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Laboratory for Ballistic  
Research (LBO)  
Visiting address:  
Suburb Ypenburg  
Ypenburgse Boslaan 2  
2496 ZA 's-Gravenhage

## Test certificate \*

The test has been carried out according to **STANAG 4569/AEP55 - Phase 1**  
class **KE-1, "7,62\*51 FMJ Ball" [PARTIAL] NS**

Assignor Allplast B.V.  
Schelde Rijnweg 6  
4691 RW Tholen  
Nederland

**Subject**  
Ballistic experiments

**Date**  
21-09-2010

**Reference**  
10MB03015 / 10MB03016 /  
10MB03017

**Contact**  
J.P.F. Broos

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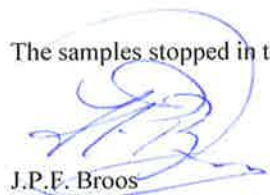
Project Glass

Sample identification STANAG 1 - 1, 2 and 3 7.62x51 NB 20°C

The Standard Conditions for Research  
Instructions given to TNO, as filed at  
the Registry of the District Court and  
the Chamber of Commerce in The  
Hague shall apply to all instructions  
given to TNO.

For details see page 2 upto page 5.

The samples stopped in total 10 impacts of a 7.62x51 Nato Ball projectile.



J.P.F. Broos

Project leader

\* This test certificate can not be used as a product certification



Test certificate number 10MB03015 / 10MB03016 / 10MB03017

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Assignor Allplast B.V.

Experiment date 26-07-2010

## Test results

### Description of testmethod

*Phase 1: Ballistic evaluation of single plate targets and minimum engineered targets used for R&D and quality control of materials and basics assemblies.*

*Establishing the ballistic protection capacity of bulletproof materials according to the requirements specified in the Stanag 4569 volume 1 (KE threats) version Feb. 2005. To this end the bulletproof sample was attached to a rigid frame and tested to determine to what extent the requirements concerning the ballistic protection are met. No requirement concerning number of shots are stated, only threat, impact velocity and multi-hit pattern (based on 4 shots).*

### Results

STANAG 1 - 1/3 7.62x51 NB 20 ° C (10MB03015) : KE-1, "7,62*51 FMJ Ball" - 7.62x51 Ball (Sintox)				
Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05479	817	Stopped	0	Yes
KKW1 10SN05480	825	Stopped	0	Yes
KKW1 10SN05481	811	Stopped	0	Yes

STANAG 1 - 2/3 7.62x51 NB 20 ° C (10MB03016) : KE-1, "7,62*51 FMJ Ball" - 7.62x51 Ball (Sintox)				
Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05482	832	Stopped	0	Yes
KKW1 10SN05483	831	Stopped	0	Yes
KKW1 10SN05484	836	Stopped	0	Yes

STANAG 1 - 3/3 7.62x51 NB 20 ° C (10MB03017) : KE-1, "7,62*51 FMJ Ball" - 7.62x51 Ball (Sintox)				
Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05486	832	Stopped	0	Yes
KKW1 10SN05487	829	Stopped	0	Yes
KKW1 10SN05488	832	Stopped	0	Yes
KKW1 10SN05489	829	Stopped	0	Yes

\* This test certificate can not be used as a product certification



Test certificate number 10MB03015 / 10MB03016 / 10MB03017

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Assignor Allplast B.V.

Experiment date 26-07-2010

**Sample specifications**

<b>Assignor identification</b>	:	STANAG 1 - 1/3 7.62x51 NB 20 ° C	STANAG 1 - 2/3 7.62x51 NB 20 ° C	STANAG 1 - 3/3 7.62x51 NB 20 ° C
<b>TNO identification</b>	:	10MB03015	10MB03016	10MB03017
<b>Date of arrival</b>	:	22-07-2010	22-07-2010	22-07-2010
<b>Size</b>	:	500 x 500 mm <sup>2</sup>	500 x 500 mm <sup>2</sup>	500 x 500 mm <sup>2</sup>
<b>Thickness</b>	:	43 mm	43 mm	43 mm
<b>Weight</b>	:	20850 gram	20850 gram	20850 gram
<b>Areal mass</b>	:	83.4 kg/m <sup>2</sup>	83.4 kg/m <sup>2</sup>	83.4 kg/m <sup>2</sup>
<b>Composition of sample in direction as encountered by projectile (Specification assignor)</b>	:	Assignee known to	Assignee known to	Assignee known to
<b>Remarks</b>	:	None	None	None

**Test specifications**

<b>Experimental facility</b>	:	Small Calibre Firing Range no. 1 Ypenburg	Small Calibre Firing Range no. 1 Ypenburg	Small Calibre Firing Range no. 1 Ypenburg
<b>- temperature</b>	:	22 °C	22 °C	22 °C
<b>- relative humidity</b>	:	66 %	66 %	66 %

**Conditioning of sample material**

<b>- duration at least</b>	:	12 - hours	12 - hours	12 - hours
<b>- temperature</b>	:	15 - 25 °C	15 - 25 °C	15 - 25 °C
<b>- relative humidity</b>	:	- %	- %	- %
<b>Remarks</b>	:	None	None	None

**Ballistic specifications**

<b>Weapon</b>	:	SVB	SVB	SVB
<b>- barrel length</b>	:	665 mm	645 mm	645 mm
<b>- rifling twist</b>	:	1 : 254 mm	1 : 254 mm	1 : 254 mm
<b>Projectile</b>	:	7.62x51 Ball (Sintox)	7.62x51 Ball (Sintox)	7.62x51 Ball (Sintox)
<b>- weight</b>	:	9.55 gram	9.55 gram	9.55 gram
<b>- calibre</b>	:	7.62 mm	7.62 mm	7.62 mm
<b>- manufacturer</b>	:	Metallwerk Elisenhutte Gmbh	Metallwerk Elisenhutte Gmbh	Metallwerk Elisenhutte Gmbh
<b>Distance muzzle to target</b>	:	7.8 m	7.8 m	7.8 m

**Other specifications**

<b>Contract number</b>	:	32242	32242	32242
<b>Backing</b>	:	Aluminium 0,5mm AL-2024	Aluminium 0,5mm AL-2024	Aluminium 0,5mm AL-2024



Test certificate number 10MB03015 / 10MB03016 / 10MB03017

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Assignor Allplast B.V.

Experiment date 26-07-2010



Figure 1 : Strike face, sample 10MB03015. Shot 5478 not valid, wrong projectile



Figure 2 : Strike face, sample 10MB03016



Test certificate number 10MB03015 / 10MB03016 / 10MB03017

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Assignor Allplast B.V.

Experiment date 26-07-2010

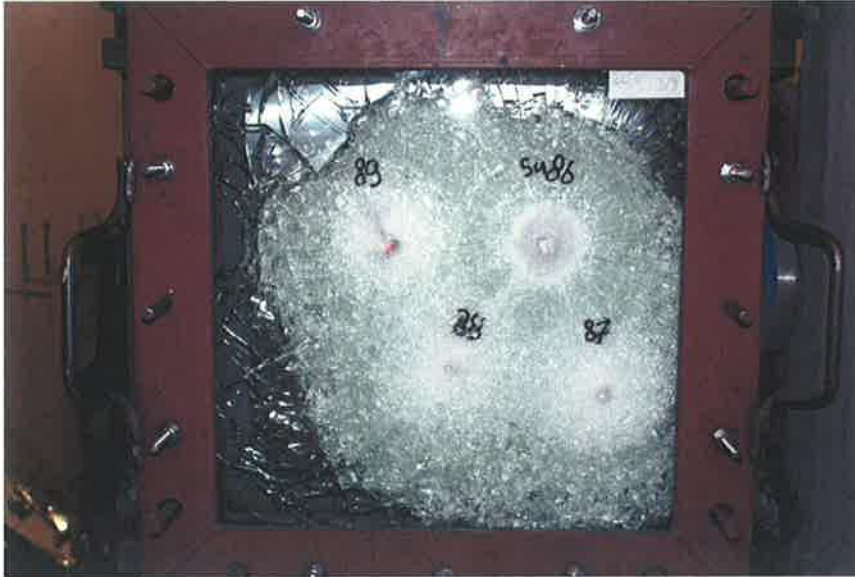
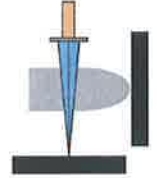


Figure 3 : Strike face, sample 10MB03017



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Laboratory for Ballistic  
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Visiting address:  
Suburb Ypenburg  
Ypenburgse Boslaan 2  
2496 ZA 's-Gravenhage

## Test certificate \*

The test has been carried out according to **STANAG 4569/AEP55 - Phase 1**  
class **KE-2, "7,62\*39 API-BZ" [PARTIAL] NS**

Assignor Allplast B.V.  
Schelde Rijnweg 6  
4691 RW Tholen  
Nederland

**Subject**  
Ballistic experiments  
**Date**  
21-09-2010

**Reference**  
10MB03024 / 10MB03025 /  
10MB03026

**Contact**  
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Experiment date 27-07-2010

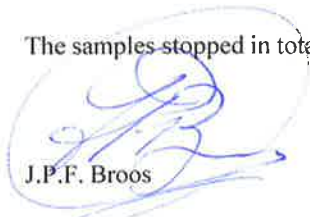
Project Glass

Sample identification STANAG 2 - 1, 2 and 3 7.62x39 API 20 ° C

The Standard Conditions for Research  
Instructions given to TNO, as filed at  
the Registry of the District Court and  
the Chamber of Commerce in The  
Hague shall apply to all instructions  
given to TNO.

For details see page 2 upto page 5.

The samples stopped in total 10 impacts with a 7.62x39 API projectile.

  
J.P.F. Broos  
Project leader

\* This test certificate can not be used as a product certification



Test certificate number 10MB03024 / 10MB03025 / 10MB03026

page 2 of 5

Assignor Allplast B.V.

Experiment date 27-07-2010

## Test results

### Description of testmethod

*Phase 1: Ballistic evaluation of single plate targets and minimum engineered targets used for R&D and quality control of materials and basics assemblies. Establishing the ballistic protection capacity of bulletproof materials according to the requirements specified in the Stanag 4569 volume 1 (KE threats) version Feb. 2005. To this end the bulletproof sample was attached to a rigid frame and tested to determine to what extent the requirements concerning the ballistic protection are met. No requirement concerning number of shots are stated, only threat, impact velocity and multi-hit pattern (based on 4 shots). For transparent armour, an alternative multi-hit pattern is accepted, an equilateral triangle 120mm (-0 / +20) as described. If no penetrations occur but splinters are released at the rear face of the test panel, this is marked as S (Splinters) behind the protection level. If not, this is marked as NS (No Splinters).*

### Results

STANAG 2 - 1/3 7.62x39 API 20 ° C (10MB03024) : KE-2, "7,62*39 API-BZ" - 7.62x39 API-BZ				
Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05558	703	Stopped	0	Yes
KKW1 10SN05559	686	Stopped	0	Yes
KKW1 10SN05560	689	Stopped	0	Yes

STANAG 2 - 2/3 7.62x39 API 20 ° C (10MB03025) : KE-2, "7,62*39 API-BZ" - 7.62x39 API-BZ				
Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05555	688	Stopped	0	Yes
KKW1 10SN05556	696	Stopped	0	Yes
KKW1 10SN05557	683	Stopped	0	Yes

STANAG 2 - 3/3 7.62x39 API 20 ° C (10MB03026) : KE-2, "7,62*39 API-BZ" - 7.62x39 API-BZ				
Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05551	686	Stopped	0	Yes
KKW1 10SN05552	683	Stopped	0	Yes
KKW1 10SN05553	677	Stopped	0	Yes
KKW1 10SN05554	707	Stopped	0	Yes

\* This test certificate can not be used as a product certification



Test certificate number 10MB03024 / 10MB03025 / 10MB03026

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Assignor Allplast B.V.

Experiment date 27-07-2010

**Sample specifications**

<b>Assignor identification</b>	:	STANAG 2 - 1/3 7.62x39 API 20 ° C	STANAG 2 - 2/3 7.62x39 API 20 ° C	STANAG 2 - 3/3 7.62x39 API 20 ° C
<b>TNO identification</b>	:	10MB03024	10MB03025	10MB03026
<b>Reference</b>	:			
<b>Date of arrival</b>	:	22-07-2010	22-07-2010	22-07-2010
<b>Size</b>	:	500 x 500 mm <sup>2</sup>	500 x 500 mm <sup>2</sup>	500 x 500 mm <sup>2</sup>
<b>Thickness</b>	:	68 mm	68 mm	68 mm
<b>Weight</b>	:	32800 gram	32800 gram	32800 gram
<b>Areal mass</b>	:	131.2 kg/m <sup>2</sup>	131.2 kg/m <sup>2</sup>	131.2 kg/m <sup>2</sup>
<b>Composition of sample in direction as encountered by projectile (Specification assignor)</b>	:	Assignee known to	Assignee known to	Assignee known to
<b>Remarks</b>	:	None	None	None

**Test specifications**

<b>Experimental facility</b>	:	Small Calibre Firing Range no. 1 Ypenburg	Small Calibre Firing Range no. 1 Ypenburg	Small Calibre Firing Range no. 1 Ypenburg
<b>- temperature</b>	:	21 °C	21 °C	22 °C
<b>- relative humidity</b>	:	62 %	62 %	55 %

**Conditioning of sample material**

<b>- duration at least</b>	:	12 - hours	12 - hours	12 - hours
<b>- temperature</b>	:	15 - 25 °C	15 - 25 °C	15 - 25 °C
<b>- relative humidity</b>	:	- %	- %	- %
<b>Remarks</b>	:	None	None	None

**Ballistic specifications**

<b>Weapon</b>	:	SVB	SVB	SVB
<b>- barrel length</b>	:	650 mm	650 mm	650 mm
<b>- rifling twist</b>	:	1 : 240 mm	1 : 240 mm	1 : 240 mm
<b>Projectile</b>	:	7.62x39 API-BZ	7.62x39 API-BZ	7.62x39 API-BZ
<b>- weight</b>	:	7.75 gram	7.75 gram	7.75 gram
<b>- calibre</b>	:	7.62 mm	7.62 mm	7.62 mm
<b>- manufacturer</b>	:	Hungary (case stamp 23)	Hungary (case stamp 23)	Hungary (case stamp 23)
<b>Distance muzzle to target</b>	:	9 m	9 m	9 m

**Other specifications**

<b>Contract number</b>	:	32242	32242	32242
<b>Backing</b>	:	Aluminium 0,5mm AL-2024	Aluminium 0,5mm AL-2024	Aluminium 0,5mm AL-2024

\* This test certificate can not be used as a product certification





Test certificate number 10MB03024 / 10MB03025 / 10MB03026

page 4 of 5

Assignor Allplast B.V.

Experiment date 27-07-2010



Figure 1 : Strike face, sample 10MB03024



Figure 2 : Strike face, sample 10MB03025

\* This test certificate can not be used as a product certification



Test certificate number 10MB03024 / 10MB03025 / 10MB03026

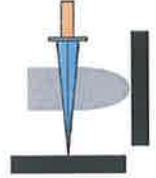
page 5 of 5

Assignor Allplast B.V.

Experiment date 27-07-2010



Figure 3 : Strike face, sample 10MB03026



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Visiting address:  
Suburb Ypenburg  
Ypenburgse Boslaan 2  
2496 ZA 's-Gravenhage

## Test certificate \*

The test has been carried out according to **STANAG 4569/AEP55 - Phase 1**  
class **KE-3, "7.62\*51 AP (WC core)" [PARTIAL]**  
**NS**

Assignor Allplast B.V.  
Schelde Rijnweg 6  
4691 RW Tholen  
Nederland

### Subject

Ballistic experiments

### Date

21-09-2010

### Reference

10MB03033 / 10MB03034 /  
10MB03035

### Contact

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Experiment date 26-07-2010

Project Glass

Sample identification STANAG 3.1 - 1, 2 and 3 7.62x51 AP WC core 20°C

For details see page 2 upto page 4.

The samples stopped in total 10 impacts of a 7.62x51 AP (WC core) projectile.

Project leader

\* This test certificate can not be used as a product certification



Test certificate number 10MB03033 / 10MB03034 / 10MB03035

page 2 of 4

Assignor Allplast B.V.

Experiment date 26-07-2010

## Test results

### Description of testmethod

*Phase 1: Ballistic evaluation of single plate targets and minimum engineered targets used for R&D and quality control of materials and basics assemblies. Establishing the ballistic protection capacity of bulletproof materials according to the requirements specified in the Stanag 4569 volume 1 (KE threats) version Feb. 2005. To this end the bulletproof sample was attached to a rigid frame and tested to determine to what extent the requirements concerning the ballistic protection are met. No requirement concerning number of shots are stated, only threat, impact velocity and multi-hit pattern (based on 4 shots). For transparent armour, an alternative multi-hit pattern is accepted, an equilateral triangle 120mm (-0 / +20) as described. If no penetrations occur but splinters are released at the rear face of the test panel, this is marked as S (Splinters) behind the protection level. If not, this is marked as NS (No Splinters).*

### Results

#### STANAG 3.1 - 1/3 7.62x51 AP WC core 20 ° C (10MB03033) : KE-3, "7.62\*51 AP (WC core)" - 7.62x51 AP WC (FFV)

Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05495	927	Stopped	0	Yes
KKW1 10SN05496	925	Stopped	0	Yes
KKW1 10SN05497	923	Stopped	0	Yes
KKW1 10SN05498	923	Stopped	0	Yes

#### STANAG 3.1 - 2/3 7.62x51 AP WC core 20 ° C (10MB03034) : KE-3, "7.62\*51 AP (WC core)" - 7.62x51 AP WC (FFV)

Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05499	924	Stopped	0	Yes
KKW1 10SN05500	924	Stopped	0	Yes
KKW1 10SN05501	924	Stopped	0	Yes

#### STANAG 3.1 - 3/3 7.62x51 AP WC core 20 ° C (10MB03035) : KE-3, "7.62\*51 AP (WC core)" - 7.62x51 AP WC (FFV)

Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05502	931	Stopped	0	Yes
KKW1 10SN05503	935	Stopped	0	Yes
KKW1 10SN05504	925	Stopped	0	Yes

\* This test certificate can not be used as a product certification



Test certificate number 10MB03033 / 10MB03034 / 10MB03035

page 3 of 4

Assignor Allplast B.V.

Experiment date 26-07-2010

**Sample specifications**

<b>Assignor identification</b>	:	STANAG 3.1 - 1/3 7.62x51 AP	STANAG 3.1 - 2/3 7.62x51 AP	STANAG 3.1 - 3/3 7.62x51 AP
		WC core 20 ° C	WC core 20 ° C	WC core 20 ° C
<b>TNO identification</b>	:	10MB03033	10MB03034	10MB03035
<b>Date of arrival</b>	:	22-07-2010	22-07-2010	22-07-2010
<b>Size</b>	:	500 x 500 mm <sup>2</sup>	500 x 500 mm <sup>2</sup>	500 x 500 mm <sup>2</sup>
<b>Thickness</b>	:	110 mm	110 mm	110 mm
<b>Weight</b>	:	55950 gram	55950 gram	55950 gram
<b>Areal mass</b>	:	223.8 kg/m <sup>2</sup>	223.8 kg/m <sup>2</sup>	223.8 kg/m <sup>2</sup>
<b>Composition of sample in direction as encountered by projectile (Specification assignor)</b>	:	Assignee known to	Assignee known to	Assignee known to
<b>Remarks</b>	:	None	None	None

**Test specifications**

<b>Experimental facility</b>	:	Small Calibre Firing Range no. 1 Ypenburg	Small Calibre Firing Range no. 1 Ypenburg	Small Calibre Firing Range no. 1 Ypenburg
<b>- temperature</b>	:	22 °C	22 °C	22 °C
<b>- relative humidity</b>	:	66 %	66 %	55 %

**Conditioning of sample material**

<b>- duration at least</b>	:	12 - hours	12 - hours	12 - hours
<b>- temperature</b>	:	15 - 25 °C	15 - 25 °C	15 - 25 °C
<b>- relative humidity</b>	:	- %	- %	- %
<b>Remarks</b>	:	None	None	None

**Ballistic specifications**

<b>Weapon</b>	:	SVB	SVB	SVB
<b>- barrel length</b>	:	645 mm	645 mm	645 mm
<b>- rifling twist</b>	:	1 : 254 mm	1 : 254 mm	1 : 254 mm
<b>Projectile</b>	:	7.62x51 AP WC (FFV)	7.62x51 AP WC (FFV)	7.62x51 AP WC (FFV)
<b>- weight</b>	:	8.33 gram	8.33 gram	8.33 gram
<b>- calibre</b>	:	7.62 mm	7.62 mm	7.62 mm
<b>- manufacturer</b>	:	Bofors Ordnance	Bofors Ordnance	Bofors Ordnance
<b>Distance muzzle to target</b>	:	7.8 m	7.8 m	7.8 m

**Other specifications**

<b>Contract number</b>	:	32242	32242	32242
<b>Backing</b>	:	Aluminium 0,5mm AL-2024	Aluminium 0,5mm AL-2024	Aluminium 0,5mm AL-2024

\* This test certificate can not be used as a product certification



Test certificate number 10MB03033 / 10MB03034 / 10MB03035

page 4 of 4

Assignor Allplast B.V.

Experiment date 26-07-2010

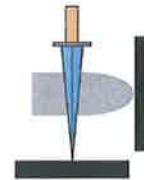


Figure 1 : Strike face, sample 10MB03033



Figure 2 : Strike face, sample 10MB03035, there is no picture of sample 10MB03034

\* This test certificate can not be used as a product certification



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Laboratory for Ballistic  
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Visiting address:  
Suburb Ypenburg  
Ypenburgse Boslaan 2  
2496 ZA 's-Gravenhage

## Test certificate \*

The test has been carried out according to **STANAG 4569/AEP55 - Phase 1**  
class **KE-3, "7.62\*51 AP (WC core)" [PARTIAL]**  
**NS**

Assignor Allplast B.V.  
Schelde Rijnweg 6  
4691 RW Tholen  
Nederland

**Subject**  
Ballistic experiments

**Date**  
21-09-2010

**Reference**  
10MB03030 / 10MB03031 /  
10MB03032

**Contact**  
J.P.F. Broos

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Experiment date 27-07-2010

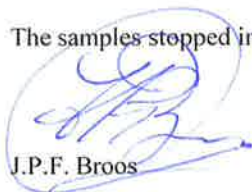
Project Glass

Sample identification STANAG 3.2 - 1, 2 and 3 7.62\*51 AP (WC core) -40°C

The Standard Conditions for Research  
Instructions given to TNO, as filed at  
the Registry of the District Court and  
the Chamber of Commerce in The  
Hague shall apply to all instructions  
given to TNO.

For details see page 2 upto page 5.

The samples stopped in total 10 impacts of a 7.62x51 AP (WC core) projectile.



J.P.F. Broos

Project leader

\* This test certificate can not be used as a product certification



Test certificate number 10MB03030 / 10MB03031 / 10MB03032

page 2 of 5

Assignor Allplast B.V.

Experiment date 27-07-2010

## Test results

### Description of testmethod

*Phase 1: Ballistic evaluation of single plate targets and minimum engineered targets used for R&D and quality control of materials and basics assemblies. Establishing the ballistic protection capacity of bulletproof materials according to the requirements specified in the Stanag 4569 volume 1 (KE threats) version Feb. 2005. To this end the bulletproof sample was attached to a rigid frame and tested to determine to what extent the requirements concerning the ballistic protection are met. No requirement concerning number of shots are stated, only threat, impact velocity and multi-hit pattern (based on 4 shots). For transparent armour, an alternative multi-hit pattern is accepted by the standard, an equilateral triangle of 120mm (-0 / +20).*

### Results

STANAG 3.2 - 1/3 7.62x51 AP WC core -40 ° C (10MB03030) : KE-3, "7.62*51 AP (WC core)" - 7.62x51 AP WC (FFV)				
Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05505	927	Stopped	0	Yes
KKW1 10SN05506	930	Stopped	0	Yes
KKW1 10SN05507	924	Stopped	0	Yes
KKW1 10SN05508	930	Stopped	0	Yes

STANAG 3.1 - 2/3 7.62x51 AP WC core -40 ° C (10MB03031) : KE-3, "7.62*51 AP (WC core)" - 7.62x51 AP WC (FFV)				
Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05580	924	Stopped	0	Yes
KKW1 10SN05581	923	Stopped	0	Yes
KKW1 10SN05582	928	Stopped	0	Yes

STANAG 3.1 - 3/3 7.62x51 AP WC core -40 ° C (10MB03032) : KE-3, "7.62*51 AP (WC core)" - 7.62x51 AP WC (FFV)				
Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05583	926	Stopped	0	Yes
KKW1 10SN05584	927	Stopped	0	Yes
KKW1 10SN05585	931	Stopped	0	Yes

\* This test certificate can not be used as a product certification





Test certificate number 10MB03030 / 10MB03031 / 10MB03032

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Assignor Allplast B.V.

Experiment date 27-07-2010

**Sample specifications**

<b>Assignor identification</b>	:	STANAG 3.2 - 1/3 7.62x51 AP	STANAG 3.1 - 2/3 7.62x51 AP	STANAG 3.1 - 3/3 7.62x51 AP
		WC core -40 ° C	WC core -40 ° C	WC core -40 ° C
<b>TNO identification</b>	:	10MB03030	10MB03031	10MB03032
<b>Reference</b>	:			
<b>Date of arrival</b>	:	22-07-2010	22-07-2010	22-07-2010
<b>Size</b>	:	500 x 500 mm <sup>2</sup>	500 x 500 mm <sup>2</sup>	500 x 500 mm <sup>2</sup>
<b>Thickness</b>	:	110 mm	110 mm	110 mm
<b>Weight</b>	:	55950 gram	55950 gram	55950 gram
<b>Areal mass</b>	:	223.8 kg/m <sup>2</sup>	223.8 kg/m <sup>2</sup>	223.8 kg/m <sup>2</sup>
<b>Composition of sample in direction as encountered by projectile (Specification assignor)</b>	:	Assignee known to	Assignee known to	Assignee known to
<b>Remarks</b>	:	None	None	None

**Test specifications**

<b>Experimental facility</b>	:	Small Calibre Firing Range no. 1 Ypenburg	Small Calibre Firing Range no. 1 Ypenburg	Small Calibre Firing Range no. 1 Ypenburg
<b>- temperature</b>	:	22 °C	21 °C	21 °C
<b>- relative humidity</b>	:	66 %	60 %	60 %

**Conditioning of sample material**

<b>- duration at least</b>	:	12 hours	12 hours	12 hours
<b>- temperature</b>	:	-40 °C	-40 °C	-40 °C
<b>- relative humidity</b>	:	- %	- %	- %
<b>Remarks</b>	:	None	None	None

**Ballistic specifications**

<b>Weapon</b>	:	SVB	SVB	SVB
<b>- barrel length</b>	:	645 mm	645 mm	645 mm
<b>- rifling twist</b>	:	1 : 254 mm	1 : 254 mm	1 : 254 mm
<b>Projectile</b>	:	7.62x51 AP WC (FFV)	7.62x51 AP WC (FFV)	7.62x51 AP WC (FFV)
<b>- weight</b>	:	8.33 gram	8.33 gram	8.33 gram
<b>- calibre</b>	:	7.62 mm	7.62 mm	7.62 mm
<b>- manufacturer</b>	:	Bofors Ordnance	Bofors Ordnance	Bofors Ordnance
<b>Distance muzzle to target</b>	:	7.8 m	9 m	9 m

**Other specifications**

<b>Contract number</b>	:	32242	32242	32242
<b>Backing</b>	:	Aluminium 0,5mm AL-2024	Aluminium 0,5mm AL-2024	Aluminium 0,5mm AL-2024

\* This test certificate can not be used as a product certification



Test certificate number 10MB03030 / 10MB03031 / 10MB03032  
Assignor Allplast B.V.

page 4 of 5  
Experiment date 27-07-2010



Figure 1 : Strike face, sample 10MB03030



Figure 2 : Strike face, sample 10MB03031



Test certificate number 10MB03030 / 10MB03031 / 10MB03032

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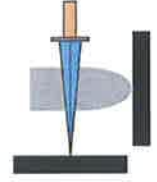
Assignor Allplast B.V.

Experiment date 27-07-2010



Figure 3 : Strike face, sample 10MB03032

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Laboratory for Ballistic  
Research (LBO)  
Visiting address:  
Suburb Ypenburg  
Ypenburgse Boslaan 2  
2496 ZA 's-Gravenhage

## Test certificate \*

The test has been carried out according to **STANAG 4569/AEP55 - Phase 1**  
class **KE-2, "7,62\*39 API-BZ" [PARTIAL] NS**

Assignor Allplast B.V.  
Schelde Rijnweg 6  
4691 RW Tholen  
Nederland

**Subject**  
Ballistic experiments

**Date**  
21-09-2010

**Reference**  
10MB03021 / 10MB03022 /  
10MB03023

**Contact**  
J.P.F. Broos

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+31 15 2843973

Experiment date 27-07-2010

Project Glass

Sample identification STANAG 2 - 1, 2 and 3 7.62x39 API -40°C

The Standard Conditions for Research  
Instructions given to TNO, as filed at  
the Registry of the District Court and  
the Chamber of Commerce in The  
Hague shall apply to all instructions  
given to TNO.

For details see page 2 upto page 5.

The samples stopped in total 10 impacts of a 7.62x39 API projectile

J.P.F. Broos

Project leader

\* This test certificate can not be used as a product certification



Test certificate number 10MB03021 / 10MB03022 / 10MB03023

page 2 of 5

Assignor Allplast B.V.

Experiment date 27-07-2010

## Test results

### Description of testmethod

*Phase 1: Ballistic evaluation of single plate targets and minimum engineered targets used for R&D and quality control of materials and basics assemblies. Establishing the ballistic protection capacity of bulletproof materials according to the requirements specified in the Stanag 4569 volume 1 (KE threats) version Feb. 2005. To this end the bulletproof sample was attached to a rigid frame and tested to determine to what extent the requirements concerning the ballistic protection are met. No requirement concerning number of shots are stated, only threat, impact velocity and multi-hit pattern (based on 4 shots). For transparent armour, an alternative multi-hit pattern is accepted, an equilateral triangle 120mm (-0 / +20) as described. If no penetrations occur but splinters are released at the rear face of the test panel, this is marked as S (Splinters) behind the protection level. If not, this is marked as NS (No Splinters).*

### Results

#### STANAG 2 - 1/3 7.62x39 API -40 ° C (10MB03021)

Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05561	710	Stopped	0	Yes
KKW1 10SN05562	694	Stopped	0	Yes
KKW1 10SN05563	686	Stopped	0	Yes
KKW1 10SN05564	699	Stopped	0	Yes

#### STANAG 2 - 2/3 7.62x39 API -40 ° C (10MB03022)

Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05565	693	Stopped	0	Yes
KKW1 10SN05566	690	Stopped	0	Yes
KKW1 10SN05567	687	Stopped	0	Yes

#### STANAG 2 - 3/3 7.62x39 API -40 ° C (10MB03023)

Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05568	688	Stopped	0	Yes
KKW1 10SN05569	694	Stopped	0	Yes
KKW1 10SN05570	686	Stopped	0	Yes

\* This test certificate can not be used as a product certification



Test certificate number 10MB03021 / 10MB03022 / 10MB03023

page 3 of 5

Assignor Allplast B.V.

Experiment date 27-07-2010

**Sample specifications**

<b>Assignor identification</b>	:	STANAG 2 - 1/3 7.62x39 API -40 ° C	STANAG 2 - 2/3 7.62x39 API -40 ° C	STANAG 2 - 3/3 7.62x39 API -40 ° C
<b>TNO identification</b>	:	10MB03021	10MB03022	10MB03023
<b>Reference</b>	:			
<b>Date of arrival</b>	:	22-07-2010	22-07-2010	22-07-2010
<b>Size</b>	:	500 x 500 mm <sup>2</sup>	500 x 500 mm <sup>2</sup>	500 x 500 mm <sup>2</sup>
<b>Thickness</b>	:	68 mm	68 mm	68 mm
<b>Weight</b>	:	32800 gram	32800 gram	32800 gram
<b>Areal mass</b>	:	131.2 kg/m <sup>2</sup>	131.2 kg/m <sup>2</sup>	131.2 kg/m <sup>2</sup>
<b>Composition of sample in direction as encountered by projectile (Specification assignor)</b>	:	Assignee known to	Assignee known to	Assignee known to
<b>Remarks</b>	:	None	None	None

**Test specifications**

<b>Experimental facility</b>	:	Small Calibre Firing Range no. 1 Ypenburg	Small Calibre Firing Range no. 1 Ypenburg	Small Calibre Firing Range no. 1 Ypenburg
<b>- temperature</b>	:	21 °C	21 °C	21 °C
<b>- relative humidity</b>	:	62 %	65 %	65 %

**Conditioning of sample material**

<b>- duration at least</b>	:	12 hours	12 hours	12 hours
<b>- temperature</b>	:	-40 °C	-40 °C	-40 °C
<b>- relative humidity</b>	:	- %	- %	- %
<b>Remarks</b>	:	None	None	None

**Ballistic specifications**

<b>Weapon</b>	:	SVB	SVB	SVB
<b>- barrel length</b>	:	650 mm	650 mm	650 mm
<b>- rifling twist</b>	:	1 : 240 mm	1 : 240 mm	1 : 240 mm
<b>Projectile</b>	:	7.62x39 API-BZ	7.62x39 API-BZ	7.62x39 API-BZ
<b>- weight</b>	:	7.75 gram	7.75 gram	7.75 gram
<b>- calibre</b>	:	7.62 mm	7.62 mm	7.62 mm
<b>- manufacturer</b>	:	Hungary (case stamp 23)	Hungary (case stamp 23)	Hungary (case stamp 23)
<b>Distance muzzle to target</b>	:	9 m	9 m	9 m

**Other specifications**

<b>Contract number</b>	:	32242	32242	32242
<b>Backing</b>	:	Aluminium 0,5mm AL-2024	Aluminium 0,5mm AL-2024	Aluminium 0,5mm AL-2024

\* This test certificate can not be used as a product certification



Test certificate number 10MB03021 / 10MB03022 / 10MB03023

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Assignor Allplast B.V.

Experiment date 27-07-2010



Figure 1 : Strike face, sample 10MB03021



Figure 2 : Strike face, sample 10MB03022

\* This test certificate can not be used as a product certification



Test certificate number 10MB03021 / 10MB03022 / 10MB03023

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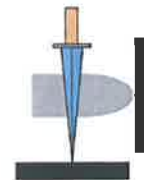
Assignor Allplast B.V.

Experiment date 27-07-2010



Figure 3 : Strike face, sample 10MB03023





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Laboratory for Ballistic  
Research (LBO)  
Visiting address:  
Suburb Ypenburg  
Ypenburgse Boslaan 2  
2496 ZA 's-Gravenhage

## Test certificate \*

The test has been carried out according to **STANAG 4569/AEP55 - Phase 1**  
class **KE-3, "7.62\*54R B32/API" [PARTIAL] NS**

Assignor Allplast B.V.  
Schelde Rijnweg 6  
4691 RW Tholen  
Nederland

**Subject**  
Ballistic experiments

**Date**  
21-09-2010

**Reference**  
10MB03040 / 10MB03041 /  
10MB03042

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Experiment date 27-07-2010

Project Glass

Sample identification STANAG 3.2 - 1,2 and 3 7.62x54R API B32 20°C

The Standard Conditions for Research  
Instructions given to TNO, as filed at  
the Registry of the District Court and  
the Chamber of Commerce in The  
Hague shall apply to all instructions  
given to TNO.

For details see page 2 upto page 5.

The samples stopped in total 10 impacts of a 7.62x54R API B32 projectile

J.P.F. Broos

Project leader

\* This test certificate can not be used as a product certification



Test certificate number 10MB03040 / 10MB03041 / 10MB03042

page 2 of 5

Assignor Allplast B.V.

Experiment date 27-07-2010

## Test results

### Description of testmethod

*Phase 1: Ballistic evaluation of single plate targets and minimum engineered targets used for R&D and quality control of materials and basics assemblies.*

*Establishing the ballistic protection capacity of bulletproof materials according to the requirements specified in the Stanag 4569 volume 1 (KE threats) version Feb. 2005. To this end the bulletproof sample was attached to a rigid frame and tested to determine to what extent the requirements concerning the ballistic protection are met. No requirement concerning number of shots are stated, only threat, impact velocity and multi-hit pattern (based on 4 shots). For transparent armour, an alternative multi-hit pattern is accepted by the standard, an equilateral triangle 120mm (-0 / +20).*

### Results

STANAG 3.2 - 1/3 7.62x54R API B32 20 ° C (10MB03040) : KE-3, "7.62*54R B32/API" - 7.62x54R API B32				
Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05521	846	Stopped	0	Yes
KKW1 10SN05522	845	Stopped	0	Yes
KKW1 10SN05523	849	Stopped	0	Yes
KKW1 10SN05524	848	Stopped	0	Yes

STANAG 3.2 - 2/3 7.62x54R API B32 20 ° C (10MB03041) : KE-3, "7.62*54R B32/API" - 7.62x54R API B32				
Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05528	848	Stopped	0	Yes
KKW1 10SN05529	846	Stopped	0	Yes
KKW1 10SN05530	841	Stopped	0	Yes

STANAG 3.2 - 3/3 7.62x54R API B32 20 ° C (10MB03042) : KE-3, "7.62*54R B32/API" - 7.62x54R API B32				
Shot number	Impact velocity [m/s]	Stop / Perforation	Shot angle [°NATO]	Valid (Yes/No)
KKW1 10SN05525	844	Stopped	0	Yes
KKW1 10SN05526	837	Stopped	0	Yes
KKW1 10SN05527	842	Stopped	0	Yes

\* This test certificate can not be used as a product certification



Test certificate number 10MB03040 / 10MB03041 / 10MB03042

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Assignor Allplast B.V.

Experiment date 27-07-2010

**Sample specifications**

<b>Assignor identification</b>	:	STANAG 3.2 - 1/3 7.62x54R API B32 20 ° C	STANAG 3.2 - 2/3 7.62x54R API B32 20 ° C	STANAG 3.2 - 3/3 7.62x54R API B32 20 ° C
<b>TNO identification</b>	:	10MB03040	10MB03041	10MB03042
<b>Date of arrival</b>	:	22-07-2010	22-07-2010	22-07-2010
<b>Size</b>	:	500 x 500 mm <sup>2</sup>	500 x 500 mm <sup>2</sup>	500 x 500 mm <sup>2</sup>
<b>Thickness</b>	:	105 mm	105 mm	105 mm
<b>Weight</b>	:	50500 gram	50500 gram	50500 gram
<b>Areal mass</b>	:	202 kg/m <sup>2</sup>	202 kg/m <sup>2</sup>	202 kg/m <sup>2</sup>
<b>Composition of sample in direction as encountered by projectile (Specification assignor)</b>	:	Assignee known to	Assignee known to	Assignee known to
<b>Remarks</b>	:	None	None	None

**Test specifications**

<b>Experimental facility</b>	:	Small Calibre Firing Range no. 1 Ypenburg	Small Calibre Firing Range no. 1 Ypenburg	Small Calibre Firing Range no. 1 Ypenburg
<b>- temperature</b>	:	22 °C	22 °C	22 °C
<b>- relative humidity</b>	:	55 %	55 %	55 %

**Conditioning of sample material**

<b>- duration at least</b>	:	12 - hours	12 - hours	12 - hours
<b>- temperature</b>	:	15 - 25 °C	15 - 25 °C	15 - 25 °C
<b>- relative humidity</b>	:	- %	- %	- %
<b>Remarks</b>	:	None	None	None

**Ballistic specifications**

<b>Weapon</b>	:	SVB	SVB	SVB
<b>- barrel length</b>	:	665 mm	665 mm	665 mm
<b>- rifling twist</b>	:	1 : 240 mm	1 : 240 mm	1 : 240 mm
<b>Projectile</b>	:	7.62x54R API B32	7.62x54R API B32	7.62x54R API B32
<b>- weight</b>	:	10.4 gram	10.4 gram	10.4 gram
<b>- calibre</b>	:	7.62 mm	7.62 mm	7.62 mm
<b>- manufacturer</b>	:	Factory 539, Tula.	Factory 539, Tula.	Factory 539, Tula.
<b>Distance muzzle to target</b>	:	9 m	9 m	9 m
<b>Target obliquity</b>	:	0 °NATO	0 °NATO	0 °NATO

**Other specifications**

<b>Contract number</b>	:	32242	32242	32242
<b>Backing</b>	:	Aluminium 0,5mm AL-2024	Aluminium 0,5mm AL-2024	Aluminium 0,5mm AL-2024

\* This test certificate can not be used as a product certification



Test certificate number 10MB03040 / 10MB03041 / 10MB03042

page 4 of 5

Assignor Allplast B.V.

Experiment date 27-07-2010



Figure 3 : Strike face, sample 10MB03042



Figure 2 : Strike face, sample 10MB03041

\* This test certificate can not be used as a product certification



Test certificate number 10MB03040 / 10MB03041 / 10MB03042

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Assignor Allplast B.V.

Experiment date 27-07-2010



Figure 3 : Strike face, sample 10MB03042