**Preparing for Vega-C**

**After the success of the European Space Agency’s Vega launcher it was decided in 2014 to develop a more powerful launcher based on Vega’s design. This became the Vega-C with the C standing for consolidation. This launcher is a response to ever evolving market demands and long term institutional needs. The launcher will be even more versatile and able to deliver heavier payloads into orbit. Recently a successful test of the P120C solid rocket marked a crucial step in Vega-C’s development process. Vega-C will first launch in 2019. In this video we see how Vega-C’s stages are created from lightweight carbon fibre, how the Vega Launchpad in Kourou is being prepared for the larger Vega-C and how ESA continuous development of the Vega launcher makes it even more versatile.**

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| 10:00:00 | ESA leader  |
| 10:00:10 | Title: **Preparing for Vega-C** |
| 10:00:10ext. Avio factory – Colleferro, Italy – 2018 – AVIOInt. Avio factory, Vega Solid prop. rockets – Colleferro, Italy – 2018 – AVIOInt. Avio factory, casting of the casings – Colleferro, Italy – 2018 – AVIOInt. Avio factory, poster of Vega-C – Colleferro, Italy – 2018 – EuronewsInt. Avio factory, Vega Solid prop. rocket – Colleferro, Italy – 2018 – EuronewsInt. factory, propellant casting – 2018 – AVIOExt. P120C outside of the BEAP – Kourou, French Guiana – 2018 – ArianespaceExt. firing test of P120C outside at BEAP – Kourou, French Guiana – 2018 – ArianespaceStill. Artist impression of Vega-c at Launchpad – 2018 - ESA | This is Avio rocket factory in Colleferro, Italy. Here engineers are developing the carbon fibre casing for the solid propellant rocket stages of ESA’s new Vega-C launcher. To build them 5000km of carbon fibre impregnated with epoxy resin is winded around a premade metal mandrel. This produces the very lightweight but sturdy casings for the first, second and third stages of the Vega launcher. These casings are later fitted with an engine and loaded with the solid propulsion. One of these solid propulsion engines is the P120C. It was recently successfully tested in Kourou and is the largest and most powerful monolithic solid propulsion rocket ever build. With this new rocket ESA hopes to respond to launcher market demands. |
| 10:01:03:00ITW. Giorgio Tumino @ Avio factory – Colleferro, Italy – 2018 - Euronews | **Itw Giorgio Tumino****Vega development programme manager – ESA***So certainly in the launcher sector the competition is growing worldwide but we believe that the European answer, the ESA answer with Vega-C and Ariane 6 is the right answer. In an aggressive manner we are trying to make things more and more competitive. One of these examples is the joint solid rocket motor that we are developing across the two programmes, the Vega C and Ariane 6 - the P120C solid rocket motor - that enables the possibility to harmonise resources and to have the same motor serving the Vega C as a first stage as well as the Ariane 6 in both configurations as strap on boosters. So this is a very good answer to tackle the competiveness aspect.*  |
| 10:01:48:21Animated still. Comparison between Vega-c and Vega – 2018 – ESAInt. Avio factory, Vega Solid prop. rocket – Colleferro, Italy – 2018 – EuronewsInt. Avio factory, Vega components – Colleferro, Italy – 2018 – EuronewsInt. Avio factory, Vega Solid prop. rocket – Colleferro, Italy – 2018 – EuronewsINT. timelapse P120C solid Prop. Rocket prep. – Kourou, French Guiana – 2018 – ArianespaceExt. P120C transport from BIL to BEAP – Kourou, French Guiana – 2018 – ArianespaceExt. Zefiro-40 firing test – unknown date – ItalyInt. Avio Factory Avum+ construction – Colleferro, Italy – 2018 – EuronewsExt. Vega launch pad – kourou, French Guiana – 2018 – ESA | With Vega-C, with the C standing for consolidation, ESA is further developing Vega It will add an increased performance to the flexibility of the current system without increasing the costs. Today Vega can launch up to 1,5 tonnes on a 700km orbit, with Vega-C this will be 2,3 tonnes. In order to increase the performances two new solid propulsion engines have been developed: the P120C but also the Zefiro-40 for the second stage. Further enhancements are made with AVUM+, which is derived from the current VEGA’s AVUM upper stage. It will be lighter and have a larger fairing for bigger payloads. These changes have also implications for the Vega launchpad in Kourou.  |
| 10:02:39:10ITW. Antonio Pizzicaroli @Vega launch pad– Kourou, French Guiana – 2018 - ESA | **ITW Antonio Pizzicaroli, Vega Site Manager, AVIO***We have foreseen a lot of activities to modify the launch site from the Vega configuration to the Vega-C configuration. Vega-C is a heavier, longer in length launcher with respect to the Vega one. So for this reason the access to the stages, increase the diameters for what concerns the first stage.* |
| 10:03:07:08Ext. Vega launch pad – Kourou, French Guiana – 2018 – ESAExt. Vega launch pad, close up crane and platforms – Kourou, French Guiana – 2018 – ESAExt. Vega launch (Aeolus) – Kourou, French Guiana – August 2018 – ESAAnimation. Vega-C launch – 2017 – ESAInt. Cleanroom IXV locking inside VEGA fairing – 2015 – ESAAnimation. IXV re-entry – 2015 – ESAExt. Recovery of IXV – 2015 - ESA | Other changes include modified fluid services and installation of a more powerful crane, needed to lift the heavier second stage of Vega-C. During these modifications the site has to remain operational for the scheduled Vega launches. In the end the launch site will be compatible with both launchers. With Vega-C, ESA is also working on related products such as the Space Rider, based on ESA experimental re-entry vehicle IXV. It should allow for payloads to be send onto orbit and later return to earth. |
| 10:03:44:17ITW. Giorgio Tumino @ Avio factory – Colleferro, Italy – 2018 – EuronewsStill. Artists impression Space rider – 2018 - ESA | **Itw Giorgio Tumino****Vega Development Programme Manager – ESA***In addition to this we have other products like a specific adaptor for launching into orbit small spacecraft. So enabling the possibility of universities and research centres to access space at limited cost. So coping with payloads which go from 1kg up to 500kg. //We also have early elements of definition for a platform called Venus which could allow payloads to transfer from orbit to orbit.*  |
| 10:04:17:20Animation. Vega-C launch to orbit – 2017 – ESA | With these developments of Vega-C ESA aims to offer an improved flexible and reliable launch system to the commercial and institutional market worldwide. With its ever expanding family of launchers ESA continuous to secure independent access to space for Europe.  |
| **10:04:34:13** | **B-ROLL** |
| 10:04:34:13ITW. Giorgio Tumino @ Avio factory – Colleferro, Italy – 2018 - Euronews | **Itw Giorgio Tumino****Vega Development Programme Manager – ESA - ENGLISH*** Vega-c competive for the worldwide market and other products
* The role of ESA in development of space transportation
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| 10:07:54:07ITW. Antonio Pizzicaroli @Vega launch pad– Kourou, French Guiana – 2018 - ESA | **ITW Antonio Pizzicaroli, Vega Site Manager, AVIO - ENGLISH*** How to modify the Vega launch site for Vega-C
* The difficulties of working on an active launch pad
* Launchpad compatible with both launchers
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| 10:09:55:11ITW. Antonio Pizzicaroli @Vega launch pad– Kourou, French Guiana – 2018 - ESA | **ITW Antonio Pizzicaroli, Vega Site Manager, AVIO - FRENCH*** How to modify the Vega launch site for Vega-C and why
* Launchpad compatible with both launchers
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| 10:10:53:21ITW. Antonio Pizzicaroli @Vega launch pad– Kourou, French Guiana – 2018 - ESA | **ITW Antonio Pizzicaroli, Vega Site Manager, AVIO - ITALIAN*** How to modify the Vega launch site for Vega-C and why
* Launch pad compatible with both launchers
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| 10:11:43:22Ext. Vega launch pad – Kourou, French Guiana – 2018 – ESA | **GV’s Vega launch pad and Gantry****Arianespace****Kourou, French Guiana** |
| 10:12:58:14Ext. firing test of P120C outside at BEAP – Kourou, French Guiana – 2018 – Arianespace | **GV's P120C firing test at BEAP****Ariane spaceport** **Kourou, French Guiana** |
| **10:15:01:20** | **END** |