

LOX TURBINE

VULCAIN AND VULCAIN 2 ENGINES



The Vulcain engine of the Ariane 5 launch vehicle uses a high-performance turbine to power its liquid oxygen pump. The basic version is a 1-stage supersonic LOX turbine. As a GG-cycle engine, the Vulcain uses hydrogen-rich gases to power its turbines.

The LOX turbine for the Vulcain 2 is an upgraded version in a more powerful configuration. It is a 2-stage transonic turbine that operates at speeds similar to those of its predecessor, but at higher pressure and flow rate to develop more power.

CHARACTERISTICS OF THE LOX TURBINE

Vulcain

Type	1-stage axial, supersonic
Power rating	2.0 – 4.8 MW
Speed	11 000 – 14 800 rpm
Inlet pressure	45 – 88 bar
Outlet pressure	3.5 – 7.8 bar
Inlet temperature	760 – 950 K
Blade meanline diameter	0.32 m

Vulcain 2

Type	2-stage axial, transonic
Power rating	3.7 – 6.6 MW
Speed	11 300 – 13 700 rpm
Inlet pressure	40 – 101 bar
Outlet pressure	4.5 – 7.0 bar
Inlet temperature	770 – 960 K
Blade meanline diameter	0.32 m

Volvo Aero responsibility

Volvo Aero has been subcontracted by Avio for the LOX turbine and its derivatives since 1985.

Volvo Aero is responsible for turbine development, manufacture and qualification. This includes development of test facilities, materials testing in a hydrogen atmosphere, aerothermal and mechanical design, and advanced measuring techniques.

Similar assignments

- LH2 turbine for the Vulcain and Vulcain 2 engines powering the Ariane 5 launcher.
- Turbines for the Vinci engine of the Ariane 5 upper stage.
- Turbine blades integrated with the disk (blik) to drive the turbopumps of the Viking 4, 5 and 6 engines of the Ariane 4 launcher.

Volvo Aero Corporation

Volvo Aero develops and manufactures components for aircraft and rocket engines with a high technology content in cooperation with the world's leading producers. Service and maintenance are an important part of our operations. The company offers an extensive range of products, including

sales of spare parts for aircraft engines and aircraft, sales and leasing of aircraft engines and aircraft, and overhaul and repair of aircraft engines. Volvo Aero also develops and services gasturbines for propulsion and power generation.

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