

ANGUIL

Committed to Energy Recovery.

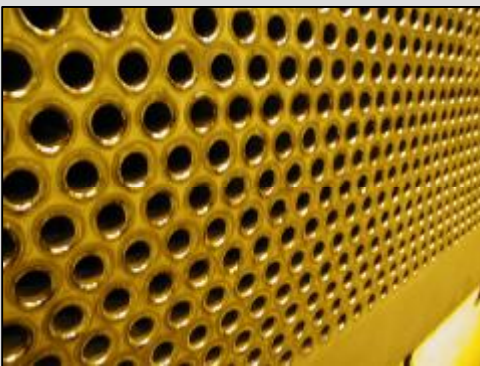
Heat & Power Products:

Shell & Tube Heat Exchanger



Practical Applications

- Recover exhaust stack heat for use in industrial ovens and dryers
- Recover exhaust stack heat for other plant and/or process heating applications
- Upgrade Heat Efficiency of existing VOC control equipment



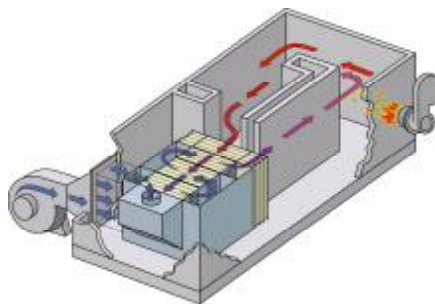
For decades, reducing the operating cost of air pollution control systems has been a driving force in the development of new control technologies. Advancements have been made to both air pollution control systems and the way these systems interact with production equipment. Every energy demand is unique, as is every energy-efficiency improvement possibility. At Anguil, our track record includes an ability to blend time-tested, standard products with innovative engineered solutions. Some of the same strategies we've developed to drive down the operating cost of pollution control equipment can be applied throughout your plant to improve your bottom line.

One example of this is Anguil's Shell & Tube Heat Exchanger. For over 25 years Anguil's Shell & Tube Heat Exchanger has played a major role in helping customers achieve both their VOC Destruction Efficiency and Energy Efficiency goals by providing heat recovery efficiencies of up to 75%

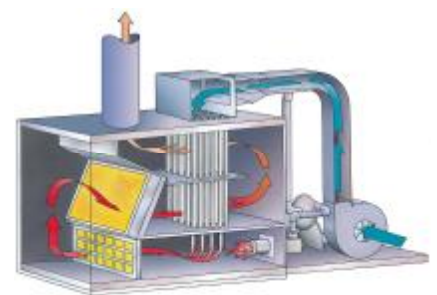
How the Shell & Tube Heat Exchanger Works

All Air-to-Air Heat Exchangers are designed to transfer heat or energy from one air stream to another. In the Shell & Tube Heat Exchanger design, one air stream passes through the inside of a set of tubes, called the "tube side", while the other air stream passes over the outside of the tubes, called the "shell side". Heat is transferred from the hotter air stream to the cooler air stream through the tube wall, while the two streams never mix.

Traditionally, heat exchangers have played a critical role in Recuperative Oxidizer designs – both Thermal and Catalytic. The hot, treated air is used to preheat the incoming process air, cutting down on the fuel needed to raise the process exhaust air to oxidation temperatures, thus saving energy.



3-Pass HX in Thermal Oxidizer



2-Pass HX in Catalytic Oxidizer

Over the years, heat exchangers have also been applied "outside the box". For example, many companies with operating systems similar to those diagrammed above have retrofitted another stand-alone heat exchanger to the exhaust stack. This application is often called a "Secondary Heat Exchanger" and can be used to heat fresh air for return to production ovens or dryers or simply as plant make-up air in cold winter months.

ANGUIL

Innovative Heat Recovery Solutions for Industry.

Design Factors:

The critical design factors for an air-to-air heat exchanger application are:

- The airflow rate of each air stream
- The temperature of each air stream
- The permissible pressure drop of each air stream
- The desired heat to be transferred or the air temp. exiting the heat exchanger

Anguil will review this information and analyze your application with our Heat Exchanger Performance Modeling Program. This program allows us to:

- Model temperatures from ambient up to 1,800°F (980°C)
- Model airflow rates from 100 to 100,000 SCFM
- Perform a boundary layer analysis for your application
- Adjust the plate thickness and spacing of your heat exchanger to maximize performance.

Standard and Custom Designs

Based upon the results of Performance Modeling, the best fit for your application may be one of our standard designs:

SPECIFICATIONS FOR STANDARD HEAT EXCHANGER MODULES

Tube Length:	4ft.	8ft.
Pressure Drop (tube side):	4"wc	4-6"wc
Pressure Drop (shell side):	4"wc	4"wc
Effectiveness:	50%	65%

Or, a customized design can easily be developed based upon your pressure drop or space constraints. All designs can come as bare tube bundles or as a complete insulated housing with inlet and outlet flanges.

Materials Selection

Typical materials of construction for Anguil's Shell and Tube Heat Exchanger are outlined in the table below. On some occasions a process stream is sufficiently corrosive that conventional stainless steels are inadequate because they will not

STANDARD MATERIAL SPECIFICATIONS

Material	Typically Specified For:
304 SS	Non corrosive applications up to 1200°F (650°C)
316 SS	Chloride corrosion resistance up to 1200°F (650°C)
321 SS	Non corrosive applications up to 1800°F (980°C)
309 SS	Additional temperature resistance
Hastelloy	Specialty alloy for corrosive airstreams
Other Alloys	254 SMO, AL6XN, 600 & 800 Alloy, 2205 Duplex, and others available upon request

Contact Anguil for an application data sheet. With the data we will provide equipment recommendations, costs and energy savings.

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DID YOU KNOW?

Anguil has designed and supplied hundreds of innovative, cost-effective solutions for customers in search of greater heat and power efficiency, either to augment their pollution control systems or as stand-alone energy cost reductions. This is particularly valuable experience in this time of unstable and rising fuel costs.



Shell & Tube Bundle Only



Packaged Unit Complete with Insulated Housing