United States Test Laboratory, LLC
7447 W. 33rd. North
Wichita, KS 67205

This Data Is Not To Be Used For NIJ Compiance Testing Purposes

FACILITY DESCRIPTION:

Test Laboratory: United States Test Laboratory, LLC
Test Start Date: 07/07/05
Report Number: PPI05029
Report Date: 07/08/05

TESTING CERTIFICATION:

Laboratory Representative: Richard W. Mouser
Name

Witnessed by:
Name

Representing

ARMOR DESCRIPTION:

Manufacturer: Protective Products International
Date Rec'd: 07/06/05
*Ballistic Material: Hybrid

*Ballistic Material Choices

Aramid	*PBO*	*Ceramic*	*Metal*
Polyethylene	*Hybrid*	*Composite*	*Other*

Model: HC-5105-II
Style: N/A
Male/Female: Male

NIJ Armor Type: 2 *Enter as: 1, 2A, 2, 3A, 3, 4, or Special*
NIJ STD-0101.03 Compliant: No

SAMPLE DESCRIPTION:

	Penetration-Backface Signature (P-BFS)								Baseline Ballistic Limit											
	Sample 1		Sample 2		Sample 3		Sample 4		Sample 5		Sample 6		Sample 7		Sample 8		Sample 9		Sample 10	
	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back
Size:	LARGE	LARGE	LARGE	LARGE	LARGE	LARGE	LARGE	LARGE	LARGE	LARGE										
Panel Serial Number:	88181	88181	80560	80560	89317	89317	83397	83397	86947	86947										
Plate Serial Number:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A										
Lot Number:	0405	0405	0305	0305	0505	0505	0105	0105	0305	0305										
Gross Weight (lb.):	1.69	2.16	1.69	2.14	1.69	2.15	1.69	2.14	1.69	2.15										

TEST DESCRIPTION:

	Penetration-Backface Signature (P-BFS)								Baseline Ballistic Limit											
	Sample 1		Sample 2		Sample 3		Sample 4		Sample 5		Sample 6		Sample 7		Sample 8		Sample 9		Sample 10	
	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back
Test Condition:	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Threat Ammunition:	9mm	9mm	9mm	9mm	.357 Mag	.357 Mag	.357 Mag	.357 Mag	9mm	9mm	9mm	9mm	9mm	9mm	9mm	9mm	9mm	9mm	9mm	9mm
Bullet (grain/type):	124/FMJ	124/FMJ	124/FMJ	124/FMJ	158/JSP	158/JSP	158/JSP	158/JSP	124/FMJ	124/FMJ	124/FMJ	124/FMJ	124/FMJ	124/FMJ	124/FMJ	124/FMJ	124/FMJ	124/FMJ	124/FMJ	124/FMJ
NIJ Reference Velocity (ft/s):	1205	1205	1205	1205	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430
Provided BL Lower Velocity (ft/s):																				
Bullet Manufacturer:	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.
Bullet Lot Number:	23558	23558	23558	23558	22847	22847	22847	22847	23558	23558	23558	23558	23558	23558	23558	23558	23558	23558	23558	23558
Test Barrel Manufacturer:	H.S	H.S	H.S	H.S	H.S	H.S	H.S	H.S	H.S	H.S	H.S	H.S	H.S	H.S	H.S	H.S	H.S	H.S	H.S	H.S
Test Barrel Length (in):	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0

ARMOR CONSTRUCTION:

	Front Panel	Rear Panel
Front Closure (Y/N):	N	N
Removable Carrier (Y/N):	Y	Y
Number of Layers:	20	20
Description of Stitching:	Layers 1-20: 6.5" horizontal bar tack at center on top and bottom, 1.5" vertical bar tack at sides. Layers 6-15: 1" diagonal box quilt.	Layers 1-20: 6.5" horizontal bar tack at center on top and bottom, 1.5" vertical bar tack at sides. Layers 6-15: 1" diagonal box quilt.
Individual Layer Description:	Layers 1-5, 16-20: Flex aramid film. Layers 6-15: Flex woven aramid fiber (27x27).	Layers 1-5, 16-20: Flex aramid film. Layers 6-15: Flex woven aramid fiber (27x27).

REMARKS:

Kennedy/Nguyen/Lutz
V50: Nguyen/C.Mouser

HANDLOAD VERIFICATION WORKSHEET

Report Number: PPI05029
Report Date: 07/08/05
NIJ Armor Type: 2

TEST CONDITIONS:
Ambient Temp: 71 F
Rel. Humidity: 48 %

TEST DIMENSIONS:
Range Length: 16.40 ft.
Velocity 1: 5.73 ft.
Velocity 2: 4.09 ft.

Ammunition: 9mm 124/FMJ
Test Date: 07/07/05

Ammunition: .357 Mag 158/JSP
Test Date: 07/07/05

Test Round 1							Test Round 2						
Shot No.	Charge (grain)	Time 1 (μs)	Vel. 1 (ft/s)	Time 2 (μs)	Vel. 2 (ft/s)	Vel. Avg. (ft/s)	Shot No.	Charge (grain)	Time 1 (μs)	Vel. 1 (ft/s)	Time 2 (μs)	Vel. 2 (ft/s)	Vel. Avg. (ft/s)
1	4.6	4875	1175	3474	1176	1175	1	8.6	4026	1423	2870	1423	1423
2	4.6	4717	1214	3361	1215	1215	2	8.6	3968	1444	2829	1444	1444
3	4.6	4813	1190	3430	1191	1191	3	8.7	3985	1437	2841	1438	1438
4	4.7	4669	1227	3328	1227	1227	4	8.6	3975	1441	2833	1442	1441
5	4.7	4755	1205	3388	1206	1205	5	8.7	3957	1448	2821	1448	1448
6	4.7	4647	1233	3312	1233	1233	6	8.7	3974	1441	2833	1442	1442
7	4.6	4763	1203	3395	1203	1203	7	8.5	4054	1413	2889	1414	1413
8	4.6	4702	1218	3352	1219	1218	8	8.5	4061	1410	2895	1411	1411
9	4.6	4813	1190	3430	1191	1191	9	8.5	4048	1415	2885	1416	1415
10	4.6	4800	1193	3421	1194	1194	10	8.5	4054	1413	2889	1414	1413

Mean: 4.6 **Mean:** 1205

Mean: 8.6 **Mean:** 1429

	Test Round 1		
NIJ Reference Velocity:	1205		ft/s
Handload (NIJ Reference ± 10 ft/s):	1205		ft/s
Range (NIJ Reference ± 30 ft/s):	1175	1235	ft/s
	Min	**Max**	
Velocity Summary:	1175	1233	ft/s

	Test Round 2		
NIJ Reference Velocity:	1430		ft/s
Handload (NIJ Reference ± 10 ft/s):	1429		ft/s
Range (NIJ Reference ± 30 ft/s):	1400	1460	ft/s
	Min	**Max**	
Velocity Summary:	1411	1448	ft/s

NOTE:

Velocity input for time factor requires microsecond (10^{-6}) format.
Conduct handload verification test for each new compliance test series.
Use 3-shot series (Sec. 5.11.1) to check handload viability within each compliance series when there are significant breaks during testing.

Daily Wet Conditioning Spray Calibration

Manufacturer: Protective Products International
Model: HC-5105-II

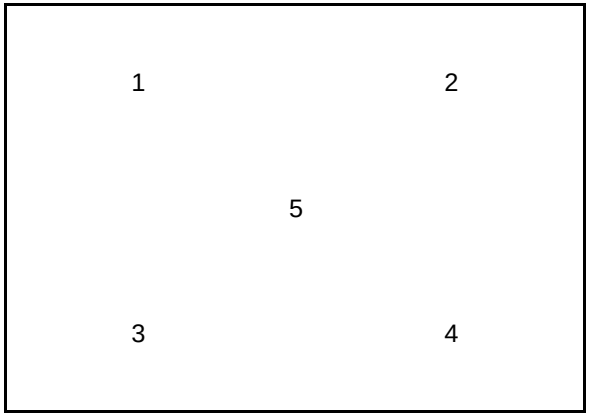
Report Number: PPI05029
Report Date: 07/08/05

Calibration Date:	07/07/05					

	Interval (min)						
Gauge Location	**15**	**15**	**15**	**15**	**15**	**15**	
1	1.1						inches
2	0.8						inches
3	0.7						inches
4	1.2						inches
5	1.0						inches
Average:	1.0						inches
Requirement:	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*inches*
Pass:	**Y**	**N**	**N**	**N**	**N**	**N**	

Required Flow Rate: 4.0 +/- 0.8 in/hr 1.0 +/- 0.2 in/0.25 hr
Conditioning Surface Dimensions: 30.0 x 30.0 inches square

Gauge Locations



Top View

Drop Test Results

Sample/Panel: Sample 1 Front
Manufacturer: Protective Products International
Model: HC-5105-II

Test Date: 07/07/05
Range Conditions:
Temperature: 71 F
RH: 48 %

Report Number: PPI05029
Report Date: 07/08/05

Pre-Test Drop Calibration:

Block ID: 4
Time of Day: 1700 hrs
Clay Temperature: 86 deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:	18	17	17	17	17	17

Requirement: *19 ± 2 mm*
Pass: Y

Post-Test Drop Calibration:

Block ID: 4
Time of Day: hrs
Clay Temperature: deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:						

Requirement: *19 ± 2 mm*
Pass: N

Sample/Panel: Sample 1 Back

Test Date: 07/07/05
Range Conditions:
Temperature: 71 F
RH: 48 %

Report Number: PPI05029
Report Date: 07/08/05

Pre-Test Drop Calibration:

Block ID: 4
Time of Day: 1715 hrs
Clay Temperature: 84 deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:	21	18	19	18	17	19

Requirement: *19 ± 2 mm*
Pass: Y

Post-Test Drop Calibration:

Block ID: 4
Time of Day: hrs
Clay Temperature: deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:						

Requirement: *19 ± 2 mm*
Pass: N

Sample/Panel: Sample 2 Front
Manufacturer: Protective Products International
Model: HC-5105-II

Test Date: 07/07/05
Range Conditions:
Temperature: 71 F
RH: 48 %

Report Number: PPI05029
Report Date: 07/08/05

Pre-Test Drop Calibration:

Block ID: 4
Time of Day: 1729 hrs
Clay Temperature: 84 deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:	21	20	17	17	17	18

Requirement: *19 ± 2 mm*
Pass: Y

Post-Test Drop Calibration:

Block ID: 4
Time of Day: hrs
Clay Temperature: deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:						

Requirement: *19 ± 2 mm*
Pass: N

Sample/Panel: Sample 2 Back

Test Date: 07/07/05
Range Conditions:
Temperature: 71 F
RH: 48 %

Report Number: PPI05029
Report Date: 07/08/05

Pre-Test Drop Calibration:

Block ID: 4
Time of Day: 1739 hrs
Clay Temperature: 84 deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:	21	19	18	19	18	19

Requirement: *19 ± 2 mm*
Pass: Y

Post-Test Drop Calibration:

Block ID: 4
Time of Day: 1749 hrs
Clay Temperature: 84 deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:	20	19	19	18	18	19

Requirement: *19 ± 2 mm*
Pass: Y

Drop Test Results

Sample/Panel: Sample 3 Front
Manufacturer: Protective Products International
Model: HC-5105-II

Test Date: 07/07/05
Range Conditions:
Temperature: 71 F
RH: 49 %

Report Number: PPI05029
Report Date: 07/08/05

Pre-Test Drop Calibration:

Block ID: 1
Time of Day: 1751 hrs
Clay Temperature: 86 deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:	20	20	18	19	18	19

Requirement: *19 ± 2 mm*
Pass: Y

Post-Test Drop Calibration:

Block ID: 1
Time of Day: hrs
Clay Temperature: deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:						

Requirement: *19 ± 2 mm*
Pass: N

Sample/Panel: Sample 3 Back

Test Date: 07/07/05
Range Conditions:
Temperature: 71 F
RH: 49 %

Report Number: PPI05029
Report Date: 07/08/05

Pre-Test Drop Calibration:

Block ID: 1
Time of Day: 1810 hrs
Clay Temperature: 84 deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:	22	20	21	19	17	20

Requirement: *19 ± 2 mm*
Pass: Y

Post-Test Drop Calibration:

Block ID: 1
Time of Day: hrs
Clay Temperature: deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:						

Requirement: *19 ± 2 mm*
Pass: N

Drop Test Results

Sample/Panel: Sample 4 Front
Manufacturer: Protective Products International
Model: HC-5105-II

Test Date: 07/07/05
Range Conditions:
Temperature: 71 F
RH: 49 %

Report Number: PPI05029
Report Date: 07/08/05

Pre-Test Drop Calibration:

Block ID: 1
Time of Day: 1822 hrs
Clay Temperature: 84 deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:	22	21	21	21	19	21

Requirement: *19 ± 2 mm*
Pass: Y

Post-Test Drop Calibration:

Block ID: 1
Time of Day: hrs
Clay Temperature: deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:						

Requirement: *19 ± 2 mm*
Pass: N

Sample/Panel: Sample 4 Back

Test Date: 07/07/05
Range Conditions:
Temperature: 71 F
RH: 49 %

Report Number: PPI05029
Report Date: 07/08/05

Pre-Test Drop Calibration:

Block ID: 1
Time of Day: 1834 hrs
Clay Temperature: 84 deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:	22	19	20	19	19	20

Requirement: *19 ± 2 mm*
Pass: Y

Post-Test Drop Calibration:

Block ID: 1
Time of Day: 1842 hrs
Clay Temperature: 84 deg. F

	Drop 1	Drop 2	Drop 3	Drop 4	Drop 5	Avg.
Depth of Indent:	21	20	21	18	18	20

Requirement: *19 ± 2 mm*
Pass: Y

Penetration and BFS Firing Data - Sample 1

Sample No: Sample 1
Manufacturer: Protective Products International
Model: HC-5105-II

Ammunition: 9mm 124/FMJ
Conditioning: Wet
Test Date: 07/07/05

Report Number: PPI05029
Report Date: 07/08/05
NIJ Armor Type: 2

Panel Serial No: 88181
Plate Serial No: N/A

Panel Serial No: 88181
Plate Serial No: N/A

FRONT PANEL											BACK PANEL											COMPLIANCE	
Shot No.	Time 1 (μs)	Vel. 1 (ft/s)	Time 2 (μs)	Vel. 2 (ft/s)	Vel. Avg. (ft/s)	30º (Y)	Fair (Y/N)	Penetrate (Y/N)	Note	BFS (mm)	Shot No.	Time 1 (μs)	Vel. 1 (ft/s)	Time 2 (μs)	Vel. 2 (ft/s)	Vel. Avg. (ft/s)	30º (Y)	Fair (Y/N)	Penetrate (Y/N)	Note	BFS (mm)	Front Panel	Back Panel
1	4819	1189	3435	1189	1189		Y	N		29	1	4753	1205	3387	1206	1206		Y	N		31	Y	Y
2	4801	1193	3422	1194	1193		Y	N			2	4680	1224	3353	1218	1221		Y	N		29	Y	Y
3	4721	1213	3365	1214	1214		Y	N		26	3	4741	1208	3379	1209	1209		Y	N			Y	Y
4	4745	1207	3382	1208	1208	Y	Y	N			4	4709	1216	3356	1217	1217	Y	Y	N			Y	Y
5	4904	1168	3495	1169	1168	Y	N	N	b		5	4732	1210	3373	1211	1211	Y	Y	N				Y
6	4809	1191	3428	1192	1191	Y	Y	N			6	4826	1187	3440	1188	1187		Y	N			Y	Y
7	4745	1207	3382	1208	1208		Y	N			7		0		0							Y	
8		0		0							8		0		0								

Velocity input for time factor requires microsecond (10^{-6}) format.

Firing Sequence Start: 1702 hrs
Firing Sequence End: 1713 hrs
Duration: 11 min

Firing Sequence Start: 1718 hrs
Firing Sequence End: 1727 hrs
Duration: 9 min

TEST CONDITIONS:

Ambient Temp: 71 F
Rel. Humidity: 48 %

TEST DIMENSIONS:

Range Length: 16.40 ft.
Velocity 1: 5.73 ft.
Velocity 2: 4.09 ft.

VELOCITY SUMMARY:

	Min	Max	
Front Panel 0º:	1189	1214	ft/s
Front Panel 30º:	1191	1208	ft/s
Back Panel 0º:	1187	1221	ft/s
Back Panel 30º:	1211	1217	ft/s

Handload Verification Velocity: 1205 ft/s
NIJ Reference Velocity: 1205 ft/s
Velocity Range: 1175 1235 ft/s

NOTE:

a - Excessive velocity
b - Insufficient velocity
c - Too close to edge
d - Too close to prior impact
e - Excessive total impacts (test terminated)
f - Excessive area impacts (test terminated)
g - Impact on seam

Penetration and BFS Firing Data - Sample 2

Sample No: Sample 2
Manufacturer: Protective Products International
Model: HC-5105-II

Ammunition: 9mm 124/FMJ
Conditioning: Wet
Test Date: 07/07/05

Report Number: PPI05029
Report Date: 07/08/05
NIJ Armor Type: 2

Panel Serial No: 80560
Plate Serial No: N/A

Panel Serial No: 80560
Plate Serial No: N/A

FRONT PANEL											BACK PANEL											COMPLIANCE	
Shot No.	Time 1 (μs)	Vel. 1 (ft/s)	Time 2 (μs)	Vel. 2 (ft/s)	Vel. Avg. (ft/s)	30º (Y)	Fair (Y/N)	Penetrate (Y/N)	Note	BFS (mm)	Shot No.	Time 1 (μs)	Vel. 1 (ft/s)	Time 2 (μs)	Vel. 2 (ft/s)	Vel. Avg. (ft/s)	30º (Y)	Fair (Y/N)	Penetrate (Y/N)	Note	BFS (mm)	Front Panel	Back Panel
1	4718	1214	3363	1215	1214		Y	N		29	1	4689	1222	3342	1222	1222		Y	N		29	Y	Y
2	4685	1223	3339	1223	1223		Y	N		28	2	4738	1209	3377	1210	1209		Y	N			Y	Y
3	4791	1196	3415	1196	1196		Y	N			3	4723	1213	3366	1214	1213		Y	N		28	Y	Y
4	4687	1222	3340	1223	1223	Y	Y	N			4	4648	1232	3312	1233	1233	Y	Y	N			Y	Y
5	4650	1232	3320	1230	1231	Y	Y	N			5	4735	1210	3375	1210	1210	Y	Y	N			Y	Y
6	4739	1209	3377	1210	1209		Y	N			6	4761	1203	3393	1204	1204		Y	N			Y	Y
7		0		0							7		0		0								
8		0		0							8		0		0								

Velocity input for time factor requires microsecond (10^{-6}) format.

Firing Sequence Start: 1731 hrs
Firing Sequence End: 1736 hrs
Duration: 5 min

Firing Sequence Start: 1740 hrs
Firing Sequence End: 1746 hrs
Duration: 6 min

TEST CONDITIONS:

Ambient Temp: 71 F
Rel. Humidity: 48 %

TEST DIMENSIONS:

Range Length: 16.40 ft.
Velocity 1: 5.73 ft.
Velocity 2: 4.09 ft.

VELOCITY SUMMARY:

	Min	Max	
Front Panel 0º:	1196	1223	ft/s
Front Panel 30º:	1223	1231	ft/s
Back Panel 0º:	1204	1222	ft/s
Back Panel 30º:	1210	1233	ft/s

Handload Verification Velocity:	1205		ft/s
NIJ Reference Velocity:	1205		ft/s
Velocity Range:	1175	1235	ft/s

NOTE:

a - Excessive velocity
b - Insufficient velocity
c - Too close to edge
d - Too close to prior impact
e - Excessive total impacts (test terminated)
f - Excessive area impacts (test terminated)
g - Impact on seam

Penetration and BFS Firing Data - Sample 3

Sample No: Sample 3
Manufacturer: Protective Products International
Model: HC-5105-II

Ammunition: .357 Mag 158/JSP
Conditioning: Wet
Test Date: 07/07/05

Report Number: PPI05029
Report Date: 07/08/05
NIJ Armor Type: 2

Panel Serial No: 89317
Plate Serial No: N/A

Panel Serial No: 89317
Plate Serial No: N/A

FRONT PANEL											BACK PANEL											COMPLIANCE	
Shot No.	Time 1 (μs)	Vel. 1 (ft/s)	Time 2 (μs)	Vel. 2 (ft/s)	Vel. Avg. (ft/s)	30º (Y)	Fair (Y/N)	Penetrate (Y/N)	Note	BFS (mm)	Shot No.	Time 1 (μs)	Vel. 1 (ft/s)	Time 2 (μs)	Vel. 2 (ft/s)	Vel. Avg. (ft/s)	30º (Y)	Fair (Y/N)	Penetrate (Y/N)	Note	BFS (mm)	Front Panel	Back Panel
1	4023	1424	2867	1425	1424		Y	N		36	1	4029	1422	2871	1423	1422		Y	N		39	Y	Y
2	4031	1421	2872	1422	1422		Y	N			2	4050	1414	2886	1415	1415		Y	N			Y	Y
3	4021	1425	2866	1425	1425		Y	N		42	3	4040	1418	2880	1418	1418		Y	N		42	Y	Y
4	4037	1419	2877	1420	1419	Y	Y	N			4	4055	1413	2891	1413	1413	Y	Y	N			Y	Y
5	4055	1413	2889	1414	1413	Y	Y	N			5	4024	1423	2868	1424	1424	Y	Y	N			Y	Y
6	4034	1420	2875	1421	1420		Y	N			6	4025	1423	2869	1424	1423		Y	N			Y	Y
7		0		0							7		0		0								
8		0		0							8		0		0								

Velocity input for time factor requires microsecond (10^{-6}) format.

Firing Sequence Start: 1759 hrs
Firing Sequence End: 1807 hrs
Duration: 8 min

Firing Sequence Start: 1812 hrs
Firing Sequence End: 1819 hrs
Duration: 7 min

TEST CONDITIONS:

Ambient Temp: 71 F
Rel. Humidity: 49 %

TEST DIMENSIONS:

Range Length: 16.40 ft.
Velocity 1: 5.73 ft.
Velocity 2: 4.09 ft.

VELOCITY SUMMARY:

	Min	Max	
Front Panel 0º:	1420	1425	ft/s
Front Panel 30º:	1413	1419	ft/s
Back Panel 0º:	1415	1423	ft/s
Back Panel 30º:	1413	1424	ft/s

Handload Verification Velocity: 1429 ft/s
NIJ Reference Velocity: 1430 ft/s
Velocity Range: 1400 1460 ft/s

NOTE:

a - Excessive velocity
b - Insufficient velocity
c - Too close to edge
d - Too close to prior impact
e - Excessive total impacts (test terminated)
f - Excessive area impacts (test terminated)
g - Impact on seam

Penetration and BFS Firing Data - Sample 4

Sample No: Sample 4
Manufacturer: Protective Products International
Model: HC-5105-II

Ammunition: .357 Mag 158/JSP
Conditioning: Wet
Test Date: 07/07/05

Report Number: PPI05029
Report Date: 07/08/05
NIJ Armor Type: 2

Panel Serial No: 83397
Plate Serial No: N/A

Panel Serial No: 83397
Plate Serial No: N/A

FRONT PANEL											BACK PANEL											COMPLIANCE	
Shot No.	Time 1 (μs)	Vel. 1 (ft/s)	Time 2 (μs)	Vel. 2 (ft/s)	Vel. Avg. (ft/s)	30º (Y)	Fair (Y/N)	Penetrate (Y/N)	Note	BFS (mm)	Shot No.	Time 1 (μs)	Vel. 1 (ft/s)	Time 2 (μs)	Vel. 2 (ft/s)	Vel. Avg. (ft/s)	30º (Y)	Fair (Y/N)	Penetrate (Y/N)	Note	BFS (mm)	Front Panel	Back Panel
1	4026	1423	2869	1424	1423		Y	N		40	1	4057	1412	2892	1413	1412		Y	N		34	Y	Y
2	3980	1439	2837	1440	1440		Y	N		35	2	4040	1418	2879	1419	1418		Y	N			Y	Y
3	4004	1431	2854	1431	1431		Y	N			3	4031	1421	2873	1422	1421		Y	N		42	Y	Y
4	4008	1429	2856	1430	1430	Y	Y	N			4	3965	1445	2826	1446	1445	Y	Y	N			Y	Y
5	4006	1430	2855	1431	1430	Y	Y	N			5	4012	1428	2859	1429	1428	Y	Y	N			Y	Y
6	3977	1440	2834	1441	1441		Y	N			6	4011	1428	2859	1429	1428		Y	N			Y	Y
7		0		0							7		0		0								
8		0		0							8		0		0								

Velocity input for time factor requires microsecond (10^{-6}) format.

Firing Sequence Start: 1823 hrs
Firing Sequence End: 1831 hrs
Duration: 8 min

Firing Sequence Start: 1834 hrs
Firing Sequence End: 1840 hrs
Duration: 6 min

TEST CONDITIONS:

Ambient Temp: 71 F
Rel. Humidity: 49 %

TEST DIMENSIONS:

Range Length: 16.40 ft.
Velocity 1: 5.73 ft.
Velocity 2: 4.09 ft.

VELOCITY SUMMARY:

	Min	Max	
Front Panel 0º:	1423	1441	ft/s
Front Panel 30º:	1430	1430	ft/s
Back Panel 0º:	1412	1428	ft/s
Back Panel 30º:	1428	1445	ft/s

Handload Verification Velocity:	1429		ft/s
NIJ Reference Velocity:	1430		ft/s
Velocity Range:	1400	1460	ft/s

NOTE:

a - Excessive velocity
b - Insufficient velocity
c - Too close to edge
d - Too close to prior impact
e - Excessive total impacts (test terminated)
f - Excessive area impacts (test terminated)
g - Impact on seam

Ballistic Limit Firing Data

Manufacturer: Protective Products International
Model: HC-5105-II
Test Date: 07/08/05

Ammunition: 9mm 124/FMJ
Conditioning: Dry

Report Number: PPI05029
Report Date: 07/08/05
NIJ Armor Type: 2

Enter NIJ Armor Types III and IV Sample Number(s) in Remarks Column as Applicable

BL PANEL 1										BL PANEL 2									
Shot No.	Time 1 (μs)	Vel. 1 (ft/s)	Time 2 (μs)	Vel. 2 (ft/s)	Vel. Avg. (ft/s)	Penetration C	Penetration P	Remarks	Used (Y/N)	Shot No.	Time 1 (μs)	Velocity (f/s)	Time 1 (μs)	Velocity (ft/s)	Vel. Avg. (ft/s)	Penetration C	Penetration P	Remarks	Used (Y/N)
1	3615	1585	2572	1588	1586		X		N	1	3599	1592	2561	1595	1593		X		Y
2	3507	1633	2495	1637	1635		X		Y	2	3474	1649	2471	1653	1651		X		Y
3	3467	1652	2467	1656	1654	X			Y	3	3400	1685	2420	1688	1686	X			Y
4	3528	1624	2511	1627	1625		X		Y	4	3381	1694	2406	1698	1696	X			N
5	3399	1685	2419	1689	1687		X		Y	5	3556	1611	2531	1614	1612		X		Y
6	3339	1715	2376	1719	1717	X			N	6	3381	1694	2405	1699	1696	X			N
7	3432	1669	2443	1672	1671	X			Y	7	3481	1646	2477	1649	1647	X			Y
8	3491	1641	2485	1644	1642	X			Y	8	3481	1646	2476	1650	1648	X			Y
9	3577	1601	2545	1605	1603		X		Y	9	3548	1614	2525	1618	1616		X		Y
10	3543	1617	2521	1620	1619		X		Y	10	3545	1616	2523	1619	1617		X		Y
11	3440	1665	2448	1669	1667	X			Y	11	3506	1634	2495	1637	1636	X			Y
12	3384	1693	2408	1696	1695	X			Y	12	3564	1607	2536	1611	1609	X			Y
13		0		0						13		0		0					
14		0		0						14		0		0					
15		0		0						15		0		0					
				Count:	12	6	6		10					**Count:**	12	7	5		10

INSTRUCTIONS:

1. Fill in shaded cells - all others are automatic calcualtions
2. Enter an "x" to designate complete or partial penetrations
3. Enter a "y" to designate use of the shot for calculation purposes - calculation group must include highest partial and lowest complete.
4. Velocity input for time factor requires microsecond (10-6) format.

TEST CONDITIONS:

Ambient Temp: 72 F
Rel. Humidity: 66 %

TEST DIMENSIONS:

Range Length: 16.40 ft.
Velocity 1: 5.73 ft.
Velocity 2: 4.09 ft.

Provided Lower Velocity: ft/s
Calculated Lower Velocity: 1655 ft/s
Calculated Upper Velocity: 1805 ft/s
Calculated First Shot Velocity: 1730 ft/s

Velocity Results:	**Min**	**Max**
Panel 1:	1586	1717
Panel 2:	1593	1696

CLAY BLOCK TEMPERATURE:

Pre-Test: 87 F
Post Test: 85 F

Remarks: Enter Sample No. e.g., 5…10
a - Too close to edge
b - Too close to prior impact
c - Impact on seam

NIJ BASELINE BALLISTIC LIMIT CALCULATION

Manufacturer: Protective Products International
Model: HC-5105-II
Test Date: 07/08/05

Ammunition: 9mm 124/FMJ
Conditioning: Dry

Report Number: PPI05029
Report Date: 07/08/05
NIJ Armor Type: 2

BL PANEL 1				BL PANEL 2			
Shot No.	Velocity (ft/s)	Penetration		Shot No.	Velocity (ft/s)	Penetration	
		Complete	Partial			Complete	Partial
				1	1593		X
2	1635		X	2	1651		X
3	1654	X		3	1686	X	
4	1625		X				
5	1687		X	5	1612		X
7	1671	X		7	1647	X	
8	1642	X		8	1648	X	
9	1603		X	9	1616		X
10	1619		X	10	1617		X
11	1667	X		11	1636	X	
12	1695	X		12	1609	X	
Count:	10	5	5	**Count:**	10	5	5

BALLISTIC LIMIT SUMMARY		
Panel 1 BL:	1650	ft/s
Velocity Range:	92	ft/s
Standard Deviation (σ):	30	ft/s
Panel 2 BL:	1632	ft/s
Velocity Range:	93	ft/s
Standard Deviation (σ):	27	ft/s
Difference Panel 1 to 2:	18	ft/s
Panel 1 & 2 Average BL:	1641	ft/s

PAGE WILL AUTOMATICALLY CALCULATE

Summary of Results

Armor Manufacturer: Protective Products International **Armor Style:** N/A **Report Number:** PPI05029
Armor Model No: HC-5105-II **NIJ Armor Type:** 2 **Report Date:** 07/08/05

PENETRATION AND BACKFACE SIGNATURE												
Test Samples (b)					Ballistic Threat					Results		
Item Number	Serial Number	Panel	Weight (lbs)	No. of Plies	Caliber	Obliquity (degrees)	Req'd Shots	Velocity (ft/s) Max.	Velocity (ft/s) Min.	Penetration (Y/N)	BFS (mm) BFS 1	BFS (mm) BFS 2
Sample 1	88181	Front	1.69	20	9mm	0	4	1214	1189	N	29	26
						30	2	1208	1191			
	88181	Back	2.16	20	9mm	0	4	1221	1187	N	31	29
						30	2	1217	1211			
Sample 2	80560	Front	1.69	20	9mm	0	4	1223	1196	N	29	28
						30	2	1231	1223			
	80560	Back	2.14	20	9mm	0	4	1222	1204	N	29	28
						30	2	1233	1210			
Sample 3	89317	Front	1.69	20	.357 Mag	0	4	1425	1420	N	36	42
						30	2	1419	1413			
	89317	Back	2.15	20	.357 Mag	0	4	1423	1415	N	39	42
						30	2	1424	1413			
Sample 4	83397	Front	1.69	20	.357 Mag	0	4	1441	1423	N	40	35
						30	2	1430	1430			
	83397	Back	2.14	20	.357 Mag	0	4	1428	1412	N	34	42
						30	2	1445	1428			

NOTES:

Maximum BFS: 44 mm
Ballistic Material: Hybrid

Model Compliance: YES

P-BFS Result

Penetration: Pass
BFS: Pass

NIJ Baseline Ballistic Limit

Panel 1:
Type: 10 shots
Ballistic Limit: 1650 ft/s
Std Dev. (σ): 30 ft/s

Panel 2:
Type: 10 shots
Ballistic Limit: 1632 ft/s
Std Dev. (σ): 27 ft/s

CERTIFICATION:

Test Data Certification: Richard W. Mouser
Name

Signature

Witnessed by: 0 0
Name Representing