



# Wiltshire Ballistic Services Ltd

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Trial no: 3573

Intelligent Armour Ltd  
Operations Centre  
Eastington Bridge  
Stonehouse  
Gloucestershire  
GL10 3SQ

FAO Alex Bomberg

12<sup>th</sup> July 2011

## BALLISTIC TEST REPORT

This test was carried out to determine the ability of helmets MACH 1, MACH 2 and MACH 3 to defeat 9mm FMJ rounds to NIJ 0108.01 level IIIA.

All three helmets passed against the 9mm threat only to NIJ 0108.01 level IIIA at Wiltshire Ballistic Services Ltd on the 11<sup>th</sup> of July 2011.

The results contained in this report are only valid for the samples tested and detailed above. The publication of these results in any abridged form is **not** allowed without approval by Wiltshire Ballistic Services Ltd. in writing.

Signed:

Prepared by: E Petrou  
Range Engineer

Approved by: D Stow  
Range Manager

Date: 12<sup>th</sup> July 2011

**THE TRIAL**

<b>Report/trial number</b>	3573
<b>Test date</b>	11 <sup>th</sup> July 2011
<b>Report prepared by</b>	E M L Petrou
<b>Trial commissioned by</b>	Intelligent Armour Ltd
<b>Manufacturer of sample</b>	Intelligent Armour Ltd
<b>Sample designation</b>	MACH 1, MACH 2 and MACH 3
<b>Sample temperature</b>	Ambient
<b>Calibre of test rounds</b>	9mm
<b>Bullet type</b>	FMJ 124gr
<b>Bullet make</b>	Remington
<b>Test gun</b>	Universal Receiver
<b>Muzzle to target distance</b>	5m
<b>Distance of detectors from muzzle</b>	2.5m
<b>Range temperature</b>	22.9°C
<b>Relative humidity</b>	53%
<b>Range pressure</b>	1010mBar

## RANGE EQUIPMENT & CONFIGURATION

### THE GUN

All rounds were shot from a track mounted laser-sighted Universal Receiver fitted with the appropriate barrel to give both projectile stability and the required velocity.

### VELOCITY MEASUREMENT

The projectile velocity is measured using optical sky screens, with 1.0m separation, positioned on a track-mounted housing fitted with D.C. light sources to detect the passage of the projectile. The optical sky screens are connected to an electronic timing unit and velocity calculating computer, each unit being calibrated and certified in accordance with the manufacturer's requirements. The accuracy of the velocity measurement equipment has been calculated to be 0.17% overall.

**NOTE:** Unless otherwise stated, projectile velocity is measured at a point 2.5m from the attack face of the sample under test.

### SAMPLE HOLDER

The track mounted sample holder trolley is of heavy steel construction to form a rigid mounting into which various specialised sample holders can be fitted to meet a multitude of different testing standards. Provision is also made to allow for turning samples to predetermined angles for angled attacks.

### WITNESS SYSTEM

The witness system comprises of a 0.5mm +/- 0.05mm thick 2024 T3 aluminium alloy sheet with a minimum tensile strength of 440N/mm<sup>2</sup> mounted securely behind the sample.

### PROJECTILE STABILITY

Where necessary the projectile stability was tested by firing the rounds through a test/witness panel set-up in the same place as the sample to be shot.

### SHOT PLACEMENT

All firing is carried out using a laser-sighted Universal Receiver. Accuracy tends to be far better than would usually be the case when hand-held weapons are used. Therefore, unless otherwise stated, all shots have hit the sample in the required pattern and with the required spacing.

### TEST RESULTS

The test results for these tests are contained in ANNEX A to this report.

ANNEX A**RESULTS****Helmet MACH 2, 1.362kg**

9mm FMJ 124gr Remington

Required velocity 411m/s to 441m/s

To NIJ 0108.01 IIIA

Shot No.	Velocity (m/s)	Sample Held or Penetrated	Trauma code	Comments / Assessment
1	430.3	Held	C	Front
2	428.8	Held	C	Back
3	433.9	Held	C	LHS
4	434.0	Held	C	RHS
5	435.6	Held	C	Crown

**Helmet, MACH 1, size: large, date of manufacture: 4-2011, lot no: E14486, serial no: 0002, item no: H31-L-F6-06, 1.336kg**

9mm FMJ 124gr Remington

Required velocity 411m/s to 441m/s

To NIJ 0108.01 IIIA

Shot No.	Velocity (m/s)	Sample Held or Penetrated	Trauma code	Comments / Assessment
1	432.9	Held	C	Front
2	430.8	Held	C	Back
3	431.6	Held	C	LHS
4	433.5	Held	C	RHS
5	436.2	Held	C	Crown

**Helmet, MACH 3, size: large, date of manufacture: 4-2011, lot no: E14486, serial no: 0001, item no: H33-L-F6-01, 1.218kg**

9mm FMJ 124gr Remington

Required velocity 411m/s to 441m/s

To NIJ 0108.01 IIIA

Shot No.	Velocity (m/s)	Sample Held or Penetrated	Trauma code	Comments / Assessment
1	432.8	Held	C	Front
2	433.4	Held	C	Back
3	440.5	Held	C	LHS
4	433.3	Held	C	RHS
5	434.4	Held	C	Crown

**END OF REPORT**