

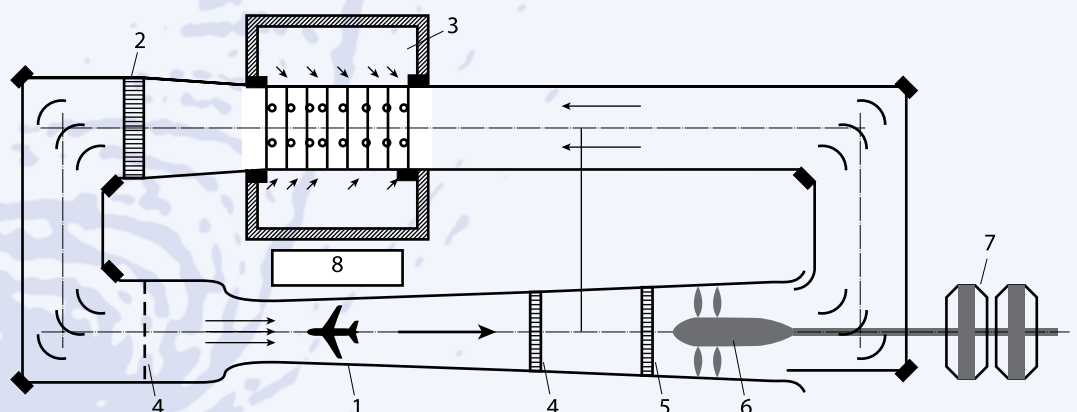


Main Technical Parameters

Flow M number 0.1...0.86
 Re number per 1 m up to 14.5·10⁶
 Total pressure atmospheric
 Dynamic pressure до 35 kPa
 Stagnation temperature 280...323 K
 Angle of attack (α) range -8° ... 14.5°
 Primary suspension arrow-like band suspension
 Run duration continuous

Test section sizes:
 Cross-Section diameter 2.7 m
 Test section length 3.5 m
 Tested object sizes:
 Length up to 2.2 m
 Wingspan up to 1.8 m
 Wing area up to 0.5 m²
 Weight up to 200 kg

1. Test section
2. Honeycomb
3. Mixing chamber
4. Vortex splitting screen
5. Fan guard
6. Coaxial fan
7. Electro-motor
8. Operator's cabin



General Description

T-107 Wind Tunnel is an atmospheric continuous operation closed-loop facility that is equipped with four-component electro-mechanical balance to measure the aerodynamic forces and moments that affect the model. The WT is assigned to research (by use of specialized fan testing device) the high-speed fans, aircraft models and their components aerodynamic characteristics.



Capabilities

T-107 WT provides the following experimental studies to be carried out:

- Assessment of single fan and birotating coaxial fans aerodynamic characteristics by VP-107 Device;
- Assessment of total models aerodynamic coefficients by mechanical balance and strain gage one;
- Assessment of pressure distribution by drain ports;
- Physical researches (method of kaolin covering, oil film etc.);
- Other types of physical researches.



Technological Advantages

- The only test-bench in TsAGI assigned to test the high-speed fans (bi-rotary ones including) at cruising flight.
- Low test-costs due to lower drive power and air-cooling.
- Low level of flow initial vorticity.
- Application of band suspension enables the minimal model geometry distortion.



Application

It is in T-107 WT where propulsions for such aircraft as Tu-95, An-22, An-70 and so on were enhanced. The total amount of cruising flight regimes tests within DREAM European FP7 was carried out in this WT. The thrust and moment characteristics of high-speed bi-rotary fans, the blades loads, blades strain, distribution of blade pressure, near-field blade noise and engine pylon influence were investigated. The helicopters profiles characteristics were studied.

