

What is a Trisonic Wind Tunnel?

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About Trisonic wind tunnel:

- The massive structure, which can perform tests in three speed regimes, equips the Indian Space Research Organisation (ISRO) with a robust in-house support system for space missions.
- Trisonic Wind Tunnel is a system to aid aerodynamic design of rockets and re-entry spacecrafts by characterising a scaled model by evaluating forces, moments, load distribution, unsteady pressures, acoustic levels etc.
- The tunnel has an overall length of about 160m and has a maximum cross section of 5.4m.
- The tunnel can be used for testing various space vehicles in three flight regimes —
 - **below the speed of sound (subsonic),**
 - **at the speed of sound (transonic) and**
 - **above the speed of sound (supersonic),**
- hence the **name trisonic wind tunnel**
- The tunnel can **simulate flight conditions from 0.2 times the speed of sound (68 m/s) to 4 times the speed of sound (1360 m/s).**
- Its parts include air storage vessels, a settling chamber where the airflow is 'smoothened' out, and nozzles for releasing the air into the test section.

- **Implementation:** The trisonic wind tunnel was implemented through M/s Tata Projects India Ltd with the assistance of industries across the country.
 - For years, ISRO had depended on the trisonic wind tunnel at the National Aerospace Laboratory (NAL), Bengaluru.
 - **Hypersonic wind tunnel:**
 - The VSSC is already equipped with a hypersonic wind tunnel for testing parameters of re-entry missions.
 - Commissioned in 2017, this tunnel can simulate flow speeds up to Mach 12.
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Q1) Where is the world's 3rd largest hypersonic wind tunnel located?

ISRO commissioned a one-metre hypersonic wind tunnel and shock tunnel, the world's third largest such facility, at the **Vikram Sarabhai Space Centre in Thiruvananthapuram**.

Source: [The Hindu](#)

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