THE INSTITUTE OF SECURITY TECHNOLOGIES
„MORATEX"
90-505 ŁÓDŹ, 3 M. SKŁODOWSKIEJ-CURIE Str., POLAND

BALLISTIC LABORATORY

Akredytacja OIB JB

31/MON/2015

PCA Polskie Centrum Akredytacji BADANIA

AB 155

Copy ... 1

TESTS REPORT No. 011/2017U

Customer's name and address: UKRAINE

Contract/order number: (Agreement 001/2017/NB)

Date of completion of the test: 05.03.2017

Date of drawing up the report: 10.03.2017

Tests carried out by:

Andrzej Wijatkowski

Tomasz Madaj

Authorizing person

Laboratorium Badań Balistycznych
KIEROWNIK
dr inż. Marcin Landwijt

Remarks:
1. The results included in the report refer only to the tested objects.
2. Tests were carried on the samples delivered by a customer
3. Without a written consent of Head of Ballistic Laboratory, the report must not be duplicated otherwise than a whole.
4. Number with ± symbol is a value of standard uncertainty for the factor k=2 and confidence interval 95 %

1. Subject of the test

1.1	Description of the object:	Bulletproof Helmet
1.2	Quantity:	2
1.3	Customer's marking:	N/A
1.4	Laboratory code:	1. 011/2017U I H(2) STANAG 2920 2. 011/2017U II H(2) STANAG 2920
1.5	Size:	N/A
1.6	Weight:	1. 1585,4/1363,8 g (helmet/shell) 2. 1630,6/1413,2 g (helmet/shell)
1.7	Method of collection:	Supplied by the customer on 31th of March 2017.
1.8	Conditioning:	At a temperature of 20±2°C and a relative humidity 65±5 % for 24 hours.

2. Testing methodology

2.1	Procedure:	NATO STANAG 2920 "Ballistic Test Method For Personal Armour Materials And Combat Clothing".

3. Weapon used

3.1	Type:	Velocity ballistic barrel
3.2	Marking:	DN 525
3.3	Calibre:	7,62 mm
3.4	Length:	600 mm

4. Ammunition used

4.1	Bullet type:	FSP .22
4.2	Bullet weight:	1,1 g

5. Testing conditions

5.1	Ambient temperature:	21 °C
5.2	Humidity:	47 %

6. Witness panel

6.1	Type:	Aluminum panel, 0,5 mm thick made of aluminum alloy 2024-T3

7. Measuring and testing equipment used for the test

7.1	Hytherograph	P/14/S /24-3
7.2	Ballistic velocity barrel	U/07/S/24-3
7.3	Measuring tape 5m	P/08/S/24-3
7.4	Bullet velocity measurement system	B/01/L/24-3
7.5	Analytical balance HR200	P/16/L/24-3
7.6	Penetration test headform	U/06/S/24-3
7.7	Technical balance WPT-5	P/05/L/24-3

8. Summary of the results

8.1 Determination of V50 ballistic limit.

1) V50 = 695,2 m/s, delta = 23,2 m/s
2) V50 = 698,8 m/s, delta = 31,4 m/s

9. Qualifications to carry out the tests

9.1 The Polish Center of Accreditation has accredited Ballistic Laboratory in the field of testing of bullet proof qualities and resistance to perforation with sidearm according to the standards and testing procedures. Certificate of accreditation No. AB155

Attachement	Type:	Results of ballistic tests
	Numbering:	105, 106 from 2017w-105h.VT8 file
	Quantity:	2
Distribution list	Copy 1	Customer
	Copy 2	Ballistic Laboratory

Ballistic Laboratory	ITB "MORATEX"
Results of ballistic tests **Determining of bulletproof qualities**	Date: 2016-04-05 Number: 106 File No.: 2017w-105h.VT8

1	Contract/internal order No.	- 001/2017/NB
2	Object code	- 011/2017U II H(2) STANAG 2920
3	Date of collection/receiving of the object	- 31.03.2017
4	Object mass (g)	- 1630,6/1413,2
5	Ambient temperature (°C)	- 21
6	Ambient humidity (%)	- 47
7	Backing plasticity (mm)	- N/A
8	Standard/testing procedure No.	- STANAG 2920
9	Weapon type	- DN 525
10	Caliber (mm)	- 7,62
11	Barrel length (mm)	- 600
12	Bullet type and mass	- FSP .22 / 1,1
13	Uncertainty of measurement V_u (m/s)	± 0,9
14	Uncertainty of measurement G_d (mm)	± 1,0

Shot No.	Velocity V (m/s)	Impact angle (°)	Depth of backing deformation Gd (mm)	Penetration yes/no
1	712,3	0,0	-	yes
2	680,9	0,0	-	no
3	702,8	0,0	-	no
4	709,7	0,0	-	yes
5	697,9	0,0	-	yes
6	689,4	0,0	-	no
Average	698,8		-	
Max. Value	712,3		-	
Min. value	680,9		-	

Remarks: V50 = 698,8 m/s, delta = 31,4 m/s

Tests carried out by		Head of Laboratory
Andrzej Wijatkowski.....	Tomasz Madaj	Marcin Łandwijt .....

Number with ± symbol is a value of standard uncertainty for the factor k=2 and confidence interval 95 %

Ballistic Laboratory	ITB "MORATEX"
Results of ballistic tests **Determining of bulletproof qualities**	Date: 2016-04-05 Number: 105 File No.: 2017w-105h.VT8

1	Contract/internal order No.	- 001/2017/NB
2	Object code	- 011/2017U I H(2) STANAG 2920
3	Date of collection/receiving of the object	- 31.03.2017
4	Object mass (g)	- 1585,4/1363,8
5	Ambient temperature (°C)	- 21
6	Ambient humidity (%)	- 47
7	Backing plasticity (mm)	- N/A
8	Standard/testing procedure No.	- STANAG 2920
9	Weapon type	- DN 525
10	Caliber (mm)	- 7,62
11	Barrel length (mm)	- 600
12	Bullet type and mass	- FSP .22 / 1,1
13	Uncertainty of measurement V_u (m/s)	± 0,9
14	Uncertainty of measurement G_d (mm)	± 1,0

Shot No.	Velocity V (m/s)	Impact angle (°)	Depth of backing deformation Gd (mm)	Penetration yes/no
1	706,5	0,0	-	yes
2	691,1	0,0	-	yes
3	683,3	0,0	-	no
4	688,0	0,0	-	no
5	695,9	0,0	-	no
6	706,2	0,0	-	yes
Average	695,2		-	
Max. Value	706,5		-	
Min. value	683,3		-	

Remarks: V50 = 695,2 m/s, delta = 23,2 m/s

Tests carried out by		Head of Laboratory
Andrzej Wijatkowski.....	Tomasz Madaj	Marcin Łandwijt .....

Number with ± symbol is a value of standard uncertainty for the factor k=2 and confidence interval 95 %