

**PROCESS
TECHNOLOGY**



TIH Inline Chemical Heater

The most reliable Inline Chemical Heater for unmatched semiconductor process fluid heating!



Now heat semiconductor process fluids up to 210°C!

Faster heatup: Single heater chamber sizes up to 18kW.

Rapid installation: Customized plumbing connections available to match existing plumbing and ease installation.

Long heater life for reduced cost of ownership (COO): Patented heater gas purge system continuously removes any chemical permeation and ensures long element life.

Long heater life and clean operating: Patented heater gas purge system continuously removes chemical permeation and ensures exceptionally long element life. This system also protects against any potential ionic contamination of the chemistry.

Rugged construction: Thick-walled chamber provides long service life in the harshest high temperature applications.

Exceptionally clean performance: Thick fluoropolymer sheath minimizes permeation. Element purge monitoring minimizes ionic contamination potential. Cleanroom assembly and testing ensures the highest manufacturing standards.

Outstanding chemical compatibility: All fluoropolymer-wetted parts compatible with virtually any chemistry.

Excellent temperature stability: Low watt density design enables accurate control of process temperature.

TIH Series Applications Include:

- SC1: ammonium hydroxide (NH_4OH), and hydrogen peroxide (H_2O_2)
- SC2: hydrochloric acid (HCl) and hydrogen peroxide
- Buffered oxide etch (BOE) process: hydrofluoric acid (HF) and ammonium fluoride (NH_4F)
- Nitride etch/strip: phosphoric acid (H_3PO_4)
- Various acids such as:
 - Hydrochloric (HCl)
 - Hydrofluoric (HF)
 - Acetic ($\text{C}_2\text{H}_4\text{O}_2$)
 - Nitric (HNO_3)
 - Sulfuric (H_2SO_4)
- Sulfuric acid and hydrogen peroxide
- Sulfuric acid and ozone (O_3)
- Hydrofluoric acid and glycol ($\text{C}_2\text{H}_6\text{O}_2$)
- Potassium hydroxide (KOH)
- Sodium hydroxide (NaOH)
- Electroless nickel
- Electroless copper
- Electroless gold
- Deionized water
- Some solvents (consult factory)

TIH Benefits and Specifications

Benefits:

- Unmatched heating of semiconductor process fluids up to 210°C.
- Patented heater gas purge system ensures long element life and reduced cost of ownership.
- Thick-walled chamber provides long service life in the harshest high temperature applications.
- Element purge monitoring minimizes ionic contamination potential. Cleanroom assembly and testing ensures the highest manufacturing standards.
- Low watt density design enables precise and stable control of process temperature.
- PVDF high temperature mounting brackets (High temperature model)

Options:

- Horizontally mounted configuration
- Integral cooling coils
- 100 ohm RTDs or “J”, “K”, or “E” type process and element thermocouples
- Lower watt density heaters for special applications

Specifications:

Temperature Range: Up to 210°C.

Maximum Working Pressure:

- 100 PSIG (7 Bar) at 25°C
- 29 PSIG (2 Bar) at 210°C

Heater Sizes: 1,000 watts up to 18,000 watts

Heater Voltages Available:

- 200 to 600 volts, single or three phase (12kW and larger requires three phase).

Watt Density: 10 watts per square inch (1.5w/cm²)

Fluid Connections Available:

- ¼” (6mm) to 1” (25mm)
- Flared, Super 300 Type Pillar® and other connections available.

Sensor:

- 1000 ohm RTD process and element sensors

Third Party Certificatons: CE, UL, Semi S2 and S3

Element Purge:

- Small amount of clean dry air (CDA) or N₂ gas flows between the metal grounded element and the PTFE sheath.

Dimensions

