



Food & Feed

Oils & Fats Processes

Nano Neutralization™

A collaboration with



A new oil neutralization technology

Nano Neutralization™

CTI is a research and development firm located in California, U.S.A. specializing in Nano Reaction technology for a wide variety of liquid process applications. CTI have patented their Nano Reactors™ and have multiple process patents pending for process applications of their patented Nano Reactors.

Since early 2009, CTI and Desmet Ballestra have collaborated closely on Nano Reaction Technology developments specific to the oils & fats industry. The first such application to complete lab testing, plant scale testing and ready for industrial use is Nano Neutralization™. Desmet Ballestra

has been given exclusive global rights by CTI to market Nano Neutralization™ and execute its implementation through Desmet Ballestra's worldwide network of offices.

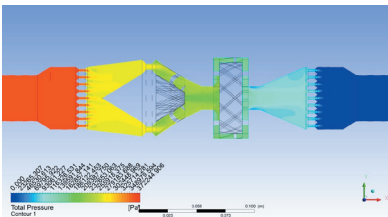
The Advantages of Nano Neutralization™

Nano Neutralization™ is an add-on process to an existing oil refinery neutralization system which has the potential to improve oil yield, save silica (or wash water), save phosphoric acid, save caustic, and perhaps save steam and electricity.

- ▶ Oil yield can be improved via improved separation of the heavy phase from the light phase in the neutralizing centrifugal separator as a result of conditioning the oil in the Nano Reactors™. Less neutral oil remains in the heavy phase, thus improving yield.
- ▶ Silica (or wash water) can be saved via improved separation of the heavy phase from the light phase in the neutralizing centrifugal separator as a result of conditioning the oil in the Nano Reactors™. Less soap remains in the light phase, thus reducing the need for silica (or wash water) downstream to remove this residual soap. Less silica (or wash water) also directly results in less oil loss in the spent silica (or spent wash water).
- ▶ Phosphoric acid can be saved via conditioning the oil in the Nano Reactors™ which converts most of the non-hydratable phospholipids to a hydratable form. By accomplishing this task in Nano Neutralization™, the upstream phosphoric acid addition can be substantially reduced or totally eliminated.
- ▶ Caustic can be saved because phosphoric acid is significantly reduced and a stoichiometric amount of caustic is used strictly to neutralize the phosphoric acid. Caustic can be further reduced due to improved mixing of the caustic-water solution into the oil inside the Nano Reactors™.
- ▶ Steam can be saved in those refineries that presently heat the oil above centrifugal separation temperature during the acid pretreatment step to increase acid reactivity. With Nano Neutralization™ there is not a need to warm the oil above centrifugal separation temperature, thus saving steam.
- ▶ Electricity can be saved in those refineries that presently use a high shear mixer and an acid reactor to intensely mix the phosphoric acid into the oil and provide retention. In these cases, the high shear mixer energy, pump energy and tank agitator energy combined exceed the energy of Nano Neutralization™ and thus save overall electricity.

.... with Nano Neutralization process™

Crude oil or water degummed oil is pumped from the existing acid pretreatment section, through a new safety filter, through a new totalizing flow transmitter, and into a new small surge tank at a desired process flow rate. The oil gravity drains from the small surge tank to the inlet of a new high pressure pump. A caustic water solution is injected into the oil between the small surge tank and the inlet of the high pressure pump from the existing caustic dosing system. The amount of caustic-water solution is automatically controlled via the PLC by a set-point dosage and the incoming oil flow transmitter data.

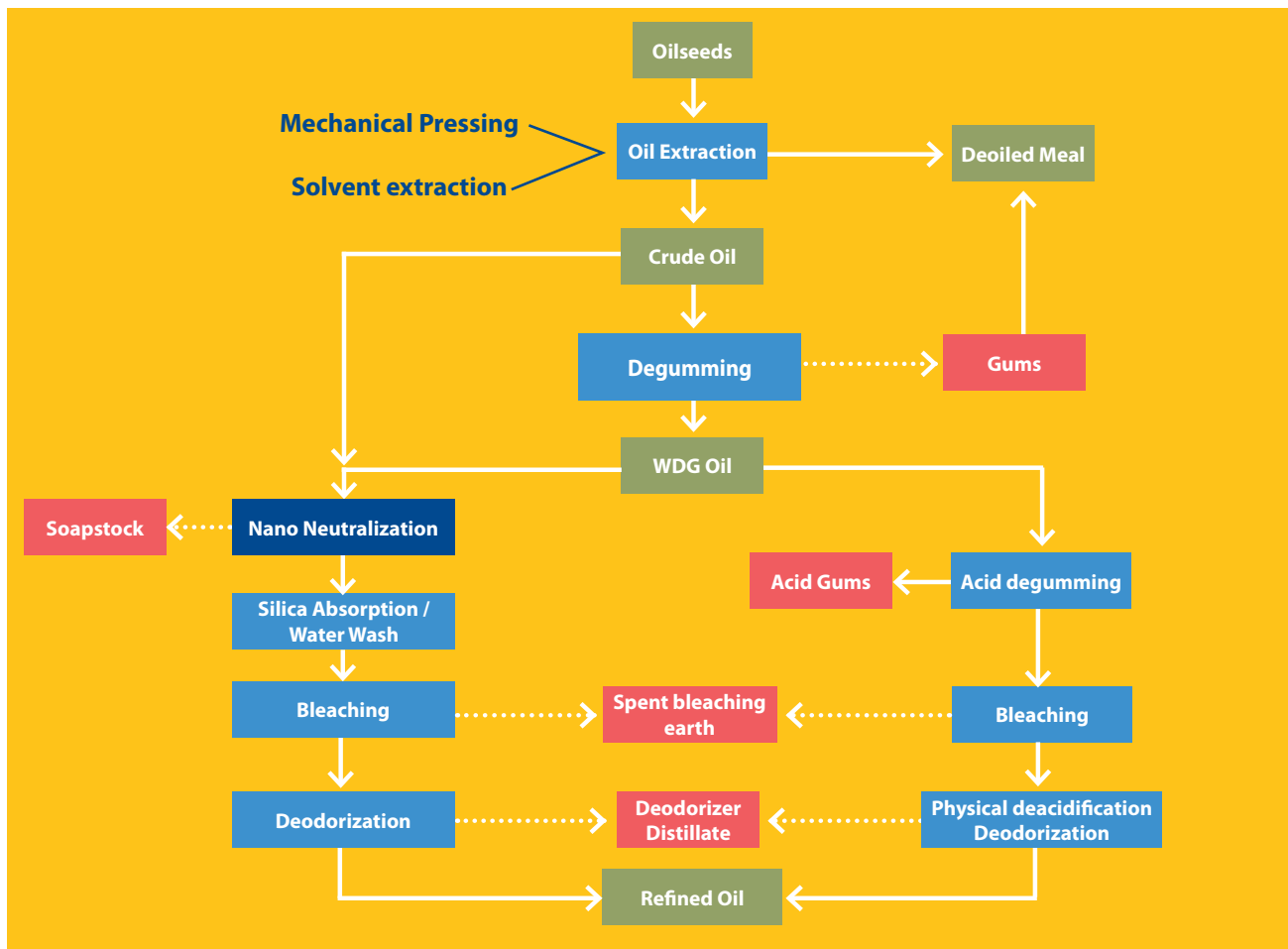
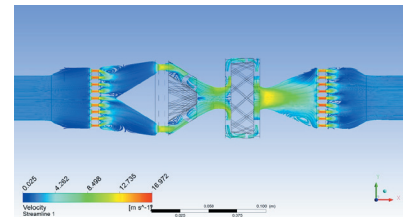


The high pressure pump is used to push the oil plus caustic water stream into the Nano Reactors™ immediately downstream. The pump is driven by a variable frequency motor which is automatically controlled by a level transmitter in the small surge tank upstream so that the flow rate through the Nano Reactors™ is matched to the desired process flow rate established upstream.

The high pressure pump elevates the pressure of the oil plus caustic water stream to a pressure of 41 to 68 bar (600 to 1000 psig). This pressure is dissipated as the oil plus caustic water solution passes through the three Nano Reactors™ in series.

Once the oil plus caustic water solution has passed through the Nano Reactors™, it proceeds on to the existing retention mixers, and then on to the existing centrifugal separator.

After the centrifugal separator, the light phase neutralized oil stream passes through a new totalizing flow transmitter, used to measure yield. After the flow transmitter the neutralized oil flows on to the silica absorption system (or water wash system) to removed residual soap.





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Animal Feed

Chemicals for Life

Oleochemicals

Detergents, Surfactants & Chemicals

Soap

Biofuels

Biodiesel

Bioethanol

Biomass

