

NASA Ames Panel Test Facility (PTF)

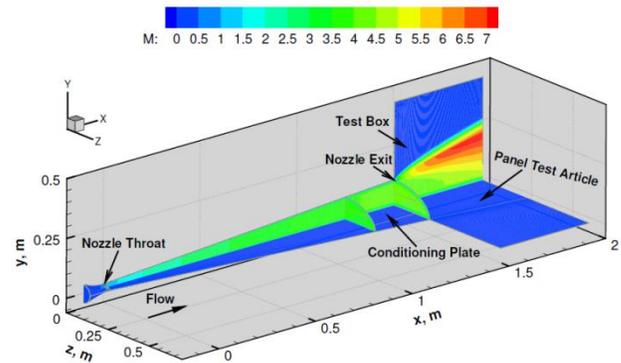


Mission: The Panel Test Facility is designed to enable testing spacecraft heat shield material samples in a high enthalpy, high shear boundary layer flow field. A modified version is available for higher shear and pressure conditions (TPTF).

Location: NASA Ames Research Center, Moffett Field CA 94035-1000, USA.

Type of tunnel: Constricted arc heater facility.

Test gas	Air
Nozzle type	Semielliptical
Nozzle exit (mm)	102x432 (TPTF: 38x170)
Input power (MW)	20
Bulk enthalpy (MJ/kg)	4.6 - 32
Shear Stress (Pa)- est.	5-30 (TPTF: 80-270)
Test duration (min)	≤ 30
Test article type	Flat plate, -5 to +8°
Test article size (mm)	406x406 (TPTF: 103 x 103)
Surface pressure, kPa	0.05-5 (TPTF: 0.05 – 280)
Heating rate (kW/m ²)	5.7- 341 (TPTF: 10 – 1950)



Computed PTF nozzle flow and flowfield over the calibration plate at 0° deflection.



Side view of a PTF run

Instrumentation:

- Hot wall temperature: thermocouples, IR thermography
- Pressure: Pitot/static
- Cold wall heat flux: copper gauges
- Optical diagnostics
- Optical emission spectroscopy (OES)



References:

Gökçen, T., Alunni, I.A., and Skokova, K.A., "Computational Simulations of Panel Test Facility Flow: Compression-Pad Arc-Jet Tests," *In 42nd AIAA Thermophysics Conference*, AIAA 2011-3635, June 2011, Honolulu, HI.

Balboni, J.A., Gökçen, T., Frank, C.L.H., Taunk, J.S., Noyes, E. and Schickele, D., "Calibration of the Truncated Panel Test Arc-Jet Facility," *In 41st AIAA Thermophysics Conference*, AIAA 2009-4090, June 2009, San Antonio, TX

Terrazas-Salinas, I., et. al., "Test Planning Guide for NASA Ames Research Center Arc Jet Complex and Range Complex," Document A029-9701-XM3 Rev.C., April 2009

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<http://www.nasa.gov/centers/ames/thermophysics-facilities-home>



MER TIRS cover test (top)
 Body flap test in PTF (bottom)