

# Beschussamt Mellrichstadt

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PPSS Ltd.  
Knaresborough Technology park,  
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UK-Knaresborough HG5 8LF

## Test Report

Testing the ballistic resistance of body armour  
according to NIJ-Std. 0101.04

Report No. : 11W221A01#, order No.: 7229  
Date of delivery : 18.07.2011  
Tester : Schmitt, Klier  
Sample : insert for body armour vest (soft armour)  
Designation : P2M/PPSS Standard IIIA  
Applicant : SEAS SCANDINAVIA SVERIGE AB  
Manufacturer : SEAS SCANDINAVIA SVERIGE AB  
Requirement : Armor Type IIIA

Bötsch

Mellrichstadt, 22.07.2011

The test results are only valid for the samples described in this test report.  
The applicability of this test report is restricted to five years from the date of testing. It will expire prematurely, if any alteration or modification to the manufacturing process, materials and/or quality management system could impact the product conformity.  
This test report is only valid with the correspondence of the report numbers on all pages and with the official seal.  
Duplication in extracts of this report is only allowed with written approval of the Beschussamt Mellrichstadt.

Beschussamt Mellrichstadt  
Lohstraße 5, 97638 Mellrichstadt

Report-No.: 11W221A01#  
Report part-No.: 01  
Test date: 19.07.2011

Description of the specimen in shooting direction (specification of the manufacturer):

16 layers PE-shield (Dyneema SB51)  
1 layer coated aramid laminate (0,95mm)  
3 layers PE-shield (Dyneema SB51)  
All layers are welded in a textile cover.  
front part  
large  
816g

Total weight determined by the Beschussamt (g) : 816  
mass per unit area determined by the Beschussamt (kg/m<sup>2</sup>) : ---  
mass per unit area determined by the manufacturer (kg/m<sup>2</sup>) : ---

Test conditions and results:

Calibre : 9mm Luger (9 x 19)  
Bullet type : FMJ/RN/SC (R9MM2, Index 23558, Rem, CN263)  
Bullet mass : 8,00g  
required bullet speed: 436m/s  
Weapon : test barrel No. 08/02  
Barrel length : 260mm  
Twist length : 250mm  
Shooting distance : 5,00m  
Test range temp. : 21°C  
Test range humid. : 50%  
Sample temperature : 21°C  
Backing material calibration (average value): 18,8mm

Test requirement:  
wet test according to NIJ

No.	veloc. V(2,50) [m/s]	energy E(2,50) [J]	pene- trat. Y/N	angle [deg.]	depth plasticine [mm]	diam. [mm]	remarks
1	437	764	N	90,0	29,0	70	
2	436	760	N	90,0	----	----	
3	436	760	N	90,0	25,0	70	
4	438	767	N	60,0	----	----	
5	437	764	N	60,0	----	----	
6	436	760	N	90,0	----	----	

90 degree = 0 degree NATO

Beschussamt Mellrichstadt  
Lohstraße 5, 97638 Mellrichstadt

Report-No.: 11W221A01#  
Report part-No.: 02  
Test date: 19.07.2011

Description of the specimen in shooting direction (specification of the manufacturer):

16 layers PE-shield (Dyneema SB51)  
1 layer coated aramid laminate (0,95mm)  
3 layers PE-shield (Dyneema SB51)  
All layers are welded in a textile cover.  
back part  
large  
868g

Total weight determined by the Beschussamt (g) : 868  
mass per unit area determined by the Beschussamt (kg/m<sup>2</sup>) : ---  
mass per unit area determined by the manufacturer (kg/m<sup>2</sup>) : ---

Test conditions and results:

Calibre : 9mm Luger (9 x 19)  
Bullet type : FMJ/RN/SC (R9MM2, Index 23558, Rem, CN263)  
Bullet mass : 8,00g  
required bullet speed: 436m/s  
Weapon : test barrel No. 08/02  
Barrel length : 260mm  
Twist length : 250mm  
Shooting distance : 5,00m  
Test range temp. : 21°C  
Test range humid. : 50%  
Sample temperature : 21°C  
Backing material calibration (average value): 18,8mm

Test requirement:  
wet test according to NIJ

No.	veloc. V(2,50) [m/s]	energy E(2,50) [J]	pene- trat. Y/N	angle [deg.]	depth plasticine [mm]	diam. [mm]	remarks
1	436	760	N	90,0	25,0	70	
2	434	753	N	90,0	----	----	
3	437	764	N	90,0	25,0	70	
4	435	757	N	60,0	----	----	
5	434	753	N	60,0	----	----	
6	437	764	N	90,0	----	----	

90 degree = 0 degree NATO

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Lohstraße 5, 97638 Mellrichstadt

Report-No.: 11W221A01#  
Report part-No.: 03  
Test date: 19.07.2011

Description of the specimen in shooting direction (specification of the manufacturer):

16 layers PE-shield (Dyneema SB51)  
1 layer coated aramid laminate (0,95mm)  
3 layers PE-shield (Dyneema SB51)  
All layers are welded in a textile cover.  
front part  
large  
820g

Total weight determined by the Beschussamt (g) : 820  
mass per unit area determined by the Beschussamt (kg/m<sup>2</sup>) : ---  
mass per unit area determined by the manufacturer (kg/m<sup>2</sup>) : ---

Test conditions and results:

Calibre : 9mm Luger (9 x 19)  
Bullet type : FMJ/RN/SC (R9MM2, Index 23558, Rem, CN263)  
Bullet mass : 8,00g  
required bullet speed: 436m/s  
Weapon : test barrel No. 08/02  
Barrel length : 260mm  
Twist length : 250mm  
Shooting distance : 5,00m  
Test range temp. : 21°C  
Test range humid. : 50%  
Sample temperature : 21°C  
Backing material calibration (average value): 18,8mm

Test requirement:  
wet test according to NIJ

No.	veloc. V(2,50) [m/s]	energy E(2,50) [J]	pene- trat. Y/N	angle [deg.]	depth plasticine [mm]	diam. [mm]	remarks
1	433	750	N	90,0	26,0	80	
2	438	767	N	90,0	----	----	
3	434	753	N	90,0	24,0	70	
4	438	767	N	60,0	----	----	
5	438	767	N	60,0	----	----	
6	436	760	N	90,0	----	----	

90 degree = 0 degree NATO

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Report-No.: 11W221A01#  
Report part-No.: 04  
Test date: 19.07.2011

Description of the specimen in shooting direction (specification of the manufacturer):

16 layers PE-shield (Dyneema SB51)  
1 layer coated aramid laminate (0,95mm)  
3 layers PE-shield (Dyneema SB51)  
All layers are welded in a textile cover.  
back part  
large  
871g

Total weight determined by the Beschussamt (g) : 871  
mass per unit area determined by the Beschussamt (kg/m<sup>2</sup>) : ---  
mass per unit area determined by the manufacturer (kg/m<sup>2</sup>) : ---

Test conditions and results:

Calibre : 9mm Luger (9 x 19)  
Bullet type : FMJ/RN/SC (R9MM2, Index 23558, Rem, CN263)  
Bullet mass : 8,00g  
required bullet speed: 436m/s  
Weapon : test barrel No. 08/02  
Barrel length : 260mm  
Twist length : 250mm  
Shooting distance : 5,00m  
Test range temp. : 21°C  
Test range humid. : 50%  
Sample temperature : 21°C  
Backing material calibration (average value): 18,8mm

Test requirement:  
wet test according to NIJ

No.	veloc. V(2,50) [m/s]	energy E(2,50) [J]	pene- trat. Y/N	angle [deg.]	depth plasticine [mm]	diam. [mm]	remarks
1	436	760	N	90,0	28,0	70	
2	436	760	N	90,0	----	----	
3	438	767	N	90,0	25,0	80	
4	435	757	N	60,0	----	----	
5	436	760	N	60,0	----	----	
6	433	750	N	90,0	----	----	

90 degree = 0 degree NATO

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Report-No.: 11W221A01#  
Report part-No.: 05  
Test date: 19.07.2011

Description of the specimen in shooting direction (specification of the manufacturer):

16 layers PE-shield (Dyneema SB51)  
1 layer coated aramid laminate (0,95mm)  
3 layers PE-shield (Dyneema SB51)  
All layers are welded in a textile cover.  
front part  
large  
813g

Total weight determined by the Beschussamt (g) : 813  
mass per unit area determined by the Beschussamt (kg/m<sup>2</sup>) : ---  
mass per unit area determined by the manufacturer (kg/m<sup>2</sup>) : ---

Test conditions and results:

Calibre : .44 Rem.Mag.  
Bullet type : SJHP (TM Hohlspitz, R44MG3, Rem, CN71)  
Bullet mass : 15,60g  
required bullet speed: 436m/s  
Weapon : test barrel No. 05/01  
Barrel length : 380mm  
Twist length : 508mm  
Shooting distance : 5,00m  
Test range temp. : 21°C  
Test range humid. : 50%  
Sample temperature : 21°C  
Backing material calibration (average value): 18,8mm

Test requirement:  
wet test according to NIJ

No.	veloc. V(2,50) [m/s]	energy E(2,50) [J]	pene- trat. Y/N	angle [deg.]	depth plasticine [mm]	diam. [mm]	remarks
1	432	1456	N	90,0	37,0	90	
2	434	1469	N	90,0	----	----	
3	435	1476	N	90,0	35,0	90	
4	433	1462	N	60,0	----	----	
5	435	1476	N	60,0	----	----	
6	437	1490	N	90,0	----	----	

90 degree = 0 degree NATO

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Report-No.: 11W221A01#  
Report part-No.: 06  
Test date: 19.07.2011

Description of the specimen in shooting direction (specification of the manufacturer):

16 layers PE-shield (Dyneema SB51)  
1 layer coated aramid laminate (0,95mm)  
3 layers PE-shield (Dyneema SB51)  
All layers are welded in a textile cover.  
back part  
large  
869g

Total weight determined by the Beschussamt (g) : 869  
mass per unit area determined by the Beschussamt (kg/m<sup>2</sup>) : ---  
mass per unit area determined by the manufacturer (kg/m<sup>2</sup>) : ---

Test conditions and results:

Calibre : .44 Rem.Mag.  
Bullet type : SJHP (TM Hohlspitz, R44MG3, Rem, CN71)  
Bullet mass : 15,60g  
required bullet speed: 436m/s  
Weapon : test barrel No. 05/01  
Barrel length : 380mm  
Twist length : 508mm  
Shooting distance : 5,00m  
Test range temp. : 21°C  
Test range humid. : 50%  
Sample temperature : 21°C  
Backing material calibration (average value): 18,8mm

Test requirement:  
wet test according to NIJ

No.	veloc. V(2,50) [m/s]	energy E(2,50) [J]	pene- trat. Y/N	angle [deg.]	depth plasticine [mm]	diam. [mm]	remarks
1	438	1496	N	90,0	39,0	80	
2	436	1483	N	90,0	36,0	90	
3	432	1456	N	90,0	----	----	
4	436	1483	N	60,0	----	----	
5	432	1456	N	60,0	----	----	
6	429	1436	N	90,0	----	----	

90 degree = 0 degree NATO

Beschussamt Mellrichstadt  
Lohstraße 5, 97638 Mellrichstadt

Report-No.: 11W221A01#  
Report part-No.: 07  
Test date: 19.07.2011

Description of the specimen in shooting direction (specification of the manufacturer):

16 layers PE-shield (Dyneema SB51)  
1 layer coated aramid laminate (0,95mm)  
3 layers PE-shield (Dyneema SB51)  
All layers are welded in a textile cover.  
front part  
large  
818g

Total weight determined by the Beschussamt (g) : 818  
mass per unit area determined by the Beschussamt (kg/m<sup>2</sup>) : ---  
mass per unit area determined by the manufacturer (kg/m<sup>2</sup>) : ---

Test conditions and results:

Calibre : .44 Rem.Mag.  
Bullet type : SJHP (TM Hohlspitz, R44MG3, Rem, CN71)  
Bullet mass : 15,60g  
required bullet speed: 436m/s  
Weapon : test barrel No. 05/01  
Barrel length : 380mm  
Twist length : 508mm  
Shooting distance : 5,00m  
Test range temp. : 21°C  
Test range humid. : 50%  
Sample temperature : 21°C  
Backing material calibration (average value): 18,8mm

Test requirement:  
wet test according to NIJ

No.	veloc. V(2,50) [m/s]	energy E(2,50) [J]	pene- trat. Y/N	angle [deg.]	depth plasticine [mm]	diam. [mm]	remarks
1	437	1490	N	90,0	36,0	90	
2	437	1490	N	90,0	----	----	
3	447	1559	N	90,0	35,0	90	
4	444	1538	N	60,0	----	----	
5	450	1580	N	60,0	----	----	
6	446	1552	N	90,0	----	----	

90 degree = 0 degree NATO



Beschussamt Mellrichstadt  
Lohstraße 5, 97638 Mellrichstadt

Report-No.: 11W221A01#  
Report part-No.: 08  
Test date: 19.07.2011

Description of the specimen in shooting direction (specification of the manufacturer):

16 layers PE-shield (Dyneema SB51)  
1 layer coated aramid laminate (0,95mm)  
3 layers PE-shield (Dyneema SB51)  
All layers are welded in a textile cover.  
back part  
large  
870g

Total weight determined by the Beschussamt (g) : 870  
mass per unit area determined by the Beschussamt (kg/m<sup>2</sup>) : ---  
mass per unit area determined by the manufacturer (kg/m<sup>2</sup>) : ---

Test conditions and results:

Calibre : .44 Rem.Mag.  
Bullet type : SJHP (TM Hohlspitz, R44MG3, Rem, CN71)  
Bullet mass : 15,60g  
required bullet speed: 436m/s  
Weapon : test barrel No. 05/01  
Barrel length : 380mm  
Twist length : 508mm  
Shooting distance : 5,00m  
Test range temp. : 21°C  
Test range humid. : 50%  
Sample temperature : 21°C  
Backing material calibration (average value): 18,8mm

Test requirement:  
wet test according to NIJ

No.	veloc. V(2,50) [m/s]	energy E(2,50) [J]	pene- trat. Y/N	angle [deg.]	depth plasticine [mm]	diam. [mm]	remarks
1	448	1565	N	90,0	39,0	90	
2	449	1572	N	90,0	43,0	90	
3	438	1496	N	90,0	----	----	
4	446	1552	N	60,0	----	----	
5	442	1524	N	60,0	----	----	
6	444	1538	N	90,0	----	----	

90 degree = 0 degree NATO

Beschussamt Mellrichstadt  
Lohstraße 5, 97638 Mellrichstadt

Report-No.: 11W221A01#  
Report part-No.: 09  
Test date: 19.07.2011

Description of the specimen in shooting direction (specification of the manufacturer):

16 layers PE-shield (Dyneema SB51)  
1 layer coated aramid laminate (0,95mm)  
3 layers PE-shield (Dyneema SB51)  
All layers are welded in a textile cover.  
back part  
large  
871g

Total weight determined by the Beschussamt (g) : 871  
mass per unit area determined by the Beschussamt (kg/m<sup>2</sup>) : ---  
mass per unit area determined by the manufacturer (kg/m<sup>2</sup>) : ---

Test conditions and results:

Calibre : 9mm Luger (9 x 19)  
Bullet type : FMJ/RN/SC (R9MM2, Index 23558, Rem, CN263)  
Bullet mass : 8,00g  
Weapon : test barrel No. 10/02  
Barrel length : 270mm  
Twist length : 250mm  
Shooting distance : 5,00m  
Test range temp. : 21°C  
Test range humid. : 50%  
Sample temperature : 21°C  
Backing material calibration (average value): 18,8mm

Test requirement:  
determination of the ballistic limit

No.	veloc. V(2,50) [m/s]	energy E(2,50) [J]	pene- trat. Y/N	angle [deg.]	depth plasticine [mm]	diam. [mm]	remarks
1	597	1426	Y	90,0	----	----	
2	594	1411	Y	90,0	----	----	
3	585	1369	Y	90,0	----	----	
4	582	1355	N	90,0	----	----	
5	573	1313	Y	90,0	----	----	
6	569	1295	Y	90,0	----	----	
7	562	1263	N	90,0	----	----	
8	559	1250	N	90,0	----	----	
9	558	1245	N	90,0	----	----	
10	559	1250	N	90,0	----	----	

90 degree = 0 degree NATO  
Determined ballistic limit: 574m/s

Beschussamt Mellrichstadt  
Lohstraße 5, 97638 Mellrichstadt

Report-No.: 11W221A01#  
Report part-No.: 10  
Test date: 19.07.2011

Description of the specimen in shooting direction (specification of the manufacturer):

16 layers PE-shield (Dyneema SB51)  
1 layer coated aramid laminate (0,95mm)  
3 layers PE-shield (Dyneema SB51)  
All layers are welded in a textile cover.  
front part  
large  
815g

Total weight determined by the Beschussamt (g) : 815  
mass per unit area determined by the Beschussamt (kg/m<sup>2</sup>) : ---  
mass per unit area determined by the manufacturer (kg/m<sup>2</sup>) : ---

Test conditions and results:

Calibre : 9mm Luger (9 x 19)  
Bullet type : FMJ/RN/SC (R9MM2, Index 23558, Rem, CN263)  
Bullet mass : 8,00g  
Weapon : test barrel No. 10/02  
Barrel length : 270mm  
Twist length : 250mm  
Shooting distance : 5,00m  
Test range temp. : 21°C  
Test range humid. : 50%  
Sample temperature : 21°C  
Backing material calibration (average value): 18,8mm

Test requirement:  
determination of the ballistic limit

No.	veloc. V(2,50) [m/s]	energy E(2,50) [J]	pene- trat. Y/N	angle [deg.]	depth plasticine [mm]	diam. [mm]	remarks
1	584	1364	Y	90,0	----	----	
2	589	1388	N	90,0	----	----	
3	575	1323	Y	90,0	----	----	
4	585	1369	Y	90,0	----	----	
5	585	1369	Y	90,0	----	----	
6	584	1364	N	90,0	----	----	
7	585	1369	N	90,0	----	----	
8	577	1332	N	90,0	----	----	
9	583	1360	N	90,0	----	----	
10	588	1383	Y	90,0	----	----	

90 degree = 0 degree NATO  
Determined ballistic limit: 584m/s

The sample met the ballistic requirements according to  
NIJ Standard-0101.04 Armor Type IIIA.

This report consists of 11 pages and 1 appendix

Abkürzungen von Geschossarten:

L	Blei	Lead
FMs	Vollmessing	Full Brass
CB	Kegelstumpfgeschoss	Coned Bullet
FMJ	Vollmantel	Full Metal Jacket
RN	Rundkopf	Round Nose
SC	Weichkern	Soft Core
HC	Hartkern	Hard Core
WC	Wolframcarbidkern	Tungsten Core
PB	Spitzkopfgeschoss	Pointed Bullet
FN	Flachkopf	Flat Nose
FeC	Weicheisenkern	Fe-Core
SCP	Weichkern mit Penetrator	Soft Core Penetrator
TPSC	Zwei Stahlkerne	Two-piece Steel Core
I	Brandsatz	Incendiary
JSP	Teilmantelgeschoss	Jacketed Soft Point
JHP	Teilmantelhohlspitzgeschoss	Jacketed Hollow Point
SJSP	Teilmantelgeschoss	Semi Jacketed Soft Point
SJHP	Teilmantelhohlspitzgeschoss	Semi Jacketed Hollow Point
SWC	Scharfrandgeschoss	Semiwadcutter

Abkürzungen von Bemerkungen:

giH	gestoppt im Hartschutz	stopped in hard armour
giW	gestoppt im Weichschutz	stopped in soft armour
gLD	glatter Durchschuss	complete penetration
SS	Steckschuss	bullet lodged in the armour
Apr	Geschossabpraller an der Oberfläche	bullet ricocheted from the surface
GaO	Geschossaustritt an der Oberfläche	bullet exit on the surface
GaS	Geschossaustritt seitlich	bullet exit sideways

Sonstige Abkürzungen:

J	Ja	yes
N	Nein	no
SI	Splitterindikator	fragmentation witness plate
DS	Durchschussindikator	penetration witness plate
TA	Trefferabstand	hit distance
FG	Flächengewicht	mass per unit area

# Beschussamt Mellrichstadt

Lohstraße 5, 97638 Mellrichstadt  
Tel.: 09776/70500, Fax: 09776/5457, e-mail: poststelle@ba-mel.bayern.de

PPSS Ltd.  
Knaresborough Technology park,  
Manse Lane

UK-Knaresborough HG5 8LF

## Test Report

Testing the ballistic resistance of body armour

Report No. : 11W221B01#, order No.: 7229  
Date of delivery : 18.07.2011  
Tester : Schmitt, Klier  
  
Sample : insert for body armour vest (soft armour)  
Designation : P2M/PPSS Standard IIIA  
  
Applicant : SEAS SCANDINAVIA SVERIGE AB  
Manufacturer : SEAS SCANDINAVIA SVERIGE AB  
  
Requirement : 7,62 x 25 Tokarev

Bötsch

Mellrichstadt, 22.07.2011

The test results are only valid for the samples described in this test report.  
The applicability of this test report is restricted to five years from the date of testing. It will expire prematurely, if any alteration or modification to the manufacturing process, materials and/or quality management system could impact the product conformity.  
This test report is only valid with the correspondence of the report numbers on all pages and with the official seal.  
Duplication in extracts of this report is only allowed with written approval of the Beschussamt Mellrichstadt.

Beschussamt Mellrichstadt  
Lohstraße 5, 97638 Mellrichstadt

Report-No.: 11W221B01#

Test date: 19.07.2011

Description of the specimen in shooting direction (specification of the manufacturer):

16 layers PE-shield (Dyneema SB51)  
1 layer coated aramid laminate (0,95mm)  
3 layers PE-shield (Dyneema SB51)  
All layers are welded in a textile cover.  
back part  
large  
869g

Total weight determined by the Beschussamt (g) : 869  
mass per unit area determined by the Beschussamt (kg/m<sup>2</sup>) : ---  
mass per unit area determined by the manufacturer (kg/m<sup>2</sup>) : ---

Test conditions and results:

Calibre : 7,62 x 25 Tokarev  
Bullet type : FMJ/RN/SC (VMR/WK, Russ, CN84)  
Bullet mass : 5,50g  
required bullet speed: 410m/s  
Weapon : test barrel No. 01/01  
Barrel length : 590mm  
Twist length : 240mm  
Shooting distance : 5,00m  
Test range temp. : 21°C  
Test range humid. : 50%  
Sample temperature : 21°C  
Backing Material : Roma No.1  
Backing material calibration: 19,0mm 18,5mm 19,0mm

No.	veloc. V(2,50) [m/s]	energy E(2,50) [J]	pene- trat. Y/N	angle [deg.]	depth plasticine [mm]	diam. [mm]	remarks
1	409	460	N	90,0	22,0	60	
2	419	483	N	90,0	20,0	60	
3	409	460	N	90,0	20,0	70	
4	418	480	N	90,0	19,0	70	

90 degree = 0 degree NATO

The test was performed according to special requirements of the applicant. A final classification is not applicable.

This report consists of 2 pages and 1 appendix

Abkürzungen von Geschossarten:

L	Blei	Lead
FMs	Vollmessing	Full Brass
CB	Kegelstumpfgeschoss	Coned Bullet
FMJ	Vollmantel	Full Metal Jacket
RN	Rundkopf	Round Nose
SC	Weichkern	Soft Core
HC	Hartkern	Hard Core
WC	Wolframcarbidkern	Tungsten Core
PB	Spitzkopfgeschoss	Pointed Bullet
FN	Flachkopf	Flat Nose
FeC	Weicheisenkern	Fe-Core
SCP	Weichkern mit Penetrator	Soft Core Penetrator
TPSC	Zwei Stahlkerne	Two-piece Steel Core
I	Brandsatz	Incendiary
JSP	Teilmantelgeschoss	Jacketed Soft Point
JHP	Teilmantelhohlspitzgeschoss	Jacketed Hollow Point
SJSP	Teilmantelgeschoss	Semi Jacketed Soft Point
SJHP	Teilmantelhohlspitzgeschoss	Semi Jacketed Hollow Point
SWC	Scharfrandgeschoss	Semiwadcutter

Abkürzungen von Bemerkungen:

giH	gestoppt im Hartschutz	stopped in hard armour
giW	gestoppt im Weichschutz	stopped in soft armour
glD	glatter Durchschuss	complete penetration
SS	Steckschuss	bullet lodged in the armour
Apr	Geschossabpraller an der Oberfläche	bullet ricocheted from the surface
GaO	Geschossaustritt an der Oberfläche	bullet exit on the surface
GaS	Geschossaustritt seitlich	bullet exit sideways

Sonstige Abkürzungen:

J	Ja	yes
N	Nein	no
SI	Splitterindikator	fragmentation witness plate
DS	Durchschussindikator	penetration witness plate
TA	Trefferabstand	hit distance
FG	Flächengewicht	mass per unit area

# Beschussamt Mellrichstadt

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PPSS Ltd.  
Knaresborough Technology park,  
Manse Lande

UK-Knaresborough HG5 8LF

## Test Report

Testing the ballistic resistance of body armour

Report No. : 11W221C01#, order No.: 7229  
Date of delivery : 18.07.2011  
Tester : Schmitt, Klier  
Sample : insert for body armour vest (soft armour)  
Designation : P2M/PPSS Standard IIIA  
Applicant : SEAS SCANDINAVIA SVERIGE AB  
Manufacturer : SEAS SCANDINAVIA SVERIGE AB  
Requirement : 9mm Makarov (9mm x 18)

Bötsch

Mellrichstadt, 22.07.2011

The test results are only valid for the samples described in this test report.  
The applicability of this test report is restricted to five years from the date of testing. It will expire prematurely, if any alteration or modification to the manufacturing process, materials and/or quality management system could impact the product conformity.  
This test report is only valid with the correspondence of the report numbers on all pages and with the official seal.  
Duplication in extracts of this report is only allowed with written approval of the Beschussamt Mellrichstadt.



Beschussamt Mellrichstadt  
Lohstraße 5, 97638 Mellrichstadt

Report-No.: 11W221C01#  
Report part-No.: 1  
Test date: 19.07.2011

Description of the specimen in shooting direction (specification of the manufacturer):

16 layers PE-shield (Dyneema SB51)  
1 layer coated aramid laminate (0,95mm)  
3 layers PE-shield (Dyneema SB51)  
All layers are welded in a textile cover.  
back part  
large  
867g

Total weight determined by the Beschussamt (g) : 867  
mass per unit area determined by the Beschussamt (kg/m<sup>2</sup>) : ---  
mass per unit area determined by the manufacturer (kg/m<sup>2</sup>) : ---

Test conditions and results:

Calibre : 9mm Makarov (9mm x 18)  
Bullet type : FMJ/RN/SC (VMR/WK, S&B, CN88)  
Bullet mass : 6,00g  
Weapon : test barrel No. 03/01  
Barrel length : 260mm  
Twist length : 240mm  
Shooting distance : 5,00m  
Test range temp. : 21°C  
Test range humid. : 50%  
Sample temperature : 21°C  
Backing Material : Roma No.1  
Backing material calibration: 19,0mm 18,5mm 19,0mm

No.	veloc. V(2,50) [m/s]	energy E(2,50) [J]	pene- trat. Y/N	angle [deg.]	depth plasticine [mm]	diam. [mm]	remarks
1	305	279	N	90,0	13,0	60	
2	334	335	N	90,0	15,0	60	
3	367	404	N	90,0	17,0	60	
4	375	422	N	90,0	17,0	60	

90 degree = 0 degree NATO

Beschussamt Mellrichstadt  
Lohstraße 5, 97638 Mellrichstadt

Report-No.: 11W221C01#  
Report part-No.: 2  
Test date: 19.07.2011

Description of the specimen in shooting direction (specification of the manufacturer):

16 layers PE-shield (Dyneema SB51)  
1 layer coated aramid laminate (0,95mm)  
3 layers PE-shield (Dyneema SB51)  
All layers are welded in a textile cover.  
back part  
large  
867g

Total weight determined by the Beschussamt (g) : 867  
mass per unit area determined by the Beschussamt (kg/m<sup>2</sup>) : ---  
mass per unit area determined by the manufacturer (kg/m<sup>2</sup>) : ---

Test conditions and results:

Calibre : 9mm Makarov (9mm x 18)  
Bullet type : FMJ/RN/FeC (mild steel core, DDR, CN89)  
Bullet mass : 6,00g  
Weapon : test barrel No. 03/01  
Barrel length : 260mm  
Twist length : 240mm  
Shooting distance : 5,00m  
Test range temp. : 21°C  
Test range humid. : 50%  
Sample temperature : 21°C  
Backing Material : Roma No.1  
Backing material calibration: 19,0mm 18,5mm 19,0mm

No.	veloc. V(2,50) [m/s]	energy E(2,50) [J]	pene- trat. Y/N	angle [deg.]	depth plasticine [mm]	diam. [mm]	remarks
1	361	391	N	90,0	18,0	60	
2	376	424	N	90,0	17,0	70	

90 degree = 0 degree NATO

The test was performed according to special requirements of the applicant. A final classification is not applicable.

This report consists of 3 pages and 1 appendix

Abkürzungen von Geschossarten:

L	Blei	Lead
FMs	Vollmessing	Full Brass
CB	Kegelstumpfgeschoss	Coned Bullet
FMJ	Vollmantel	Full Metal Jacket
RN	Rundkopf	Round Nose
SC	Weichkern	Soft Core
HC	Hartkern	Hard Core
WC	Wolframcarbidkern	Tungsten Core
PB	Spitzkopfgeschoss	Pointed Bullet
FN	Flachkopf	Flat Nose
FeC	Weicheisenkern	Fe-Core
SCP	Weichkern mit Penetrator	Soft Core Penetrator
TPSC	Zwei Stahlkerne	Two-piece Steel Core
I	Brandsatz	Incendiary
JSP	Teilmantelgeschoss	Jacketed Soft Point
JHP	Teilmantelhohlspitzgeschoss	Jacketed Hollow Point
SJSP	Teilmantelgeschoss	Semi Jacketed Soft Point
SJHP	Teilmantelhohlspitzgeschoss	Semi Jacketed Hollow Point
SWC	Scharfrandgeschoss	Semiwadcutter

Abkürzungen von Bemerkungen:

giH	gestoppt im Hartschutz	stopped in hard armour
giW	gestoppt im Weichschutz	stopped in soft armour
gLD	glatter Durchschuss	complete penetration
SS	Steckschuss	bullet lodged in the armour
Apr	Geschossabpraller an der Oberfläche	bullet ricocheted from the surface
GaO	Geschossaustritt an der Oberfläche	bullet exit on the surface
GaS	Geschossaustritt seitlich	bullet exit sideways

Sonstige Abkürzungen:

J	Ja	yes
N	Nein	no
SI	Splitterindikator	fragmentation witness plate
DS	Durchschussindikator	penetration witness plate
TA	Trefferabstand	hit distance
FG	Flächengewicht	mass per unit area