Elbit Systems, Land

Comprehensive Advanced Artillery Solutions (ID 22047)

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Business AREAS

Maneuverability

Artillery

AMMUNITION

Survivability

Naval Solutions

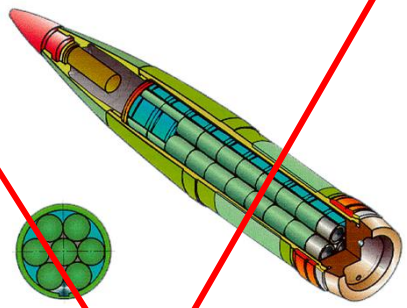
Aerial solutions

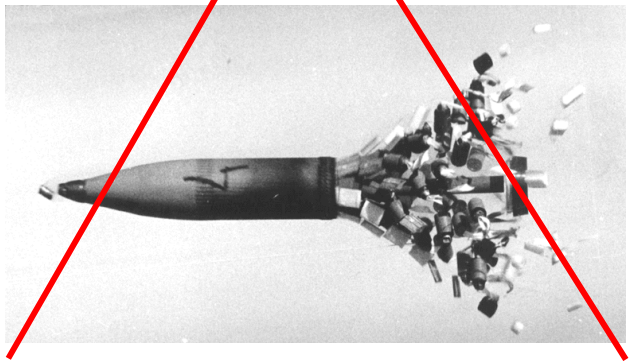
Land and beyond

The Evolution of Artillery ammunition

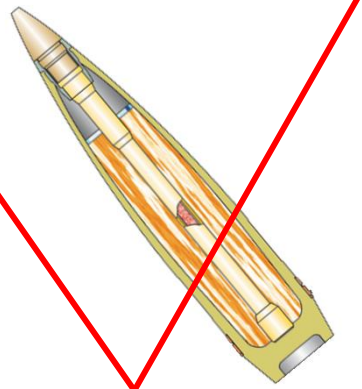
Elbit Systems™ Land

Cargo Ammunition

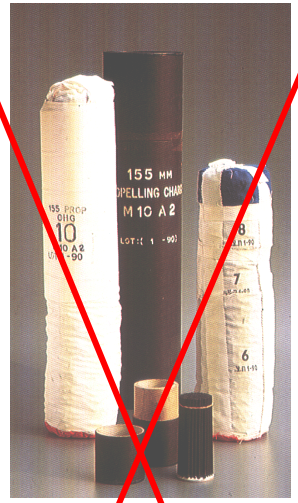


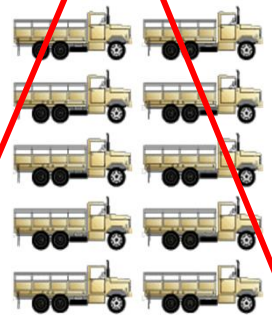


SMOKE (WP) Ammunition



Bags Charges



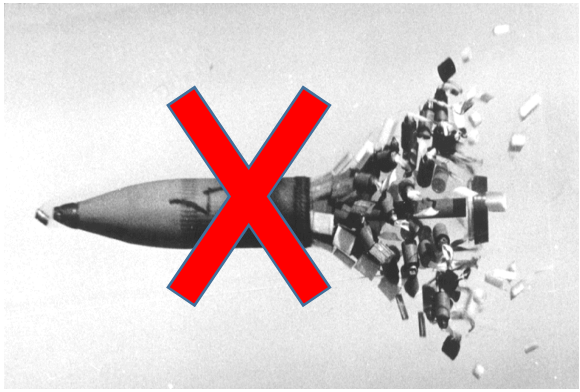


Need New Portfolio to Replace the Restricted Projectiles and Ineffective Charges

New Generation - MISSION STATMENT

New Generation

&

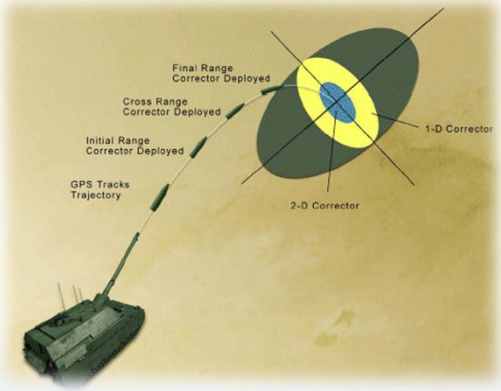


- **Improve efficiency** over any conventional HE projectile and **increase lethality** capability.
- **Incapacitate** and defeat **infantry** troops.
- Improve the **performance** against **variety of targets** in the battle field (tracks, LAV's, Infrastructures etc.).
- **Low collateral damage** by using self-destruct mechanism.
- **Shoot & scoot** ability in order to prevent counter artillery fire.

155mm Super HE – M454

- Advanced 155mm Super - HE projectile designed
- Neutralize infantry and “soft” targets (LAV’s) with **greater effectiveness** by utilizing an **advanced warhead**
- Compatible with all 155mm guns

155mm Super HE – M454



Time fuze initiation and ejection of parachuted warhead (500m)

Detonation on optimum height over the target

Fuze setting, Loading and firing

12 sec.

3 m

R

155mm Super HE – Technical characteristics

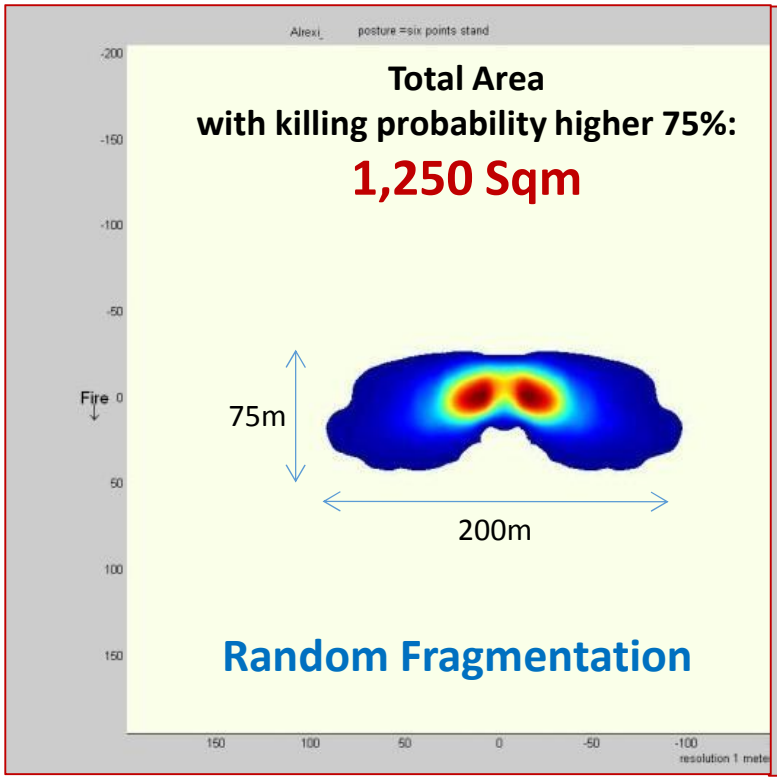
- Weight in flight: 48 Kg
- Length (w/o fuze): 804 mm
- Explosive & control fragmentation weight: 3 Kg CLX663 + ↑7,000 steel balls
- Time fuze type: IMI M910/M762 or similar
- Ranges: (*)
  - 39-cal barrel - 22 Km
  - 45-cal barrel - 24 Km
  - 52-cal barrel - 26 Km
- Proximity fuze operation height: 3 m Approx.
- Accuracy with time fuze : 60m CEP

(*) – For HB type

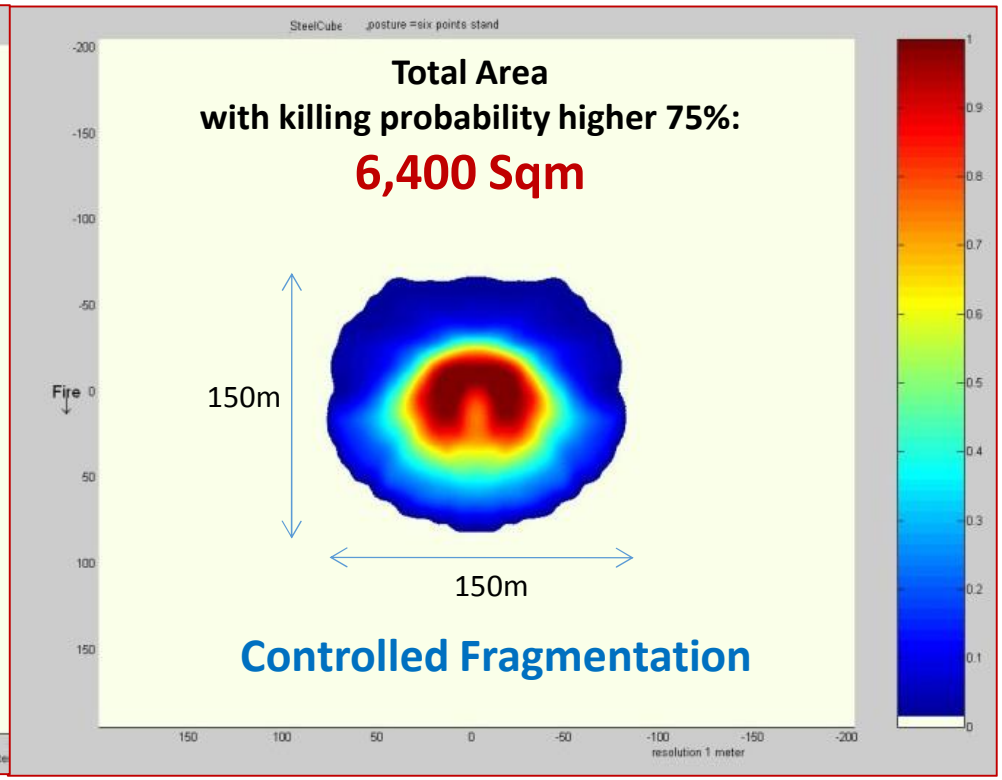
155mm Super HE – M454

Operations Research Results
Kill Probability Chart – Infantry in open terrain

Standard HE Cover Area



Super HE Cover Area



Up to 5 times more effective! than the standard HE

155mm Super HE – M454

155mm Super HE - Logistics Advantages
Minimal Logistic Footprint

S-HE

Regular HE

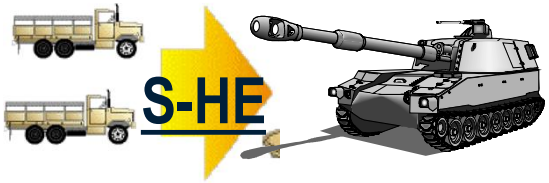
ADVANTAGES USING S-HE over HE PROJECTILES

Greater Effect on target &

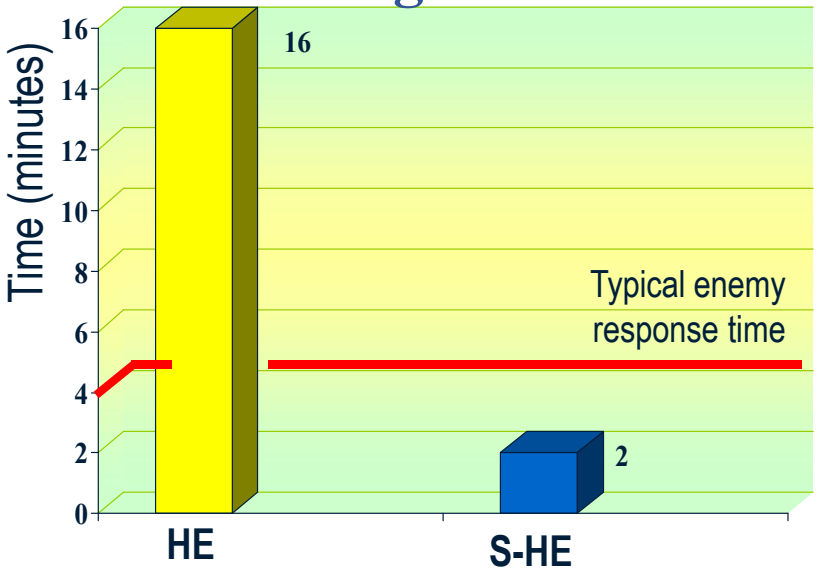
Shoot & Scoot capability

LOGISTICS Benefits

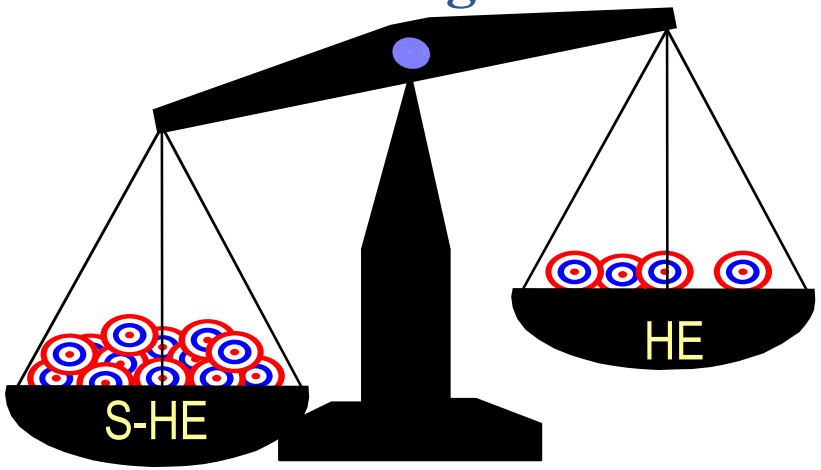
& More projectiles per barrel



TIME for target destruction



More TARGETS per Artillery carrier stowage



Propellant charge Market development

Bags

Five types:
M-4A2;M-8; M-8 ½; M-9; M-10

JBMoU* BMACS

Two types:

Short-range “green” module

Long-range “white” module

? (Modification)

*Joint Ballistic Memorandum Of Understanding

BMACS - Description

- The BMACS consists of two module types:
  - TCM - Top Charge Module (White colour)
  - BCM - Bottom Charge Module (Green colour)

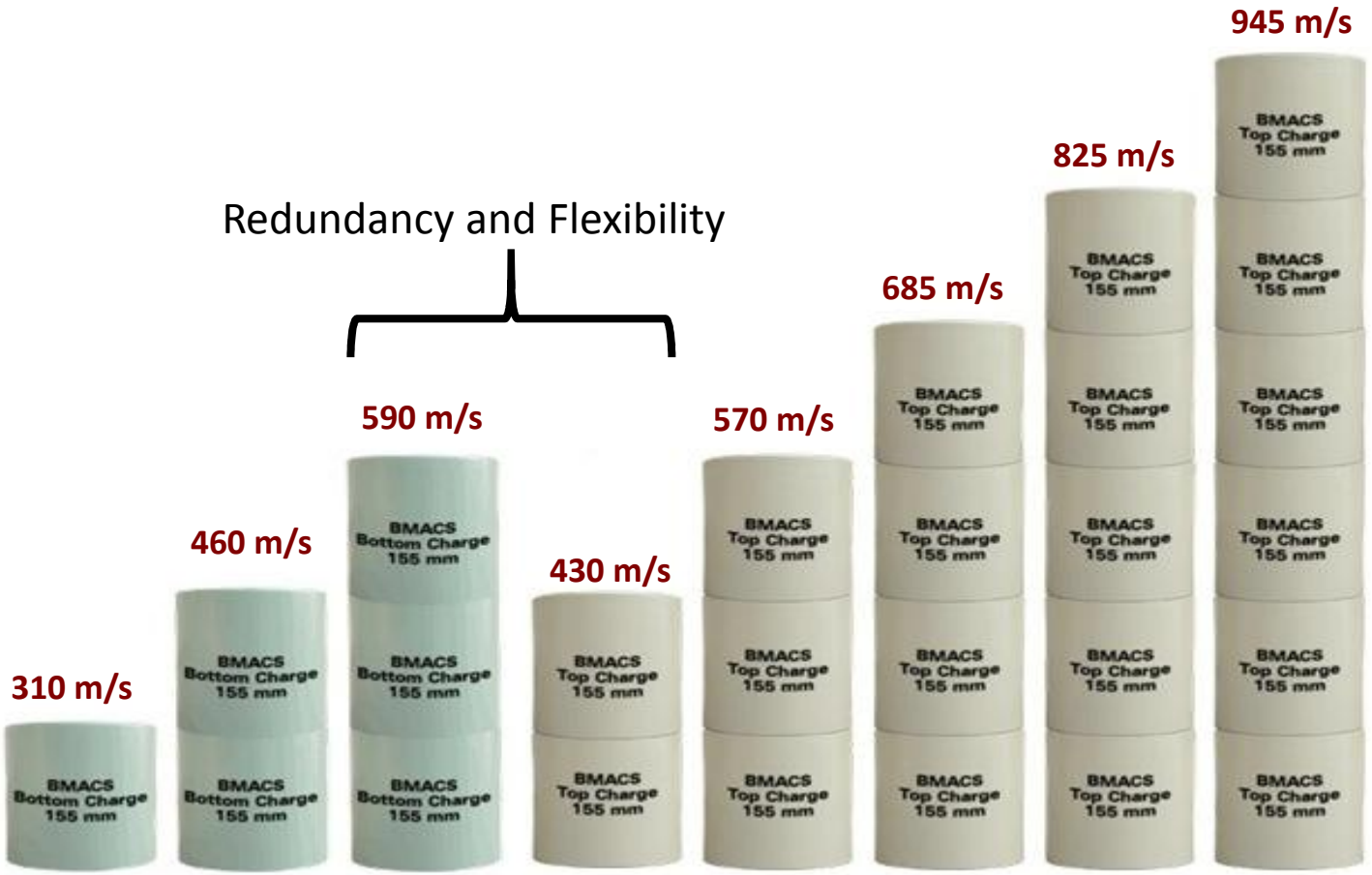
- Developed by IMI according to MIL-STD and NATO standards to replace the existing old charge systems.

- Based on JBMoU principles for firing from all standard 155-mm Howitzer guns (39, 45 & 52 Cal.)

Modified BMACS

Modified BMACS Version (redesign)

Based on JBMoU principles (L15)



JBMoU Compliance

Parameter	Requirement	Compliance
Ignition Delay	≤ 300 ms	≤ 100 ms
Differential Pressure	≤ 725 Bar	≤ 150 Bar
Pressure Limit	≤ 4158 Bar	≤ 4158Bar
Upper Temp Limit	63°c	63°c
Residues	no detrimental residues to operation	no detrimental residues to operation

Parameter	Requirement	Compliance
Module Dimensions	D ≤ 158mm	D ≤ 153 mm
	L ≤ 156mm	L ≤ 155mm
	Ignition hole dia. ≥ 20mm	d ≥ 28 mm
Muzzle Velocity	945m/s	945m/s 6 Modules

Parameter	Requirement	Compliance
Trails for safety	Safety in a New Gun	Comply
	Safety in Worn Barrel	Comply
	Sequential Environmental	Comply
	Safety of Prop. Charge	Comply
	12m Safety Drop	Comply
	Low Charge Trial	Comply
	Cook-Off in Hot Gun	Comply

Propellant charge Market development

Bags

Five types:
M-4A2;M-8; M-8 ½; M-9; M-10

JBMoU*

BMACS & Modified BMACS

? (NEW GENERATION)

*Joint Ballistic Memorandum Of Understanding

Propellant charge Market development

Bags

Five types:
M-4A2;M-8; M-8 ½; M-9; M-10

JBMoU*

BMACS & Modified BMACS

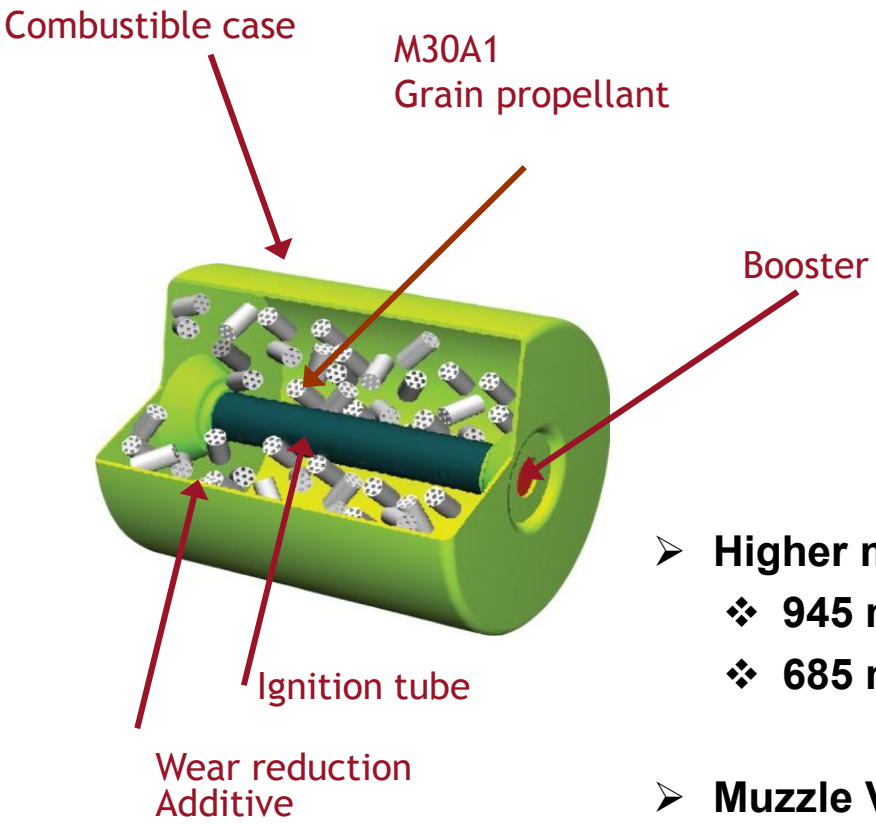
JBMoU* UCM

One type

*Joint Ballistic Memorandum Of Understanding

Uni – Charge Module

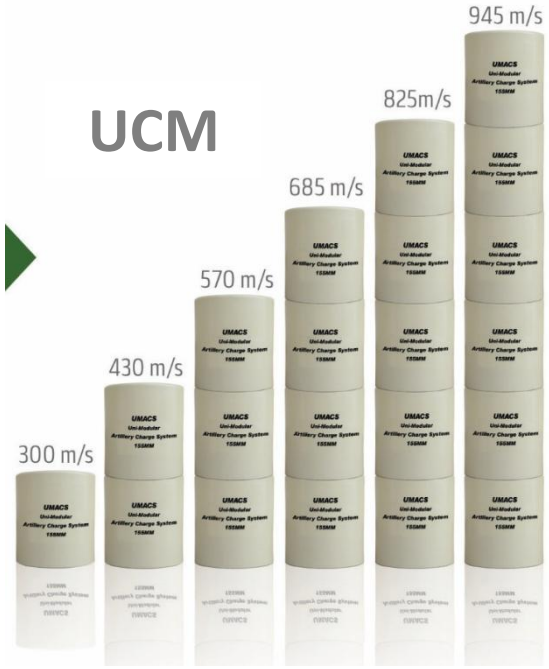
IMI's UCM is the only Uni-Modular charge propellant system which is based on single module type - one size.



- **Higher muzzle velocities with less modules:**
  - **945 m/s with 6 modules (for 52 cal. gun)**
  - **685 m/s with 4 modules (Optimized 39 cal. gun)**
- **Muzzle Velocity could be tailored to customer requirements**

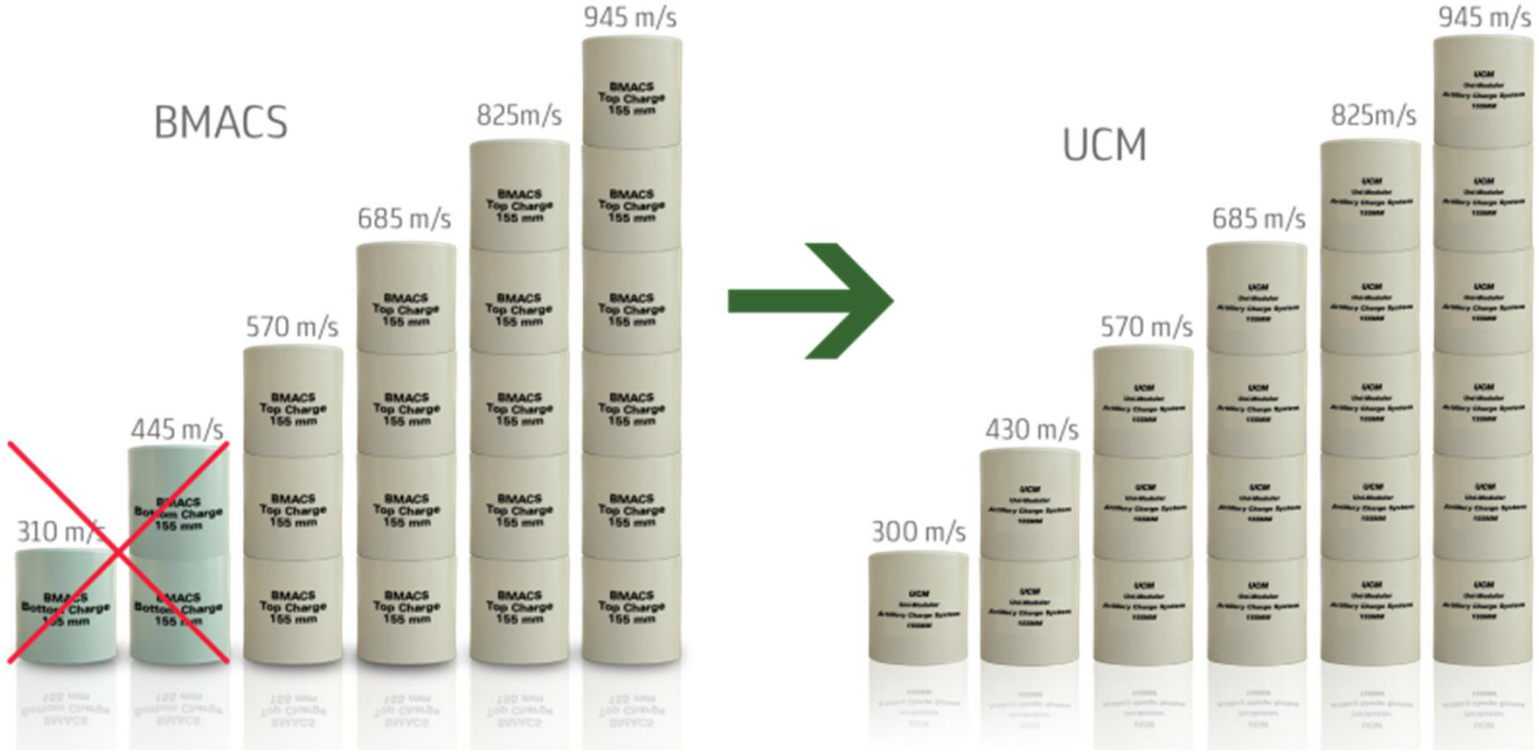
UCM - Product Advantages

- **Next generation technology** for next generation of cannons.
- Only **one type** of modular artillery charge system in all artillery **logistics chain**, from the artillery gun, company, battalion and above.
- Adjusted to **FALCS** (**F**ull **A**utomatic **L**oad **C**harge **S**ystem).
- Minimum **ignition** delay time.
- Increase **fire rate**.
- **Water proof** protecting surface.
- **No residue** in the barrel.
- Proper **internal ballistics** - pressure and differential Pressure.
- Reducing barrel's wear, **longer barrel life**.
- Identical and symmetric module design **prevents** any chance of **human/loading error** in day or night-operation.



Uni-Modular Artillery Charge System M662

- New and STATE-OF-THE-ART solution
- **Fully Comply with JBMoU**
- Can be used with any 155mm gun
- The most affordable solution with logistic simplicity (FIFO)
- **Qualified by the IDF**
- **In service by the IDF (no risk)**

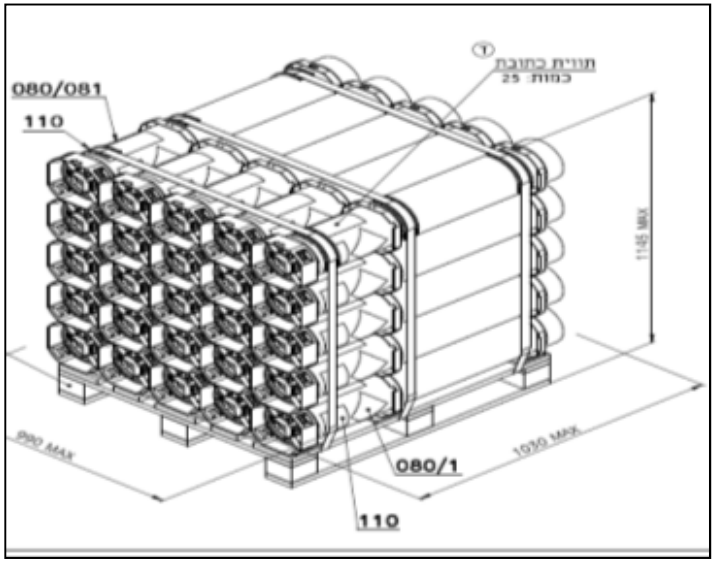


UCM M662 - PACKAGE

Remove before loading

Absorber to prevent wear between the modules

Sponge sleeve for high protection during storage and handling

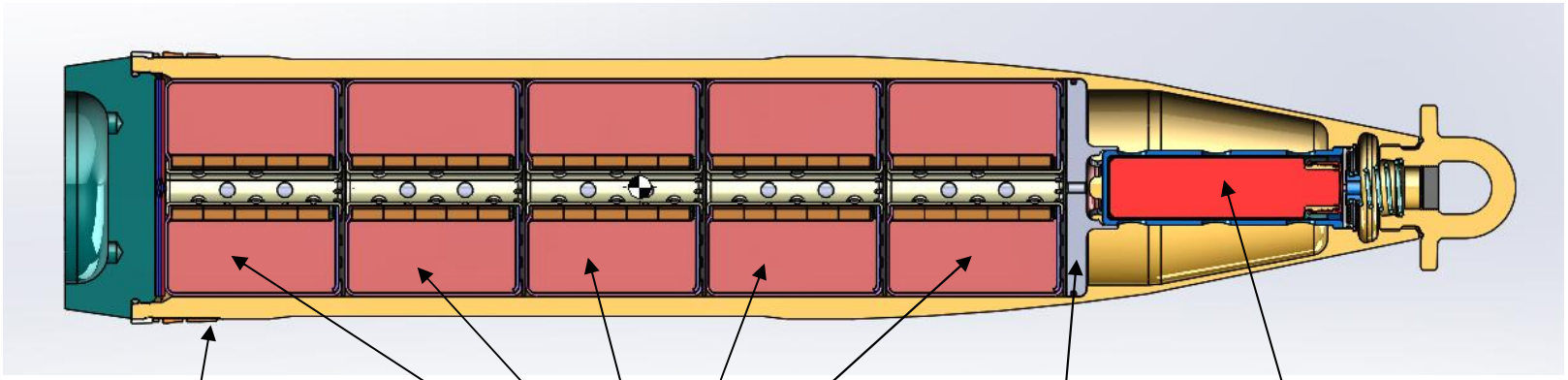


SMOKE Projectile - Background

1. Need Smoke projectile for **screening** and **spotting**
2. **<u>Smoke WP has Phosphor</u>**, which may cause burns when in contact with human skin.
3. Israeli internal committee decided not to use of such projectiles in urban terrain involving civilians.
4. Decision to use improved smoke projectile –> **<u>Elbit's Smoke HC .</u>**

155mm Smoke HC M150

155 mm SMOKE HC – Description



Mono - block Body

5 HC canisters

Ejection Plate

Expulsion Charge

155 mm SMOKE HC – Comparison with M116

Feature	Elbit's M150 Smoke HC	M116 (WP)
Duration	~ 3 Minutes	~ 2 Minutes
Screen Size	120% (in L&H)	100%
Range (39 Caliber)	22 km	18km
Canisters	5	3
Quantity	HC = 13.5 kg	WP = 8.7 kg
Projectile	Based on M483 family	Based on M107 family
MV (m/sec)	Up to 890 (52 Caliber)	685

155 mm SMOKE HC – Advantages

1. Long lasting smoke – up to 3 minutes
2. Higher screening size
3. Higher density
4. Better spotting at long distances
5. No use of phosphor

- The M910 fuze is suitable for use on all projectiles in accordance with STANAG 9216 (MIL – STD - 333B) for 105mm to 203mm calibers
- The fuze initiates all types of carrier shells at airburst (smoke, illuminating and Super- HE) or Impact
- The fuze can receive the data by using Stand Alone Setter Device or by inductive during automatic projectile loading in compliance with STANAG 4369

UCM /BMACS

M910
Electronic time fuse

M454
(S-HE) 155mm artillery projectile

M401-A1
(HE-ER-BB) 155mm artillery projectile

M107-A3

M150
155mm smoke projectile

M481
(HE-ER-IM) 155mm artillery projectile

NEW GENERATIONS OF ARTILLERY AMMUNITION

A globally recognized leader in high-performance combat-proven artillery ammunition

THANK YOU
FOR LISTENING

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