

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
Launch Vehicles in Service or in Development (1)

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ARIANE 6 LAUNCH SYSTEM DEVELOPMENT UPDATE

**Abstract**

In December 2014, the European Space Agency (ESA) Council at Ministerial level decided to commence the Ariane and Vega development programme. The Ariane 6 launch system development started with the decision for ESA to procure the development of the Ariane 6 launcher system from ArianeGroup, and the development of the launch base from the French National Centre for Space Studies (CNES). ESA acts as procurement entity and launch system architect to coordinate parallel development activities and ensure launcher system coherence. The aim of developing Ariane 6 is to guarantee independent European access to space at the lowest overall cost. Today, Europe relies on Ariane 5, Vega, and Soyuz to lift payloads off to space. Tomorrow, the European launch vehicle fleet will be composed of Ariane 6 with two different versions – Ariane 62 and 64 – as well as Vega-C that replaces and upgrades the Vega launch system.

Ariane 6's maiden flight is planned for the first half of 2022. Major milestones in the accomplishment of this timeline include the three static test firings of the P120C solid rocket motor which occurred in July 2018, January 2019 and October 2020 respectively; the successful completion of the Vinci re-ignitable engine's test campaign in October 2018; the successful completion of the Vulcain 2.1 core stage engine's test campaign in July 2019; and the successful completion of the launch system Critical Design Review in September 2019. The new Ariane 6 launch complex is also on track with a new launch base featuring a mobile gantry to perform the final assembly of the launcher directly on the launch pad and offer maximum operability and availability. The aim of this paper is to present the status of the development of the Ariane 6 launch system as of autumn 2021 and focus in particular on the main tests that support the qualification of the launcher: a series of Vinci engine firing tests with a model of Ariane 6's Upper Stage in DLR Lampoldshausen facilities a combined tests campaign in Kourou, French Guiana, to qualify all the interfaces between the launcher system and the launch base. This combined tests campaign will

allow in particular testing final chronology procedures and will feature a long duration static firing test of Ariane 6 main cryogenic stage with Vulcain 2.1 engine.