Pharmaceutical : Low Flow Limited Geometry

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 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 Solution

Exergy engineered a custom sanitary shell & tube heat exchanger specifically optimized for low flow applications. The design utilized 316L stainless steel construction with miniature tube geometry to maximize surface area and enhance heat transfer efficiency at minimal flow rates. The compact dimensions ensured seamless integration into the limited installation space.

The Results / Benefits

The heat exchanger successfully maintained required process temperatures while operating at very low flow rates. Its compact, sanitary design prevented fouling and ensured consistent thermal performance. The customer achieved reliable operation without sacrificing space or efficiency.

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Conclusion

Exergy's low flow limited geometry solution demonstrated the ability to deliver efficient, compact, and sanitary heat transfer where standard equipment was insufficient. This case highlights Exergy's capability to design tailored heat exchangers for specialized applications with stringent space and flow limitations.