

Tactical missiles can strike and intercept targets, on land, in the air and at sea. NATO needs to maintain a capability edge over potential adversaries, with new and upgraded missile systems. Concept definition is the first step towards a new missile system. Mission requirements will determine the size and performance of a system, both are strongly related to the type and size of the propulsion subsystem.

Currently in NATO, different individual proprietary models and databases, are used for design. This leads to inconsistent results and is hindering collaboration. A task group formed by the applied vehicle technology panel of NATO's science and technology organization, has leveraged the expertise of defense contractors, research organizations and governmental agencies from five NATO nations, to create a unified tactical missile kinetic performance model.

This model provides consistency and interoperability in defence planning studies and can eliminate barriers for collaboration.

The model allows the user to create basic design of a tactical missile, with a choice of different propulsion subsystems. The user can select a surface, or air-launched mission trajectory and define the size and shape of a missile body. They can define the appropriate propulsion system, choosing between a solid propellant rocket motor, which is still the most common choice today.

A throttle ducted rocket, an advanced air breathing system for missions demanding long-range and sustained high speed. Or potential future candidates for tactical missile propulsion, like a rocket motor with gelled propellant, which operates similar to a liquid fueled rocket motor . A hybrid rocket motor which burns a solid fuel with a liquid oxidizer.

Or a solid fuel ramjet, an air-breathing engine, which burns a solid fuel with air.

In addition, the code offers an option to apply thrust vector control. The code has an easy-to-use graphical user interface, and does not require expert knowledge to run. It runs on 64-bit windows computers with a contemporary browser and Microsoft Excel. The unified tactical missile kinetic performance model, represents state-of-the-art propulsion design techniques and is suitable, quick screenings, tactical studies and preliminary design. The code was validated, by using real engine test data and by comparing against high fidelity proprietary codes. "One of the things that has hindered a lot of our nation's procurements, is trying to over specify requirements **what abt 236** is trying to do, is go into a better requirement trade space, so the technologists can inform the operator what's in the realm of the possible". The code, together with a detailed description of the models and a user's manual, is distributed by

NATO science and technology organizations collaborative support office. Contact us to start using the NATO STO unified tactical missile performance model in your organization.