Advanced Air® Heat Exchanger

The Advanced Air® Heat Exchanger is the most recent innovation by Thermoplastic Engineering in energy savings, in some cases cutting energy costs by 40%.

The Advanced Air® Heat Exchanger system saves energy by transferring up to 60% of the heat from exhaust air to the incoming air. Pre-conditioning the incoming air through the Advanced Air® Heat Exchanger means that the cost of heat/cooling the air through the Air Handling Unit is reduced greatly.

TPE's Advanced Air® heat exchanger system is built without any moving parts, entirely from corrosion resistant plastics - meaning it will last longer than similar metal constructions. It is innovatively built in such a way that the two airstreams are kept separate, the supply air is passed twice over the exhaust air, allowing for a greater transfer of heat/cooling to the incoming airstream.

The Advanced Air® Heat Exchanger is designed and built in New Zealand to the highest safety standards even in the event of damage to the system. The Advanced Air® Heat Exchanger maintains an air pressure differential between supply and exhaust air so that even in the case of severe damage the exhaust air will never contaminate supply air.

Key features

- Saves energy by transferring up to 60% of the heat from exhaust air to incoming air.
- Can pay for itself in as little as a year and a half in optimal conditions.
- Built without any moving parts, entirely from corrosion resistant plastics – meaning it will last longer that similar metal constructions.
- Can be used with corrosive fume cupboard exhaust fumes without risk of damage to heat exchanger.
- Maintains safe working conditions even in the event of severe damage to the Advanced Air® Heat Exchanger.
- Expected lifetime savings: $10,000 to $20,000 per unit in optimal conditions.

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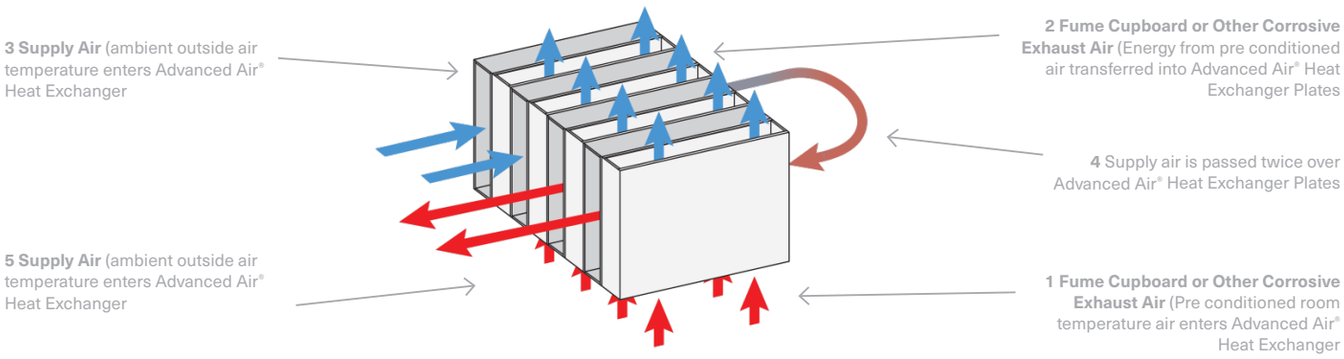
TPE

How the Advanced Air® Heat Exchanger works



Unique features and lifetime value

The Advanced Air® Heat Exchanger is unique in that it can be installed in situations where corrosive fumes are involved without the risk of damage to the heat exchanger. A typical example of this is exhaust fumes from fume cupboards in a laboratory, environments such as this will often corrode similar metal constructions. The design of the Advanced Air® Heat Exchanger layout also means that even in the unlikely event of severe damage to the unit, the corrosive fumes will never be released into the laboratory supply air.

An energy saving strategy is completed with the addition of the Advanced Air® Heat Exchanger system, which can pay for itself in energy savings in just over a year and a half in optimal conditions. TPE's innovative design also increases the expected lifetime of a heat exchange system meaning the lifetime savings (after covering costs) stretch far beyond that of standard designs. Our calculations forecast lifetime savings between $10,000 and $20,000 per unit in optimal conditions.

Advanced Air® Heat Exchanger effectiveness test

After simulating a variety of real-world laboratory conditions in our test facility, we tested the effectiveness of the Advanced Air® Heat Exchanger design at a range of airflow values, representing performance on a 2 metre fume cupboard. The results of this testing are shown to the right.

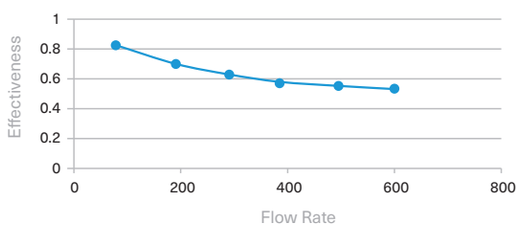
The results show the exchanger performs best at low flow rates, but even with the cupboard fully open, at maximum flow, over half the sensible heat in the exhaust stream is recovered by the Advanced Air® Heat Exchanger.

NOTE: The Advanced Air® Heat Exchanger is designed and built in New Zealand to relevant Fume Cupboard standards (NZS 2243.8-2014).

Heat Exchanger effectiveness vs. flow rate

Effectiveness	Average Flow rates (l/s)
0.5315	600
0.553	495
0.58	385
0.629	291.4
0.697	191
0.826	78.2

Effectiveness vs flow rate



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