

## Application Note

# Honeywell Sensing and Control Flexible Heaters Meet Medical Industry Autoclave Requirements

### Background

Honeywell Sensing and Control flexible heaters have been tested to meet standard steam autoclave sterilization practices commonly used in medical applications that utilize equipment such as respirators, ventilators, dialysis machines, infusion machines, sterilizers, nebulizers, and more. After multiple exposures to extreme steam temperatures and soakings, the flexible heaters continued to meet Honeywell's high performance standards for electrical integrity and functionality.

### Key benefits:

- **Customization:** Honeywell's flexible heater line can be customized to meet any need, without worry of performance due to exposure to autoclave environments. Honeywell's design engineers create each flexible heater per customer requirements, taking into account such parameters as color, connector, lead wire exits, geometry, technical specifications, wattage zones, and autoclave requirements.
- **Simplicity:** No extra sterilization steps are required other than the standard autoclave, saving both time and costs.

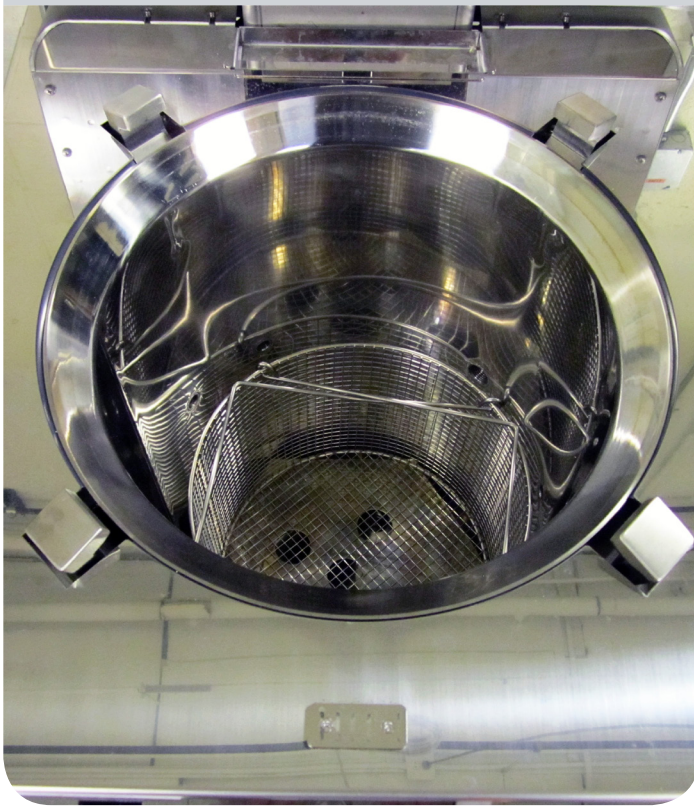
*Medical ventilators often benefit from the inclusion of an autoclave-able flexible heater.*



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Macro view of an autoclave's stainless steel basket.



### The Test

Honeywell's flexible heaters were placed in a stainless steel basket and subjected to steam temperatures up to 132 °C at a pressure of 29 psi within a sealed autoclave. The heaters were soaked in this harsh condition for 30 minutes and then cooled to room temperature for 10 minutes. This process was repeated five times, on the same flexible heaters, to complete each test cycle.

### Results

After the cycle was completed, the flexible heaters were tested for electrical integrity and functionality. All components performed within Honeywell's originally specified product parameters.

This same testing cycle was completed 50 times and the dielectric strength and insulation resistance (IR) of the flexible heaters was maintained after each cycle.

### Industry Solutions

Honeywell Sensing and Control is committed to turning challenges into value-added solutions for customers within the medical industry, and customization and flexibility features have long defined Honeywell products.

"By confirming Honeywell flexible heaters meet customers' autoclave requirements, we are able to provide greater application flexibility in applications such as ventilators," said Robert Ward, Honeywell Sensing and Control application engineer. "For example, Honeywell heating assemblies can be custom fit to the exhalation valve cover to dry condensation and prevent pooling at the airflow sensing point. This helps to provide a more comfortable breathing environment for patients. It may also be used to warm water for delivering heated and humidified air to patients."

"Meeting the steam autoclave sterilization testing provides customers with the reassurance that Honeywell's flexible heating products are built to work and to last even during the harshest conditions."

More information on Honeywell's flexible heaters can be found at [sensing.honeywell.com](http://sensing.honeywell.com) or by contacting Robert Ward, Honeywell S&C application engineer, at 401-739-1712.

### Potential Applications

- Respiratory equipment
- Ventilator equipment
- Dialysis equipment
- Infusion equipment
- Sterilization equipment
- Nebulizers
- Paraffin wax bath heaters
- Blood analysis equipment

## Find out more

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