PROJECT REPORT: BRUZAHOLMS

[redacted]

Waste Heat Recovery at Bruzaholms

2025-05-07

INTRODUCTION

Bruzaholms, located in Småland, is one of Sweden's oldest foundries, with roots dating back to the 1660s. Today, it is one of the world's leading manufacturers of wear- and heat-resistant castings.

Foundry work and metal processing are energy-intensive activities, but what many don't know is that approximately 25% of the total energy usage at a sand-casting foundry goes towards heating and ventilating the premises to maintain a good working environment.*

*Source: Sommarin and Arvidsson (2011), Thermal Storage for Energy-Intensive SMEs with a Focus on Swedish Foundries, Report No. 2011006, Swerea SWECAST.

Although many processes within a foundry emit heat, recovering this energy has traditionally been difficult due to the presence of high levels of steam, particles, and binding agents in the air, which render conventional heat exchangers unusable.

In spring 2025, Bruzaholms decided to install the Swedish-developed heat exchanger, Lepido, in a hot airflow from the sand cooler. The objective was to determine whether this technology could reliably recover waste heat from their own process, thereby reducing energy use and fossil CO_2 emissions.

After three months of initial operation, all data indicate that they are succeeding in their mission.

02

The challenge

Various processes within the foundry generate hot airflows where energy could be used to preheat replacement air supplied to the facility. The challenge lies in the air's high content of particles, moisture, and binders. Bruzaholms has previously tested conventional heat exchangers in this environment, but was forced to remove them due to clogging and the need for weekly maintenance.

Photos of the previous system, now dismantled due to recurring clogging and frequent maintenance requirements.

Sollution

Lepido is a Swedish-developed heat exchanger specifically designed for dirty exhaust air. It is used to recover waste heat from various polluted processes such as food production, industrial laundries, drying plants, and foundries. Lepido requires no pre-filtration and instead uses a patented coil-based design (no fins) that allows particles to pass through the exchanger without becoming trapped.

The recovered heat can be used to preheat air or water, which in turn can be used for space heating or reintegrated into the process.

Lepido by Enjay – a heat exchanger specifically developed for polluted exhaust air.

PROJECT DATA

03

In this project, Lepido was installed in a duct from the sand reclamation system, with an airflow of approximately 4 m^3/s and a temperature of 30°C.

The heat recovered by Lepido reduces the system's power demand by 95 kW. In this project, that covers 85% of the system's total heating/energy needs. Heating was previously provided by an oil-fired boiler, so every recovered kilowatt hour reduces fossil CO_2 emissions by 750 grams.*

The estimated annual heat recovery in this project is 150,000 kWh, resulting in a reduction of fossil CO_2 emissions by 90 tons per year.

Lepido installed on-site at Bruzaholms.

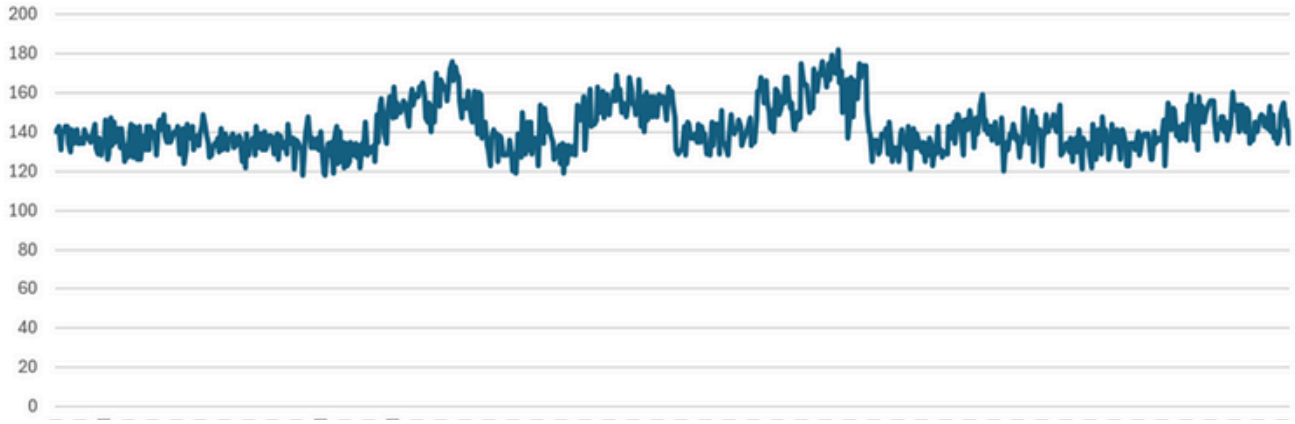
* Comparing CO_2 emissions from different energy sources 2025

OPERATIONS

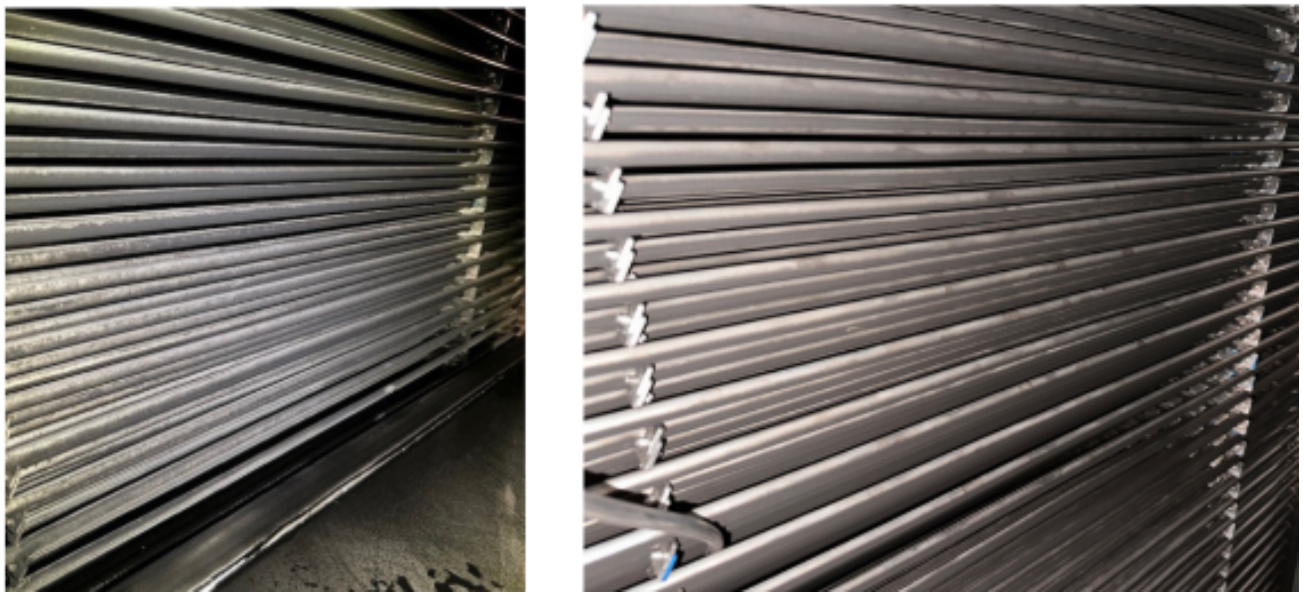
04

It's no surprise that recovered heat reduces emissions. The key question is how reliable the system is in operation, considering the previous solution required maintenance every seven days.
After three months of operation (February–April 2025), several on-site inspections have found no need for cleaning or any other maintenance of the heat exchanger. This is further supported by the virtually unchanged pressure drop across the system.

Photo taken during inspection after approx. 4 weeks of operation. No cleaning needed.
Photo taken during inspection after approx. 12 weeks of operation. No cleaning needed.



Data points showing consistent pressure drop over time (1 month of data).



Photos taken during inspection after approx. 4 weeks (left) and 12 weeks (right) of operation.
No cleaning needed.

CONCLUSION 5

All available data indicate that Bruzaholms has found a reliable way to reduce both energy costs and fossil CO_2 emissions by recovering waste heat from its sand cooling process.

> "Enjay, through Lepido, has enabled us to recover waste heat from our sand preparation process. Unlike previous systems, it can handle the dusty and humid air over extended periods, which has led to significant energy savings and a substantial reduction in maintenance. We have not yet run it through a full annual cycle, but the results so far are very promising."

Mats Ekegren, Technical Director Bruzaholms

Jesper Wirén & Nils Lekeberg, founders of Enjay

Questions or requests

Derbyvägen 20, 212 35, Malmoe Sweden

+46 4012 33 30

www.enjaysystems.com

enquiries@enjaysystems.com

ENJAY