

Pros and Cons of Air-to-Air Heat Exchangers

What are Air-to-Air Heat Exchangers?

When energy transfers from one piece of equipment to another, or even from one kind of energy to another, at least a portion of that energy transitions to heat. Air-to-air heat exchangers enable the transfer of thermal energy, exchanging heat between a minimum of two environments of different temperatures. These exchangers use a working fluid like liquid or gas as well as a working surface, with heat transfer occurring between them through a crossflow or a cross-counterflow air stream movement without actually mixing them.

Heat exchangers recover wasted heat from equipment like ovens, dryers, and incinerators and circulate it around tubes containing fresh, cool air. The tubes have thin walls, facilitating heat transfer between the exhaust air and the cooler air, efficiently preheating the cooler air for use elsewhere in a system for more environmentally friendly operations.

Applications of Air-to-Air Heat Exchangers



Automotive



Air Pollution



Food & Beverage Production



Mining & Minerals



Metals & Surface Finishing

Advantages

Energy Efficiency

Air-to-air heat exchangers recover energy by capitalizing on exhaust airstreams, wasted or latent heat, and passive cooling without running any power.

Cost Efficiency

Heat exchangers are more cost-efficient for thermal management in an enclosed space than other cooling equipment like air conditioners.

Clean Indoor Air Quality

In addition to removing pollutants and excess moisture from the air, heat exchangers also effectively eliminate foul smells.

Application Versatility

Heat exchangers can be utilized in almost every manufacturing industry.

Disadvantages

Leaks & Pressure Drops

When leaks do develop, allowing two airstreams to mix through a hole in the exchanger, they can be hard to fix, often requiring a full deconstruction.

Temperature Limitations

Air-to-air heat exchangers can only function in environments where the external air temperature is less than the system's internal maximum operational temperature.

Customized Solutions from PRE-heat

Air-to-air heat exchangers are viable options for improving heating and cooling efficiency. By understanding the benefits and drawbacks, you can decide whether or not a heat exchanger is the right solution for your needs.

The team at PRE-heat, Inc. can help. For over four decades, PRE-heat has designed and manufactured customized air-to-air heat exchangers as well as packaged heat recovery systems. If you're interested in learning more about air-to-air heat exchangers or would like to request a quote for your operation, contact us today.