Improvement of the Oxidation Stability of Edible Oils and Biofuels by De-oxygenation

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The oxidation stability of edible oils as well as vegetable oils used as biofuels can be significantly improved by de-oxygenation using the rotary jet head system. The de-oxygenation process is performed by circulating oil from the bottom of a tank via a pump and re-injecting it into the bulk liquid through the nozzles of an ISO-MIX rotary jet head (RJH) mixer. The RJH is equipped with 4 nozzles which are rotating around two axes – driven by the inlet pressure of the fluid – in such a way that the liquid jets sweep the entire tank volume. Stripping gas in the form of e.g. nitrogen is added on the pressure side of the pump and distributed in the tank by the RJH which is responsible for breaking down bubbles and consequently given a larger specific surface area than would result if the gas was blown directly into the tank.

The process design and results from lab scale and industrial tests will be presented. Oxygen levels below 0.5 ppm have been reached. Also, to sustain the low level of oxygen after processing it is important to inert the bottles, drums, etc. containing the de-oxygenated oil with e.g. nitrogen.