

Oleochemicals – Step into a growing market with Sulzer Chemtech

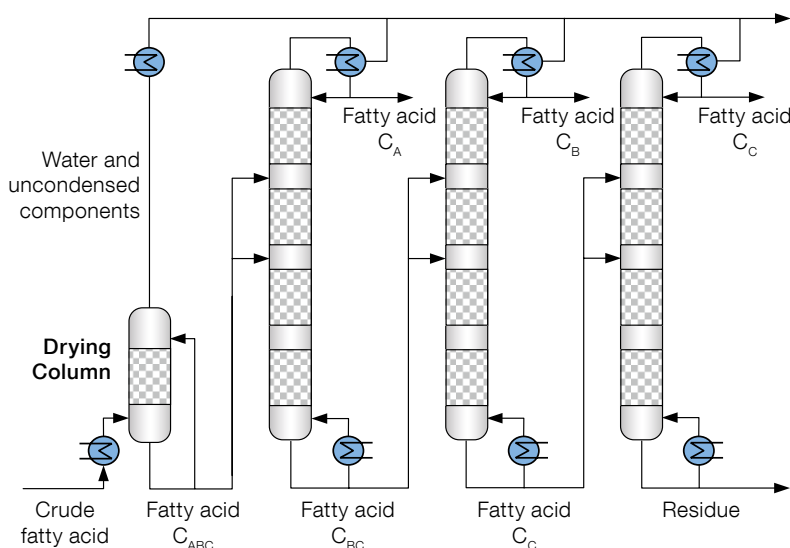


Sulzer Chemtech benefits from decades of experience distilling oleochemicals (fatty acids, fatty alcohols, fatty acid esters). Pilot distillation experiments have been performed in Winterthur (Switzerland) and in-house vapor-liquid-equilibrium (VLE) parameters are available. It is estimated that today more than 500 industrial columns, utilizing Sulzer Chemtech structured packing and internals, are in operation.

Fatty Acid Distillation

Fatty acids are saturated and unsaturated aliphatic carboxylic acids with carbon chain length in the range of C6 up to C24.

Example: palmitic acid,
 $\text{CH}_3 - (\text{CH}_2)_{14} - \text{COOH}$



Multipurpose Fatty Acid Distillation Plant

Distillation of oleochemicals requires attention to the following key features:

- High vacuum
- Low pressure drop
- Low bottom temperature
- Minimum holdup
- Short residence time

Knowledge of the chemical and physical properties of fatty acids is one of the basic prerequisites for industrial manufacturing and technical applications. Thermodynamic data are necessary for the calculation of heat transfer and thermal separation.

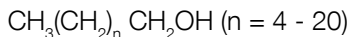
Sulzer Chemtech has the know-how, the extensive experience and the structured packing with internals to ensure the most gentle distillation of fatty acids.

Further specialties in this field are:

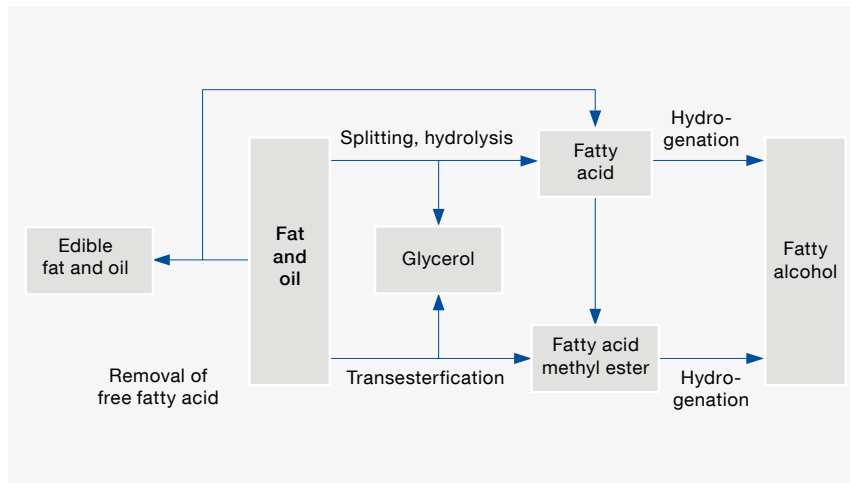
- Multipurpose fatty acid distillation plants
- Separation of $C_{18}' / C_{18}'' / C_{18}'''$
- Liquid / gas side product draw-off
- Pump-around condensers
- Steam generation (condenser heat recovery)

Fatty Alcohol Distillation

Fatty alcohols are aliphatic alcohols with carbon chain lengths between C6 and C22:



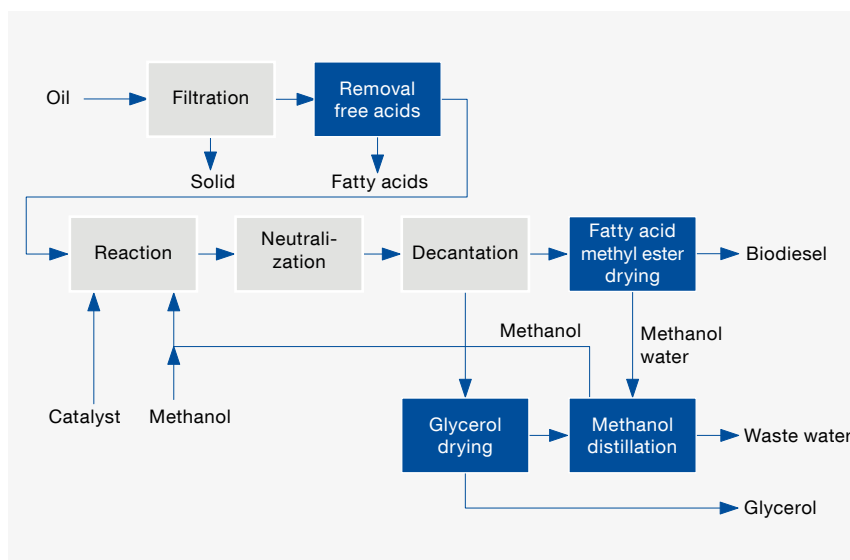
In the oleochemical production of fatty alcohols, molecules never have a uniform carbon chain length. For purification and quality improvement, the fatty alcohol mixture has to be distilled. For this separation and purification, the same high technical demands are required as for the fatty acid distillation.



Overview of Fat and Oil Processes

Biodiesel

To be powered by a renewable fuel is not a dream any longer. The biodiesel process overview shows the field of Sulzer Chemtech activities in the blue boxes.



Biodiesel process

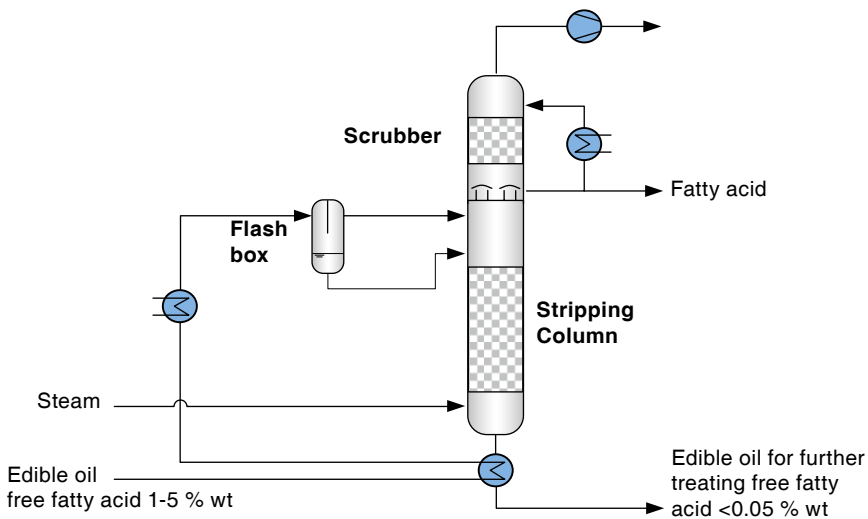
Glycerol

Glycerol ($\text{C}_3\text{H}_8\text{O}_3$), 1,2,3-propanetriol, commonly known as glycerin, is the simplest triol. It is obtained as a byproduct during the conversion of fats and oils to fatty acids and fatty acid methyl esters. Depending on a customer's requirements, glycerol can be purified up to:

- Technical grade by atmospheric drying
- Pharmaceutical grade by vacuum distillation

Edible Fat and Oil Deodorization

Through the use of structured packing, free fatty acids present in vegetable oils must be removed with extreme care. The columns operate at a very low vacuum so that it is of immense importance that the pressure drop in the stripping column is also low. In comparison with a conventional apparatus, steam consumption falls by 70%



Free fatty acid removal for edible and oil treating