

Exergy Sanitary Shell and Tube & Tube Heat Exchangers

Advanced heat transfer solutions enable effective thermal energy exchange between two fluids. These systems are important in applications that require precise temperature control, heating, cooling, and thermal stabilization processes in various production environments. The industries that utilize heat transfer solutions, including **pharmaceutical and biotechnology, food & beverage, and semiconductors**, place specific importance on temperature levels that yield proper product quality, regulatory compliance, and operational effectiveness. The consumers of these industries make use of heat exchangers to make sure overheating is avoided, uniform temperatures are maintained, and stringent sanitary parameters are adhered to. In addition, avoiding contamination is closely related to the design of the process systems, ensuring the velocity of the water through loop adheres to sterility standards and ensuring safe and quality outputs.

Sanitary Shell and Tube Heat Exchangers



Exergy designs its Sanitary Shell and Tube Heat Exchangers to meet the strict temperature control demands of high-purity applications. These exchangers feature 316L stainless steel as the standard construction material, with options for more exotic materials like Hastelloy® and Inconel® to ensure excellent performance in high-pressure, high-temperature, and corrosive environments. Equipped with sanitary fittings, electropolished surfaces, and customizable double tube sheet designs, these exchangers prevent cross-contamination and ensure compliance with the rigorous sanitary standards required in industries such as pharmaceuticals and biotechnology.

Performance Specs:

- Heat transfer rates up to 5,000,000 BTU/hr. (1465 kW)
- Liquid flows to 250 GPM (946 LPM)
- Pressures up to 1,500 psi (104 bar)

Design Advantages:

Compact Design:

The exchangers combine high heat transfer area and low weight in the most compact footprint available, ideal for environments where space is at a premium.

Surface Finish:

Standard Surface Finish of 20µin (0.5µm) Ra and can be upgraded to a superior 15µin (0.38µm) Ra for even greater cleanliness. This electropolished finish complies with ASME BPE SF4 standards, ensuring a hygienic surface that is critical for high-purity applications.

Hydrophobic Coating:

NSF certified and FDA compliant coating process specially functionalized to achieve industry-leading chemical inertness and non-stick properties in high sterility applications.

Sanitary Compliance:

Exergy features ASME BPE design considerations and offers full drainability on the tube side, important to clean-in-place processes in sensitive applications.

Double-Tube Sheet:

To prevent cross-contamination between working fluids and product streams, these exchangers are built to meet ASME BPE double-tube sheet design standards to ensure process purity in regulated environments.

Sanitary Tube in Tube Heat Exchangers



The Sanitary Tube in Tube Heat Exchanger is ideal for low-flow, high-pressure applications where precision and hygiene are important. This model utilizes a dual-tube coiled design making it very efficient and, at the same time, resistant to thermal fatigue, which is beneficial to thermal stress applications, even under the most aggressive temperature conditions.

Performance Specifications:

- Heat transfer rates up to 100,000 BTU/hr. (29 kW)
- Liquid flows to 10 GPM (38 LPM)
- Pressures to 4,500 psi (310 bar)

Design Features and Benefits:

Thermal Efficiency: The coiled tube design promotes increased heat transfer, at low flow rates and extremely elevated temperatures.

Sanitary Standards:

Exergy uses seamless tube construction and offers electropolished surface finishes. As such, cGMP and ASME BPE standards are guaranteed. This makes it ideal for pharmaceutical applications where cross contamination is a risk, we follow ASME BPE orbital weld standards and use seamless tubing in fluid-to-fluid design exchanges is eliminated.

Maintenance-Free:

Long-term durability and performance with minimum maintenance are secured by all-welded construction and corrosion-resistant materials.

Shell and Tube and Tube in Tube Applications Across Major Industries

Pharmaceutical:

Sterilization, fermentation, precise temperature control and sanitary design are essential for maintaining product integrity and preventing contamination. Clean Steam Sampling ensures the sterility of equipment and product surfaces by validating steam quality.

Biotechnology:

Cultivating cells requires constant heating or cooling of sensitive biological processes. Our unique Hydrophobic Coating reduces protein adhesion in these critical processes.

Semiconductors:

Specific temperature precision is maintained to allow for critical control during wafer processing, among other fabrication operations.

Food & Beverage:

Providing the highest levels of hygiene in the heating and cooling for various products such as syrups, oils, and beverages while maintaining taste and quality.