



Press release

# Successful final test firing of the P120C solid rocket motor for Ariane 6 and Vega-C

Kourou, October 7, 2020

- **Success of the third and final static test fire of the P120C rocket motor, lasting 130 seconds, at Europe's Spaceport in French Guiana**
- **The P120C solid rocket motor will act as side boosters for Ariane 6 as well as being the Vega-C first stage**
- **For this last test before maiden flight, the motor was in the Ariane 6 configuration, as the P120C will equip both configurations of Ariane 6: Ariane 62, with two boosters, and Ariane 64, with four boosters**
- **The Ariane 6 and Vega-C development programs are managed and funded by ESA**
- **Footage of the test is available at [https://www.esa.int/ESA\\_Multimedia/Videos/2020/10/P120C\\_motor\\_configured\\_for\\_Ariane\\_6\\_is\\_test\\_fired](https://www.esa.int/ESA_Multimedia/Videos/2020/10/P120C_motor_configured_for_Ariane_6_is_test_fired)**

The P120C was successfully tested for the third time on October 7, at Europe's Spaceport solid rocket motor test bench operated by the French Space Agency (CNES). This third successful test, carried out in the Ariane 6 configuration, paves the way for final qualification by the European Space Agency (ESA). The first and second tests on July 16, 2018, and January 28, 2019 were also successful.

The P120C will equip both configurations of Ariane 6: Ariane 62 will be equipped with two boosters<sup>1</sup> and Ariane 64 will have four. For all the teams involved, these successful firings are also a source of great pride, because all the steps in the development process took place nominally.

The P120C motor is co-developed by ArianeGroup and Avio, through their 50/50 joint venture Europropulsion. The P120C program is managed and funded by the European Space Agency. The P120C symbolizes the fruitful collaboration between Avio and ArianeGroup in the launch vehicle field – an example of the strength of "Space Team Europe" comprising industry, national space agencies, and the European Space Agency.

Considering the major investments required for producing solid-propellant motors, the P120C is a perfect example of industrial optimization, as it will equip both of the Ariane 6 configurations as well as the first stage of Vega-C. This will make optimal use of industrial facilities across the European continent and French Guiana, thus meeting the goals of the Ariane 6 and Vega-C programs: optimized costs, shorter operation cycles owing to a simplified design, and the application of innovative technologies and processes.

The P120C has a maximum thrust of 4,500 kN and a combustion time of 130 seconds. It consists of two principal parts. The first is the structural casing, built by Avio and made of carbon fiber (filament-wound, automated fabric layup pre-impregnated epoxy sheets). The second part is the nozzle, built



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by ArianeGroup, made of various composite materials including carbon/carbon, which allows very high-speed ejection of the extremely hot gases (3,000°C) generated by the motor, transforming this combustion gas energy into kinetic energy to create thrust. The nozzle can also be pivoted which enables the launch vehicle to be steered. Propellant manufacturing, loading, and final integration of the motor take place in French Guiana.

### The P120C in figures:

- Motor length: 13.5 m
- Diameter: 3.4 m
- Propellant mass: 142 t
- Motor dry mass: 11 t
- Motor case mass: 8.3 t
- Maximum thrust: 4,500 kN
- Specific impulse: 278.5 s
- Combustion time: 130 s

<sup>1</sup> In Ariane 6 program terminology, these boosters are called ESR (Equipped Solid Rocket) and consist of the P120C rocket motor and specific Ariane 6 equipment, notably the rear skirt.

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### About ArianeGroup

ArianeGroup develops and supplies innovative and competitive solutions for civil and military space launchers, with expertise in all aspects of state-of-the-art propulsion technologies. ArianeGroup is lead contractor for Europe's Ariane 5 and Ariane 6 launcher families, responsible for both design and the entire production chain, up to and including marketing by its Arianespace subsidiary, as well as for the missiles of the French oceanic deterrent force. ArianeGroup and its subsidiaries enjoy a global reputation as specialists in the field of equipment and propulsion for space applications, while their expertise also benefits other industrial sectors. The group is a joint venture equally owned by Airbus and Safran, and employs approximately 9,000 highly qualified staff in France and Germany. Its 2019 revenues amounted to 3.1 billion Euros.



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[www.ariane.group](http://www.ariane.group)

### About Avio

Avio is a leading international group engaged in the construction and development of space launchers and solid and liquid propulsion systems for space travel. The experience and know-how built up over more than 50 years puts Avio at the cutting-edge of the space launcher sector, solid, liquid and cryogenic propulsion and tactical propulsion. Avio operates in Italy, France and France Guyana with 5 facilities, employing approx. 850 highly-qualified personnel, of which approx. 30% involved in research and development. Avio is a prime contractor for the Vega program and a sub-contractor for the Ariane program, both managed and funded by the European Space Agency (ESA), placing Italy among the limited number of countries capable of producing a complete spacecraft.

[www.avio.com](http://www.avio.com)

### About CNES

CNES is the government agency responsible for shaping France's space policy and executing it in Europe. Its task is to conceive and orbit satellites, invent the space systems of the future and nurture new services to aid us in our daily lives. Founded in 1961, it is the initiator of major space projects, launch vehicles and satellites, and the partner of choice for industry, supporting exports and fuelling innovation. CNES is working to further applications in five core areas of focus: Ariane, science, Earth observation, telecommunications and Defence. CNES is a key player driving technology research, economic development and industrial policy for the nation. It also fosters scientific collaborations and has forged numerous international partnerships. France, represented by CNES, is the leading contributor to the European Space Agency (ESA), which conducts Europe's space policy on behalf of its 22 member states.

[www.cnes.fr](http://www.cnes.fr)

### About ESA

The European Space Agency (ESA) provides Europe's gateway to space.

ESA is an intergovernmental organisation, created in 1975, with the mission to shape the development of Europe's space capability and ensure that investment in space delivers benefits to the citizens of Europe and the world.

ESA has 22 Member States: Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland and the United Kingdom. Slovenia and Latvia are Associate Members.

ESA has established formal cooperation with six Member States of the EU. Canada takes part in some ESA programmes under a Cooperation Agreement.

Learn more about ESA at [www.esa.int](http://www.esa.int)