Łukasiewicz
Institute
of Aviation

The product is developed under the ESA program ESA–FLPP (Future Launchers Preparatory Program)

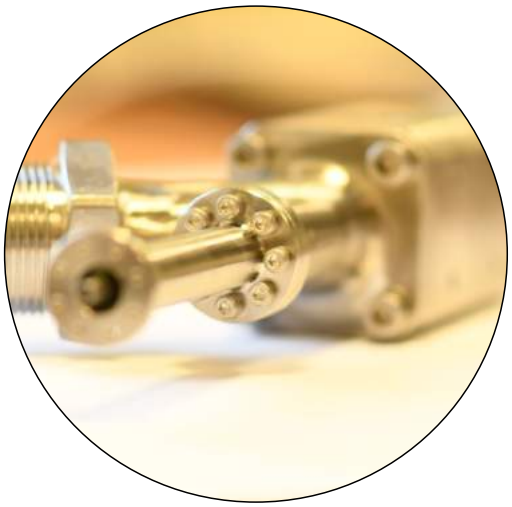
CAVITATING VENTURI REGULATORY VALVE

CHARACTERISTICS

Cavitating Venturi valves have been developed by Łukasiewicz – Institute of Aviation and partners under the European Space Agency contract for Throttleable Liquid Propulsion Demonstrator. Hydrogen peroxide 98%+ and 96% ethanol are assumed as baseline propellants, however obtained capabilities allow for adjusting the control valve to be compatible with other state-of-the-art oxidizers and fuels. Its purpose is to master, control and adjust the propellant mass-flows in demanding applications such as propulsion systems for kick-stages, launcher upper-stages or landers.
This technology can be also used for large valves of reusable 1st stages of launch vehicles.

APPLICATION

Propellants mass-flow control.



CONSTRUCTION

The mass-flow is controlled by the needle's position adjustment located inside the venturi throat. The needle modifies the size of the critical cross section defining the mass-flow. The position is controlled by an electric actuator.

KEY FEATURES

- Continuously adjustable propellant mass-flow rate.
- Easy and precise flow control.
- High insensitivity to pressure instabilities occurring downstream of the valve, incl. ones from the combustion process in the combustion chamber.
- Possible application to other storable (non-cryogenic) propellants.

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