



## Aerothermodynamics test benches

### Identification of the installation/facility :

Country: FRANCE  
Location (city): Palaiseau  
Name of the facility: Cellules ATD (Aerothermodynamics test benches)  
Date of construction or of acquisition or of main refurbishment: 1998  
Owner: ONERA  
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Internet site: [www.onera.fr](http://www.onera.fr)

### Technical characteristics:

#### 1 - Type of infrastructure

Wind tunnel	<input type="checkbox"/>
Propulsion bench	<input checked="" type="checkbox"/>
Structures facility	<input type="checkbox"/>
Material facility	<input type="checkbox"/>
Simulator (ex. Flight simulator, tower, ...)	<input type="checkbox"/>
Flight test bed (aircraft, embedded facilities, ...)	<input type="checkbox"/>
Supercomputers	<input type="checkbox"/>
Other	<input type="checkbox"/>

#### 2 - Main technical characteristics

experimental research works are conducted in ATD Laboratories (AeroThermoDynamical Laboratories) for applied research testing on combustors, combustor components, single sector and injection system performances on tubular combustor (ignition limits, stability limits, pollutant emission measurements, etc...)

There is three flow lines available today

Maximum Air mass flow: 4 kg/s

Maximum pressure: 4 Mpa

Minimum pressure: 0.1 to 1 Mpa

Maximum temperature : 900 K

Type of fuel : Kerosen and propane c3h8 (1.7 MPa and biofuels with maximum pressure 8 Mpa

#### 3 - Research domains which can be addressed (refer to ACARE taxonomy <http://www.acare4europe.com/docs/ASD-Annex-final-211004-out-asd.pdf>)

##### Propulsion/ Combustion

- Combustor operability
- Combustion technologies for reducing emissions produce by conventional engines configurations
- Enhance mixing design /technologies for lean combustion
- Multi-point fuel injection

#### 4 - Main (or specific) associated measurement techniques

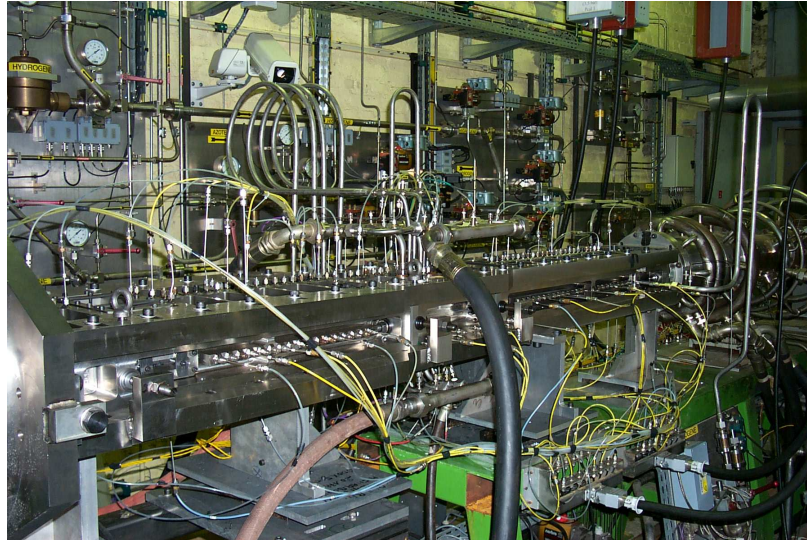


- Dedicate to the bench: pressure, temperature, mass flow rate, gas analysis
- Specific measurements: non intrusive optical measurement methods (LDV, PIV, PLIF, CARS) one one line

#### 5 - Operational status

- Fully operational (around 300h for 2010)

#### 6 - Picture



#### Financial elements:

Replacement cost (M€uros)

- |               |                                     |
|---------------|-------------------------------------|
| Less than 10  | <input type="checkbox"/>            |
| 10 to 30      | <input type="checkbox"/>            |
| 30 to 60      | <input type="checkbox"/>            |
| 60 to 100     | <input type="checkbox"/>            |
| More than 100 | <input checked="" type="checkbox"/> |

#### Practices concerning:

Access policy (contract, voucher, free access for research, etc...): contract  
Support (regional, national, European, private, ...): all

**Origin of information** ('signature'): author and date

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