HeatMatrix
TURNS WASTE HEAT INTO PROFIT

Kennisdossier RVO

25% extra heat recovery on dryers

Drying processes require significant amounts of heat to evaporate water from products. The vapor laden exhaust air still contains large quantities of energy. Up to 25% of the total energy consumed can be recovered when the sensible heat from the hot exhaust stream is transferred to the cold air inlet stream.

Common challenges when recovering dryer waste heat

Whilst the potential savings are worthwhile, implementation of heat recovery may face a number of challenges:

- Concerns about corrosion due to the presence of moisture or possibly acids
- Fouling concerns
- Complexity of developing and implementing the heat recovery

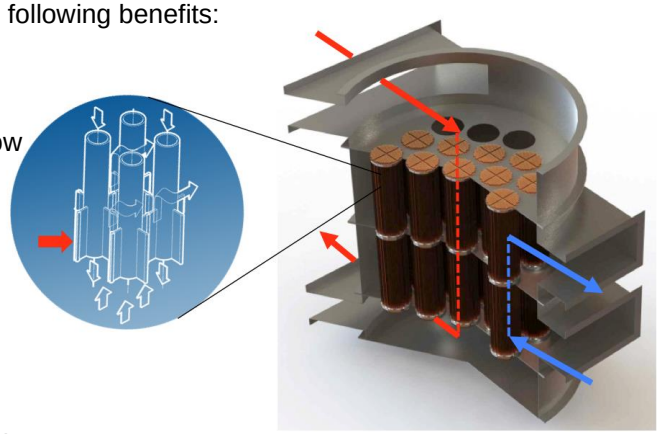
The HeatMatrix solution

Polymer based heat exchange technology

HeatMatrix Group offers a proven **polymer-based** heat exchange technology for drying processes, that allows **recovery of heat from fouling and/or corrosive** exhaust air from dryers, to warm up the fresh drying air. Our polymers are corrosion-resistant. The polymer delays fouling deposition through low stickiness. The polymer heat exchanger is designed for easy cleaning.

The HeatMatrix **polymer-based** heat exchangers offer the following benefits:

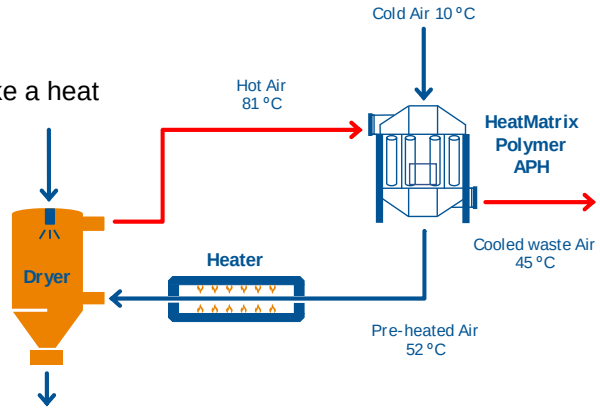
- Corrosion/fouling resistance
- Flows from 5,000 to over 500,000 kg/hr
- Enhanced heat recovery through 100% counter-flow
- Small footprint
- Easy, light-weight installation
- Easy maintenance and cleaning



Proven 5-step approach for heat recovery projects

How do you start a heat recovery project from concept to implementation? Based on our long experience in heat recovery, we have developed a stepwise approach, that ensures that all relevant aspects are considered and options are evaluated. The 5-step plan makes the complexity manageable:

Step 1: Heat balance: Collect and validate the process data, to make a heat balance over the dryer.
Step 2: Selection of the optimal technology, based on the operating conditions and the layout of the existing system.
Step 3: Calculate the saving potential and determine whether there is a viable project.
Step 4: Perform a concept design, detailing the installation and the financial overview for the investment decision
Step 5: Execute the project: Acquisition of the necessary components, installation, commissioning and validation



Our heat recovery engineers can help with each step. Steps 1 through 3 are executed free of charge to make sure you have a viable business case before you start spending money. We will do the engineering and finally deliver a working system as a turnkey project. For more information, please visit: https://heatmatrixgroup.com

Case studies

Our heat recovery engineers have solved the challenges on many dryers in different applications.

Case study: Spray dryer in the food industry

At a production site in the Netherlands, proteins are dried in spray dryers. Hot exhaust air was vented off without any heat recovery. The operator was facing two challenges in recovering the waste heat:
1. The proteins tend to stick, leading to fouling and clogging.
2. The system, being operated in the food industry needs to be cleaned (CIP), using an alkaline solution.

HeatMatrix designed and installed a solution that mitigates fouling build-up, through its design combined with rigorous washing program.

An efficiency improvement of 25 % (288 kw) was obtained by cooling the exhaust gas from 81 °C to 45 °C, by warming the fresh drying air from 10 to 52 °C. The overall pay-back time for this project was around 5 years.

Exhaust gas flow	**27,140 kg/hr**
Exhaust gas inlet temperature	**81 °C**
Exhaust gas outlet temperature	**45 °C**
Air inlet temperature	**10 °C**
Air outlet temperature	**52 °C**
Duty	**288 kW**
Energy savings (@ 0.50 €/m^3)	**132,700 €/yr**
Avoided yearly CO_2 emission	**512 ton/yr**

Case study: PVC spray dryer

A producer of PVC powder was facing excessive energy costs on their product dryers. The presence of corrosive elements, combined with the fouling nature of the exhaust gas had stopped any recovery initiatives. The HeatMatrix APH technology brought a solution.

An efficiency improvement of 8 % (169 kw) was obtained by cooling and partially condensing the laden exhaust gas temperature from 59 °C to 56 °C, by warming the fresh drying air from 10 to 56 °C. The overall pay-back time for this project was less than 5 years.

Exhaust gas flow	**13,200 kg/hr**
Exhaust gas inlet temperature	**59 °C**
Exhaust gas outlet temperature	**56 °C**
Air inlet temperature	**10 °C**
Air outlet temperature	**56 °C**
Duty	**169 kW**
Energy savings (@ 0.50 €/m^3)	**69,200 €/yr**
Avoided yearly CO_2 emission	**267 ton/yr**

Disclaimer

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