High performance, lightweight turbopump

Ref-Nr:

Technology abstract

LENA Space is a UK SME specialising in the development of lightweight, low-cost turbopump technologies for space launch propulsion systems. The turbopumps are designed to withstand extreme environments and are developed using an agile, fast-to-market approach, making them ideal for terrestrial applications where high reliability is key. The team is now seeking partners to explore and define potential applications for the turbopump technology.

I am interested in this technology

ESA Broker United Kingdom

- Helen Rogerson -

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Technology Description

LENA Space are developing lightweight, low-cost turbopump technology that has the potential to significantly reduce the size, mass, and cost of future space launch systems, while enhancing performance.

Liquid-based rocket motors require feed of propellants before combustion, to raise propellant pressure and direct flow. This is performed by either high-pressure gas (pressure-fed) or a pump system. A turbopump uses a turbine (driven by kinetic energy of propellants) to drive the pump assembly.
Turbopump specification for a small to medium launch system:
For decomposed high-test peroxide (HTP), steam flow rate is estimated at 1.7 kg/s at 10,500 rpm. Outer dimensions of the turbine are estimated as 300 mm diameter and 200 mm depth, with rotor maximum diameter approximately 190 mm. Materials are expected to be low alloy stainless steels (304 or 316), which will strike a balance of cost and adequate creep/oxidation performance at the temperature and operating durations envisaged.
With significant experience in rocket engineering as well as satellite and motorsport industries, the team are ideally placed to support the development of new terrestrial applications for the turbopump technology.

Innovations & Advantages

- Suitable for extreme environments
- Lightweight
- Low-cost
- Agile development methodology
- Highly experienced technical team
- Fast-to-market approach

Current and Potential Domains of Application

- fire-fighting
- disaster recovery
- oil and gas
- construction
- mining