CASE STUDY

Flavor Oil Heating: Compact Sanitary Heat Exchanger Solution

Exergy delivered a custom-engineered, sanitary shell-and-tube heat exchanger to heat a flavor oil-in-water emulsion across a wide flow range combining compact design, hygienic construction, and robust thermal performance for specialty food applications.

1

The Objective

Design a compact, sanitary heat exchanger capable of heating a **flavor oil-in-water emulsion** from ambient temperature to **55°C**, across a wide flow range of **4 ml/min to 200 ml/min**, using a hot water loop with supply water at a minimum of **70°C**.

2

The Challenge

The primary challenge was handling a **highly variable flow rate** of oil-in-water emulsion while maintaining efficient heat transfer and sanitary conditions. The solution needed to be compact enough for process integration while ensuring **reliable heating without fouling or contamination risks**.

3

The Solution

Exergy provided a **sanitary shell-and-tube heat exchanger, Model 00402 from the 17 Series**, designed with all 316L stainless steel components. Key specs: heat transfer area **0.14–1.16 ft²**, shell diameter **0.75"**, tube length **8.00"**, and **¾" sanitary flange** tube side connection.

4

The Results

The solution successfully enabled heating of the flavor oil emulsion within the specified flow range to **55°C**, ensuring sanitary operation. The compact design met space constraints, offered **reliable performance with minimized fouling risk**, and seamlessly integrated into the customer's hot water loop.

Technical Specifications

Model	00402 — 17 Series
Material	All 316L Stainless Steel
Heat Transfer Area	0.14 – 1.16 ft²
Shell Diameter	0.75"
Tube Length	8.00"
Tube Side Connection	¾" Sanitary Flange
Flow Rate Range	4 ml/min – 200 ml/min
Target Outlet Temp	55°C
Hot Water Supply Temp	≥ 70°C

Why Exergy?

Exergy's expertise in compact sanitary heat exchangers enabled a custom-engineered solution that addressed precise heating requirements for specialty food and flavor applications.

- Compact design for tight process integration
- Sanitary construction — no contamination risk
- Durable 316L stainless steel throughout
- Reliable across wide flow rate variability
- ISO 9001:2015 Certified Quality Management

Conclusion: By applying its expertise in compact sanitary heat exchangers, Exergy delivered a custom-engineered solution that addressed the customer's precise heating requirements — combining compact design, sanitary construction, and robust performance to meet the stringent needs of specialty food and flavor applications.