Vulcano

Precision-Guided Munitions for 5-inch and 155mm Gun Systems

The Vulcano family of precision-guided, gun-launched munitions offers U.S. and allied military forces a range of low-risk, cost effective capabilities for advanced, large caliber weapon systems.

The Vulcano family offers significantly greater range and precision, and is compatible with multiple land and naval platforms including 155mm and 5-inch (127mm) gun systems to defeat land and sea threats.

BAE Systems and Leonardo have come together to offer a low-risk, precision-guided solution that is more affordable and higher performing than current alternatives.

The Vulcano family capitalizes on new and emerging technology based on a fin-stabilized airframe with canard control for extended range and terminal guidance, with mechanical interfaces that are the same as standard ammunition.

The latest adaptations of Vulcano are compatible with the majority of in-service artillery systems including Leonardo’s 127/64 LW and 127/54C naval guns, the BAE Systems-built Advanced Gun System (AGS) currently on board the U.S. Navy’s Zumwalt class of destroyers, and the more than 250 Mk 45 naval guns delivered to fleets worldwide. For land platforms, Vulcano can be fired from all variants of BAE Systems’ M777 and M109 howitzers and the majority of weapons for allied militaries around the world.

As the original equipment manufacturer of these major gun systems, BAE Systems and Leonardo are best suited to integrate Vulcano into these weapons.

Rate of Fire – Gun system maximum rate of fire does not change with the integration of Vulcano.

Precision and Lethality – Provides all-weather precision attack capability (<5 m CEP) to fully defeat targets with a high lethality pre-fragmented warhead.

Survivability – Designed to deliver long range precision fires in denied environments.

Multi-mission capability – Effectively addresses land and surface attack on land and at sea. Can be equipped with optional Semi-Active Laser seeker and perform in-flight retargeting to address moving targets.

Proven Performance – Fully developed under final qualification and low rate initial production.

Affordability – Extended range capability without the need for a rocket motor or changes to the gun system.

The Vulcano family of munitions offers various terminal guidance capabilities.
Vulcano Range Specifications

<table>
<thead>
<tr>
<th>Weapon</th>
<th>Ballistic Extended Range (km)</th>
<th>Guided Long Range (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>127/64 LW</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td>Mk 45</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td>M777/M109</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>M777/M109 (5-inch saboted*)</td>
<td>50</td>
<td>70</td>
</tr>
<tr>
<td>M777/M109 ERCA</td>
<td>75+</td>
<td>100+</td>
</tr>
<tr>
<td>Mk 51 AGS</td>
<td>75</td>
<td>100</td>
</tr>
</tbody>
</table>

* 5-inch BER and GLR airframe saboted to 155mm caliber

155mm and 5-inch (127mm)
- Ballistic Extended Range (BER) with programmable, multifunction fuze (impact, delayed impact, height of burst, time)
- Guided Long Range (GLR) with GPS guidance and multifunction fuze
- GLR with GPS and Semi Active Laser (SAL) receiver to engage moving targets when designated by a forward observer
- IMU + GPS guidance system, gliding phase
-Insensitive Munition (IM)
-Possibility of Terminal Guidance (InfraRed-IR, Semi Active Laser SAL)
-Minimisation of engagement cost
- BER (Ballistic Extended Range)
-Unguided multipurpose ammunition
-Up to 60Km range
-Multifunctional Fuze
-Altimetric – Proximity – Time – Impact/delayed impact
-Notched HE warhead

GLR (Guided Long Range)
-Up to 80Km range
-Autonomous IMU+GPS guidance

5-inch (127mm)
-GLR with GPS and infrared (IR) terminal seeker to engage moving sea surface targets

Vulcano 155mm Guided Long Range
The Vulcano 155mm projectile gives 39-caliber howitzers the capability to extend their range and precision well beyond current limits, minimizing engagement costs and collateral damage. The Vulcano 155mm GLR is a sub-caliber, fin-stabilized airframe, compatible with standard modular charges, with no additional on-board propulsion required. With a highly lethal payload consisting of insensitive explosive fill and a pre-fragmented warhead, Vulcano 155mm has the same mechanical interfaces as standard 155mm ammunition.

Vulcano 5-in Guided Long Range
The Vulcano 5-inch munition, fired from BAE Systems and Leonardo naval guns, extends the maximum range to more than double the range of conventional ammunition.

The Vulcano ammunition configuration for naval guns can be automatically loaded without any mechanical modification to the loading system.

Vulcano is fully compatible with in-service 5-inch and 155mm guns with additional functionality including:
- Programmable initialization for fuze and guidance system
- Mission planner and technical fire control for trajectory computations, gun fire angles, selection of ammunition type and firing sequences.

Design Guidelines
- Subcaliber airframe
- Fin stabilized
- No additional propulsion required
- IMU and GPS guidance system
- Guided version minimizes collateral damage
- Insensitive munition with pre-fragmented warhead
- Internal ballistics fully compatible with in-service 5-inch and 155mm standard weapons

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