Smaller and cheaper oxidizers could be used by concentrating the VOCs in smaller air volumes, says Anguil

Time to concentrate

While thermal oxidisers have treated VOCs from canmaking plants for decades, concentrator systems could offer higher efficiences. Mónica Higuera reports

Tightening controls in the US for the capture and control of volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) in canmaking plants have prompted specialists in the field to offer technologies that augment the current use of regenerative or recuperative thermal oxidisers.

While these offer high energy recovery opportunities, tougher Maximum Attainable Control Technologies (MACTs) in North America are making it necessary for plant managers consider the use of both permanent total enclosures (PTEs) for process machines such as coaters to ensure 100 percent capture.

This, according to Chris Anguil of Anguil Environmental Systems, a Milwaukee, Wisconsin-based supplier of air pollution control equipment, will enable user to attain very high rates of overall control, meeting the needs of regulators in reducing VOC emissions but will offer users flexibility with permits.

Pressure on operating costs is also prompting closer attention on getting higher efficiencies from oxidizers which, in the canmaking industry, have to cope with high volumes of exhaust air with low concentrations of VOCs, typically close to ambient temperature.

According to Anguil, one solution to this is the use of concentrators. These increase the levels of VOCs in lower volumes of exhaust air.

"The mechanical benefit to a concentrator system is that ambient capture air is not mixed directly with oven exhaust air which has historically caused serious condensation problems," Anguil says. "The fact that VOCs are recovered from the concentrator at elevated, rather than ambient temperatures, helps alleviate the condensation issue."

VOC concentrator systems are typically based upon a medium such as zeolite that will absorb VOCs and HAPs from an exhaust air stream at minimum average efficiencies of 96 percent, says Anguil.

"Then periodically the medium is removed from the exhaust air stream and the collected VOCs are stripped back off of the medium with a high temperature 'desorption air' stream. Depending on the concentrator medium selected, typical desorption air temperatures range from 160 to 380 deg F.

"The true benefit to concentrator systems lies in the fact that the desorption air stream can be 8 to 15 times less in volume than the process exhaust stream originally treated. For example, 15,000 scfm at 50ppm from a wet end enclosure of a wicket oven would be reduced down to 1,000 scfm of airflow and increased VOC concentration," he says.

The company's rotor concentrator/oxidiser is claimed to often be the most cost-effective technology for processing high volume, low VOC concentration air streams.

Together with secondary heat exchangers, these systems are said to be playing a crucial role in energy conservation projects being carried out not only because of more stringent requirements for additional VOC capture, but due to increased fuel costs.

Demand for energy conservation and heat recovery projects on existing systems has risen. Anguil says there's more demand for secondary heat recovery systems that recover waste heat from ovens, dryers or any other plant heating applications.

"Rising fuel costs have increased our aftermarket, upgrade and service business dramatically. Customers are looking for any way to reduce the operating costs of their air pollution control systems.

"We design and build custom or standard air-to-air heat exchangers (shell-and-tube style and plate type). The recovered heat, up to 80 percent, can be used for processes such as base loading ovens or for comfort heat during the winter months," he says.

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