

Equipping War Fighters

with

the Supercavitating Multi Environment Ammo (MEA)TM



DSG



The Most Effective Solution for Self Defence

M.E.A. - Multi Environment Ammunition™

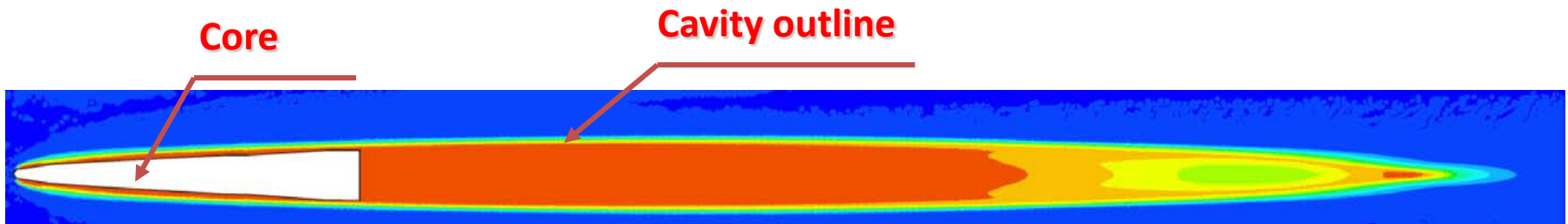
Enhancing capabilities in 7.62mm, 12.7mm, 20mm, 25mm and 30mm applications, with standard weapons



Delivers greatly increased range, improved stopping power, penetration and multi-environment capabilities without modification to existing weaponry

Supercavitation

- In water at speed $>100\text{m/s}$ (328ft/s ; 109yd/s) the core forms a cavity that is optimally designed to exceed the size of the projectile
- Water resistance in the cavity acts solely on the leading edge
- Stabilization is achieved through contact with the cavity by rear of the projectile
- The cavity collapses when speed of the projectile reduces to approx 100m/s ($\approx 328\text{ft/s}$; 109yd/s)
- DSGT's patented supercavitating projectile design enables air/water capabilities, but also gives reduced drag in air, with extended range, increased stopping power, and material penetration



Enhancing Standard Weapon Capabilities

M4A1 and M249

- Increase range in air by up to 25%
- Improved stopping power due to supercavitation
- More effective penetration of armor
- More effective penetration of windscreens
- Hit targets 15m underwater from air
- Shoot underwater with wet gun
- Hit targets in air & underwater from underwater
- One ammunition type for all purposes if reqd.



Supercavitating ammunition for 5.56mm



Enhancing Standard Weapon Capabilities

M24, M110 and M240



- Increase range in air by up to 25%
- Improved stopping power due to supercavitation
- More effective penetration of armor
- More effective penetration of windscreens, sand
- Hit targets 25m underwater from air
- Shoot underwater with wet gun
- Hit targets in air & underwater from underwater
- One ammunition type for all purposes if reqd.



Enhancing Standard Weapon Capabilities

M-107 Sniper Rifle

- Increase range in air by up to 25%
- Improved dispersion
- More effective penetration of armor
- More effective penetration of windscreens, sand

With underwater bullet, also:

- Hit targets 60m underwater from air
- Improved stopping power due to supercavitation
- Shoot underwater with wet gun
- Hit targets in air & underwater from underwater
- One ammunition type for all purposes if reqd.



Supercavitating ammunition for 12.7mm



Benefits OF MEA

- **Supercavitating MEA rounds are able to enter from the air into the water while maintaining their destructive power.**
 - MEA rounds enter or leave water at very low angles (> 2 degrees)
 - MEA rounds enter the water without danger of ricocheting, even when multiple air/water/air entries are involved (i.e. passing through waves)
 - MEA rounds:
 - Are stable in air and water
 - Are spin-stabilised in air, and cavity-stabilised in water
 - Are capable of penetrating steel targets underwater up to *60m for 12.7mm*
- **MEA bullets can penetrate water, sand and mud (wet or dry)**
 - bullet profile enables highly effective penetration of difficult materials
 - including dry or wet sand or mud. Bullet remains intact & effective.
- **Firing such rounds from existing shipboard guns offers a highly effective and cost-efficient hard-kill defense.**
- ***MEA can effectively engage close-in targets***

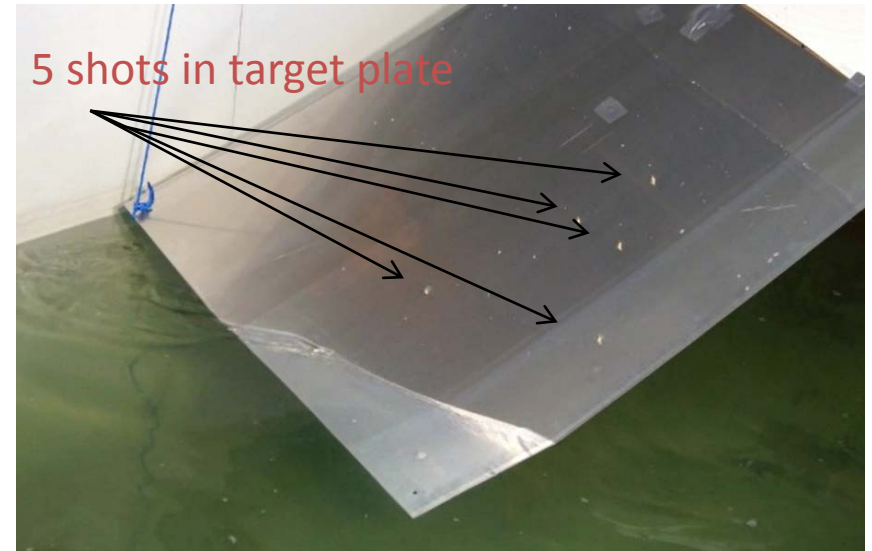
MEA Performance (Effective Range)

	<u>Caliber</u>	<u>Air Range (supersonic)</u>	<u>Underwater Range</u>
	12.7mm	>2,000m	60metres
	7.62mm	>1000m	30metres
	5.56mm	800m	15metres

Note: Just requires changing to MEA ammunition!!

Target Effectiveness-Underwater

5.56mm X2-AP



- Water to water shots
- Std HK 416 weapon
- 38 feet underwater range
- 3mm aluminium target

Target Effectiveness

7.62 A2-AP (7.62x51)



Max supersonic range in air	>3100 feet
Max effective range in water	75 feet
Will penetrate through >6mm steel plate underwater at	22 feet u/w
Will penetrate in >6mm steel plate underwater at	38 feet u/w
Will penetrate 2.5mm steel plate underwater at	75 feet u/w

Target Effectiveness



7.62mm DCS



- Air to Water shot
- Std AR-10 weapon fired air to water
- 15 degree water entry
- 22 feet underwater range
- 6mm steel target

Target Effectiveness – 7.62mm A2-AP



- Sea trials with air to water at low angles.
- Target is **submerged** 6mm steel plate.
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- Approx. 6-7m water depth.
- 7.62x51 DCS ammunition Std G3 rifle



Specifications



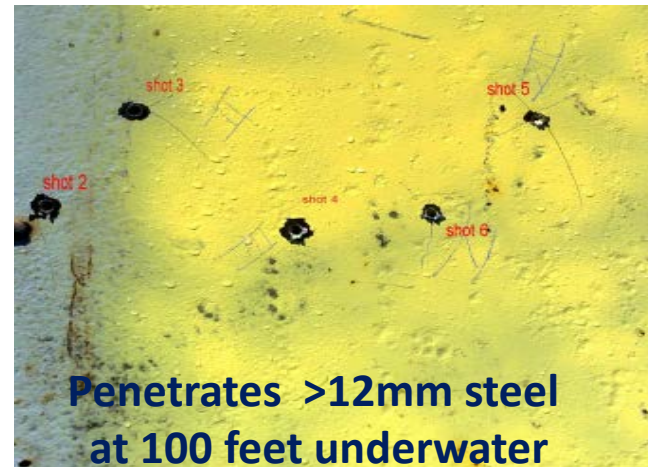
Bullet type	DCS		
Bullet weight, g	14.2		
Core weight, g	14.2		
Core diameter, mm	7.62		
Shooting in the air			
	X (range in m)	V (velocity in m/sec)	E (energy in Joule)
	10	660	3093
	200	576	2356
	400	497	1754
	600	425	1282
	800	364	941
	1000	323	740
Shooting from the air into the water at range 10 m			
	X (range in m)	V (velocity in m/sec)	E (energy in Joule)
	5	437	1356
	10	290	597
	15	193	264
	20	129	118
	23	100	81

- Samples available
- In production now
- No sabot

Target Effectiveness-12.7mm APSX



12.7 APSX



**Penetrates >12mm steel
at 100 feet underwater**

Max supersonic range in air	>6300 feet
Max effective range in water	200 feet
Will penetrate >12mm steel at	100 feet u/w
Proven against torpedo at	75 feet u/w

Specifications



- Samples available
- In production now
- Discarding sabot

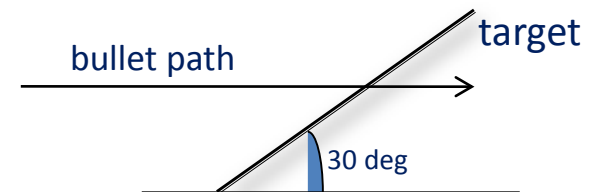
Bullet type		APSX	
Bullet weight, g		60	
Core weight, g		53	
Core diameter, mm		12.6	
Muzzle velocity, m/sec		780	
Recoil momentum, kg x s		6.7	
Shooting in the air			
	X (range in m)	V (velocity in m/sec)	E (energy in Joule)
	500	651	11230
	1000	524	7270
	1500	402	4280
	2000	326	2820
Shooting from the air into the water at range 10 m			
	X (range in m)	V (velocity in m/sec)	E (energy in Joule)
	10	627	10420
	20	510	6890
	30	415	4560
	40	338	3030
	50	275	2000
	60	223	1320

Summary



- MEA bullets give up to 25% more range in air
 - bullet profile extends supersonic phase
- MEA bullets have enhanced stopping power
 - hydro static shock due to supercavitation effect with supercavitating versions
- MEA bullets are 10-15% more effective against armor
 - bullet profile and heavy core increases penetration
- MEA Super Sniper bullets have lower dispersion
 - low profile reduces wind effect, improves stable flight
- MEA bullets penetrate inclined targets (>30 degrees)
 - armor, steel, windscreens, cylinders

- All benefits are achieved with standard weapons



- MEA bullets work in water
 - supercavitating bullets are stable in air and water
 - spin-stabilised in air, cavity-stabilised in water
 - penetrate steel targets underwater at ranges:
 - *15m for 5.56mm*
 - *25m for 7.62mm*
 - *60m for 12.7mm*
- MEA bullets enter or leave water at very low angles
 - trajectory is not deflected when entering or leaving water
 - angles as low as 2 degrees in typical sea conditions (7 – 10 degrees flat water)
- MEA bullets can penetrate sand and mud (wet or dry)
 - bullet profile enables highly effective penetration of difficult materials including dry or wet sand or mud. Bullet remains intact & effective.
- All benefits are achieved with standard weapons



Thank you.



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DSG

