

CG Thermal

PROCESS TECHNOLOGY SOLUTIONS

Uniquely Engineered to:
Stop Cold-End Corrosion
Minimize Material Stress
Reduce Pressure Drop
Maximize thermal efficiency
Optimize Temperature Distribution

AIRBTU Recuperator Uniformity results in Lowest CAPEX/OPEX Solution

Increased reliability maximizes operating life

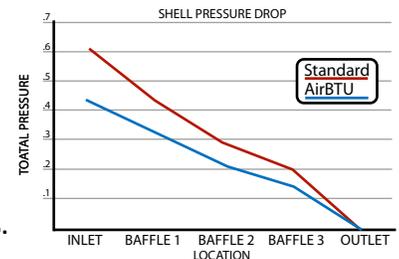
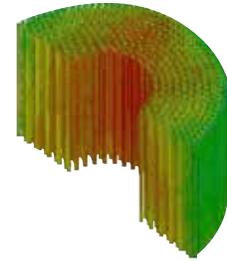
The uniformity and symmetry of the Variable Pitch Radial Recuperator (VPRR) design eliminates cold spots and minimizes uneven stresses-adding years to the useful life of the heat exchangers.

Reduced pressure drop minimizes operating costs

VPRR heat exchangers utilize proprietary designs to reduce pressure drop. The result is the lowest possible pressure drop for a given thermal duty.

Maximizing thermal efficiency minimizes first cost

Flow dynamics modeling is used to evaluate tube layouts and pass arrangements to create a symmetric design with optimal film coefficients and overall heat transfer rate. This resulting design requires less surface area and minimizes material and fabrication costs.



Ideal Solution for Catalytic Operations

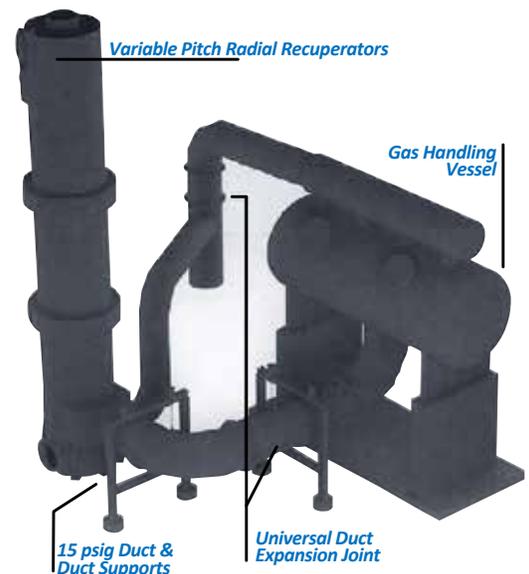
In acid manufacturing, it is common to use heat exchangers in gas to gas applications like those found in catalytic operations, air pre-heaters, and interchangers where high temperature gas streams are common.

An effective method for controlling sub-dewpoint exchanger corrosion is by fully understanding the tube temperature profile and designing the exchanger to eliminate cold spots. When the heat transfer surface or tube wall temperatures are accurately mapped, the heat exchanger can be optimally designed to maintain wall temperatures above the acid dewpoint.

The baffle design of AirBTU VPRR radial heat exchanger results in multiple radial-flow passes on the shell side. This baffle arrangement, along with a full radial bonnet for gas introduction, is designed to minimize tube wall temperature differences by promoting air distribution and flow uniformity at the cold end. Additionally, the vessel body expansion joint is pre-compressed to allow operation at "near neutral" further minimizes the operating stress at the tube to tube sheet connections.

Inlet and outlet piping connections on both the shell and tube sides can be located in any radial direction for ideal installation flexibility.

Our services include support design, duct pipe analysis, and design of ducting, dampeners, and expansion joints.



The Engineered Solution

Cold-end corrosion caused by condensation at cold spots where low temperature air is introduced, can significantly reduce the operating life of a high temperature gas-to-gas heat exchanger.

Additionally, temperature gradients across the tube bundle cause uneven stress concentrations at the tube to tube sheet connections.

The AirBTU VPRR is the engineered solution to these operational issues. Its proprietary shell-side baffle designs coupled with variable radial pitch tube arrangements promote uniform temperature profiles and tube wall temperatures with minimal pressure loss.

Using advanced thermal modeling with precise temperature and pressure profiles, all tube walls in the heat exchanger are designed to have symmetry in temperature to within 5%.

These uniform and symmetrical tube wall temperatures promote uniform stresses throughout the tube to tube sheet connections, significantly extending the useful life of the exchanger.

This highly accurate mapping is used to ensure a design that maintains wall temperatures above the acid dewpoint throughout, thus eliminating the potential for cold-end corrosion.

