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Press release

## Prometheus development accelerates with new contract from ESA

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- **The European Space Agency (ESA) has just awarded ArianeGroup a new 135 million euro contract to begin a new phase with the development of a set of Prometheus demonstrators**
  - **This new contract follows on from the December 2017 contract which launched the development at European level of very low cost, reusable engine demonstrators with thrust control**
  - **Up to 70% of Prometheus is built using 3D printing, enabling development of the latest propulsion technologies for future European launchers**
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The European Space Agency (ESA) has awarded ArianeGroup a new 135 million euro contract to continue the development of a set of reusable, very low cost Prometheus engine demonstrators.

Building on the results already achieved, the purpose of this new contract is to finalize the demonstration phase with hot-fire tests of the first two prototypes on the DLR site in Lampoldshausen, Germany, and to design an improved version of the engine, capable of delivering a thrust of 120 metric tons, compared with the current 100 tons, as well as a liquid hydrogen version. Initially designed to run on a mixture of methane and liquid oxygen, the liquid hydrogen-oxygen version of Prometheus could be used as early as 2025 on an Ariane 6 upgrade. The contract also calls for the production of a pre-series of engines to begin the pre-industrialization phase, while continuing to test new series production processes. This will enable Prometheus to meet the needs of all applications and all missions.

*“This new contract validates the quality of the work already done by our Franco-German teams in developing a new family of very low cost engines in a totally innovative way. The thrust control feature of these engines paves the way for reusable launchers,”* said André-Hubert Roussel, CEO of ArianeGroup. *“With the first Prometheus prototype now being assembled at our Vernon site, the knowledge we have acquired will enable us to develop lighter, much less expensive engines, making European launchers ever more competitive and environmentally friendly.”*

These will be the first European engines with controlled combustion, enabling them to adapt to launcher flight conditions during the various phases of the mission. A digital system will provide control over a range from 30 to 100% maximum thrust. Prometheus will also be equipped with Artificial Intelligence and a Health Monitoring system that will enable a diagnostic of the engine's operation at any time.

The Prometheus demonstrators will benefit from the latest additive manufacturing technologies, with the parts produced in this way accounting for 70% of the total mass of the engine, including the

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combustion chamber, which is entirely built using 3D printing at the ArianeGroup site in Ottobrunn, Germany.

Prometheus was initiated in 2015 with the French space agency CNES and covered by an ESA contract since 2017. Its production costs in the 100-ton thrust class will be 10 times lower than that of the current Vulcain 2 engine for Ariane 5.

A version of Prometheus can also be fitted to equip the Themis reusable stage demonstrator.

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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 7,600 highly qualified staff in France and Germany. Its 2020 revenues amounted to 2.7 billion euros.

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