FACT SHEET

Vega

About the launcher

The Vega small launcher complements the performance range offered at Europe's Spaceport in Kourou, French Guiana, to provide a capability for smaller payloads.

Vega is designed to launch payloads of 300–2500 kg into low orbits, from polar to equatorial, and is most suitable for Earth observation satellites as well as small science satellites.

It also offers different payload configurations, from a single launch to multiple launches.

Its reference mission is to carry 1500 kg into a 700 km-high polar orbit.

Vega elements

Vega is 30 m tall and has a liftoff mass of 139 tonnes. It is powered by three solid-propellant motors: P80, Zefiro-23 and Zefiro-9, topped by the liquid-propellant Attitude Vernier Upper Module (AVUM) fourth stage.

AVUM hosts Vega's avionics 'brain', controlling the flight of the launcher.

The fairing is an 8 m-long, ogival composite shell that protects payloads during liftoff and ascent.

Inside the fairing, the conical payload adapter can accommodate a single payload or, when using Vespa – Vega Secondary Payload Adapter – multiple payloads.

Vespa can carry a main satellite weighing up to 1000 kg on top, and either a secondary payload up to 600 kg in the internal cone, or several auxiliary payloads distributed on a platform with a diameter that can be extended up to 1960 mm, with a maximum overall mass of 600 kg.

The upper stage AVUM can be ignited five times. Coupled with Vespa, this means that Vega can place several payloads into different orbits, with the capability of changing orbital planes.

On the final burn, AVUM deorbits to ensure that it does not remain as a debris threat.

Vega launch site

Vehicle preparation takes place on the launch pad, inside a mobile gantry that houses all the ground support equipment to assemble and check the vehicle. The gantry, 50 m high and weighing more than 1000 tonnes, provides a protected environment for personnel.

Before liftoff, the gantry is moved on its rails back from the pad.

Operations Control Centre

Vega's control centre is located in the launch control centre that is also used for Ariane 5. It houses Vega's operational and monitoring systems.

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Payload preparation

Satellites are prepared in the state-of-the-art Ensemble de Préparation des Charges Utiles (EPCU). Once the satellite is encapsulated under the fairing, the combination is moved to the launch pad and hoisted atop the vehicle.

Vega exploitation: Verta and LEAP

In the transition towards full commercial exploitation, the Vega Research Technology and Accompaniment programme, Verta, demonstrated the flexibility and reliability of the launcher with five flights, of which three carried ESA payloads.

Vega's second flight and the first Verta mission, on 7 May 2013, carried Proba-V, VNREDSat-1 and ESTCube-1, demonstrating Vega's capability to deliver several satellites into different orbits, as well as its overall flexibility. For this launch, new flight software was developed by prime contractor ELV and a new tracking station in the northwest of French Guiana ensured telemetry links during critical phases.

Two flights followed: the commercial launch of KazEOSat-1 on 29 April 2014, and the second Verta flight carrying ESA's IXV spaceplane on 11 February 2015, demonstrating Vega's robustness and adaptability to customer needs.

During 2015, the launches of Sentinel-2A and LISA Pathfinder, which concluded Verta, demonstrated that the system can attain a rate of three flights per year.

Since 2012, the Launchers Exploitation Accompaniment Programme (LEAP) has provided a stable and comprehensive framework to accompany the exploitation of Ariane 5 and Vega. The main objectives are to ensure the maintenance of the two launch systems to keep them qualified during the exploitation phase, and to allow for a sustainable and economically balanced exploitation.

Vega's evolution

A more powerful version called Vega C is being developed to consolidate Vega's position in the market and better respond to customer needs.

Vega C will comprise a new first and second stage and an improved AVUM. This will raise its performance to about 2200 kg in a 700 km polar orbit. Its debut is scheduled for mid-2019.

The preliminary design phase was started in 2012, and the go-ahead for its full development was given at the ESA Council meeting at Ministerial level in December 2014.

Vega C development includes the design and qualification of two new solid-propellant motors, the P120C and Zefiro-40, to replace the P80 and Zefiro-23, respectively, and associated interstages.

Two or four P120C motors will also be used with Ariane 6, as strap-on boosters.

Vega C's overall height will be 34 m with a liftoff mass of 200 tonnes.

General information about this and ESA Launchers can be found at:
http://www.esa.int/launchers

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