

**2012 INSENSITIVE MUNITIONS & ENERGETIC MATERIALS
TECHNOLOGY SYMPOSIUM**

40mm Enhanced Blast Insensitive Explosive Munitions



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OBJECTIVE

- To develop the next generation 40mm munitions with improved IM signature.
- To improve performance over the existing in-service 40mm munitions with Comp A5 filling.



AGENDA

- Introduction to EBIX
- Advantages of EBIX Munitions
- IM Tests for EBIX Munitions
- Performance Test for EBIX Munitions
- Summary

INTRODUCTION TO EBIX

Pressed Formulation (MX-09)



MX 09 Powder

Pressed Charges

Density	1.87 g/cm ³
Critical Diameter	< 5.3mm
VoD	~ 7800 m/s

Explosive Safety tests (STANAG 4170)

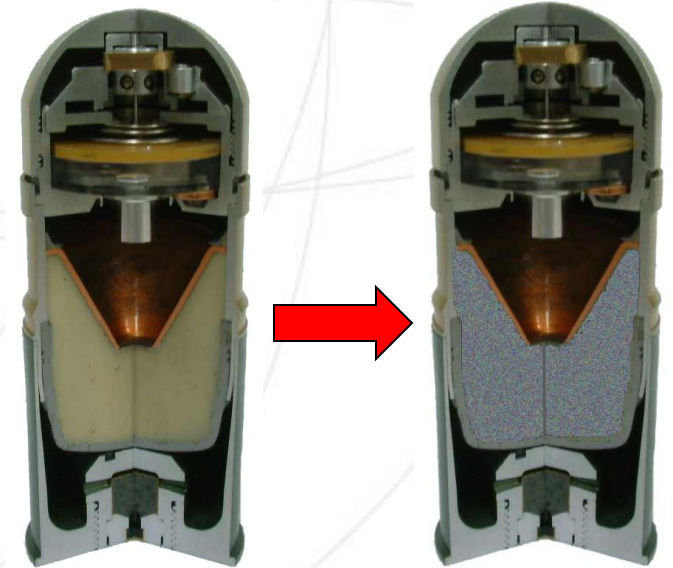
Certified safe for transportation and loading into projectile

ADVANTAGES OF EBIX MUNITIONS

Enhanced Soldier Firepower & Survivability

- 40mm **Enhanced Blast Insensitive Explosive** munitions will provide **multi target effects**, thereby enhancing the firepower of the troops significantly
- **Process Benefits** of EBIX Munitions
 - Press formulation
 - Direct replacement for Comp A5
- **Operational Benefits** of EBIX Munitions
 - Provide door & wall breaching capabilities
 - Effective against confined area
 - No degradation in fragmentation & penetration effects
 - Compatible to all LV grenade launchers & HV automatic grenade launchers
- **Logistic Benefits**
 - Insensitive munitions properties

**Direct replacement
No change in process required**



Comp A5

MX-09

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ADVANTAGES OF EBIX MUNITIONS



EBIX into door





EBIX into enclosed room

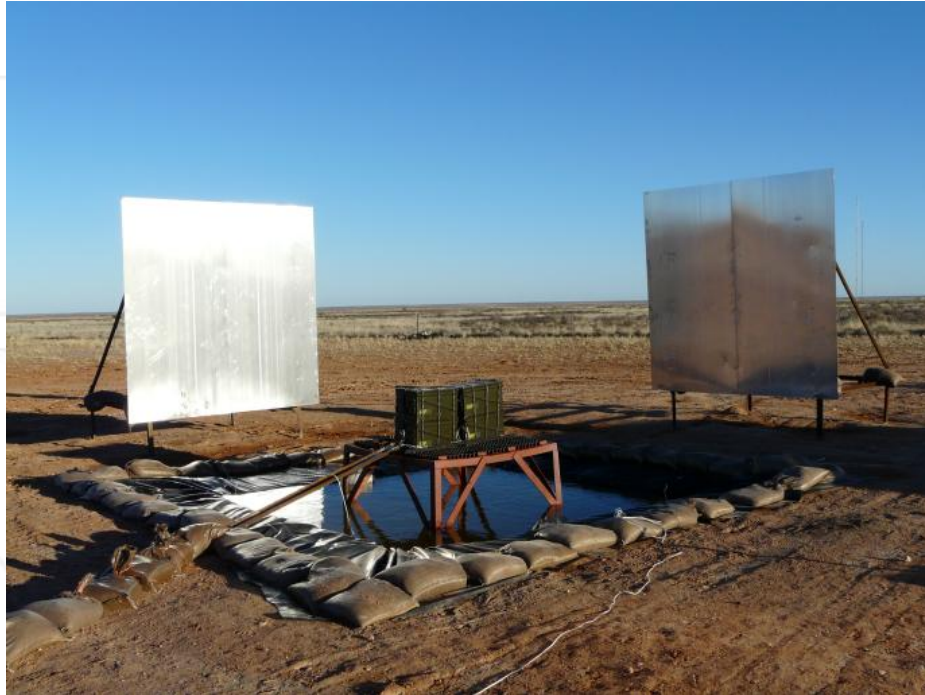
IM TESTS FOR EBIX MUNITIONS

Summary of Insensitive Munitions test results for 40mm EBIX munitions

IM Test Response	FH	SH	BI	FI	SR	SC
NR					●	●
V	●	●	●	●		
IV						
III						
II						
I						

 **Desired Response (STANAG 4439)**
 **Test Response**

IM TESTS FOR EBIX MUNITIONS Fast Heating Test (STANAG 4240)





IM TESTS FOR EBIX MUNITIONS

Fast Heating Test (STANAG 4240)



TYPE V: Burning Reaction

IM TESTS FOR EBIX MUNITIONS Slow Heating Test (STANAG 4382)



IM TESTS FOR EBIX MUNITIONS Slow Heating Test (STANAG 4382)



TYPE V: Burning Reaction

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IM TESTS FOR EBIX MUNITIONS Bullet Impact Test (STANAG 4241)



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IM TESTS FOR EBIX MUNITIONS Bullet Impact Test (STANAG 4241)



TYPE V: Burning Reaction

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IM TESTS FOR EBIX MUNITIONS

Fragment Impact Test (STANAG 4496)



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IM TESTS FOR EBIX MUNITIONS

Fragment Impact Test (STANAG 4496)



TYPE V: Burning Reaction

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IM TESTS FOR EBIX MUNITIONS

Sympathetic Reaction Test (STANAG 4396)



IM TESTS FOR EBIX MUNITIONS

Sympathetic Reaction Test (STANAG 4396)



Unconfined



Confined



TYPE VI: No Reaction

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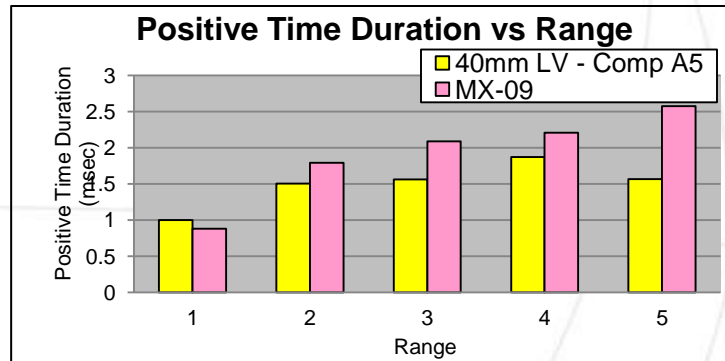
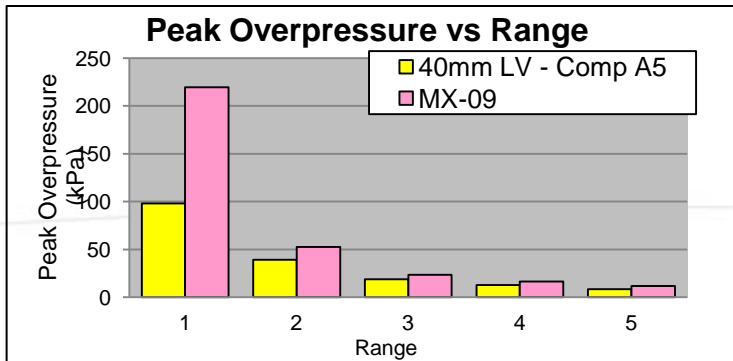
IM TESTS FOR EBIX MUNITIONS

Shaped Charge Jet Test (STANAG 4526)

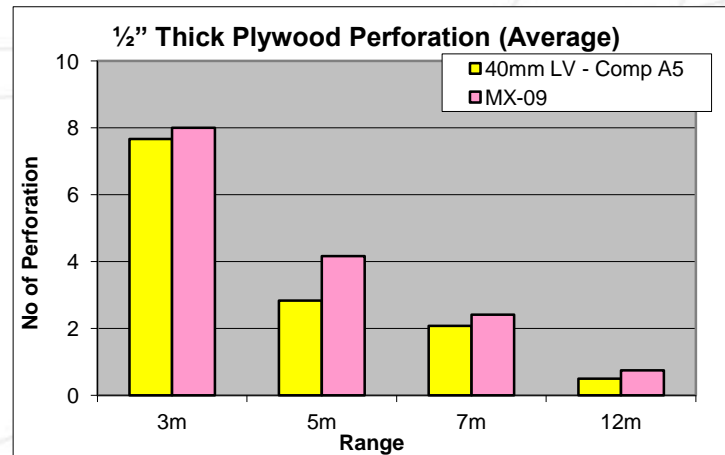
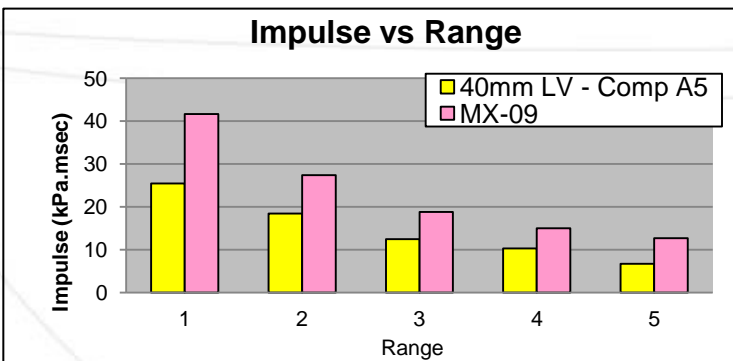


TYPE VI: No Reaction

PERFORMANCE TESTS FOR EBIX MUNITIONS



EBIX Fragments



Comp. A5 Fragments

PERFORMANCE TESTS FOR EBIX MUNITIONS



**EBIX
40mm HEDP**

**Comp A5
40mm HEDP**

**Entry hole on
63.5mm Mild Steel Plate**



**EBIX
40mm HEDP**

**Comp A5
40mm HEDP**

**Exit hole on
63.5mm Mild Steel Plate**



PERFORMANCE TESTS FOR EBIX MUNITIONS

**VARIOUS TYPES OF
EBIX MUNITIONS
FIRING IN
AUSTRALIA ON
22-03-2011**

Gray Town Test Range
at
Melbourne

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SUMMARY

- **40mm EBIX munitions is currently in production and also evaluating by various customers.**
- **Technology Readiness Level : 8**

Equipping soldiers with enhanced firepower & survivability

ENHANCING WARFIGHTER'S EFFECTIVENESS **ST Kinetics**

A company of ST Engineering

ON DEMAND SURVEILLANCE
Soldier Parachute
Aerial Reconnaissance
Camera System
(SPARCS)

PRECISION
Air Bursting
Munitions

LETHALITY
Enhanced Blast
Munitions

Thank You

PRECISION / LONG RANGE
Accuracy Extended
Munitions

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SAFETY
Self Destruct Cartridges
and Insensitive Munitions
2017 WINNER



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SINGAPORE



A company of ST Engineering