ASTER 30

TACTICAL PROPULSION

AVIO STRENGTHS

The Aster is the first European Kill Vehicle, anti-missile by design, a common building block of a missile family, which satisfies land and sea operational needs of the new century, and faces a wide spectrum of current and future air threats, which will mainly consist of new-generation missiles, characterised by higher speed, increased stealth and manoeuvrability. In order to ensure effective protection of strategic assets or naval platforms, the Aster was designed to achieve structural kill of these missiles. It also provides an outstanding functional kill against patrol aircraft, jamming them as well as fighter aircraft in close formation. The Aster Kill Vehicle configuration is the same for land and sea applications. Therefore, the Aster weapons can also be forestalled as candidates for territorial defence.
Furthermore, the Aster concept confers the capability to achieve hit-to-kill against Tactical Ballistic Missiles (TBMs); MBDA is the design authority of the system under the EUROSAM contract. The OCCAR, through EUROSAM, ensures the procurement for MoD needs (Italy, France and the United Kingdom).

The Aster 30, a Hypersonic two-stage system

The Aster 30 is an advanced two-stage hypersonic missile system for area defence against aircraft and missile attacks. Italy and France jointly developed this surface-to-air system.
The first-stage booster, fully designed and produced by Avio, is considered as one of today's most powerful and technologically advanced solid-propellant motors.

AVIO FOR ASTER 30

Avio's role in the programme, under MBDA contract, was to design, develop, test and produce the following system components: propellant, igniter, motor case, fins, nozzle and Thrust Vector Control (TVC). Through a Roxel contract, Avio also developed the loading (thermal protection and propellant grain) of the sustainer, the second-stage motor of the Aster missile.
The Aster is built at the Avio facilities in Colleferro (Rome, Italy).

First-stage booster

The booster is one of the world's highest performance solid-propellant motors.
It has a high strength filament-winding case made from pre-impregnated carbon epoxy fibre, with titan inserts, and is manufactured by using a technology set up by Avio. It is guided by a TVC system designed by Avio, with two movable nozzles, graphite inserts and flexible joints. The motor has a gross weight of 300 kg.

Fins

The fins are installed on the booster for aerodynamic stabilisation of the missile.
Designed by Avio, this extremely light yet robust missile component consists of a metal frame and a pre-impregnated carbon epoxy tissue skin. The fins are foldable to reduce missile room in the launch container but can withstand the enormous loads exerted on them as the missile manoeuvres to stay on target.

Sustainer

The sustainer is the second-stage motor; Avio designed and qualified the HTPB solid-propellant grain and EPDM thermal protection, an application in which Avio is a leader. The loaded case is delivered to Roxel, France, which is the main contractor for the sustainer motor.

ROCKET MOTOR FOR CARTRIDGE RF DISTRACTION MK216 MOD.3

In June 2004, Avio's Space Division in Colleferro signed the contract for the development and production of the rocket motor for the Anti-Ship Missile (ASM) countermeasure Cartridge RF Distraction Mk 216 Mod 3. The very high Insensitive Munition (IM) requirements oriented the selection of thermoplastic materials for the case manufacturing, an innovative successfully flight-tested choice. The rocket motor contract is between Avio and Chemring Countermeasures (PainsWessex Ltd), part of the Chemring Group. This contract constitutes a significant step forward for naval countermeasures due to the improved performance obtained and the IM characteristics at higher NATO specifications.
With the new IM rocket motor produced by Avio, the Cartridge RF Distraction Mk 216 Mod 3 will be the first known naval passive countermeasure application worldwide with a fully IM requirement. This change introduces an improvement to the safety of personnel, and reduces potential damage to ships in accidents, terrorist attacks or war. This new countermeasure round, required by the UK MoD, will foster the interest of NATO and other Naval Forces. A new metallic version of the rocket motor known as PW216 was developed by Avio and is currently in production.

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