

Cannon Life Extension Program

OBJECTIVE/SOLUTION:

The Cannon Life Extension Program has been tasked with developing a manufacturing process to extend the life of a gun barrel while eliminating the use of hexavalent chromium, through the use of a Tantalum-tungsten (Ta-10W) liner. Ta-10W has been identified as the premier barrel liner material. This material is very difficult to bond and machine, requiring novel manufacturing approaches. The program is currently focused on the medium and small caliber barrels.



50 Caliber Water Jet Ta-10 Rifling



50 Caliber Water Jet
Stainless Steel Rifling



Achievements:

- Developed an explosive bonding process that lines the M242 25mm and M2 50 Cal barrels with Ta-10W
- Developed a reliable Ta-10W lined barrel rifling process utilizing Water Jet machining technology
- Developed Ta-10W honing process that reduced the honing times down by 6X
- Developed a water jet rough chambering process
- Developed the non-destruction inspection criteria
- Developed complete TDP for the M242 25mm and M2 50 Caliber barrel
- To date, a medium caliber M242 25mm barrel has successfully been manufactured and rifled using standard two-point broach cutters that underwent a firing life test at Yuma Proving Grounds (YPG). The 25mm barrel, utilizing the accelerated wear firing schedule, has achieved a life of almost 14,000 rounds (typical chrome clad barrel is 3,500 rounds) and is currently still firing. This 4x increase in life is approaching the life of the receiver and would allow for an M242 to be fielded in a 1:1 ratio, barrel to receiver.

Achievements (cont):

- Two 50 caliber barrels have successfully been manufactured and rifled using Water jet rifling and fired 19000 rounds
- Developed Water jet rifling capability for the 7.62mm

Benefits:

- Hexavalent chrome free barrel manufacture process
- 3-5 times longer barrel life, lasting the life of the weapon system
- Able to fire higher energy ammunition
- The potential to reduce the load that the soldier are now carrying by not having to carry a spare barrel (small caliber weapons)

Transition and Weapon Systems/Secondary Items Impacted:

- M242 25MM Cannon
- M2 50 caliber
- All small and medium caliber weapons

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