

High Purity Silicon Carbide In-Line Heaters

A Solution Without Compromises

In recent years the need to heat chemistries that are not compatible with quartz has increased. High temperature HF, KOH, and other High PH chemistries are becoming more widespread and the choices for heater materials have been limited primarily to Teflon[®].

While Teflon is a good material for chemical and temperature resistance, it is a poor material for use in any heating application. Its thermal conductivity is approximately 1/5 that of quartz and its mechanical properties make it a poor choice for coupling to any type of heater element.

The net result is that heaters using Teflon fluid paths suffer from poor efficiency and/or reliability. Failures are often accompanied by process contamination when the material is compromised and the chemical comes in contact with the heater element.

Rather than follow the herd, Imtec found a better solution by using high purity Silicon Carbide (SiC) as a heat transfer material. SiC has excellent heat transfer properties and eliminates the risk of contamination due to Teflon breakdown.

Key Product-Line Features

High Efficiency

Imtec uses a low mass heater element directly coupled to the exterior of SiC tube that has a thermal conductivity rate 100 times better than quartz and 600 times better than Teflon.

The element temperature is controlled by Imtec's proprietary Power Modulator assuring that the maximum amount of heat that can be absorbed by the liquid is applied.

Aluminum Silicate insulation is tightly packed between heater tubes and housing to minimize heat loss and reduce external surface temps.

No other heater combines the purity and efficiency of the Accuheat SiC Advantage.

Designed and Built with Equipment Companies in Mind

For over 35 years, IMTEC has been the choice of many equipment manufacturers to supply solutions for their high purity heating requirements.

We know that the industry is demanding better up time, longer warranties, and reduced cost of ownership. All of these were carefully considered in the development of the ACCUHEAT[®].

IMTEC has supplied chemical heating solutions for many different types of equipment and can help you develop a system that is optimal for your needs.

Where a standard in-line heater is not appropriate, IMTEC can design custom products specific to your heating requirements.

In today's highly competitive market, IMTEC's technology can be your advantage.



12000 Watt Dual Tube



6000 Watt Single Tube



18000 Watt Dual Tube

Zero Maintenance

- ◆ No Lamp replacement
- ◆ No Calibration
- ◆ No reflectors to clean
- ◆ Hot Grip Nuts stay tight – No Leaks!
- ◆ Self Draining

Key Safety Features

Operating heaters in a harsh environment requires special safeguards. Most ACCUHEAT[®] models include these standard safety features:

- ◆ CE Marked, and designed to meet Semi S2 and S3 requirements
- ◆ Power modulator monitors element temp to reduce excess heat inside housing
- ◆ Overtemp Thermocouple attached to heater element provided for redundant protection
- ◆ Overtemperature snap switch trips if heater is run dry
- ◆ Internal leak detect strip (requires external monitor)
- ◆ PTFE Teflon[®] housing for chemical resistance and low surface temperature
- ◆ HOTGRIP[™] Nuts (Pat. Pend.) and Buttress thread stems prevent chemical leaks
- ◆ RTD provided for monitoring fluid temperature

Unsurpassed Reliability

It's not easy making heating systems that operate in harsh environments, but that has been IMTEC's business for over 35 years. Here are just a few design features that make the ACCUHEAT[®] so reliable.

- ◆ Heavy gauge pre-formed Inconel element can stand up to high stress conditions without breaking down
- ◆ Power modulator monitors heater element temp and prevents heat buildup inside the housing
- ◆ Sealed PTFE Teflon[®] housing prevents chemical fumes from attacking internal components
- ◆ Internal leak detect strip (requires external monitor) gives early detection of chemical leaks
- ◆ All wiring is run in PFA Teflon[®] conduit to prevent chemical attack

ACCUHEAT[®] Sizes and Styles

Since not all applications are the same, IMTEC offers heaters in several configurations to simplify integration for you. All models are available with 208 or 240 VAC heaters and some accommodate 400 VAC 3 phase wiring. All come standard with a power modulator and either HOTGRIP[™] (standard) or FIRMLOK[™] (optional) nuts on flare type connections.

Single Tube Models are compact and ideal for Vertical or Horizontal mounting. They are available in the following wattages:

- ◆ 4500
- ◆ 6000
- ◆ 7500
- ◆ 9000



Dual Tube Models allow for higher wattages and fit into a more rectangular space. All models are available with parallel or series flow paths. Parallel models have connections on opposite ends and can be mounted horizontally or vertically. Series models have connections on the same end and are mounted Horizontally. They are available in the following wattages:



- ◆ 9000
- ◆ 12000
- ◆ 15000
- ◆ 18000

Applications

ACCUHEAT[®] In-line heaters can be used in many applications requiring heating of high purity process fluids.

The traditional application uses the In-line heater as part of the recirculation loop, either as the sole heat source or in combination

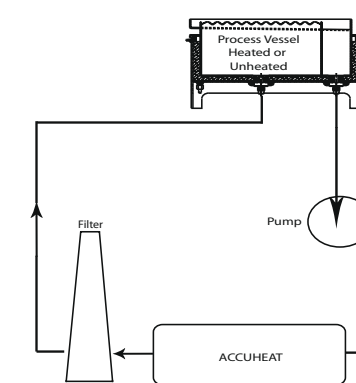
with heated tanks for faster heat up times and better control.

ACCUHEAT[®] models can also be used in some single pass applications. Even some DI water heating requirements can be met with a compact In-line heater instead of a large remote mounted DI water heater.

Tools that process single substrates can often use an ACCUHEAT[®] In-line instead of other more costly solutions.

Your IMTEC representative can help you decide whether an In-line heater can work for you and help find the right size and configuration.

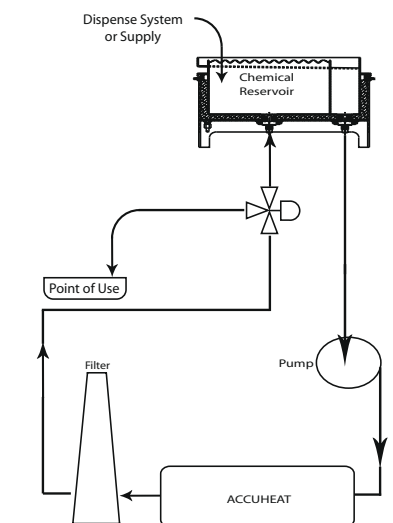
Recirculation Bath



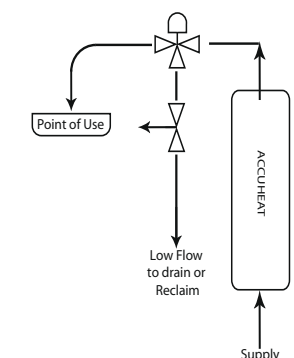
Process Chemistries

DHF - Dilute Hydrofluoric acids
 BHF - Buffered Hydrofluoric acids
 BOE - Buffered Oxide etch
 Alkaline Chemicals (TMAH, KOH, NaOH)
 Fluorinated Solvents
 Hydrofluoric Acid Glycol

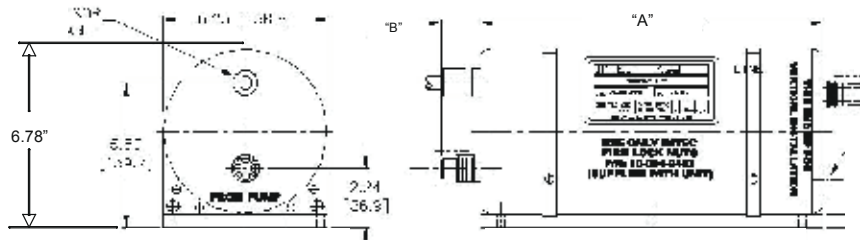
Heated Recirculation Loop with Dispense Replenish



Single Pass Dispense with Intermittent Demand



ACCUHEAT Single Tube Heater Dimensions



Accuheat SiC Advantage Specifications

Max. Operating Temp:	110°C
Max. Pressure:	30 PSI continuous (40 PSI max surge)
Voltages:	208VAC, 240VAC, 400VAC (some models), single or 3 phase model dependent

All Single Tube Heaters use the same diameter housing and base plate width. The length varies for higher wattage models.

Model	Length "A"
4500	13.08"
6000	13.08"
7500	15.75"
9000	18.97"

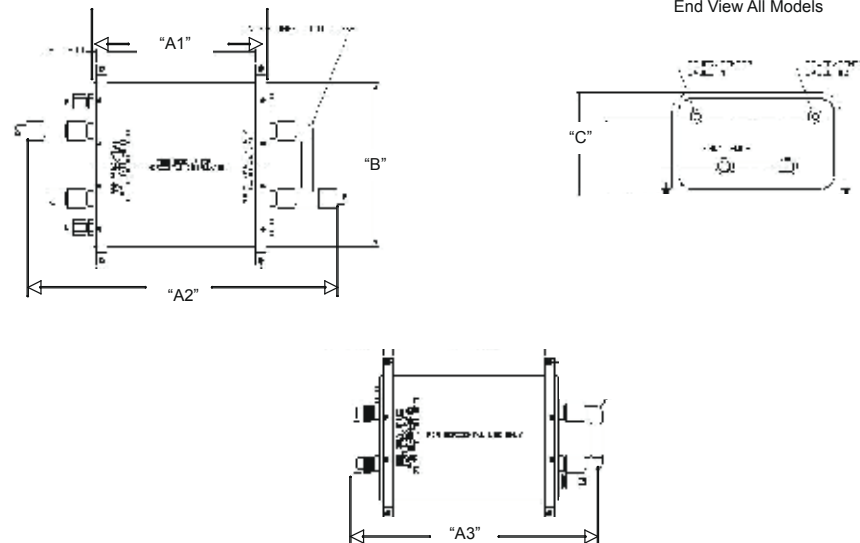
Connector dimensions from heater body to end of fitting

Type	Dimension "B" (approx.)
HOTGRIP (standard)	2.25"
FIRMLOK (optional)	2.00"

HIGH PURITY SILICON CARBIDE IN-LINE HEATERS

ACCUHEAT Dual Tube Heater Dimensions

End View All Models



ACCUHEAT Dual Tube Heater dimensions (Dimensions that include fittings or plumbing are approximate)

Model	Length "A1" All	Length "A2" Parallel	Length "A3" Series	Width "B" All	Height "C" All
9000	12.81"	22.50"	17.85"	11.50"	8.02"
12000	12.81"	22.50"	17.85"	11.50"	8.02"
15000	15.50"	25.20"	20.54"	11.50"	8.02"
18000	18.20"	26.38"	23.25"	11.50"	8.02"

