VEGETABLE OIL REFINING

The process of refining oil is basically removal of impurities like f.f.a., gums, MIV and other non-oily matters with subsequent removal of colour and odour. The process essentially involved are Degumming, Neutralisation, Bleaching and Deoderising.

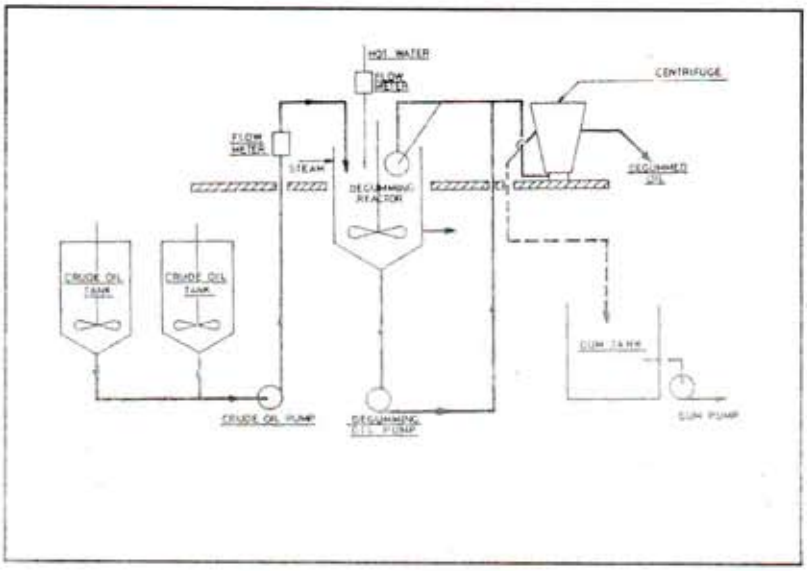
DEGUMMING

Degumming is essential for oil containing high percentage of Phosphilids such as soyabean oil, rice bran oil and most of the solvent extracted oil.

These oils basically contain two types of gums, viz. Hydratable and Non-hydratable. Hydratable gums can be removed by hot water degumming, whereas removal of Non-hyderatable gums need acid degumming. In case of soyabean oil and other oils, where the percentage of hydratable gums is much more a process of water degumming followed by gum conditioning by a acid is sufficient. But for the oil where percentage of non hydratable gums is more and also in case the oil has to go for physical refining, the process of Acid/Water Degumming is followed, which removes most of the gums from the oil.

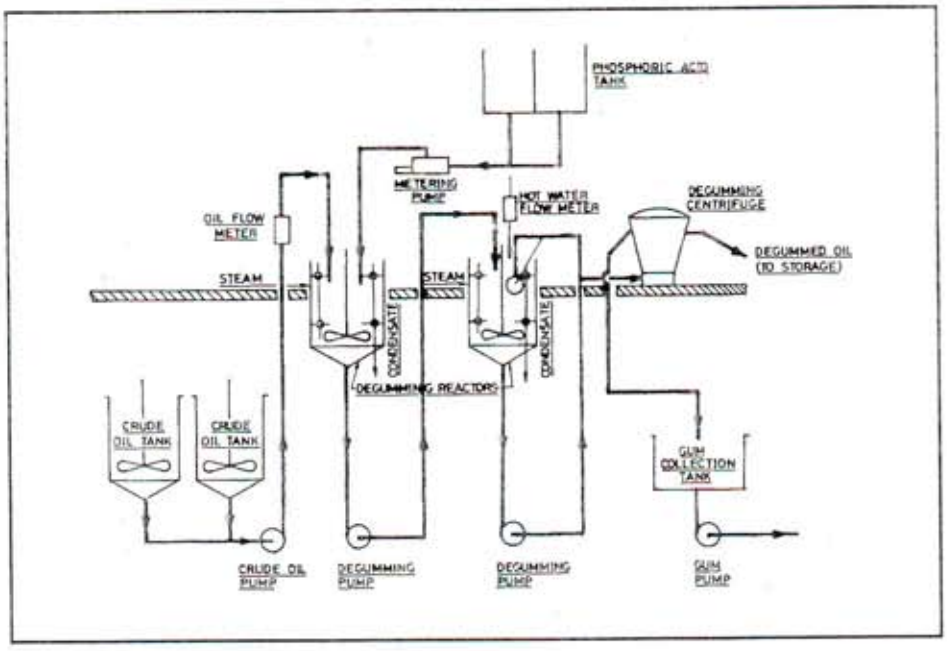
WATER DEGUMMING

The process is illustrated in the figure given below. Measured quantity of hot water is added continuously to the measured quantity of oil in a Degumming Reactor. Required temperature is maintained by indirect steam heating. The mixture is then fed by a pump into the Degumming Centrifuge, which continuously separates gums, with minimum percentage of free oil, from the oil and the degummed oil is sent to storage or further processing. The gums collected in Gum tank can be pumped out for further processing for manufacture of Lecithin.



ACID/WATER DEGUMMING

The process is essentially same as water Degumming except that there are two Degumming Reactors. In the first reactor metered quantity of the phosphoric acid is added by metering pump and in the second reactor hot water is added. The resultant mixture is pumped into certrifuge for separation of gums from oil. Because of corrosive nature of phosphoric acid, both the reactors and the oil contact parts of the centrifuge are in S.S.316.

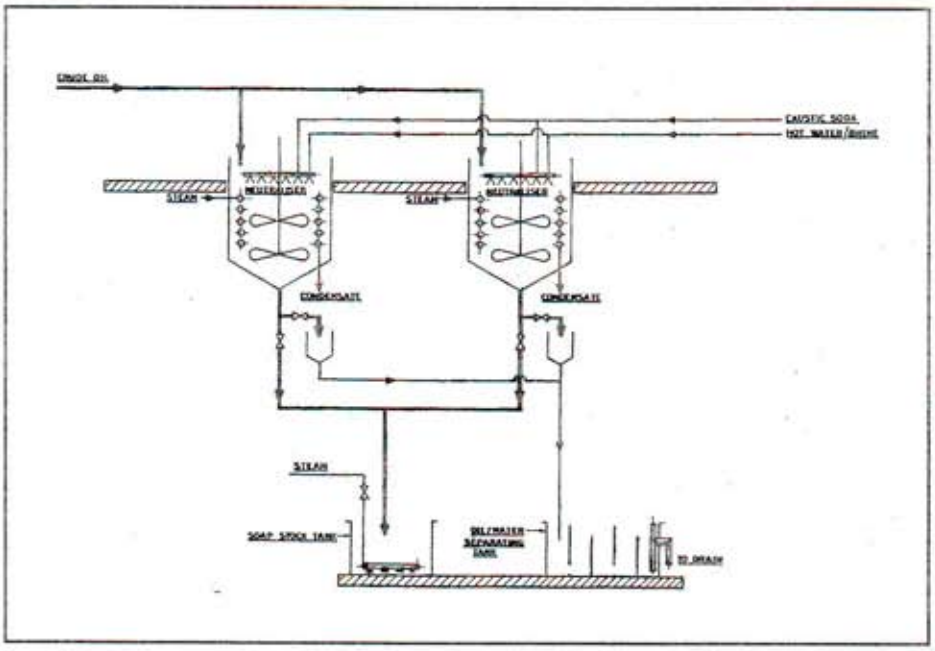


NEUTRALISATION

Most of the oils to be refined in India has to undergo Alkali Refining Process, which is basically removal of f.f.a. by Neutralisation with caustic soda. During this process several other impurities like remaining gums, MIV and some of the colouring bodies are also removed. The process can be both batch and continuous. Continuous process gives much lower loss, consistently better quality product and more reliability compared to Batch Process. The selection of process has to be done based upon installed capacity, capacity utilisation and kind of oil to be refined so that the selected process is cost efficient.

BATCH - NEUTRALISATION

The process involves addition of measured quantity of caustic soda solution into the batch of oil in a deep conical bottom tank fitted with agitator and steam heating coil. The soapstock formed is settled by gravity and removed by draining from the bottom of the tank. The neutral oil is washed with hot water to remove free caustic and remaining soap particles and the waste water is also settled by gravity and removed by draining from the bottom of the tank.



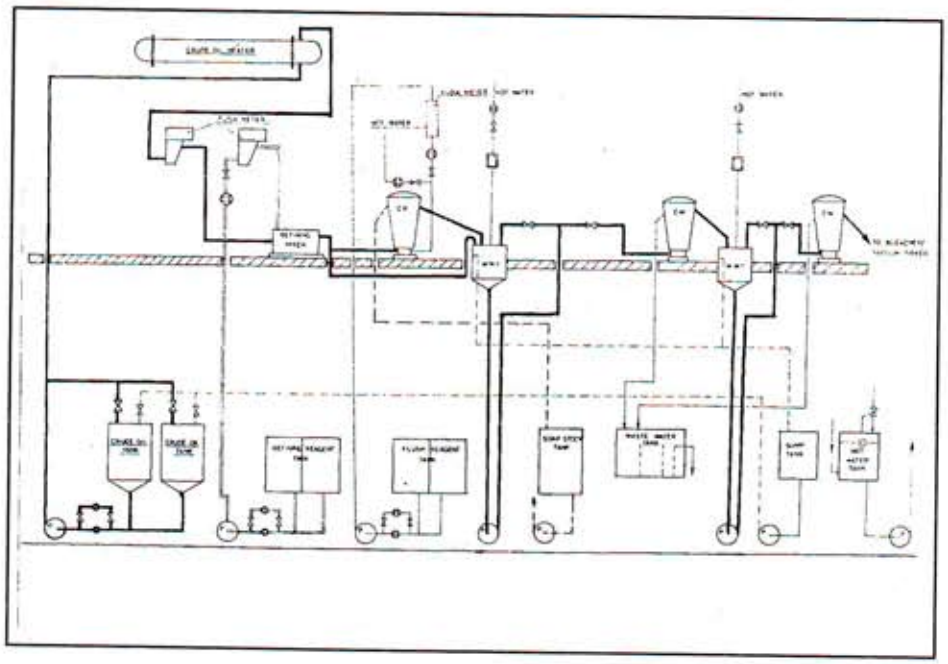
CONTINUOUS - NEUTRALISATION

In Continuous Neutralisation Process, a metered quantity of caustic soda solution is mixed with a metered quantity of crude oil in a very efficient mixer and the resultant soapstock is immediately separated by high speed centriguges. The short contact time between caustic and oil reduces the saponification to minimum level; and separation of soapstock in high speed centrifuge results in very small quantity of free oil going with the soapstock.

The oil from the feed tank is pumped into the refining mixer through a flowmeter and Oil Heater. The Caustic solution from the Caustic Tank is also pumped through another flowmeter into the refining mixer. The resultant soapstock is continuously separated in high speed Refining Centrifuge and collected in a soapstock tank from where it can be pumped periodically for further processing. The neutral oil coming out of refiner centrifuge is mixed with hot water in a water wash agitating tank and then passed through a

high speed water wash centrifuge to separate wash water from washed oil. The process of this water washing is repeated in the second water wash agitating tank and centrifuge to achieve minimum possible soap content in the neutralised and washed oil. The oil coming out of second water wash centrifuge can be either continuously dried in a vacuum dryer or directly sent to storage and dried in subsequent batch bleaching operation.

In case of dark coloured oil like cottenseed an additional Re-refining stage is added after first refining and prior to water washing. The oil coming out of refining centrifuge is pumped into another Re-refining Mixer where a dose of concentrated caustic solution is given to the oil and then it passes through a high speed Re-refining Centrifuge to separate soapstock and the resultant oil in water wash Tank as described above.



WE OFFER THE FOLLOWING PLANTS FROM CONCEPT TO COMMISSIONING

- CONTINUOUS DEGUMMING
- CONTINUOUS AND BATCH BLEACHING
- PHYSICAL REFINING
- SOAPSTOCK ACIDULATION
- DRY FRACTIONATION OF PALM OIL
- CONTINUOUS NEUTRALISATION
- CONTINUOUS AND BATCH DEODORISING
- DEWAXING
- VANASPATI PLANT
- FAT SPLITTING AND STEARIC ACID