# The Right RTO Media For Ethanol Refining

By Paul SimsT
he nascent rise in environmentally friendly fuel awareness has increased both consumer and political demand for ethanol, generating a multi-billion dollar global industry. However, ?the dynamics that drive this growth are accompanied by the scrutiny of environmental watchdogs who are keen to ensure that the ethanol production process is environmentally friendly. This scrutiny increases pressure on ethanol producers to be efficient, and ensure that their practices are non-polluting.

For ethanol refiners, this means efficiently removing volatile organic compounds (VOCs) from their gaseous waste streams, which requires regenerative thermal oxidizers (RTOs) to chemically catalyze the harmful VOCs into harmless compounds, like water and inert gases. Exhaust gases pass through the RTO, which is filled with ceramic media. The media are heated sufficiently to catalyze the VOCs into these harmless byproducts.

At the core of these RTOs is a bed of heat transfer media—workhorse devices that maintain optimal temperature and provide maximized surface area for the process of oxidizing VOCs most efficiently. Many ethanol producers opt for the type of media that comes bundled with their RTO when it was first installed, but some times this is not the most efficient solution for ethanol production. As production demand increases and operating expenses rise, existing plants are going to be under pressure to increase capacity and output, which is going to strain RTOs. Ethanol plant owners and operators can improve the efficiency and uptime of their RTOs by researching different media options.

While RTOs have become an industry standard for VOC control in ethanol production, the media used can vary. Several factors can affect performance, including physical shape, ability to maintain the optimal catalytic temperature, resistance to particulate buildup and durability against corrosives. Additionally, the physical shape of the media should provide enough open area to maintain optimal heating, thereby avoiding pressure drop.

Resistance to corrosives is also an imperative feature of any RTO media used in ethanol production. Since ethanol-refining exhaust gases are very acidic and corrosive to metal catalysts, ceramic catalysts are typically used. Standard ceramic or high-performance glaze-resistant construction provides longer product life in applications at risk for alkali glazing.

In response to these conditions and requirements, media such as FLEXISADDLE™ LPD® (low-pressure drop) random packing by Koch Knight LLC offers a unique shape that allows gases to swirl evenly around the surface of the catalyst, increasing surface-to-gas exposure, improving catalytic efficiency and resisting the particulate buildup that results in fouling.

The high open area and aerodynamic three-rib structure works to improve heat transfer through more efficient use of surface area; it also limits nesting. This design results in a more than 20 percent lower pressure drop for the same heat transfer efficiency. This can result in lower fan costs or smaller units.

The company also feels that a three-rib structure limits nesting and withstands rugged chamber loading better than open-design random media. As a result, particulate buildup is reduced by up to 40 percent, which translates into significantly longer operation between burnouts, washouts and changeouts of the media.

With the demand and production of ethanol steadily growing, and operating and maintenance costs under greater strain, overall ethanol production efficiency will become increasingly critical. Ethanol-refining plant owners and operators are now, more than ever, placing a premium on uptime for all facets of production. Given this high-pressure economic environment, owners and operators would be well served to select RTO media that can run for longer cycles and be serviced in shorter periods of time. l ?
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