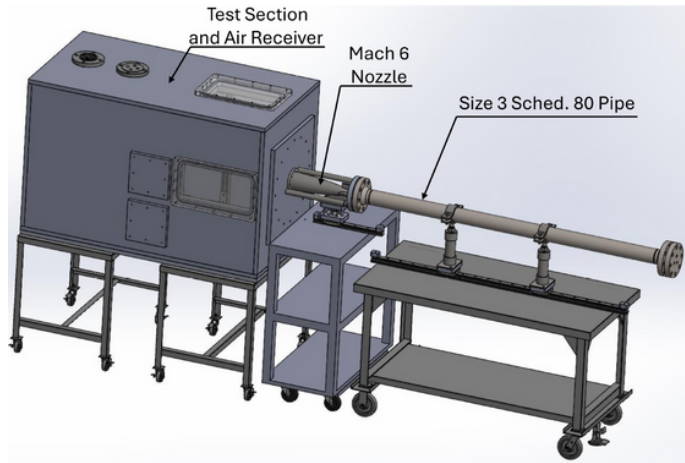
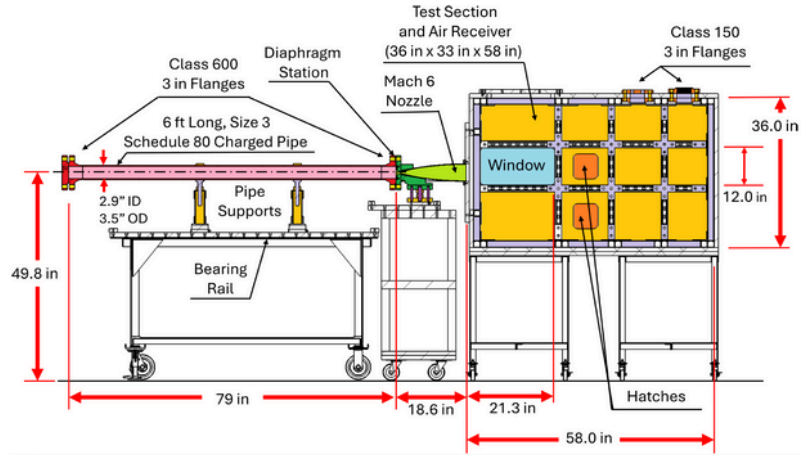


HYPERSONIC WIND TUNNEL DESIGN - FAIRFIELD UNIVERSITY



Isometric view of design



Cross-section view of design

What?

- Design and fabricate a wind tunnel capable of reaching flow speeds of Mach 6 and above.
- Largest University Run test section on the East Coast
- Completed designs for driver tube, test section, and test article mount.

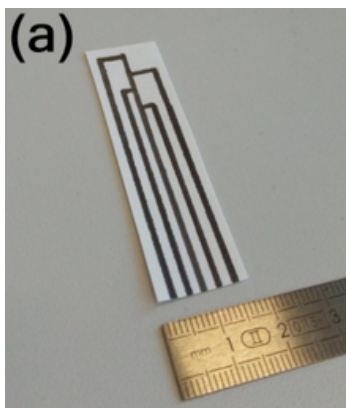
How?

- Used **SolidWorks** and applicable parts from McMaster-Carr to aid design.
- Applied **GD&T** on all drawings
- Manufactured needed parts using Xometry.

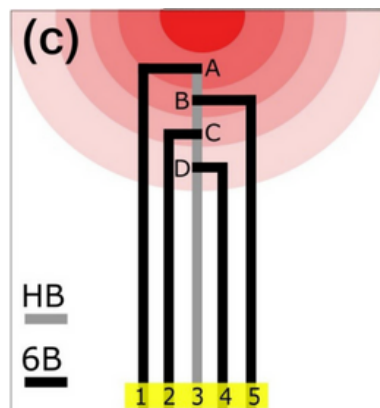
Results

- Constructed facility in spring 2025.
- Driver Tube successfully passed ASME pressure test withstanding >1000 psi.
- Test section successfully achieved full vacuum in September 2025.
- Full test expected early October 2025.

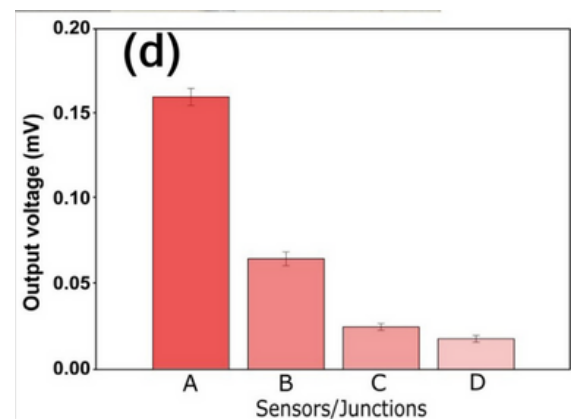
GRAPHITE THERMOCOUPLE FOR HYPERSONIC FLIGHT EQUIPMENT -



Example thermocouple



Heat dissipation



Voltage output by junction

What?

- Research efficacy and manufacturability of low cost, highly sensitive graphite thermocouples for hypersonic sensor applications.
- Design of consistent manufacturing technique.

How?

- Test thermocouples using **Hypersonic facility** to simulate high flow, high friction environments.
- Design manufacturing apparatus to ensure consistent graphite application to ceramic substrate.

Results

- Research is still in progress, exploring many graphite application processes.
- Functional testing awaiting wind tunnel operation in October.