



CONTINUOUS STANDARD OIL & FAT PRETREATMENT

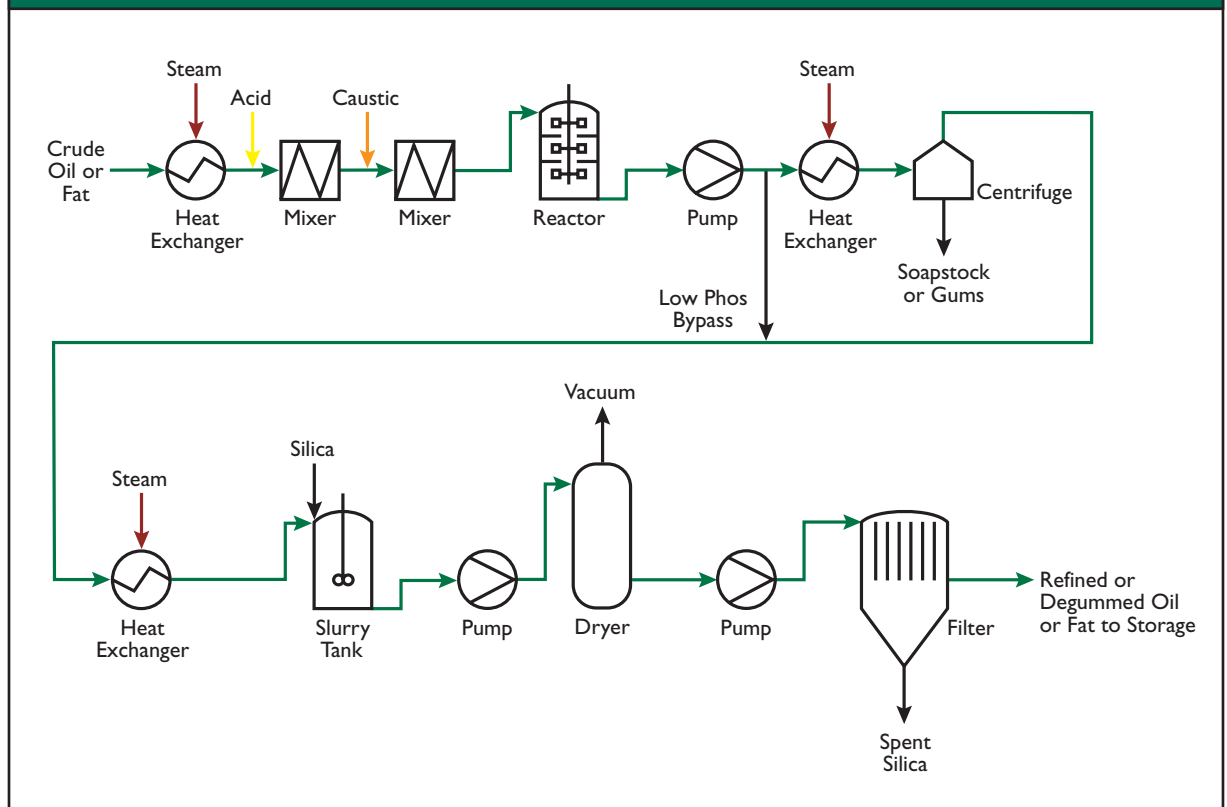
BIODIESEL PRETREATMENT PROCESSES

Most crude oil and some high quality fat feedstocks contain high amounts of phosphorus and low amounts of fatty acids. The phosphorus and fatty acids are typically removed using two known refining processes, neutralizing and bleaching. Bleaching for color is not necessary so only a silica adsorption step is used.

Neutralizing removes the bulk of the phosphorus and fatty acids by converting them to pasty substances called gums and soap, respectively, which are heavier than the oil or fat and easily separated. The balance of the gums and soap in the neutralized oil or fat are removed by silica adsorption. Only a residual amount of gums and soap remain in the dried oil or fat.

The phosphorus and fatty acid content of the discharged oil is equivalent to refined and bleached, or RB, quality.

CROWN STANDARD OIL & FAT PRETREATMENT FLOW DIAGRAM



CONTINUOUS HIGH FATTY ACID FEEDSTOCK PRETREATMENT

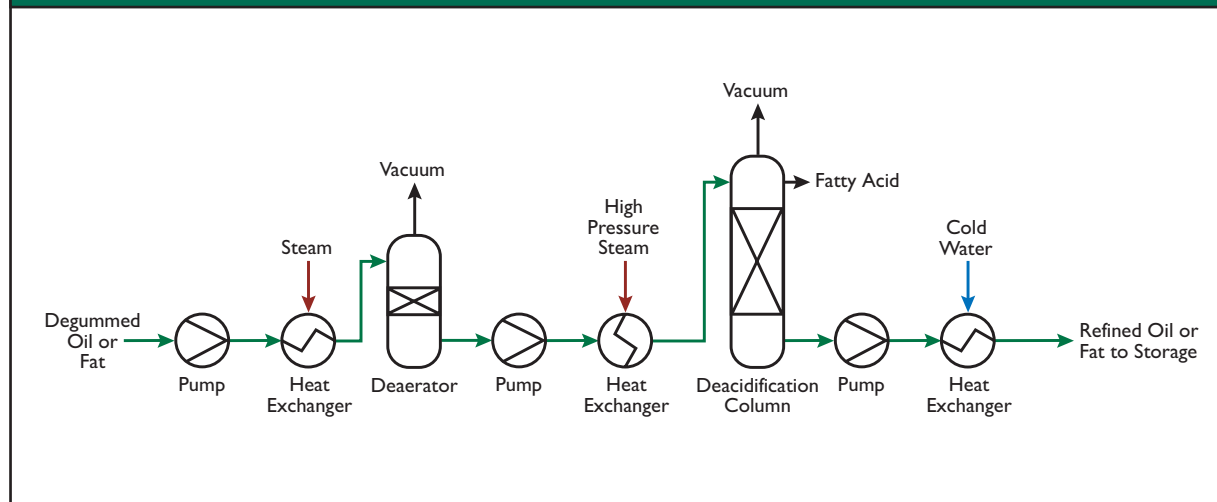
Oils or fats containing high amounts of phosphorus and high amounts of fatty acids are degummed and deacidified in two steps. The degumming process, which removes the phosphorus, is similar to the Standard Oil & Fat Pretreatment process but does not neutralize the fatty acids.

After degumming, the fatty acids are removed under vacuum at a high temperature. This deacidification process is also known as stripping because a small amount of low pressure steam is used to strip the fatty acids from the oil or fat.

Some oils and fats containing low amounts of phosphorus and high amounts of fatty acids are degummed by adding acid in the silica adsorption process. The acid is added and reacted in a separate vessel prior to the silica addition step. Since these oils and fats are deacidified by stripping, the neutralizing process is not required.

The phosphorus and fatty acid content of the discharged oil is equivalent to refined and bleached, or RB, quality.

CROWN HIGH FATTY ACID PRETREATMENT FLOW DIAGRAM



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