CHEMICAL · HIGH CORROSION

Corrosion-Resistant Heat Exchanger for EDC & HCl Gas Cooling

A custom all-titanium shell-and-tube heat exchanger engineered by Exergy to safely cool a highly corrosive, high-pressure gas stream delivering safety, reliability, and performance where conventional materials fall short.

The Objective

Cool a hot, high-pressure gas stream containing **Ethylene Dichloride (EDC)** and trace **HCl** from **160°C to 20°C** using chilled water at 10°C and 10 GPM flow rate — while maintaining long-term durability under corrosive and high-pressure conditions (20.69 bar).

The Challenge

- Highly corrosive gases and elevated pressure (20.69 bar) posed material degradation risks
- Tight geometric constraints without sacrificing performance or mechanical strength
- Standard stainless steel unsuitable — specialized alloy solution required

The Results

- Gas stream successfully cooled from **160°C to 20°C**
- Corrosion concerns completely eliminated
- Long service life and reliability ensured by titanium construction
- Compact footprint enabled easy installation in constrained environments

The Solution: Exergy Model #00540-03 (23 Series)

Exergy engineered a custom shell-and-tube heat exchanger specifically designed for corrosive gas service. All-titanium construction provides exceptional resistance to EDC and HCl exposure, while the compact design fits within tight spatial requirements.

All-Titanium Construction

Exceptional corrosion resistance against EDC and HCl — where stainless steel fails, titanium endures.

160°C → 20°C Cooling

Full thermal performance achieved using chilled water at 10°C with a 10 GPM flow rate.

High-Pressure Rated

Designed to withstand 20.69 bar operating pressure without compromise to structural integrity.

Full Certification Package

Complete material certification included. ISO 9001:2015 Quality Management System certified.

Technical Specifications

Model	#00540-03, 23 Series
Heat Transfer Area	1.19 ft²
Shell Diameter	1"
Tube Length	16"
Connections	NPT Fittings
Material	All Titanium
Operating Pressure	20.69 bar
Inlet Gas Temp	160°C
Outlet Gas Temp	20°C
Coolant Temp	10°C @ 10 GPM

Why Titanium?

→ Corrosion Immunity

Titanium is inherently resistant to chlorinated compounds like EDC and HCl, preventing pitting and stress corrosion cracking.

→ Long Service Life

Minimal maintenance requirements and extended operational lifespan reduce total cost of ownership.

→ High Strength-to-Weight

Enables compact, lightweight designs without sacrificing mechanical strength under high-pressure conditions.

This project demonstrates Exergy's ability to engineer durable, corrosion-proof heat exchangers for aggressive chemical and high-pressure applications — delivering safety, reliability, and performance where conventional materials fall short.