



The Soldier: America's Most Deployed Combat System

National Defense Industrial Association Small Arms Symposium

# Lightweight Small Caliber Ammunition

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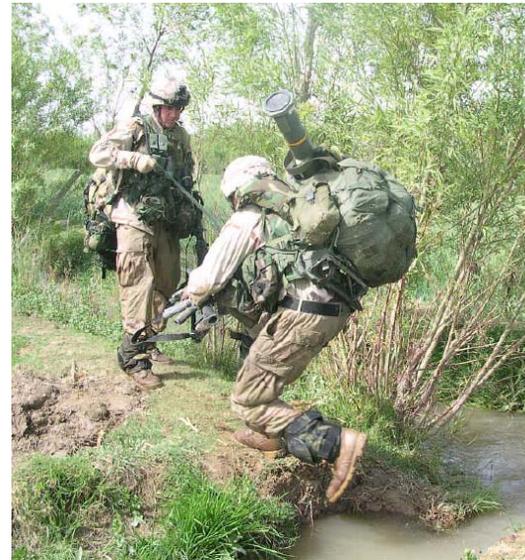
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# Lightweight Small Caliber Ammunition



"The dismounted infantryman continues to be over-burdened while conducting modern combat operations..."

"Reduce Combat Load through doctrine and equipment changes..."

Natick Soldier Center, March 2005



# Lightweight Small Caliber Ammunition



## Soldier Load

### M240B Machine Gunner

Average Fighting Load 81.4 lbs  
of which 6.3 lbs is ammunition





# Lightweight Small Caliber Ammunition



## Family of 7.62mm Caliber Ammunition



Blank M82	Ball M80	Trace M62	OHF M62	Special M118LR	Match M852	Dim M276
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# Lightweight Small Caliber Ammunition



## *Objective*

To develop a functional alternative lightweight 7.62mm cartridge case for the M80 Ball and M62 tracer cartridges that meets current ballistic performance and reliability of the current brass alloyed cartridge case



# Lightweight Small Caliber Ammunition

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## **Concept:**

Thinwall Stainless Steel Cartridge Case

## **Contractor:**

GDOTS Canada (Prime Contractor)

## **Tasks:**

- Design a 7.62mm Lightweight Cartridge Case
- Fabricate Cartridge Cases
- Test Full Up Cartridges in a Mann Barrel and Machine Gun

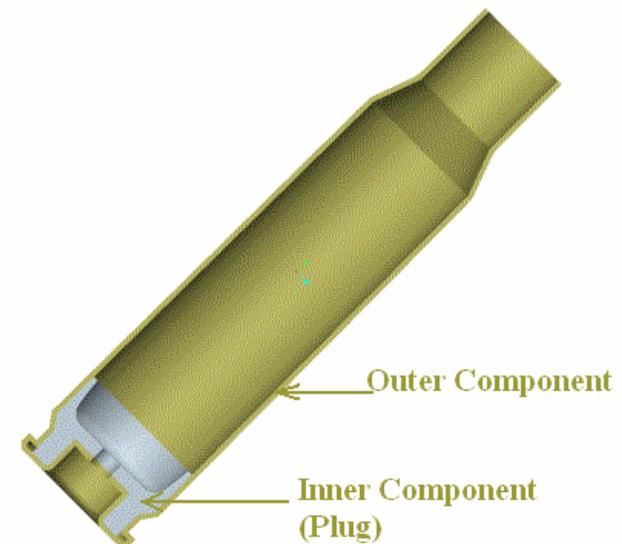


# Lightweight Small Caliber Ammunition



## Goal

- Weight savings of 20% over the M80 Ball Brass Cartridge
- Accomplished by thinwall steel replacing current brass case
- Aluminum plug is used in the base to provide structural support





# Lightweight Small Caliber Ammunition



## 7.62mm Weight Savings w/ Alternative Cartridge Case Materials

	Alternative Case Weight Reduction	M80 Assembled Cartridge Weight Savings	Unit Weight M80 Ball Cartridge (gr)	Ammo Combat Load Gunner** (100rds)	Weight Savings (lbs)	Ammo Combat Load Assistant Gunner*** (400rds)	Weight Savings (lbs)
7.62 Brass	0%	0%	392	6.3	0	29.2	0
GDOTS Steel	31%	20%	318	5.1	1.2	23.6	5.6
Canada							

<u>Weight Distribution Current 7.62mm</u>	
Case	48%
Bullet	38%
Propellant	12%
Primer / lacquer	2%

\*\* Gunner Combat Load total 81.4 lbs / 6.3 lbs ammo

\*\*\* Assistant Gunner Combat Load 69.9 lbs / 29.2 lbs ammo



# Lightweight Small Caliber Ammunition

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## *Approach*

**GDOTS Canada** – Expertise in Ammunition Production  
Current Second Source for production of Small Arms Ammunition

**Fleximation** – Patented Thin Wall Steel Concept

**O C Eyelet** – Expertise in Commercial Metal Stamping Processes

**ARDEC** – Expertise in Computer Modeling and Simulation



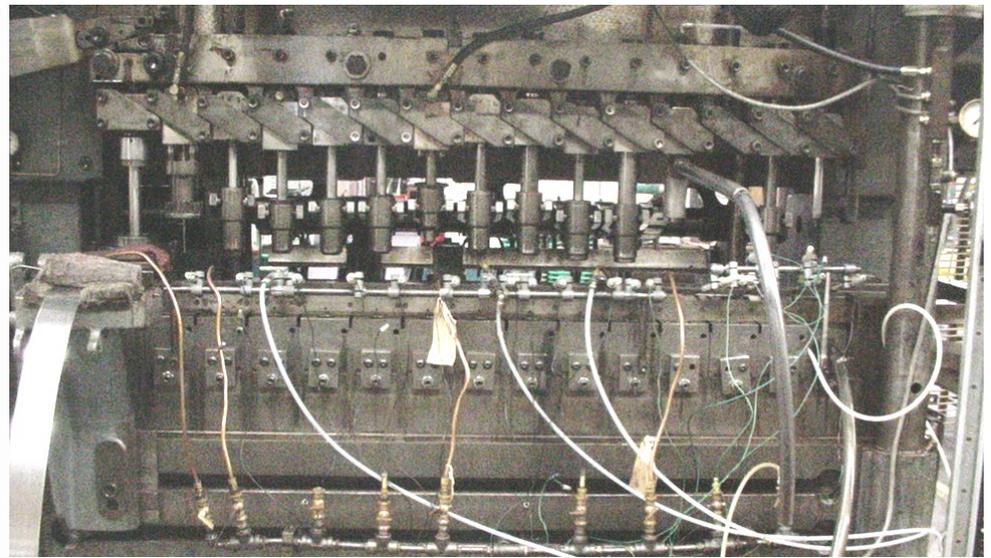
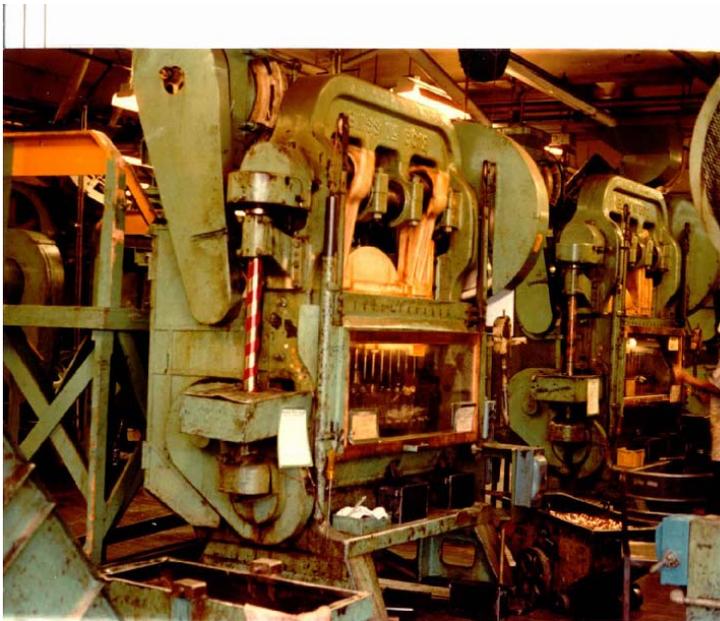
# Lightweight Small Caliber Ammunition



## *Process*

**Currently** – Brass cartridge case is a base draw process

**Concept** – Sheet metal folding process





# Lightweight Small Caliber Ammunition



**Demonstrated the feasibility of a lightweight 7.62mm cartridge based on thinwall stainless steel technology**





# Lightweight Small Caliber Ammunition



## Results:

- Stainless Steel  
Costs less than Brass
- Simplified Manufacturing Process  
Opens Markets for Other Manufacturers
- 20% of total weight of 7.62mm  
M80 Ball assembled cartridge
- Ballistic Performance matches  
current Military MIL-C- 46931  
Specifications





# Lightweight Small Caliber Ammunition



## *Further Information*

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