

# Test Bench P1.0

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## brief description

In order to develop, test and qualify propulsion systems for satellites, upper stages and space probes for their later use, it is necessary to create appropriate test conditions. At the P1.0 this was realised by setting up a vacuum test stand. Here it is possible to test the test specimens under atmospheric conditions with a few millibars of ambient pressure.

## goals

The current tasks of the P1.0 include the qualification and validation of engines for their final use, development work such as engine material tests, engine tests for future re-entry systems and flight acceptance tests for 400 Newton dual-fuel engines.

## applications

**60s/70s:** ELDO rocket program, partial developments for the Jupiter probe Galileo  
- **2003:** Engine test for the Venus Express probe  
- **Today:** Satellite propulsion systems, control and attitude control thrusters for space probes, apogee thrusters

## perspectives

- Engine tests with storable propellants under real space conditions  
real space conditions



## involved

Space industry

## facts and figures

- Up to 40 tests per year

- **Lowest tested thrust:**  
170 Newton

- **Highest tested thrust:**  
500 Newton

## Project $H_2$ ORIZON

Sector coupling with wind-hydrogen

The P1.0 test stand can be divided into three areas. The first is the height system, which forms the test cell with the height chamber and is intended for holding the test specimen.

The second large part of the system is the steam generator, whose task is to generate steam that is accelerated by supersonic nozzles located in the vacuum line. The expanding flow of vapour creates a vacuum in the line and the connected altitude chamber. The vacuum pressure generated is approx. 1-5 millibars.

The third component is the engine supply system, which supplies the operating fluids for the engine. The design of this system allows various configurations and operating modes for the test specimens. It is mainly designed for storable fuels.