M-Series Armor Piercing Cartridges Utilizing Tungsten Carbide Penetrators

General Defense Corp




The M-Series Armor Piercing (AP) bullets and bullet components utilizes unique processes to deliver the highest levels of repeatability.

While traditional jacketed bullets are produced on multi-stage stamping machines consisting of dies, with each stage and die combination producing a slightly different bullet, M-Series bullets and components are machined on state-of-the-art CNC machines to produce incredibly precise tolerances and eliminate manufacturing variations.

In addition, unlike traditional jacketed bullets that are produced statically, resulting in off-center components and voids, the M-series process involves turning each bullet from a solid bar free of inclusions and voids while spinning at a high rpm. This produces a stable bullet whose axis of symmetry is equal to its axis of geometry, thus ensuring a stable flight.




High precision CNC manufacturing

- Precise tolerances
  - Increase accuracy at longer ranges
- More flexibility in design
  - Adjust balance to best match weapon
  - More flexibility on weight
  - Reduced strain on the barrel maintains accuracy over the weapons life:
    - Bullet construction and design
    - Material composition
    - Adjust projectile ballistic bands to reduce bearing surface stress
- More capability to support low volume production Vs traditional stamping method




Why use tungsten carbide vs hardened steel as a penetrator in armor piercing ammunition?

- The density of tungsten exceeds **19 grams per cubic centimeter**, and steel, though it has a varying density owing to its different alloys, has a density on the order of **8 grams per centimeter**
- Tungsten Carbide is also about **twice as strong steel**
- Two key factors in a good AP round are velocity and density of the penetrator


1” inch
HB280
7.62x51mm

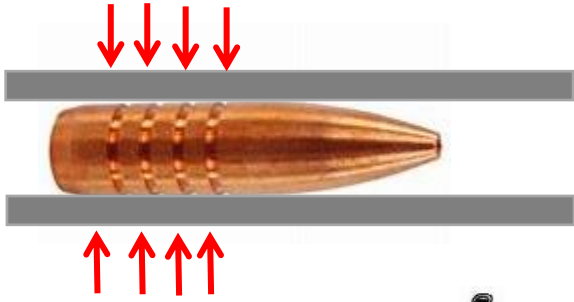

308 WIN
150 gr AP - Tungsten Core
0.375” (9mm)
Thick
HB400
100 yds
HB400




M-Series AP Ammunition

•**Are <u>completely sealed</u> using US DoD Mil-Spec HV sealant**

• **Very best <u>accuracy</u> due to the incredibly precise tolerances and eliminate manufacturing variations**



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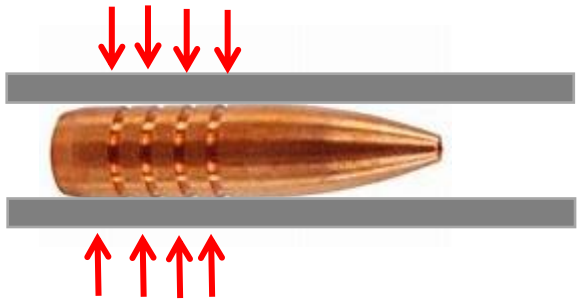





Match vs Standard Ammunition

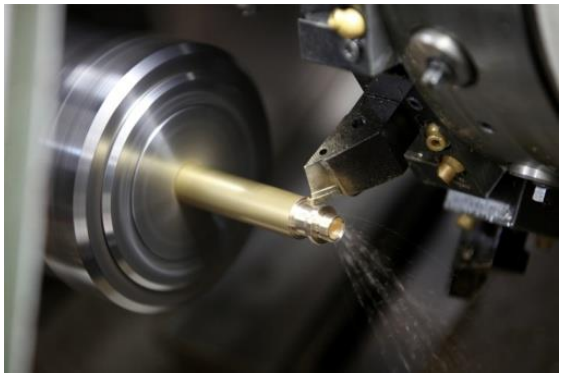
For “Match” ammunition:

- **Components are carefully selected**
  - Use of “Match” primers, such as Federal Match®
  - Use of “Match” brass cases that are manufactured to tighter tolerances. e.g. in 7.62x51mm for US DoD there are National Match cases and standard Lake City (LC) cases.
  - Powder is more carefully selected and tested to ensure the best possible accuracy and performance to match bullet type and weight.
- **More pressure/velocity testing is performed in a lab setting. and more testing using various weapon platforms is also conducted.**
  - It is preferred, if possible, test using the clients type of weapon. (Twist rate & chamber throat size for example will affect bullet performance). Matching ammo to a weapon can be important to ensure accuracy at extreme ranges.
- **The speed of actual production is slower, rds per hour, to ensure a higher Quality Control.**
- **Increased randomized LOT sampling/testing to increase the statistical likelihood of detecting an issue.**
- **100% chamber gauged checked and visible inspected**




• **<u>Flexibility in design</u>** and more capability to **<u>support low volume production</u>**
• Can produce in **<u>any caliber</u>**, including 7.62x39mm, 7.62x54R and other non-standard calibers.

• The following slides are specification sheets of some general calibers in the M-Series AP.
  - 5.56mm
  - 7.62x51mm
  - 300 Win Mag
  - 6.5 Creedmoor
  - 300 Blackout
  - 8.6x70mm (338 Lapua Mag)
  - 375 Cheytac
  - 408 Cheytac






Product Specification

CALIBER: 5.56×45mm NATO
CARTRIDGE: Armor Piercing Tactical M-Series (M620)

BULLET: 4.0g (62 grains). Copper outer jacket body Tungsten Carbide penetrator core

VELOCITY: **
945 m/s
3100 ft/s

ACCURACY: **
<1.0 MOA @ 100 yards
Mean Radius: 0.50 MOA @ 100 yards

PENETRATION:
12mm RHA @ 100 yds

CHAMBER PRESSURE:
Average Maximum: 55,000 psi (SAAMI & SCATP-5.56)

CASE: Brass Copper Alloy (#260)

PRIMER: Boxer Style, Non-Corrosive

TIP ID: Black

PRIMER SEALANT: Yes

CASE MOUTH SEALANT: Yes

HEADSTAMP: Two Stars with caliber
Custom headstamp markings are available with minimum quantity 200,000 rds

PROPELLANT DETECTION: 100% mechanical and/or electrical detection of propellant levels within the cartridge

PACKAGING:
20 rds per box, Fiber board Case
M27 Links




Product Specification

CALIBER: 7.62×51mm NATO
CARTRIDGE: Armor Piercing Tactical M-Series (M168 / M175)

BULLET: 10.8g (168 grains). 11.3g (175 grains)
Copper outer jacket body Tungsten Carbide penetrator core.

VELOCITY: **

168 grains	175 grains
807 m/s	790 m/s
2850 ft/s	2595 ft/s

ACCURACY: **
<1.0 MOA @ 100 yards
Mean Radius: 0.50 MOA @ 100 yards

PENETRATION:
16mm HB400 @ 100 yds

CHAMBER PRESSURE:
Average Maximum: 62,000 psi (SAAMI)

CASE: Brass Copper Alloy (#260)

PRIMER: Boxer Style, Non-Corrosive

TIP ID: Black

PRIMER SEALANT: Yes

CASE MOUTH SEALANT: Yes

HEADSTAMP: Two Stars with caliber
Custom headstamp markings are available with minimum quantity 200,000 rds

PROPELLANT DETECTION: 100% mechanical and/or electrical detection of propellant levels within the cartridge

PACKAGING:
20 rds per box, Fiber board Case
M13 Links




Product Specification

CALIBER: .300 Winchester Magnum (7.62X67mm)
CARTRIDGE: Armor Piercing Tactical M-Series (M220)

BULLET: 14.3g (220 grains) , Copper outer jacket body Tungsten Carbide penetrator core.

VELOCITY: **
870 m/s
2850 ft/s

ACCURACY: **
<1.0 MOA @ 100 yards
Mean Radius: 0.50 MOA @ 100 yards

PENETRATION:
16mm HB400 @ 100 yds

CHAMBER PRESSURE:
Average Maximum: 64,000 psi (SAAMI)

CASE: Brass Copper Alloy (#260)

PRIMER: Boxer Style, Non-Corrosive

TIP ID: Black

PRIMER SEALANT: Yes

CASE MOUTH SEALANT: Yes

HEADSTAMP: Two Stars with caliber
Custom headstamp markings are available with minimum quantity 200,000 rds

PROPELLANT DETECTION: 100% mechanical and/or electrical detection of propellant levels within the cartridge

PACKAGING:
20 rds per box, Fiber board Case




Product Specification

CALIBER: 6.5mm Creedmoor
CARTRIDGE: Armor Piercing Tactical M-Series (M120)

BULLET: 8g (120 grains). Copper outer jacket body Tungsten Carbide penetrator core.

VELOCITY: **
920 m/s
3020 ft/s

ACCURACY: **
<1.0 MOA @ 100 yards
Mean Radius: 0.50 MOA @ 100 yards

PENETRATION:
12mm HB400 @ 100 yds

CHAMBER PRESSURE:
Average Maximum: 62,000 psi (SAAMI)

CASE: Brass Copper Alloy (#260)

PRIMER: Boxer Style, Non-Corrosive

TIP ID: Black

PRIMER SEALANT: Yes

CASE MOUTH SEALANT: Yes

HEADSTAMP: Two Stars with caliber
Custom headstamp markings are available with minimum quantity 200,000 rds

PROPELLANT DETECTION: 100% mechanical and/or electrical detection of propellant levels within the cartridge

PACKAGING:
20 rds per box, Fiber board Case




Product Specification

CALIBER: 300 AAC BLACKOUT (7.62x35mm)
CARTRIDGE: Armor Piercing Tactical M-Series (M3001)

The M3001 Armor Piercing cartridge is an excellent short range cartridge for the M4 platform. It utilizes a Tungsten Carbide core penetrator and use for high threat targets. Affective against light armor and body armor.

BULLET: 9.7g (150 grains). Copper outer jacket body Tungsten Carbide penetrator core.

VELOCITY: **
556 m/s
1825 ft/s

ACCURACY: **
<1.5 MOA @ 100 yards
Mean Radius: 0.75 MOA @ 100 yards

PENETRATION:
10mm RHA HB300 @ 100 yds

CHAMBER PRESSURE:
Average Maximum: 55,000 psi (SAAMI)

CASE: Brass Copper Alloy (#260)

PRIMER: Boxer Style, Non-Corrosive

TIP ID: Black

PRIMER SEALANT: Yes

CASE MOUTH SEALANT: Yes

HEADSTAMP: Two Stars with caliber
Custom headstamp markings are available with minimum quantity 200,000 rds

PROPELLANT DETECTION: 100% mechanical and/or electrical detection of propellant levels within the cartridge

PACKAGING:
20 rds per box, Fiber board Case




Product Specification

CALIBER: (8.6x70mm) .338 LAPUA MAGNUM
CARTRIDGE: Armor Piercing Tactical M-Series (M250)

BULLET: 16.3g (250grains). Copper outer jacket body Tungsten Carbide penetrator core

VELOCITY: **
899.1 m/s
2950 ft/s

ACCURACY: **
<1.5 MOA @ 100 yards
Mean Radius: 0.75 MOA @ 100 yards

PENETRATION:
18mm HB400 @ 100 yds

CHAMBER PRESSURE:
Average Maximum: 65,000 psi (SAAMI)

CASE: Brass Copper Alloy (#260)

PRIMER: Boxer Style, Non-Corrosive

TIP ID: Black

PRIMER SEALANT: Yes

CASE MOUTH SEALANT: Yes

HEADSTAMP: "PETERSON" with caliber
Custom headstamp markings are available with minimum quantity 200,000 rds

PROPELLANT DETECTION: 100% mechanical and/or electrical detection of propellant levels within the cartridge

PACKAGING:
10 rds per box, Fiber board Case




Product Specification

CALIBER: 375 Cheytac
CARTRIDGE: Armor Piercing Tactical M-Series (M375)

The M-Series utilizes Tungsten Carbide core penetrators . The 375 Cheytac is an excellent anti-sniper and anti-materiel cartridge for extreme ranges of 2,000 meters. Other bullet weights are available.

BULLET: 23g (355 grains). Copper outer jacket body Tungsten Carbide penetrator core

VELOCITY: **
899.1 m/s
2950 ft/s

ACCURACY: **
<1.0 MOA @ 300 yards
Mean Radius: 0.5 MOA @ 100 yards

PENETRATION:
18mm HB400 @ 100 yds

CHAMBER PRESSURE:
Average Maximum: 63,800 psi (CIP)

CASE: Brass Copper Alloy (#260)

PRIMER: Boxer Style, Non-Corrosive

TIP ID: Black

PRIMER SEALANT: Yes

CASE MOUTH SEALANT: Yes

HEADSTAMP: "PETERSON" with caliber
Custom headstamp markings are available with minimum quantity 200,000 rds

PROPELLANT DETECTION: 100% mechanical and/or electrical detection of propellant levels within the cartridge

PACKAGING:
10 rds per box, Fiber board Case




Product Specification

CALIBER: 408 Cheytac
CARTRIDGE: Armor Piercing Tactical M-Series (M408)

The M-Series utilizes Tungsten Carbide core penetrators . The 408 Cheytac is an excellent anti-sniper and anti-materiel cartridge for extreme ranges of 2,000 meters. Other bullet weights are available.

BULLET: 27g (420 grains). Copper/brass outer jacket body Tungsten Carbide penetrator core

VELOCITY: **
894 m/s
2900 ft/s

ACCURACY: **
<1.0 MOA @ 300 yards
Mean Radius: 0.5 MOA @ 100 yards

PENETRATION:
18mm HB400 @ 100 yds

CHAMBER PRESSURE:
Average Maximum: 63,800 psi (CIP)

CASE: Brass Copper Alloy (#260)

PRIMER: Boxer Style, Non-Corrosive

TIP ID: Black

PRIMER SEALANT: Yes

CASE MOUTH SEALANT: Yes

HEADSTAMP: "PETERSON" with caliber
Custom headstamp markings are available with minimum quantity 200,000 rds

PROPELLANT DETECTION: 100% mechanical and/or electrical detection of propellant levels within the cartridge

PACKAGING:
10 rds per box, Fiber board Case

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Questions?