:

Size of each batch: **10 units**

Sample thickness: **50 mm**

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

PARAMETER	HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES		
	MANUFACTURER: A	MANUFACTURER: B	MANUFACTURER: C
	BATCH: LMI3510	BATCH: LMI3511	BATCH: LMI3512
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 **LMI3510**.

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.

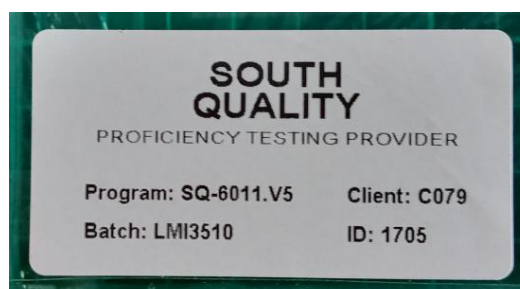
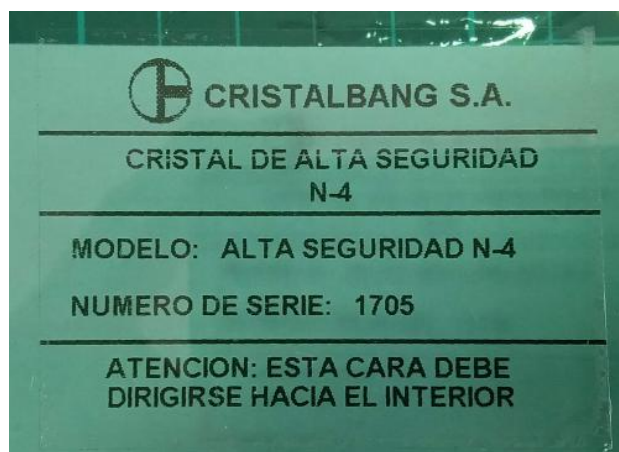
6. SAMPLE INFORMATION

The following sample was sent for testing:

Batch:	LMI3510
Sample ID:	1705
Characteristics:	Bullet resistant glazing - 310 x 310 x 50 mm

7. IMAGES

SAMPLE



8. ASSIGNED VALUES

BATCH	SPECIMEN PENETRATION (%) [*]	OPENING BETWEEN BACK AND FRONT (%) [*]	GLASS SPLINTERS FROM REARFACE (%) [*]	WITNESS PLATE INTEGRITY (%) ^{**}	BALLISTIC RESISTANCE - ARMOR TYPE III - (PASS / FAIL)
LMI3510	20	20	80	20	FAIL

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

** (%) - PERCENTAGE OF "AFFECTED"

9. PARTICIPANT RESULTS (SEE APPENDICES)

CODE	SPECIMEN PENETRATION (%) [*]	OPENING BETWEEN BACK AND FRONT (%) [*]	GLASS SPLINTERS FROM REARFACE (%) [*]	WITNESS PLATE INTEGRITY (%) ^{**}	BALLISTIC RESISTANCE - ARMOR TYPE III - (PASS / FAIL)
LMI3510 - 1705 -	20	20	80	20	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 III) 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 B.3.1.3 of ISO 17043 and the appropriate technique is to compare participant results with the assigned values. The results can be compare 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:

$|D| \leq 20 \%$ indicates "satisfactory" performance and generates no signal;

$|D| = 40 \%$ indicates "questionable" performance and generates a warning signal;

$|D| > 40 \%$ indicates "unsatisfactory" performance and generates an action signal;

11. EVALUATION OF PERFORMANCE

PROPERTY	BATCH: LMI3510		D [%]	PERFORMANCE RESULT
	PARTICIPANT RESULT	ASSIGNED VALUE		
SPECIMEN PENETRATION (%)	20	20	0	SATISFACTORY
OPENING BETWEEN BACK AND FRONT (%)	20	20	0	SATISFACTORY
GLASS SPLINTERS FROM REARFACE (%)	80	80	0	SATISFACTORY
WITNESS PLATE INTEGRITY (%)	20	20	0	SATISFACTORY

PROPERTY	BATCH: LMI3510		PERFORMANCE RESULT
	PARTICIPANT RESULT	ASSIGNED VALUE	
BALLISTIC RESISTANCE - ARMOR TYPE III - (PASS/FAIL)	FAIL	FAIL	SATISFACTORY

12. CONCLUSIONS

The overall performance of this **SQ-6011.V5** program from the participant laboratory **INDUSTRIA MILITAR - INDUMIL COLOMBIA / LABORATORIO BALISTICA**, 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)



INSTRUCTIVE & RESULTS FORM

PROGRAM:	Ballistic resistant protective materials
CODE:	SQ-6011
VERSION:	5
STANDARD:	NIJ 0108.01
COORDINATOR:	Lic. Esther Casas (ecasas@ptsouthquality.com)

1 - General

This document is intended to be filled with the results of the **SQ-6011.V5** program.

Results must be typed, not handwritten.

2 - Standard

NIJ 0108.01 - 1985

3 - Tests involved

TEST
Verification of performance requirements of test for ballistic resistant protective materials

4 - Samples

CODE	SAMPLE	QUANTITY
LMI3510-1705	Bullet resistant glazing - 310x310x50 mm	1 unit

5 - Notes

- Being a bilateral program there is no deadline to accomplish sending results.
- Tables in this document can be modified at will for the addition of data or observations.
- The samples have an identification of the inner face. Verify that the shots are made on the external face.
- In order to review the results, sending images of the tests will be required. Images can be attached at the final of this document or can be sent by email.
- Once this document is completed, it is requested to transform it into a pdf file and send it to the program coordinator.

6 - Test results

Method:	According to standard
Test date:	2025-08-14

Specimen conditioning		Witness plate		Mechanism for measuring velocity	
Temperature (°C):	21.4	Material:	Glazing	Accuracy (m/s):	2
Time (h):	10:00	Thickness (mm):	48.77		
		Density (g/m³):	2385923,93 g/m³		

CODE	Test method		Impact #	Distances (mm)				Velocity (m/s)	Fair hit (YES / NO)
	Type	Test ammunition		Muzzle-ON trigger	ON-OFF triggers	Muzzle-Specimen	Specimen-Witness plate		
LMI3510-1705	III	7.62 mm	1	11500	2000	15000	150	832,05	YES
			2	11500	2000	15000	150	838,54	YES
			3	11500	2000	15000	150	834,17	YES
			4	11500	2000	15000	150	831,08	YES
			5	11500	2000	15000	150	840,42	YES

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	NO	NO	NO	No affected
2	NO	NO	YES	No affected
3	NO	NO	YES	No affected
4	NO	NO	YES	No affected
5	YES	YES	YES	Affected

BALLISTIC RESISTANCE - ARMOR TYPE III (PASS / FAIL)	
LMI3510-1705	FAIL

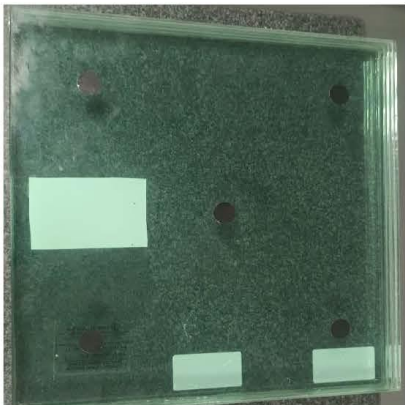
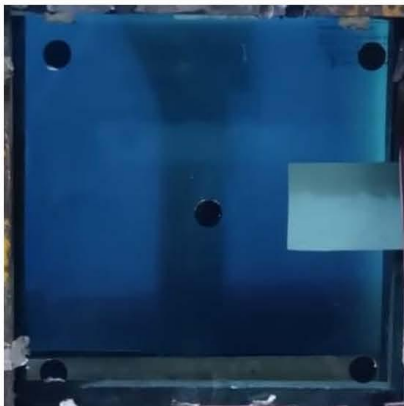
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OBSERVATIONS

- La probeta fue sometida a la prueba de resistencia balística con los criterios solicitados en la norma NIJ NIJ 0108.01 NIVEL III; los impactos se realizó a 15 metros de la boca del cañón, en un cuadrado de 200 mm de lado impactando en sus vértices y el último impacto al centro del cuadrado, la penetración se verificó mediante un testigo (Aluminio de 0,5 mm de espesor referencias 2024-T3 o 2024-T4), ubicado 150 mm atrás de la cara posterior de la probeta.
- Para la prueba de resistencia balística se usó munición calibre 7,62 X 51 mm FMJ (Full Metal Jacket), proyectil con masa promedio de 9.746 gramos.
- El resultado de la velocidad corresponde al valor de los disparos registrados durante el desarrollo de la prueba a una distancia de 2,5 metros de la cara de impacto de la probeta.
- Se generó Informe de resultados No. FJLB250041, el cual se adjunta

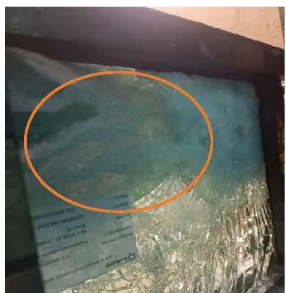
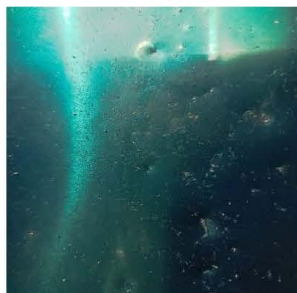
PHOTOGRAPHS	
Recepción	
	
Cara frontal probeta sin impactar	Cara trasera probeta sin impactar
	
Cara impacto	
	

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- REV 03 -

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Impacto 1		Cara trasera probeta impactada	
			
Impacto 2	Cara trasera probeta impactada	Testigo	
			
Impacto 3	Cara trasera probeta impactada	Testigo	
			
Impacto 4	Cara trasera probeta impactada	Testigo	
			
Impacto 5	Cara trasera probeta impactada	Testigo	



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APPENDIX B

PARTICIPANT RESULTS

(Test report)

INDUSTRIA MILITAR – INDUMIL
 Fábrica General José María Córdova "FAGECOR"
 Laboratorio Balístico



INFORME DE RESULTADOS
 TEST REPORT
 NÚMERO: FJLB250041

DATOS DEL CLIENTE

SOLICITANTE: CUSTOMER	EXPERQUIM SAS / SOUTH QUALITY	NIT/CC: ID	900468703-3
DIRECCIÓN: ADDRESS	Calle 68A 79 17	CIUDAD: CITY	Bogotá - Colombia
TELÉFONO: TELEPHONE NUMBER	4454475	CONTRATO: AGREEMENT	OC 45000014692 / SQ-6011.V5

IDENTIFICACIÓN DEL ÍTEM DE ENSAYO

DESCRIPCIÓN DEL ÍTEM DE ENSAYO: ITEM DESCRIPTION	Probeta de material transparente resistentes a las balas
CANTIDAD: QUANTITY	Una (01) Probeta de material transparente resistentes a las balas.
FECHA DE RECEPCIÓN: DATE OF ARRIVAL	2025-06-01
FECHA DE ENSAYO: DATE OF TEST	2025-06-03
FECHA DE EMISIÓN: DATE OF ISSUANCE	2025-06-10

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FIRMA AUTORIZADA
 Authorized signatory (ies)



Omar Alberto Pinzón Garavito
 Responsable Técnico
 Revisado y aprobado por – Checked and approved by

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INDUSTRIA MILITAR – INDUMIL
 Fábrica General José María Córdova "FAGECOR"
 Laboratorio Balístico



INFORME DE RESULTADOS
 TEST REPORT
 NÚMERO: FJLB250041

MÉTODO DE ENSAYO:

Norma **NIJ STANDARD 0108.01** Ballistic Resistant Protective Materials September 1985

EQUIPOS UTILIZADOS:

Código Interno	Descripción	Modelo	Serial	Calibrado por	Certificado de calibración No.
03B02	Balanza Digital 0,02 a 220 g	AJ-220E	63510258	INDUMIL-FEXAR	FEMA240163
03B03	Balanza Digital 0 a 60 kg	T21P / ANDE 100 TS	8033110651	INDUMIL-FEXAR	FEMA240165
03F05	Generador de pulsos HPI B-202	B 202	112503	COLMETRIK SAS	CMK-TFB-22034 CMK-GELEC-22141
03F17	B462 Precisión light screen system	B462-TR Time Recorder	170001	INDUMIL-FAGECOR	FJLC241957
03F18	Pantallas sensoras de luz infrarroja B462	B462-MF Measuring Frame	Start S/N 160048 Stop S/N 160073	INDUMIL-FAGECOR	FJLC241958
03F22	B472 Precisión Light Screen System Dual	B472-TR-1044 B472-TR-1025	B472 PS S/N: 240098 B472 PS S/N: 240099 Start 1 S/N: 230167 Start 2 S/N: 240078 Stop 1 S/N: 240079 Stop 2 S/N: 230168	HIGH PRESSURE INSTRUMENTATION	N/E
03P01	Pie de rey digital de 0 mm a 600 mm	CDC-60C / 550-205-10	0008552	ECI	LML-1241-21
03P03	Pie de rey digital de 0-150 mm	DC-6" CSX Cod.500-196-20	13287114	INDUMIL-FAGECOR	FJLC250288
03FL08	Cinta métrica 30 metros	34-262	N/E	ICCLAB LTDA	CDA-21-16449
03FL07	Flexometro 5 metros	30-615	N/E	ICCLAB LTDA	CDA-21-15040-1
03T11	Termohigrómetro digital	RH520	CH29922	Set y Gad S.A.S.	LC9312-23

TRAZABILIDAD:

- El laboratorio Balístico de la Industria Militar de Colombia asegura que las mediciones son trazables al Sistema Internacional de Unidades (SI) mediante Institutos Nacionales de Metrología o laboratorios reconocidos por Organismos Nacionales de Acreditación que forman parte de los acuerdos ILAC (Cooperación Internacional de Acreditación de Laboratorios).

CONDICIONES AMBIENTALES:

	21,4	Final
Temperatura °C	21,4°C	20,4°C
Humedad Relativa %	54%	52%

DESVIACIONES AL PROCEDIMIENTO:

-No Aplica

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INDUSTRIA MILITAR – INDUMIL
Fábrica General José María Córdova "FAGECOR"
Laboratorio Balístico



INFORME DE RESULTADOS
TEST REPORT
NÚMERO: FJLB250041

RESULTADOS DEL ENSAYO:

CONTROL DIMENSIONAL						
Código Interno de Laboratorio	Descripción del fabricante	Características				
		Largo (mm)	Ancho (mm)	Espesor (mm)	Masa (kg)	
FJLB250041- M01	LMI 3510 Modelo: Alta seguridad N-4 Serie: 1705	310,18	311,58	48,72	11,24	
		310,37	311,46	48,92		
		310,95	310,25	48,86		
		N.A.	N.A.	48,58		
	Promedio:	310,50	311,10	48,77		
PRUEBA DE RESISTENCIA BALISTICA						
Código Interno de Laboratorio	Norma	Nivel	Munición	Velocidad 1 (m/s)	Velocidad 2 (m/s)	Resultado
FJLB250041- M01	NIJ STANDARD 0108.01	III	7.62 x 51 mm FMJ	832,05	831,96	No Penetró
				838,54	839,04	No Penetró
				834,17	834,83	No Penetró
				831,08	831,77	No Penetró
				840,42	840,80	Penetró
Promedio:				835,22	835,68	

- La probeta fue sometida a la prueba de resistencia balística con los criterios solicitados en la norma NIJ NIJ 0108.01 NIVEL III; los impactos se realizó a 15 metros de la boca del cañón, en un cuadrado de 200 mm de lado impactando en sus vértices y el último impacto al centro del cuadrado, la penetración se verificó mediante un testigo (Aluminio de 0,5 mm de espesor), ubicado 150 mm atrás de la cara posterior de la probeta.

- Para la prueba de resistencia balística se usó munición calibre 7,62 X 51 mm FMJ (Full Metal Jacket), proyectil con masa promedio de 9.746 gramo

- Para la prueba de disparo se utilizó un cañón fijo no ventilado marca AVL Serial No.86120136, longitud 600 mm, cuatro (4) estrías en dextrógiro, longitud de paso estriado 1 giro x 305 mm.

- El resultado de la velocidad corresponde al valor de los disparos registrados durante el desarrollo de la prueba a una distancia de 2,5 metros de la cara de impacto de la probeta.

Observaciones:

-El material para el ensayo fue entregado al laboratorio balístico la firma EXPERTQUIM SAS, como consta en la planilla de ingreso/egreso de ítems de ensayo y/o calibración IM FC GCC FO 071.

- La muestra es recibida en el laboratorio, siendo responsabilidad de los clientes la toma, transporte y entrega de dichas muestras. No es responsabilidad del laboratorio asegurar si la muestra es representativa y si fue adecuadamente tomada, manipulada y transportada.

- El resultado descrito corresponde exclusivamente a la muestra recibida y no a otro material de la misma procedencia; el tipo de material es declarado por el fabricante; los resultados reportados en el presente informe son válidos para el ítem ensayado, en el momento y condiciones en que se realizó.

INCERTIDUMBRE DE MEDICIÓN:	
- La incertidumbre se expresa con un factor de cubrimiento de k=2 que corresponde a un nivel de confianza de aproximadamente el 95%	

Medición dimensional de las probetas Incertidumbre Expandida (U):	0,60 mm
Medición masa del proyectil Incertidumbre Expandida (U):	0,012 g
Medición de velocidad del proyectil Incertidumbre Expandida (U):	0,43 m/s

ABREVIATURAS

N.A. : NO APLICA N.E. : NO ESTABLECIDO N.R. : NO REGISTRO

FIN DEL INFORME

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