

# RAM-SHELL

## Technical User Specification

### 1. General Data



- Caliber: 12 Gauge (Body: 20.2mm)
- Length: 2.25 inch (57.4mm)
- Material: Aluminum 6061-T6
- Charge: None; Off-center axis .22 caliber blank adapter
- Projectile: None; common .68 plastic/ rubber paintball
- Weight, empty: 22.9g

## 2. Compatibility

- Platforms: All compatible 12 Gauge Shotguns. **Does not** cycle semi-automatic shotguns.
- Loads: All standard Ramset® compatible, .22 Caliber blanks or .22 rimfire blanks.

## 3. Installation Tools

Extractor: simple pin or metal rod of between 0.2" and 0.1" diameter to push spent cartridge from shell. Depending on level of blank used, more or less force may be required and use of a block of wood or metal against which the pin can be pushed is recommended.

Installation: depending on projectile, insertion can be accomplished manually or by means of a small metal pin or similar to force the projectile to the end of the cavity. A small hammer or wood/metal block to exert more force may be desirable.

## 4. Projectile Compatibility

Commonly available plastic or rubber projectiles intended for paintball guns (but not paint filled) may be used provided that they fall in the following dimensional range:

- Minimal Diameter (loose fit): 0.6687 in (16.982mm)
- Maximal Diameter (tight fit): 0.6796 in (17.260mm)

Use of solid metal projectiles is not recommended. Plastic or rubber coated metal projectiles may be used provided they fit within the above dimensional range.

## 5. Test Data: Velocities

All test shots were done with the same 5 Ram-Shells and velocity recorded using a ProChrono DLX with lighting adapter. The shotgun used was an older model 500 from Mossberg using a smooth bore, 18-inch barrel.

### a. Hard plastic ball: 0.680" (+/- 0.001), 3.62g (+/- 0.01g)

#### Level 2 Ramset® (brown tip)

Average Velocity: 531 ft/s  
Standard Deviation: 47 ft/s  
Avg. Muzzle Energy: 47.4 [J] (35 ft-lb)

#### Level 3 Ramset® (green tip)

Average Velocity: 714 ft/s  
Standard Deviation: 28 ft/s  
Avg. Muzzle Energy: 85.7 [J] (63 ft-lb)

#### Level 4 Ramset® (yellow tip)

Average Velocity: 870 ft/s  
Standard Deviation: 39 ft/s  
Avg. Muzzle Energy: 127 [J] (94 ft-lb)

### b. Rubber Ball: 0.669" (+/-0.003"), 2.72g (+/-0.02g)

#### Level 2 Ramset®

Average Velocity: 330 ft/s  
Standard Deviation: 39 ft/s  
Avg. Muzzle Energy: 13.8 [J] (10 ft-lb)

#### Level 4 Ramset®

Average Velocity: 613 ft/s  
Standard Deviation: 26 ft/s  
Avg. Muzzle Energy: 47.5 [J] (35 ft-lb)

## 6. Penetration Depth

Penetration depth into layers of cardboard, loosely stacked in a box, was performed as a comparison of the combination of the projectile's impact energy and its shape. Use of "standard" (Amazon) shipping boxes was the source of the cardboard; this is in order to allow data to be reproduced easily. Distance from the muzzle to the target was 10 feet +/- 0.5 ft. All projectiles were of the solid plastic type and the same cartridge was used for each test. The velocity was recorded at 2ft from the muzzle.

### **Level 2 Ramset®**

$V_2 = 552 \text{ ft/s}$

Penetration depth: 12 Layers

### **Level 3 Ramset®**

$V_2 = 639 \text{ ft/s}$

Penetration depth: 23 Layers

### **Level 4 Ramset®**

$V_2 = 954 \text{ ft/s}$

Penetration depth: 39 Layers

## 7. Noise Levels

Measurement of noise levels is a complex topic and greatly depends on the environment and how and where it is being measured. In order to establish an approximate level for comparison and establishing what level of noise level may be expected, a test was conducted that measured the noise levels inside a concrete warehouse, shot in the direction of a brick wall from a distance of 12 feet (4m). Two measurements were taken for each Ramset<sup>®</sup> charge level, one directly in front of the barrel at a distance of 6ft with the microphone pointing upwards and a second one near where a shooter's ear would be located (on the side away from the shotgun, as this is generally louder than on the side of the firearm). The following levels were recorded using a TopTes TS-501B Sound Level Meter using dB(A) weighted, fast time response with Max values captured:

### **Level 2 Ramset<sup>®</sup>:**

@6ft: 99 dBA

@0ft: 97 dBA

### **Level 3 Ramset<sup>®</sup>:**

@6ft: 102 dBA

@0ft: 100 dBA

### **Level 4 Ramset<sup>®</sup>:**

@6ft: 107 dBA

@0ft: 105 dBA

Considering that noise levels above 85 dB can cause hearing damage, hearing protection is strongly recommended. However, according to OSHA, 100 dB has a potential damage threshold if experienced for 1h and 110 dB at 30min so emergency, infrequent use is less likely to cause hearing loss, even in a confined space such as the test area used. Nevertheless, proper hearing protection is strongly recommended whenever feasible.

## 8. Legal & Safety Notes

Ramset® is a registered trademark of its respective owner; no affiliation or endorsement is implied.

This product is intended for training and test use only. Always verify local laws and range rules.

Distinguish training components via color/markings as appropriate.

Discharging any firearm generates potentially toxic gases and substances and loud noises as well as potential shrapnel. Always use appropriate safety equipment (at a minimum hearing and eye protection and wash hands prior to eating or drinking).

Ram-Shell is an inert metal container. It is up to the user to understand that adding a potentially explosive device in a manner it was not originally intended may put the user at harm if basic safety protocols are not observed. This is not a toy and should at all times be treated as lethal ammunition.

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