

155 MM – ARTILLERY MODULAR CHARGE SYSTEM



Interoperability with all NATO Standard 39 and 52 cal Weapons and Ammunition Configurations

Working closely with Rheinmetall Waffe Munition, the modular propelling charge system was qualified into service with the German BWB in 1996 as the DM72 high zone module and the DM82 low zone module. With the increased operational temperature demand for +63°C, the performance of the high zone module has been extended from +52°C to +63°C giving an operational performance over the entire temperature range -46°C to +63°C. The module is designated DM92.

The modules have been developed and qualified for use in all NATO standard 39 and 52 calibre gun configurations with associated projectiles complying with the Joint Ballistic Memorandum of Understanding (JBMoU). The modular charge sys-

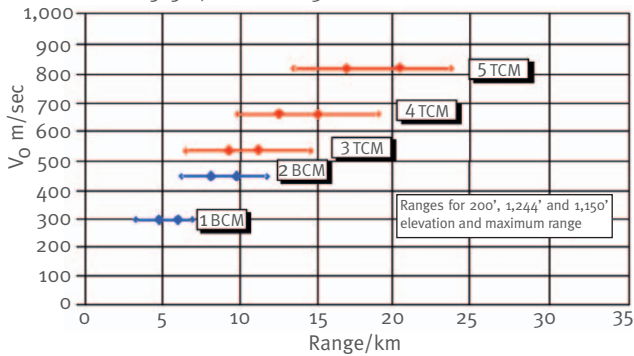
tem is now in service with numerous NATO countries and in qualification with other export customers. More than 1.5 million modules have been produced and fielded to date including operational deployment in Afghanistan.

General Product Information

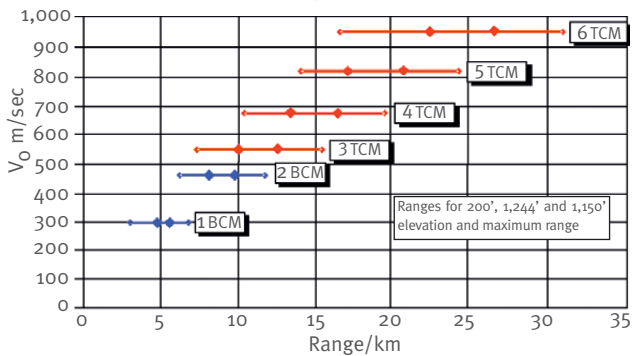
- Fully qualified with requirements of JBMoU
- Increased range to >40 km with ER projectiles
- Bi-modular charge design (high stow capacity, improved logistics)
- Excellent LOVA/IM-characteristics
- Low barrel wear, low toxicity of ingredients ("green")
- Combustion without residues
- Low muzzle flash

Range and Range Overlap

Ranges from 39 cal. Barrel (FH70/M109) with L15 projectile
 M.V. (21°C) 810 m/sec Zone 5 450 m/sec 2 Base Modules
 665 m/sec Zone 4 303 m/sec 1 Base Module
 525 m/sec Zone 3



Ranges from 52 cal. Barrel (PzH 2000) with L15 projectile
 M.V. (21°C) 945 m/sec Zone 6 548 m/sec Zone 3
 871 m/sec Zone 5 468 m/sec 2 Base Modules
 680 m/sec Zone 4 306 m/sec 1 Base Module



Ballistic Requirements

- Mean muzzle velocity 945 m/sec (52 cal. gun, 6 modules, L15A1 projectile, 21°C)
- Mean muzzle velocity 810 m/sec (39 cal. gun, 5 modules, L15A1 projectile, 21°C)
- Pressure limit: upper pressure limit at propellant proof 391 MPa at 63°C
- Standard deviation of the vo in 39- and 52-calibre barrels at all charge levels less than 2 m/sec
- Negative differential pressure: patented ignition booster enables safe ignition and prevents pressure waves in all loading conditions and temperatures

Insensitive Munitions Compliance

The modular charge system has been tested in accordance to the STANAG requirements for IM munitions including shaped charge attack from M77 bomblet sub-munitions and the 87 mm RPG7 shaped charge. In all tests, type IV to V reactions have been demonstrated.

Environmental Robustness C2 A1

The modular charge system has been independently qualified by the competent authorities of three NATO member states. The extremely demanding logistic and tactical rough handling testing has been extended to include a complete cycle in the A1 71°C hot stream, including thermal shock from -46°C to +71°C. Additionally long term storage of packaged modules under a constant 71°C for 30 days shows no degradation. This corresponds to 4.5 years storage under A1 climatic conditions.

| IM Performance DM72 (Packaged) | | | | DM72/DM92 |
|--------------------------------|-----------------------|---------------------|---------------------|--------------|
| Conducted Test | Reference | Essential Criterion | Desirable Criterion | Demonstrated |
| Standard liquid fuel fire | STANAG 4240 | IV | V | V |
| Slow heating | STANAG 4382 | III | V | V |
| Bullet attack | STANAG 4241 | III | V | V |
| Shaped charge jet impact | MIL-STD-2105 B 5.2.6. | III | V | IV-V |
| Shaped charge jet impact | against RPG7 | III | V | V |
| Sympathetic reaction | against RPG7 | III | IV | No reaction |
| Safety drop test | STANAG 4375 | No reaction | No reaction | No reaction |
| Electrostatic | STANAG 4235 | No reaction | No reaction | No reaction |
| EMP | STANAG 4236 | No reaction | No reaction | No Reaction |