

SPACE PROPULSION SYMPOSIUM (C4)
Propulsion System (2) (2)

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SOLID ROCKET MOTORS CHOICES FOR ARIANE 6 LAUNCHER

Abstract

European Space Agency (ESA) supported by space agencies of european governments involved in launcher activities decided at their Napoli 2012 conference at ministerial level to start preliminary studies of the Ariane 6 launcher concept. This launcher will be devoted to single launch missions with an overall payload capability equivalent to 6,5 tons on the reference GTO orbit. The main requirement of this launcher concept is to present a very low launch exploitation cost and an aggressive recurring cost target has been defined by ESA. The first flight is planned in 2021 and this launcher should fully replace the Ariane 5 system around 2025 after a transition phase. Preliminary approaches performed in 2012 within ESA studies and several national studies exhibits the recurring cost advantage of a three stage launcher based on solid rocket motors (SRM) for the first and second stages and a third cryogenic stage using the Vinci engine under development for A5ME version. The retained A6 concept is the so-called PPH concept. Early 2013, ESA engaged the phase A of the Ariane 6 study in order to select, regarding SRM topics, the best configuration of the first and second stages. Several possibilities were investigated on the first half of 2013 within an integrated project team at launcher level incorporating the launcher prime and solid propulsion companies. A large range of SRM projects were studied, ranging from small strap-on boosters for versatility purpose, up to very large segmented motors, going through large monolithic motors for core stages or multi-purpose applications. This paper presents an overview of the selection process regarding solid propulsion entities and the retained configurations for the following phase B1 of the study. Retained SRM general characteristics, their propulsive performances and their main technical challenges are presented.