

ESSM Propulsion System



Evolved Sea Sparrow Missile Propulsion System

Overview

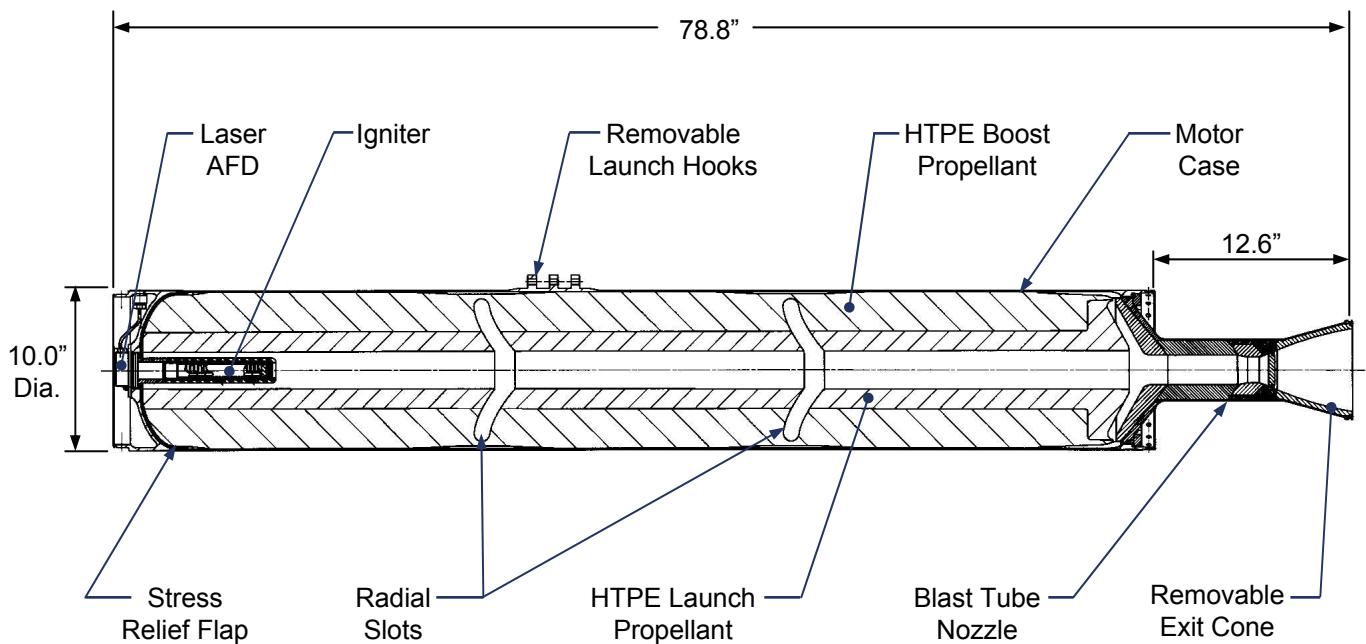
The Evolved Sea Sparrow Missile (ESSM) is a medium-range, high-speed, all-weather, all-aspect, semi-active guided missile used to intercept incoming missiles, attack aircraft, and ships. The ESSM will be utilized by the U.S. Navy and many NATO countries and can be launched from both canistered and trainable launchers.

Application

The Mk 134 Mod 0 ESSM rocket motor is a dual propellant propulsion system which is used for the surface-to-surface, surface-to-air Evolved Sea Sparrow missile. The ESSM rocket motor utilizes a dual concentric hydroxy-terminated polyether (HTPE) propellant which is formulated for improved Insensitive Munitions (IM) capability. In addition, the ESSM rocket motor is the first propulsion system to use a solid state laser initiation system which was designed and developed by ATK.

Development

ATK entered into an agreement with Raytheon Systems Company (formerly Hughes Missile Systems Company) to jointly develop the ESSM propulsion system with NAMMO/Raufoss of Norway. The development work was initiated at ATK's Allegany Ballistics Laboratory in 1995. Under the EMD contract ATK successfully fired 12 motors at temperatures from -14°F to +133°F. After completion of the EMD phase, the ESSM program transitioned into Low Rate Initial Production (LRIP) and is currently in Full Rate Production (FRP).



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Features

- Qualified Hydroxy-Terminated PolyEther (HTPE) propellant
 - Launch: Reduced Smoke
 - Boost: Aluminized
- Dual Grains (launch/boost)
- Two Radial Slots
- Forward End Stress Relief Flap
- Laser Arm/Fire Device

Performance

- Temperature Limits:
 - Operating: -14°F to +133°F
 - Storage: -40°F to +160°F
- Service Life: 10 years

Technical Data

Weight: 370 lbs
 Length: 78.8 in.
 Diameter: 10.0 in.
 Case: D6AC Steel
 Insulator: Aramid Filled EPDM
 Nozzle: Silica Phenolic Insulated, Steel/Graphite Throat
 Propellant: Dual HTPE
 Igniter: B/KNO₃ Pellets
 Arm/Fire Device: Solid State Laser

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