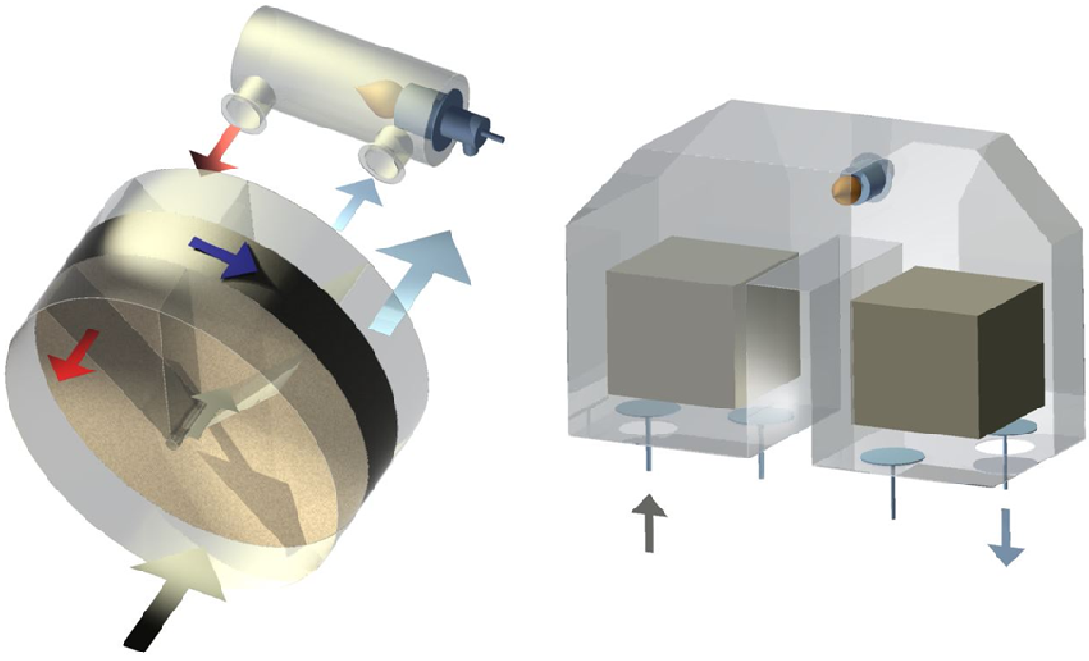
Filtrační Technika

Zeolite rotor concentrator + RTO

The Alltub company, a world leader in the production and delivery of aluminium tubes for packaging pharmaceutical, cosmetic, food, and industrial products, needed to resolve emissions from its production lines for painting aluminium tubes.

The waste air from various sections of the production lines was divided according to process parameters into hot stream and cold stream. The cold stream, with a flow of 10,000 Nm3/hour, temperature of 30°C, and VOC concentration of approximately 400 mg/Nm^3, featured a very high solid compound content – over-spraying. The hot stream had a flow of 6,000 Nm3/hour, temperature of 130°C, and concentration of up to 400 mg/Nm^3. The objective was to design a system with low operation costs and high reliability.

To resolve the issue, Filtrační technika proposed a combination of the Zeolite rotor concentrator combined with the regenerative thermal oxidation (RTO) system. The cold stream is introduced into the zeolite rotor concentrator and the hot stream, together with desorption air, is cleaned in the RTO.



Waste air (cold stream) passes through the rotor where, in the first part, adsorption of VOC takes place on the hydrophobic zeolite adsorbent, followed by displacement of VOC into a small heated air stream. The concentrate is then treated in a suitably chosen regenerative thermal oxidation (RTO) system. The rotor therefore ensures increasing concentrations of

large volumes of air with low concentrations of volatile compounds. Due to the high content of particular compounds, an automatic pulse jet filter is included before the rotor concentrator to protect the zeolite.

The waste gas of the hot stream, together with the desorption air brought into the RTO, passes through the ceramic bed into the oxidation chamber, where the oxidation of volatile organic compounds takes place. Hot clean air releases thermal energy while passing through the ceramic bed of the heat exchanger. This energy is recovered and used further us in the system, considerably reducing fuel consumption and consequently operating costs as well.

Further decreases in operating costs were obtained from the installation of the recuperation heat exchanger on the outlet from the RTO which returned heat back to the plant.

The turn-key delivery of the equipment was successfully integrated into the manufacturing process, which now meets the strict emission limits.