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Laundry + Dry-cleaning Practices

The Vesuv-S by Fercher (Villach/Austria)

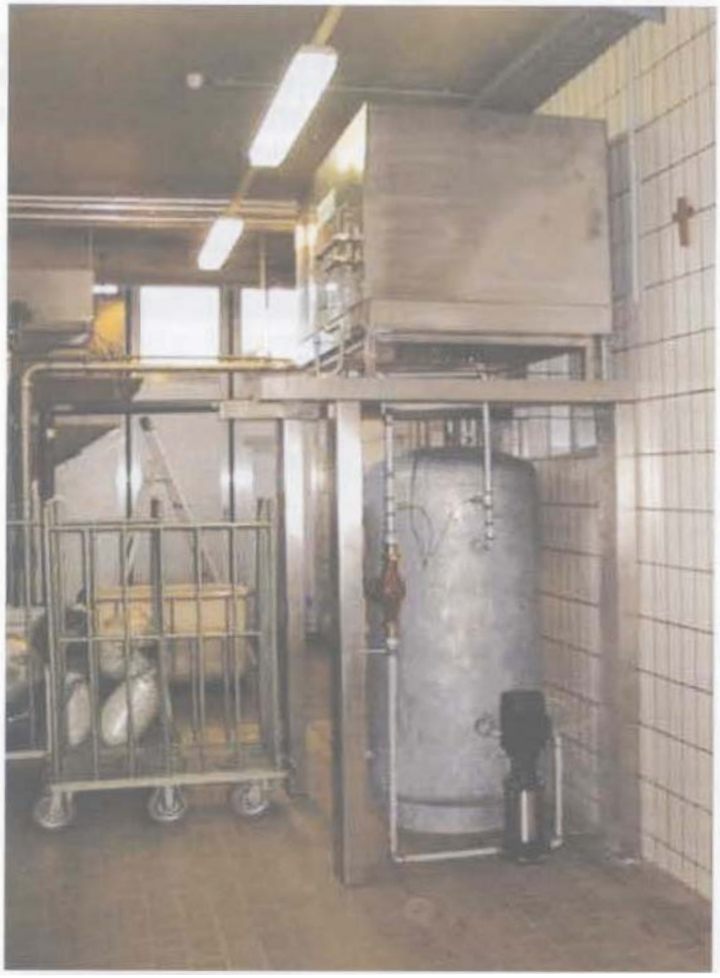
Saving with VESUV

The Fercher Company located in Villach/Austria developed its wastewater heat exchanger "Vesuv-S" with small and medium sized industrial laundries in mind. The system has been running for awhile now in the laundry of the hospital in Steyr. During regular operations with the Vesuv-S the hospital saves about 125 m³ (4414 ft³) in gas on a daily basis.

The average payback period for the Vesuv-S is about two years, explains Josef Fercher, a graduate engineer in mechanical engineering. The outer measurements are 1,800 x 1,075 x 1,310 mm (length, width and height) and it is possible to inspect the inside of the heat exchanger at any time due to its construction with removable covers, which protect against splash water and odors while closed.

The inside of the Vesuv-S features four so-called absorber plates, which make up the actual heat exchanger unit. “The wastewater runs downward without pressure as a thin film flow on a free surface warming up the absorber plate”, Fercher explains. A special drip profile on the absorber further causes additional swirling of the wastewater, creating an even cool down according to Fercher.

“The absorber plates feature flat pressed pipes. Cold freshwater runs through them, which is thereby warmed up.” Due to the fact that the wastewater does not run in narrow pipes, but on a open surface, there is no danger of clogging as with many of the competition's products for example with plate heat exchangers, so Fercher. “The heat exchanger works maintenance free during its whole lifetime.”



The Fercher Wastewater Heat Exchanger Type Vesuv-S (above) and the buffer tank below.

Space saving

To save space in the laundry, the Vesuv was installed on top of a stainless steel wall bracket at an appropriate height in the hospital laundry in Steyr and the buffer tank and the circulation pump were placed below. “Fercher Wastewater Heat Exchangers can even be ceiling mounted due to their low weight”, so Fercher.

The route of the wastewater

Wastewater travels from the automated washing system with an average of 55° C (131 °F) into the wastewater basin placed below. From there, the wastewater is pumped into the Vesuv Wastewater Heat Exchanger. Inside the wastewater distribution basin in the upper part of the Vesuv, wastewater is distributed evenly to the two absorber plate levels. During this process the wastewater is cooled down and transfers heat to the cold freshwater traveling through the pipes inside the absorber plates using the counter flow principle. The cooled down wastewater then follows the usual road into the sewer cooled down by about 20° C (68° F).

The route of the freshwater

Freshwater is pumped with an average temperature of 15° C (59° F) into the Vesuv Heat Exchanger. It then runs through the flat pressed absorber plate pipes in a counter stream to the wastewater upwards. Hot wastewater warms the freshwater to about 35° C (95° F) on average. The preheated freshwater runs back into the buffer tank. Due to this circulation, the buffer tank becomes continuously warmer until the automated washing system takes out water again and cold freshwater streams into the buffer tank.

“The advantage of this is that with correctly proportioned buffer tank heat can even be extracted from the wastewater if this is not immediately needed”, Fercher explains.

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Thus, freshwater reaches the automated washing system already preheated from the buffer tank. Fercher: ”This saves energy for heating up to the required washing temperature. A further advantage is the thereby shortened washing cycle time. Therefore, the heat recovery also caused an increase in the washing performance.”

Heating cost savings

Performance of the wastewater heat exchanger is dependent on the respective operating conditions. An average wastewater and freshwater amount of about 5.56 m^3/h and a freshwater temperature increase by 20° C (68° F) result in a continuous output of 128 kW. At normal operation this ensures savings of 125m^3 to the laundry per day.

Measurements

From the beginning of the project “Fercher Moderne Energietechnik“ analyzed the temperature relations inside the laundry using a data log and calculated savings computations. “This is an important decision making factor for the client”, according to Fercher. At the end of the project the most important water temperatures were measured again to verify the promised output of the heat exchanger. Further, a heat meter was installed, which displays the output as well as the saved heat amount for the Vesuv using the flow rate and the temperature difference at the inlet and outlet for the freshwater. This way, the client can examine at any time that the heat exchanger still functions to the desired extend without even opening the unit.

The inside of the Vesus-S: Wastewater flows down over the open surface without pressure warming up the absorber plates