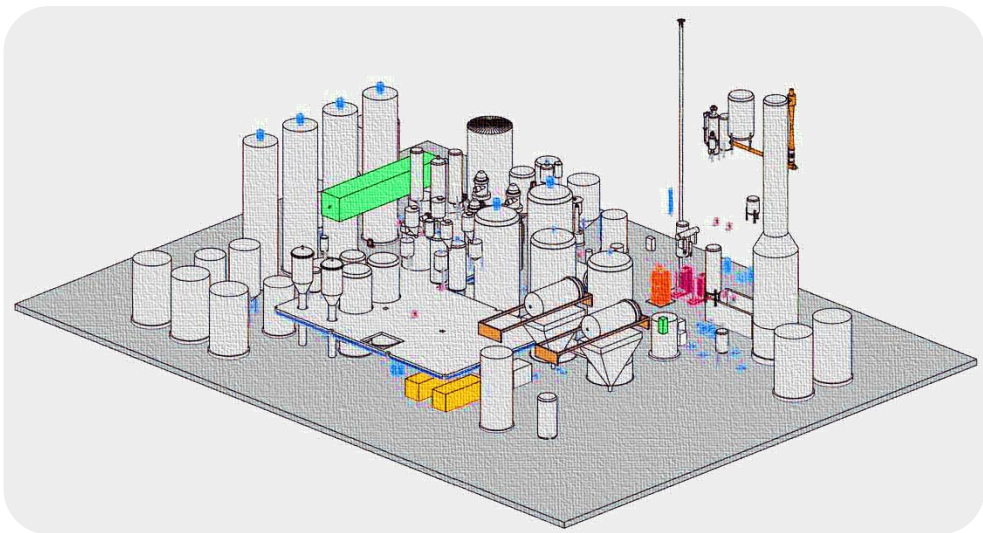


Oleochemicals

Processing Plant



General

Excellent experience gained over the last years on Edible oil refining and oleochemical plants further reinforces our commitment to offer innovative and eco sustainable solutions for both edible and inedible oil processing plants.

Our ability to design in this field is represented in the following pages which show our concepts of single unit or multi purpose unit.

Our specific solutions for specific projects are the activities that are carried out in close collaboration with the customer in order to identify the best applicable technology and optimize investment profitability. This is our best and innovative proposal to our partner. We are actively investing in upgrading and expanding our knowledge, while enhancing our design capabilities.



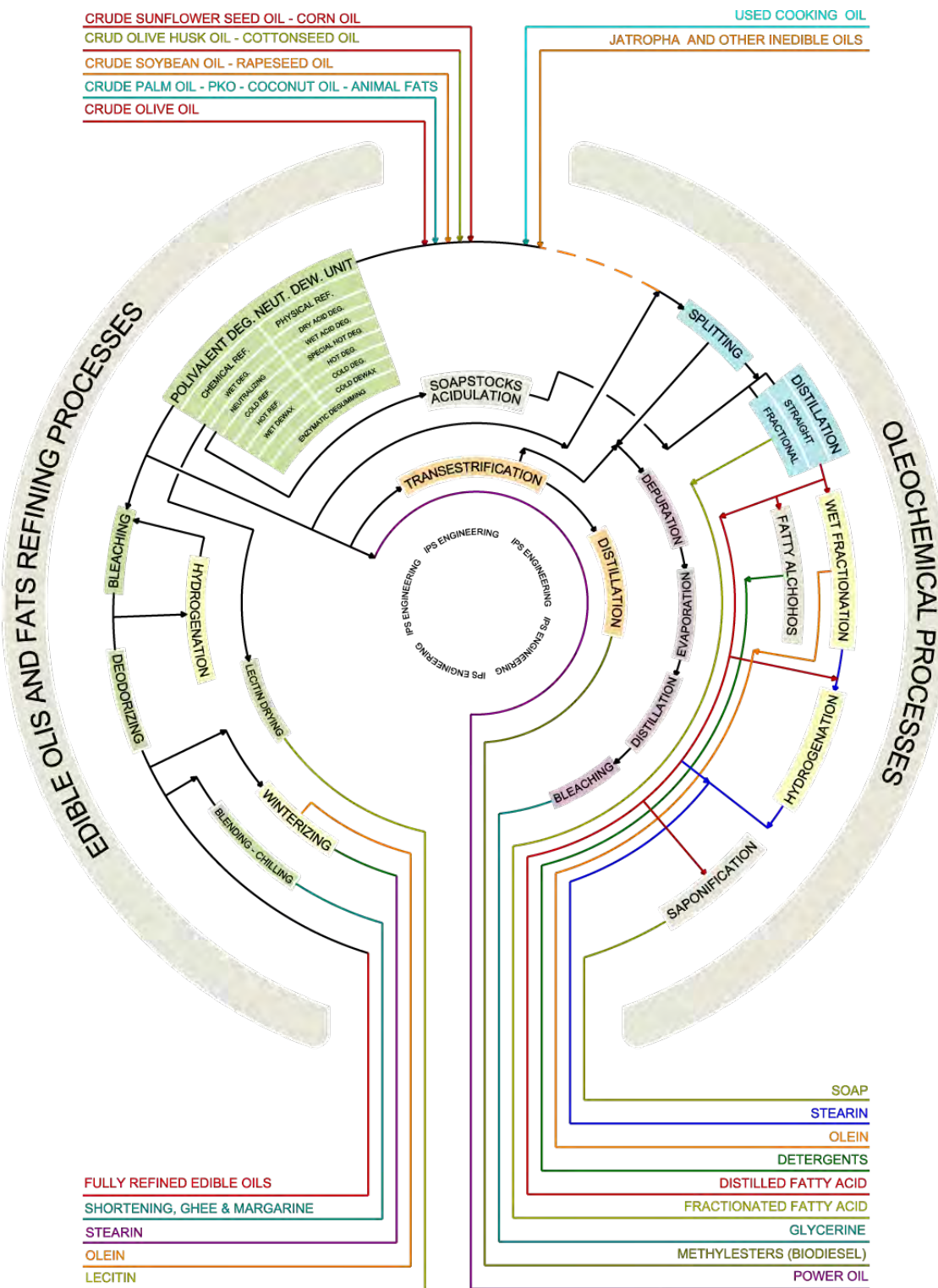
We can develop your idea.



We assist customers in the project development and realization process – from the preliminary research, feasibility study, conceptual design, technology selection, assignment of tasks specification to the detailed engineering design, procurement, construction, commissioning & start-up, maintenance & optimization and personnel training.

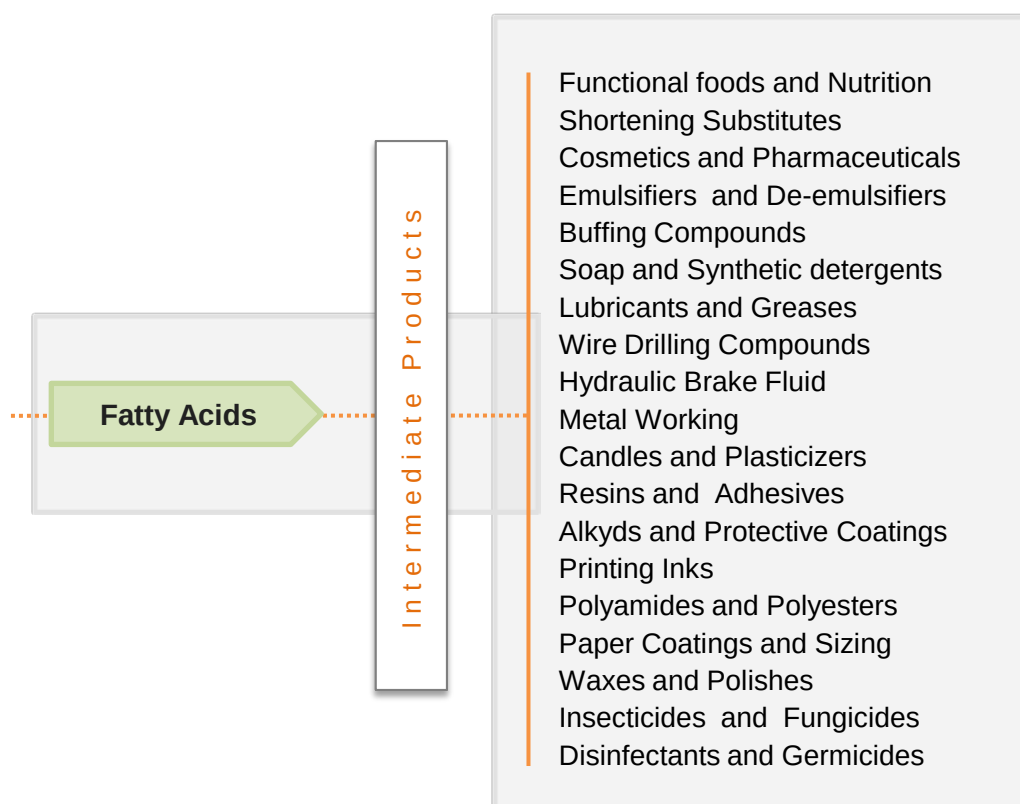
This unique focus allow us to develop services to trigger process improvement, providing a range of " Services to Compete". In this manner, with market conditions ever changing, we offering the engineering services at an extremely affordable price.

Oil & Fat Processing



Oleochemical Process

Fatty acids are widely distributed in nature as components of lipids, both of vegetable and animal origin like liquid (oil) or solid form (fat) and they have long been employed in a very wide range of industrial applications as free fatty acids.



Today, these major derivatives are manufactured by fatty acids or fatty acid methyl esters.

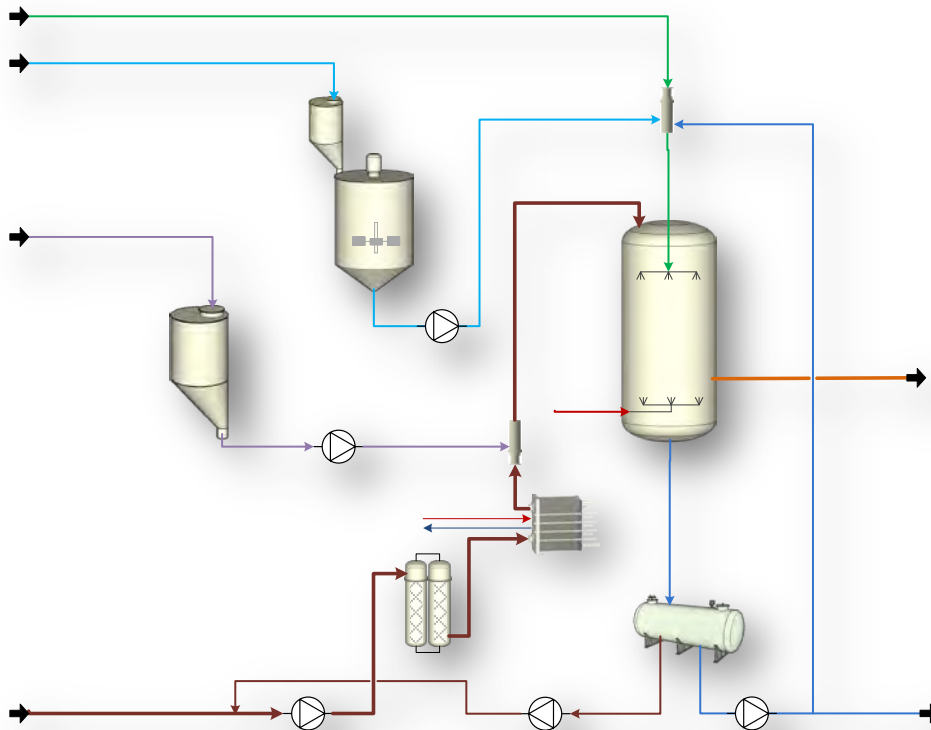
The production of fatty acid generally involves the following main unit operations:

- Pretreatment
- Splitting
- Distillation
- Fractionation

IPS Engineering has a proven experience in the plant design and can provide the best process solutions in this field.

Pretreatment

Before being subjected to splitting, crude commercial fats are sometimes purified by removing troublesome impurities, such as minerals, gums, soaps, and proteins. The normal procedure is to heat the crude fat and then filter it or treat it with a small quantity of sulfuric acid.



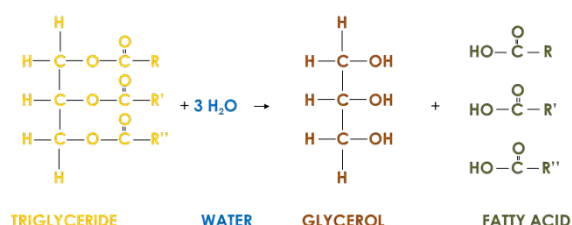
Pretreatment unit block diagram

Capability & Performance

We can supply the unit in batchwise operation for capacity up to 100 t/day. For poor quality oil, the unit is capable to remove at least 80% to 90% of the impurities. Consumption of Sulphuric acid @ 96% is only a few kg/t and consumption of wash water is about 0.2 m³ per ton of oil.

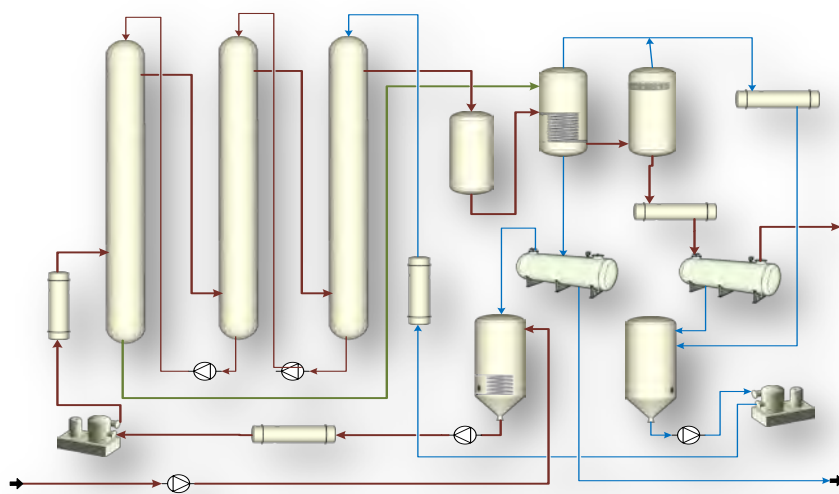
Splitting

The splitting or hydrolysis is carried out in a continuous countercurrent, at medium or high pressure, without catalyst, in multi column or a single tower depending on the production capacity.



The high temperature and pressure used permit short reaction time. Full countercurrent flow of oil and water produces a high degree of splitting

The splitting tower is the heart of the process. Most splitting towers have the same configuration and basically operate the same way. Depending on the capacity, the tower can be 500–1200 mm in diameter and 18–25 m high and is made of corrosion-resistant material such as stainless steel 316 or Inconel alloy.



Splitting block diagram

Capability & Performance

For capacity range from 30 to 100 t/d the cost-effective solution is to use multi column operating plant at 30 bar and 230 °C.

The use of single tower operating plant at 60 bar and 270 °C is recommended for up to 100 t/d. Depending on quality of feedstock, process water and operating conditions the degree of splitting ranges from 95 to 98 % .

Consumption of low pressure steam ranges from 5 to 6 wt % and process water ranges from 0.5 to .8 m3 per metric ton. Thermal energy required for oil heating for column operating at 30 bar is about 0.2 MMkcal that is supplied through diathermic fluid;

For unit operation plant at 60 bar, supplied by steam, the consumption is about 16%wt based on the oil.

Distillation

To remove low quantity of C6 ÷ C10 fraction from Coconut oil fatty acid as well as obtain only C16 ÷ C18 cut from Tallow fatty acid, by a partial fractionation, it's just needed to add to—distillation unit a simple arrangement comprising a cut column and an cut surface condenser.

Capability & Performance

We can supply continuous distillation units for capacities from 20 to 300 t/d that can also be used for straight distillation of methylesters and fatty alcohols.

The straight distilled fatty acid has a purity of 99% with an almost water white color and is free of the major impurities. The heavy ends consist of the higher boiling components, usually of lower quality, which can either be withdrawn separately or recycled directly for redistillation. The residue are polymerized material, which is disposed of by blending with heavy residual oil and used as boiler fuel.

The yield of a fatty acid distillation process is generally a function of the quality of the incoming feedstock and of the splitting degree obtained in the previous hydrolysing process. A high content of impurities, oxidised fatty acids and unsaponifiables tends to lower the yield of distilled fatty acids obtainable.

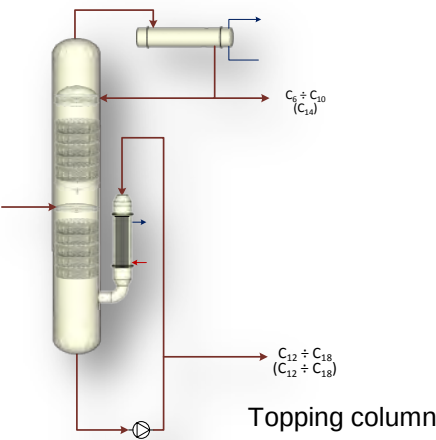
Regarding the yield, the following values should be taken into account:

Distillation loss	0.1 ÷ 0.2 %
Light ends	0.5 ÷ 5%
Residues	<1.6 x impurities
Acidity of residues	0.5÷15%

For ordinary fatty acid with a degree of split between 90 and 97% distillate yield ranges from 85 to 95%.

The approximate utility consumption per ton of crude fatty acid feed for a plant with capacity of 100 t per day is as follows:

Thermal Energy (diathermic fluid)	250.000	kcal
Low pressure steam	130	kg
Cooling water@ 20°C	15	m3
Electrical energy	5	kWh
Export steam @ 3 bar	120	kg



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