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TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

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Outline

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Introduction

What is the Advanced Lethal Armament Technology for Small Arms ATO?

An Army Technology Objective (ATO) effort funded thru the JSSAP office which was started in 2008. The aim of this effort is to identify, find, mature, and demonstrate those small arms technologies which, when developed, integrated, tested, and fielded will provide leap ahead benefits to significantly augment the effectiveness of the next generation War-Fighter.

Advanced Lethal Armament Technology for Small Arms

Objective:

- To improve the ability to incapacitate targets in defilade.

Challenges:

- Small payload
- Payload efficiency
- Delivery accuracy
- Effectiveness on defilade targets
- Recoil

Overcoming Challenges:

- Improve the distribution of warhead fragments.
- Alter flight trajectory.
- Altering the warhead orientation near the target.
- Provide advance fuzing to set-off warhead at the optimum distance from the target.
- Improve accuracy.

Expected Outcome

TRL 4 (Brass board) component technologies which, when matured, integrated, and fielded will lead to multiple capability gaps mitigation.

Technical Approach (Metrics & Objectives)

Measure	Current	Threshold	Objective	TRL
Small Fragmenting Munitions -- P(I)	Pi/Lethal Area	25% over current systems	>25% over current systems	Start 2 End 4
Control of Directionality of Fragments	None	Angle of Fall to Gravity	Optimize on Target	Start 2 End 4
Reduced Recoil / Weight	Extrapolate from current capability	Reduced by 20%	Greater than 20%	Start 2 End 4
Recoil Survival	4.2 lb sec	Reduced by 30%	Reduced by 50%	Start 2 End 4
Combined Lethal & Non-Lethal Warhead	None	Less Lethal to Lethal	Optimize on Target	Start 2 End 4

Small Fragmenting Munitions Technologies related to small arms munition which has been designed to generate ballistic fragments in a specified way (specified size, weight, spread, velocities) against a specified array of threats (anti materiel, anti personnel, etc) in specified scenarios (range, defilade, etc).

Control of Directionality of Fragments
This research area include technologies related to focusing on the augmentation of the munition system's ability to direct, channel, or otherwise enhance the performance of the fragmenting munition's warhead in its given role.

Combined Lethal & Non-Lethal Warhead.
The purpose of this research area is to advance variable effect component technology. Variable effect technology is defined as technology that limits or directs the effectiveness of the warhead in a controlled and precise way. Ideally, we are seeking to advance technology components that will eventually enable the war-fighter to deliver a selectable level of effect (ranging from less-than-lethal to lethal) to one or more targets across the full operational range envelope. Variable effects will give commanders more options in complex settings while potentially reducing the logistical footprint and/or weight of carried munitions.

Project Portfolio

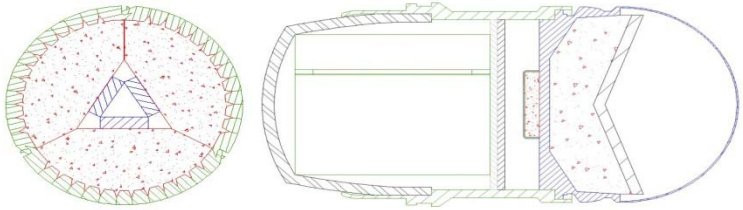
Project Name	Technology Provider	Metrics Area
40mm Directed Fragmentation Munition	Battelle	1,2
Optically-Fuzed Airburst Munition	Metal Storm	1,2
Advanced Warhead Effort	ARDEC	1,2
Dynamically Reshaped Fragmenting Warhead	Dindl Firearms	1,2
“Programmable” Fragmentation Warhead	ARDEC	1,2
Localized Annealing Fragmentation	Los Alamos National Lab (DOE) / ARDEC	1,2
40mm Precision Grenade	Georgia Tech RI	1,2
Adv. Lightweight Recoil Attenuation	Knight’s Armament Co.	3,4
Kinematic Recoil Chain Attenuation	ARDEC	3,4
Thermal Management for Smalls (Carbon Foam)	Oak Ridge National Labs (DOE)	1,3
Lethal /Non Lethal Door Breaching 40mm round	Dindl Firearms	5
Lethal/Non Lethal Munition	(Award Pending)	5
Enhanced Fragmentation Munition	(Award Pending)	1,2

Metrics **(Advanced Lethal Armament ATO)**			
1	Enhanced Effects on Target	4	Reduced Recoil Impulse
2	Dispersion and Control of Effects on Target	5	Combined Lethal/ Non Lethal
3	Reduced Recoil / Weight		

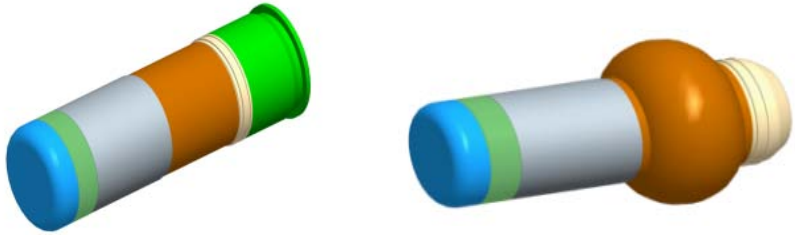
Project Updates

Small Fragmenting Munition

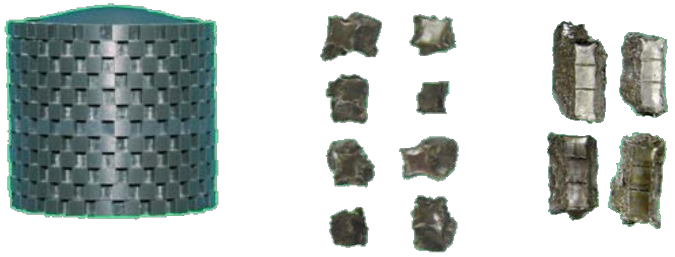
40mm Directed Fragmentation Munition



Dynamically Reshaped Fragmenting 40mm Warhead



40mm "Selectable" Fragment Warhead



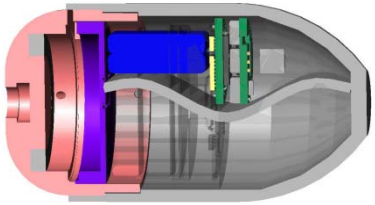
Enhanced Fragmentation Munition

Project Updates

Control Directionality of Fragments

Optically Fuzed Air-Burst Munition (OFAB)

40mm Precision Grenade



Enabling Technology

High-Temperature/ High Strength Carbon Foam

Project Updates

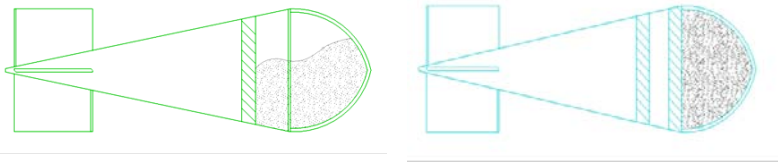
Recoil Reduction

Kinematic Recoil

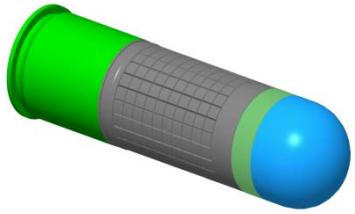
Advanced Recoil Attenuation

Combined Lethal / Non-Lethal

Lethal /Non-Lethal Munition



Lethal/Non-Lethal Door Breaching Round



Results

Progress on ATO

- **Improvements in Probability of incapacitation.**
- **Improvements in Lethal Area compared to legacy round.**
- **Improvements in Fragmentation patterns.**
- **Demonstrated 90% decrease in recoil impulse compared to M240 MG.**
- **Transition Carbon Foam material for barrel wrap application.**

Thank You!!!

Contact Information

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