Available

Medium Caliber

Barrel life improvements

NDIA Guns & Ammo

Panama City FL

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Outline

• M242 barrel life history
• Barrel life comparison test data
  • MK44
  • M242
  • 27mm
• Test result summary
• Comments
• Availability status
M242 25mm Automatic Gun

Ammo Types

Rounds of Barrel Life

Nitrided

Chrome Plated

Future High Performance Ammo

^ REQUIREMENT ^

M792
3HE to 1AP
3AP to 1HE
M919
M791
M910
Old M919 (HES9053)

Flame Temp

2600K
3000K
3600 + K

Flame Temp
MK44 test schedule

A mixture of SS, 3 round & 5 rounds burst totaling 198 rounds in 27.5 minutes and cool to ambient

- 66 rounds in 2.5 minutes
  - 10 minute cool
- 66 rounds in 2.5 minutes
  - 10 minutes cool
- 66 rounds in 2.5 minutes
30mm MK44 barrel BG-10 results

- Wearout Curve
- Nitride bore at 5,000 rounds
- Chrome bore at 21,000 rounds

Bore Diameter (mm) vs. BG-10 Position
Forcing Cone Erosion vs. Rounds Fired

- **204.0 mm wearout limit**
- **5,500 round life**
  - MK44 Nitride
- **25,000 + round life**
  - MK44 chrome
  - projected
- **21,000 rounds fired**
  - MK44 chrome

**Graph Details:**
- X-axis: Rounds Fired
- Y-axis: Distance to 30.375mm diameter

Legend:
- Green line: 5,500 round life
- Blue line: 21,000 rounds fired
- Red line: 204.0 mm wearout limit
- Black line: 25,000 + round life

Key Points:
- 25,000 + round life projected for MK44 chrome.
- 21,000 rounds fired for MK44 chrome.
- 5,500 round life for MK44 Nitride.
- 204.0 mm wearout limit.

Note: The graph shows the progression of cone erosion relative to rounds fired.
M242 test schedule

A mixture of SS, & 10 rounds burst totaling 300 rounds in 34 minutes and cool to ambient

- 150 rounds in 2 minutes
- 30 minute cool
- 150 rounds in 2 minutes
25mm M242 barrel BG-10 results

- 4,500 round life Nitride bore
- 6,500 round life US Army Chrome
- Boeing Chrome at 14,000 rounds
- Boeing Chrome at 6,500 rounds

Bore Dia. (mm)

BG-10 Position
Position 1 Ø (@158mm) vs. Rounds Fired

- **4,500 round life**
  - Nitride bore

- **6,500 round life**
  - US Army chrome

- **20,000 + round life**
  - Boeing chrome projected

- **14,000 rounds fired**
  - Boeing chrome

- Wearout limit for position one

**Graph Details:**
- **Y-axis:** Bore Diameter (mm)
- **X-axis:** Rounds Fired

**Data Points:**
- 0 rounds fired
- 774 rounds fired
- 2173 rounds fired
- 3416 rounds fired
- 4659 rounds fired
- 6045 rounds fired
- 7328 rounds fired
- 8591 rounds fired
- 9834 rounds fired
- 11117 rounds fired
- 12380 rounds fired
- 13343 rounds fired
- 13916 rounds fired
- 14800 rounds fired
- 16200 rounds fired
- 17600 rounds fired
- 18800 rounds fired
- 20000 rounds fired

**Legend:**
- Blue line: Boeing chrome
- Magenta line: US Army chrome
- Purple line: Nitride bore
Forcing Cone Erosion vs. Rounds Fired

- 4,500 round life
  Nitride bore

- 6,500 round life
  US Army chrome

- 156.5 mm wearout limit

- 20,000 + round life
  Boeing chrome projected

- 14,000 rounds fired
  Boeing chrome
BK27 test schedule

Four (4) one second bursts of 30 rounds each totaling 120 rounds in 7.5 minutes and cool to ambient

- 30 round burst in one second
  - 2.5 minute cool
- 30 round burst in one second
  - 2.5 minute cool
- 30 round burst in one second
  - 2.5 minute cool
- 30 round burst in one second
27mm Preliminary test results

- **Wearout Curve**
- **Existing Production Barrel at 461 rounds**
- **Boeing Chrome at 941 rounds**
- **Boeing Chrome at 461 rounds**

Bore diameter (mm)

Distance from Breech end (mm)
M242 25mm Automatic Gun

Ammo Types

- M792
- 3HE to 1AP
- 3AP to 1HE
- M919
- M910
- Old M919 (HES9053)

Rounds of Barrel Life

- Nitride
- US Army Chrome
- Boeing Chrome

Future High Performance Ammo

- 2600K Flame Temp
- 3000K Flame Temp
- 3600 + K Flame Temp

^ REQUIREMENT ^
Test result summary

Boeing’s chrome process increases life

• Greater than 4x compared to our baseline nitride.
  – 30mm MK44 barrels
  – 25mm M242 barrels

• Greater than 3x compared to existing M242 fielded barrels

• Greater than 4x Compared to existing BK27 fielded barrels
M242 Comments

• Current fielded M242 barrel does not meet Bradley MN barrel life requirement with present ammo mix.
• Boeing manufactured chrome barrels
  – Exceed MN requirement
  – Will reduce life cycle cost & logistical burden
  – Allows for increased performance (higher flame temp.) propellants.
MK44 Chrome barrels
Availability status

MK 44 barrels in production with deliveries on going for
US Navy
US Marines
Norwegian Army
Swiss Army
Finnish Army
M242 & 27mm Aircraft
Chrome barrels Availability status

MK 242 barrels
Process established
Awaiting kick off customer

Advanced 27mm Aircraft barrels
Process established
Ready & waiting for JSF
or
Any other Kick off customer