NASA Ames Aerodynamic Heating Facility (AHF)

**Mission:** The Aerodynamic Heating Facility is designed to match heating rates of Earth or planetary hypersonic entry to enable the selection, validation and qualification of thermal protection systems (TPS) and materials.

**Location:** NASA Ames Research Center, Moffett Field, CA, United States.

**Type of tunnel:** Huels and constricted arc heater facility.

<table>
<thead>
<tr>
<th>Test gas</th>
<th>Air, N₂</th>
<th>Test duration (min)</th>
<th>≤ 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nozzle exit (mm)</td>
<td>Conical (θ/2=8°), Ø 178, 305, 457, 610, 762, 914</td>
<td>Test article type</td>
<td>Stagnation point</td>
</tr>
<tr>
<td>Input power (MW)</td>
<td>20</td>
<td>Test article size (mm)</td>
<td>&lt; Ø 350</td>
</tr>
<tr>
<td>Bulk enthalpy (MJ/kg)</td>
<td>2-33</td>
<td>Surface pressure, kPa</td>
<td>0.5-45</td>
</tr>
<tr>
<td>Flow rates (kg/s)</td>
<td>0.05-0.7</td>
<td>Heating rate (kW/m²)*</td>
<td>90 - 9000</td>
</tr>
</tbody>
</table>

*Cold wall fully catalytic surface on a 102-mm Ø sphere*

**Instrumentation:**
- Hot wall temperature: thermocouples, IR pyrometry and radiometry
- Pressure: Pitot/static
- Cold wall heat flux: calorimetric probes of Gardon and slug types and null-point calorimetry
- Optical diagnostics: optical emission spectroscopy (OES), laser induced fluorescence (LIF)

**References:**


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