Tungsten Carbide Armor Piercing Technology

Small Arms Ammunition

AP
Armor Piercing
SMALL ARMS AMMUNITION

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Nammo

Tungsten Carbide AP Technology

Agenda

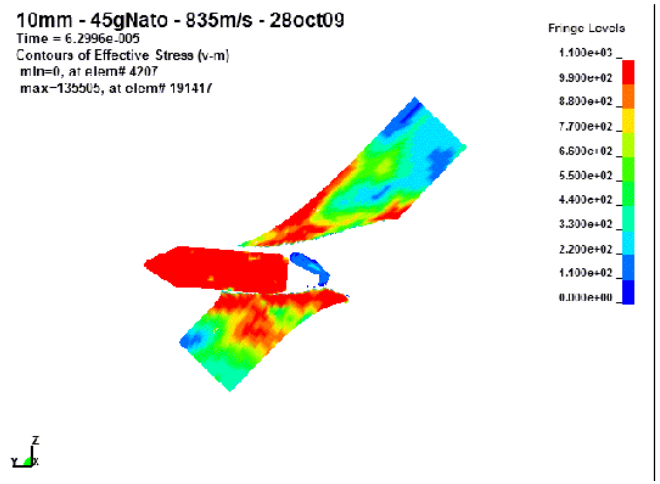
- Nammo AP Product Portfolio
- AP Performance
- Tungsten Carbide Technology
- New Developments
- Summary

SECURING THE FUTURE

Nammo Tungsten Carbide AP Product Portfolio

World leaders in tungsten carbide armor piercing

- 15 active products in calibers;
  - 5.56 mm
  - 7.62 mm
  - 12.7 mm
  - .308 Winchester
  - .338 Lapua Magnum
- Pro-active engineering
  - Additional products under development
  - Pioneers on cobalt free tungsten carbide



SECURING THE FUTURE

M993 & M995 Armor Piercing

- World leading Armor Piercing in caliber 5.56 and 7.62 mm
- Mature design, in production for 20 years

- Tungsten carbide penetrator
- Qualified as M993 and M995 by US Army 1996
- 160 million Armor Piercing cartridges delivered

M993 & M995

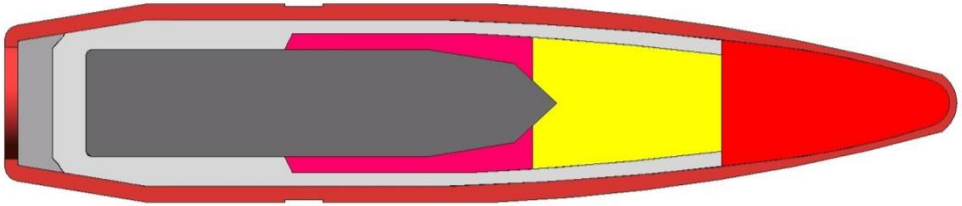
Live Fire Penetration Test – M993

- 18 mm armor steel 300 HB
- Target distance 100 m
- Impact angle 0° Nato

5.56 & 7.62 mm Long Range AP

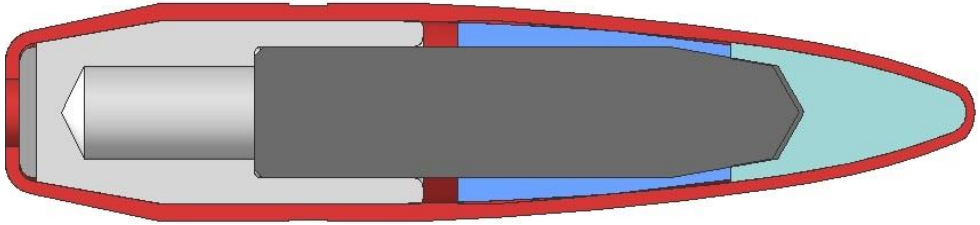
- Military specified STANAG 4172/2310
- 5 g (77 grain) / 10.9 g (168 grain) projectile
- Accuracy <1.5 MOA
- DMR or machine gun
- Long Range performance
  - Trajectory
  - Accuracy
  - Penetration

.50 Cal Armor Piercing



Multi Purpose Mk211

Trace & Dim Trace



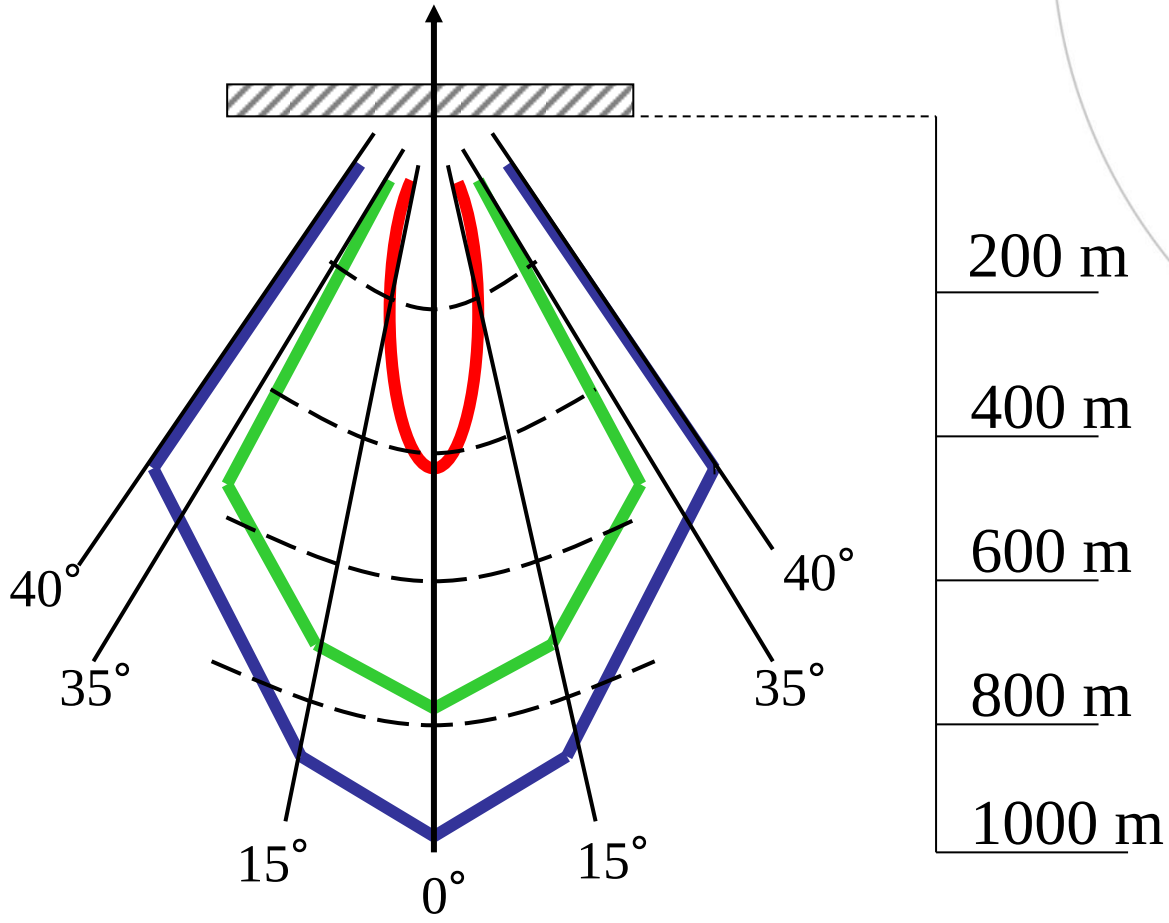
Armor Piercing Super

Incendiary

.50 Cal Armor Piercing Penetration

Penetration in a 15 mm armor plate

- **API-M8**
- **MP**
- **AP-S**



Anti-Material Sniper

- .308 Winchester AP – Matched to Scenar
- .338 Lapua Magnum AP and API – Matched to Scenar
- Match-grade bullet manufacturing technology
- World’s most accurate AP’s

Manufacturing Process Tungsten Carbide Core

From Raw materials ...

Wet milling

Spray drying

Pressing

Sintering

Grinding & Quality Control

... to Tungsten Carbide Core

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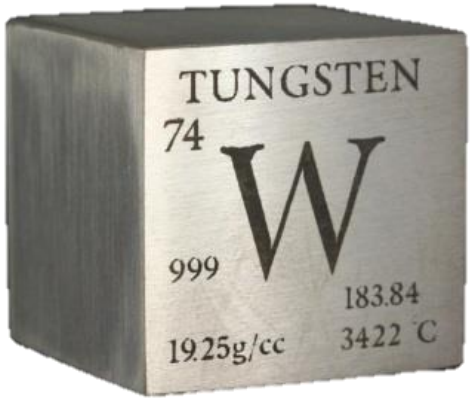
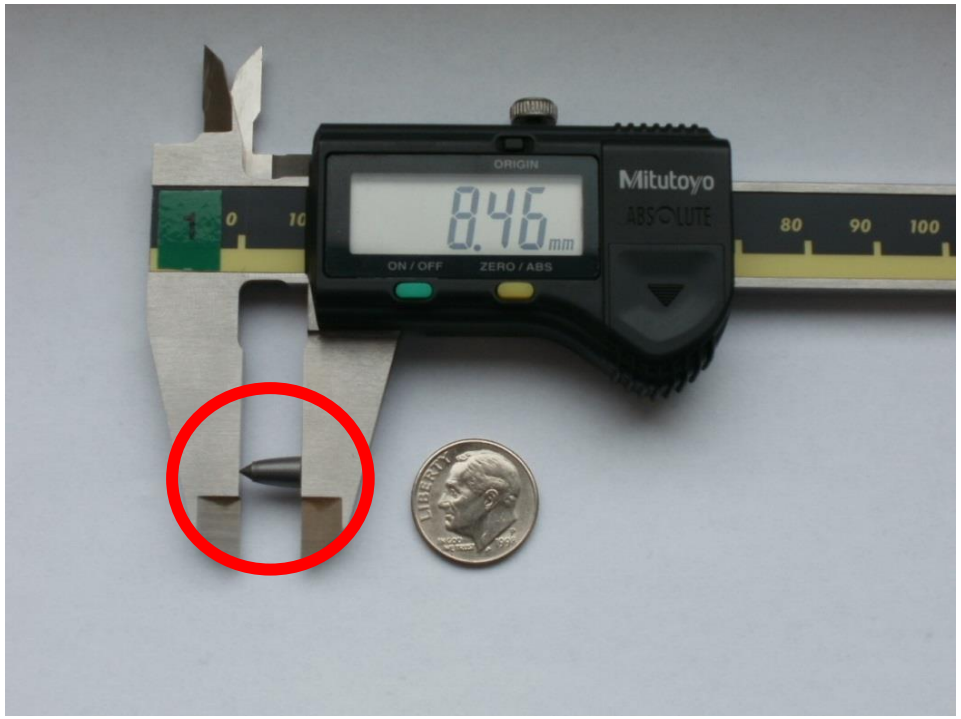
Why Tungsten Carbide?

	Steel	**Tungsten Carbide**
Density	8 g/cm^3	14.5 g/cm^3
Hardness	600-800 HV	1200-1500 HV



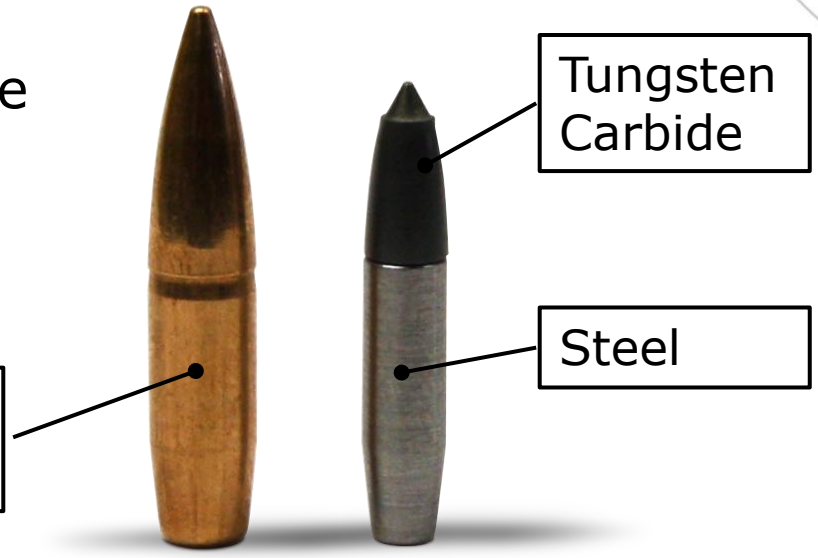
Utilizing Knowledge on Tungsten Carbide

- Worlds smallest tungsten carbide penetrator?
  - 1.1 g (17 grain) for 5.56 mm
  - 2.3 g (35 grain) for 7.62 mm



Power Ball – A New Product Family

- Ball with AP performance
- Based on Nammo lead free High Performance Ball
- Powered by Nammo AP penetrator technology
- Synergy effect
  - Armor Piercing
  - Long Range performance
  - Cost effective



5.56 mm: 4.5 g / 69 grain
7.62 mm: 9.9 g / 153 grain

Power Ball – 5.56 mm Penetration

- 7 mm RHA 400HB at 0° impact angle at 200 m
- 7 mm RHA 400HB at 30° impact angle at 100 m
- 7 mm RHA 500HB at 0° impact angle at 100 m

Power Ball – 5.56 mm Penetration

3.5 mm NATO plate at 0° obliquity	
M855 Ball	Nammo Power Ball
Penetration at 570 m	Penetration at 900 m

+ 58%

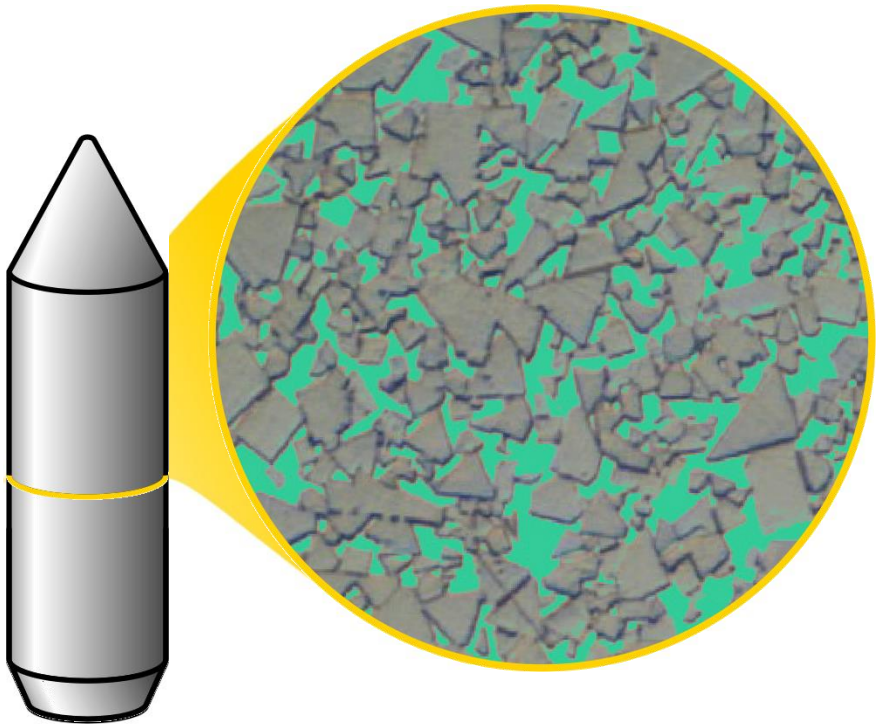
Power Ball – 5.56 mm Kinetic Energy

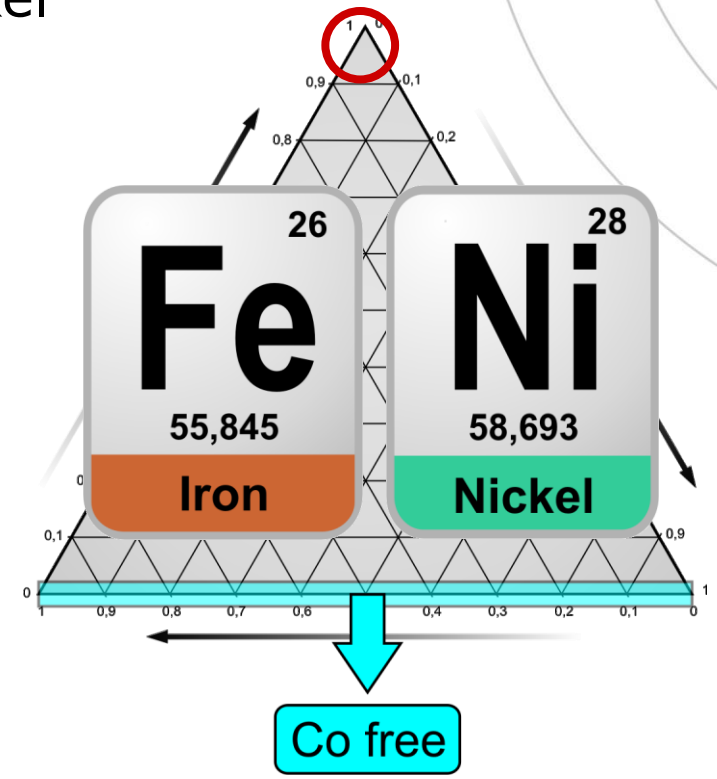
Increased combat distance compared to M855 Ball

- +13% kinetic energy at 100 m
- +36% kinetic energy at 500 m

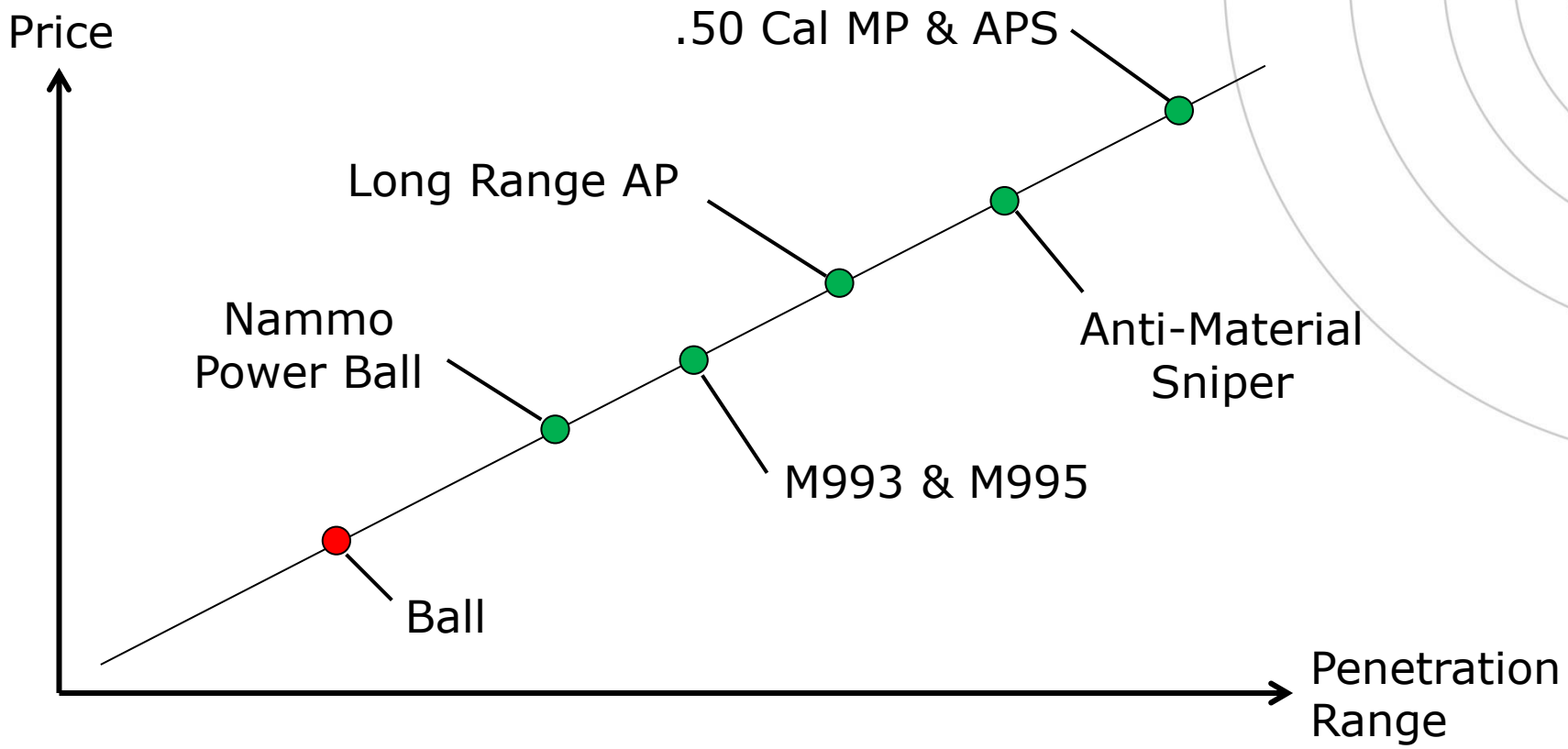
Cobalt Free Tungsten Carbide Technology

- Cobalt is the most commonly used binder metal in the hardmetal industry
- Cobalt free means: Iron and/or Nickel





Nammo Can Provide an AP for Every Need



Tungsten Carbide AP Technology

Summary

- World leading tungsten carbide core AP
- 15 active products
- Tungsten Carbide – No Compromise
- New Developments
- An AP for every need

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Speaker information

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