

# Low Flow Limited Geometry

Exergy engineered a custom sanitary shell & tube heat exchanger optimized for pharmaceutical applications requiring extremely low flow rates within a compact, space-constrained footprint — where conventional heat exchangers fell short.

## The Challenge

The customer required a solution capable of handling very low flow rates in a compact footprint. The geometry of the application limited installation space, and the heat exchanger had to deliver precise thermal performance despite restricted flow. Standard exchangers posed risks of poor heat transfer efficiency and fouling at these reduced flow conditions.

## The Objective

To provide reliable and sanitary heat transfer for a customer application requiring extremely low flow rates, where conventional heat exchangers could not meet the performance and space constraints. The system needed to operate efficiently at low fluid velocities while maintaining strict hygienic standards.

## The Solution

Exergy engineered a custom sanitary shell & tube heat exchanger specifically optimized for low flow applications. Key design features included:

- **316L stainless steel construction** for full sanitary compliance
- **Miniature tube geometry** to maximize surface area and enhance heat transfer at minimal flow rates
- **Compact dimensions** ensuring seamless integration into the limited installation space

## The Results

- Successfully maintained required process temperatures at very low flow rates
- Compact, sanitary design prevented fouling
- Consistent thermal performance throughout operation
- Reliable operation without sacrificing space or efficiency

### Low Flow Optimized

Engineered specifically for minimal fluid velocities where standard exchangers fail to perform.

### Sanitary Design

316L stainless steel construction meets strict pharmaceutical hygienic standards.

### Compact Footprint

Miniature geometry fits within severely limited installation spaces without compromise.

### Custom Engineered

Tailored solution for specialized applications with stringent space and flow limitations.

- ✔ Exergy's low flow limited geometry solution demonstrated the ability to deliver efficient, compact, and sanitary heat transfer where standard equipment was insufficient — highlighting Exergy's capability to design tailored heat exchangers for the most demanding pharmaceutical applications. **ISO 9001:2015 Certified Quality Management System.**