CENTRIONICS®

Process & Analytical Instruments Company

MONITORING SOLUTIONS FOR PALM OIL REFINERY

PROCESS CONTROL

Edible Oil Refining Process

Oil Dry Fractionation

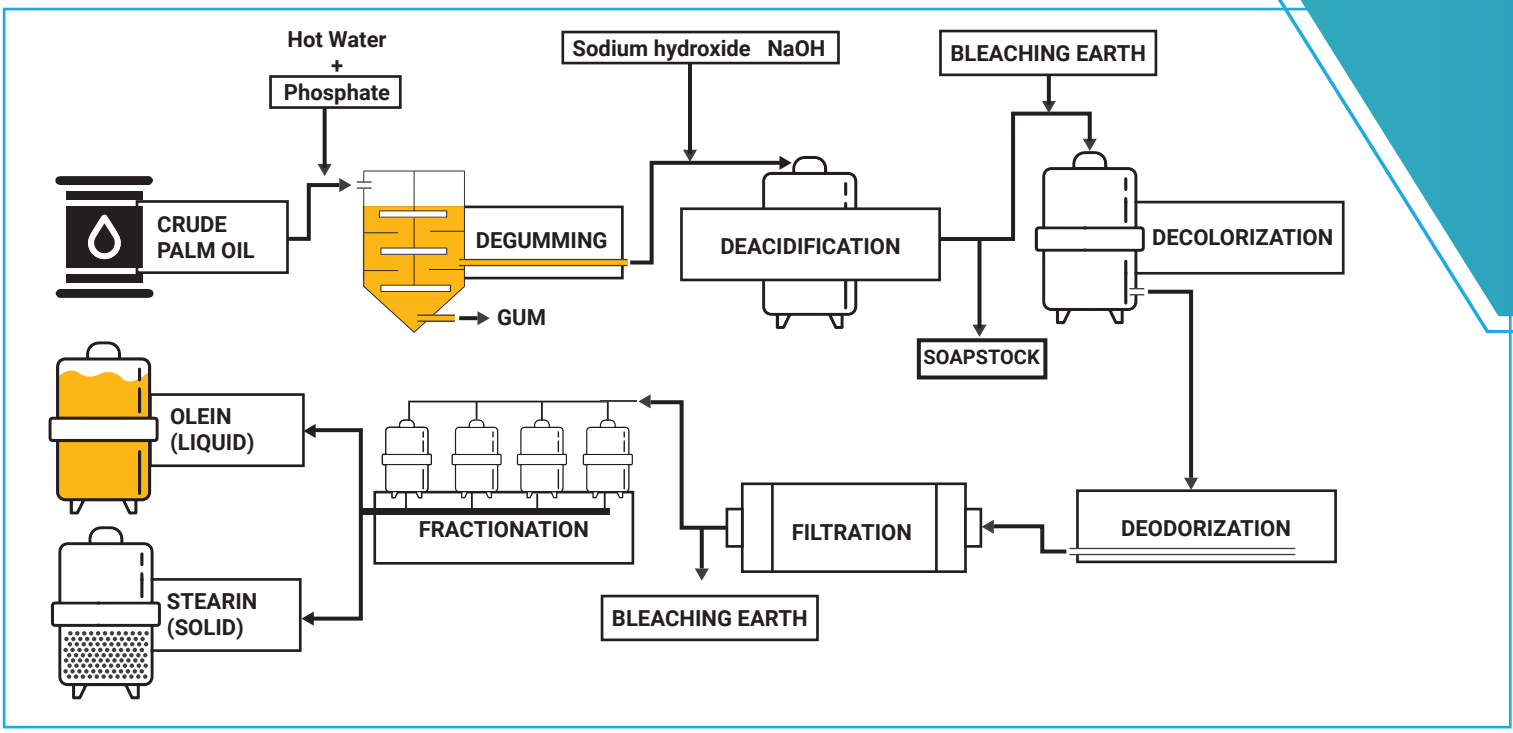
Color Measurement for Quality Control

Filtration and Bleaching

Winterizing and Dewaxing

Hydrogenation of Edible Oil

MONITORING SOLUTIONS FOR PALM OIL REFINERY



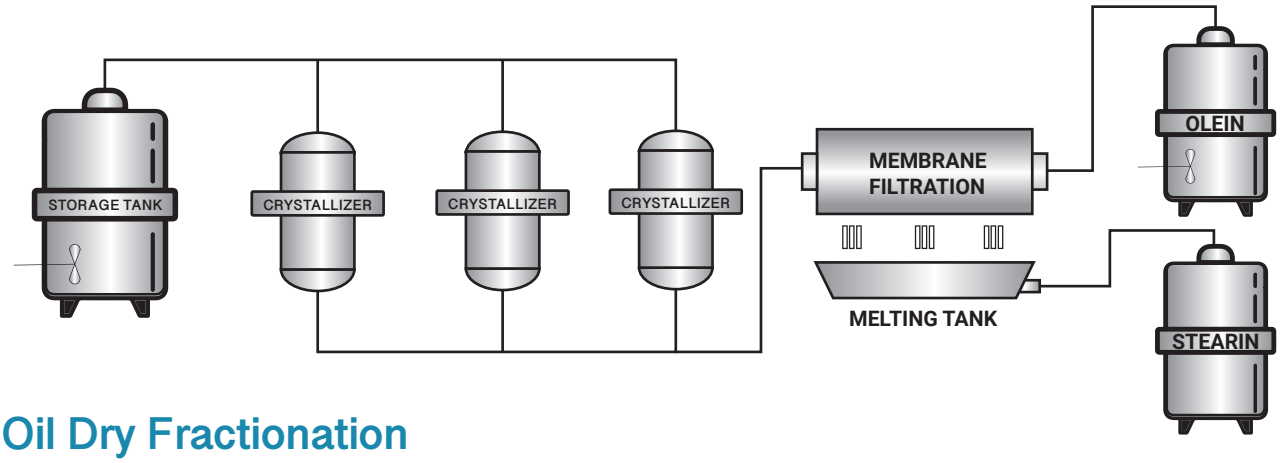
Edible Oil Refining Process

Oil refining processes such as bleaching, winterization, hydrogenation, and final product quality with instantaneous monitoring will improve with the use of online analyzers. Off-spec products can be immediately detected and countered with process improvement or adjustments quickly, reducing product rework. Galvanic In-line sensors deliver accurate and reliable process outcomes and specially designed to suit harsh conditions in process refineries.

Benefits of Edible Oil Process Control:

- **Improved** Product Yield
- **Lesser** Product Lost
- **Reduced** Human Errors
- **Continuous** Production Control
- **Eliminate** Human Error

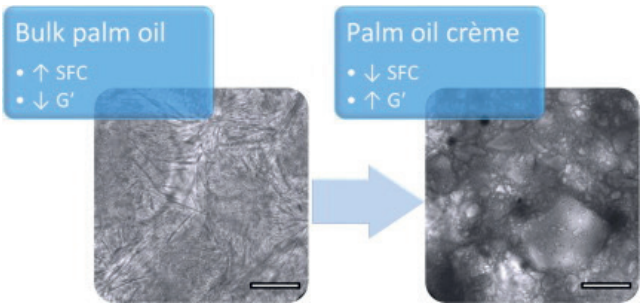
OIL DRY FRACTIONATION APPLICATION



Oil Dry Fractionation

Dry fractionation is based upon the principle of separation according to the varying melting points for the fat fractions within the edible oil. The method works without solvents. Caused by temperature changes, valuable fatty acids with a higher melting point are separated from the low melting liquid fat fraction. Incase of palm kernel oil, solid fat is used as cocoa butter substitute.

In a crystallization unit, the temperature is slowly lowered until semisolid palm oil forms crystals. The Resulting solid fat consists of high melting fat crystals (Stearins). The liquid fat fraction (Oleins) is separated by high-pressure membrane filtration.



Crystallization of Fats and Fatty Acids in Edible Oils

In their native type, numerous edible oils are not usable for food purposes. To optimize their texture and structural properties, the food industry uses various chemical and physical modifications. Edible oils with a modified texture are most suitable for a consistent final product quality and a stable processing chain.

OIL DRY FRACTIONATION APPLICATION SOLUTIONS

APPLICATION SOLUTIONS

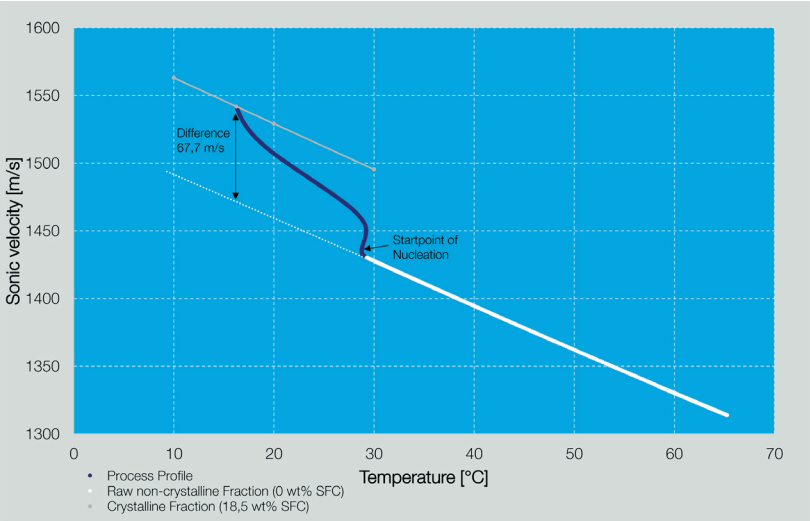
LiquiSonic® convinces customers with precise inline solid fat content determination and real-time process monitoring, based on sonic velocity and attenuation.

The robust sensor construction without moving parts enables a long-time use in process. The crystallization time is reduced by optimal monitoring of nucleation, cooling rate and SFC. That increases the dry fractionation efficiency.

Additional advantages are:

- Optimum Line Control
- Reliable Process Data
- Quality Check
- SFC Determination
- Stable Product Properties & Texture
- Early Recognition Of Nucleation
- Malfunctions In A Matter Of Seconds
- Reduced Material,
- Maintenance And Energy Costs
- Reduced Sampling
- Lab Analyse

LiquiSonic® sonic velocity profile of RBDPO dry fractionation



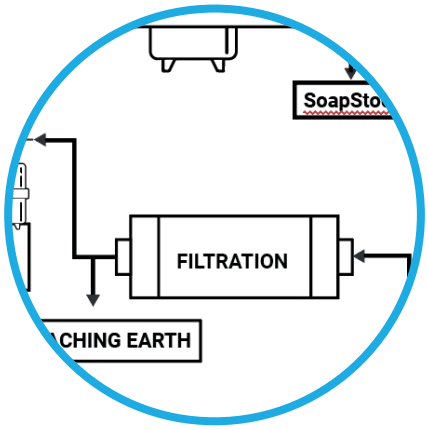
SensoTech
In liquids, we set the measure.

www.centrionics.com

APPLICATIONS FOR PALM OIL REFINERY

Color Measurement for Quality Control

Color measurement in the oils and fats industry is an essential part of the refining process. It is a means of assessing when the desired colour has been reached and when the refining can be halted. This ability to regularly monitor the colour during processing cuts down the waste of refining materials and also helps to maintain colour consistancy of the end product.



Filtration and Bleaching

The bleaching process can be enhanced very efficiently using Galvanic colorimeters. Monitoring the color after the bleaching filter is the fundamental to controlling the addition of bleaching clay. Filtration process can be automatically set to a recycle mode until the desired transparency is achieved. Moreover, filtrate monitoring will immediately detect filter breaks and track filter performance – a brilliant tool for quality assurance and quality control.

Winterizing and Dewaxing

The winterization process for edible oils serves to remove high melting components like wax from the oil. Installed directly inline following the winterization process, Galvanic's scattered light turbidimeter can provide real-time monitoring of the performance of the process. Any remaining high melting components (such as waxes) can be immediately detected and measured down to low PPM ranges and thereby greatly reduce losses due to rework of out-of-spec product.

MONITORING SOLUTIONS FOR PALM OIL REFINERY

Hydrogenation of Edible Oil

Hydrogenation of oils applied in the production of solid fats and margarine is required to give the finished oil a higher melting temperature and better oxidation stability, improving the product's resistance to spoilage. Generally, nickel-based catalysts are used in this process. Once the hydrogenation is complete, the nickel catalyst must be filtered off.

Filtering off the catalyst can be controlled by an Galvanic turbidimeter capable of detecting very low catalyst concentrations, thus reducing the loss of nickel catalyst and optimizing the filtration process while ensuring final product quality.

APPLICATION SOLUTIONS

MONITEK™ IN-LINE TURBIDITY, TSS, COLOR

Monitek measures turbidity, suspended solids, and color in liquid samples.

Whether you're brewing beer, optimizing critical pharmaceutical-manufacturing processes, or monitoring industrial wastewater for contamination, you need rugged, reliable, real-time results to optimize your processes and assure consistent quality and regulatory compliance.

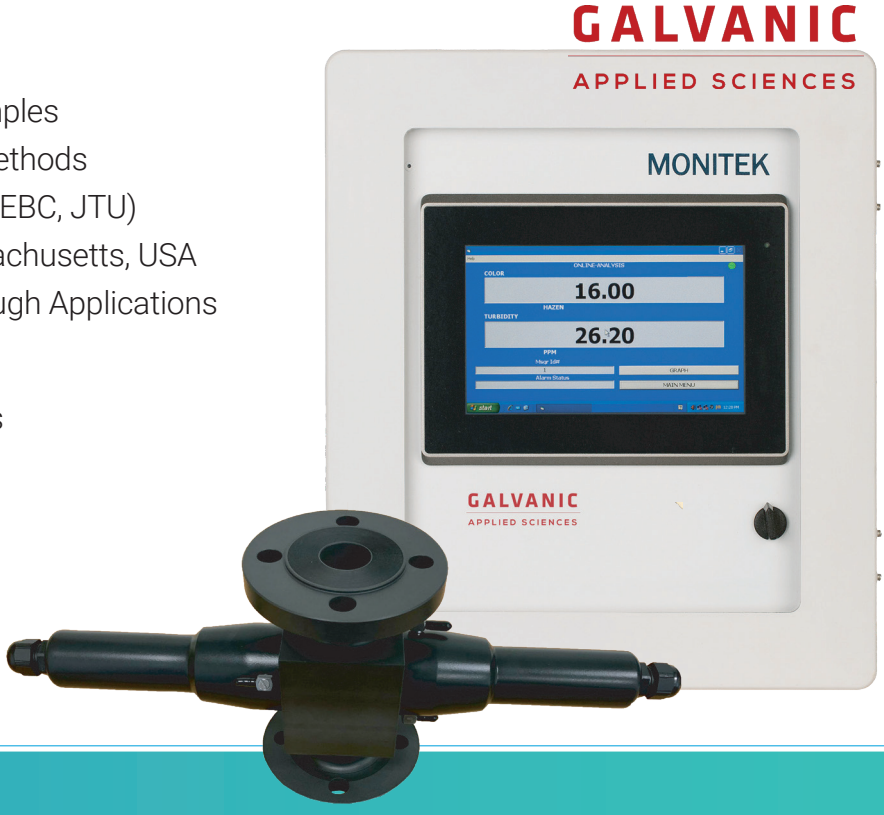
Galvanic delivers with its Monitek optical-technology-based turbidity, suspended solids, and color monitors, which delivers the highest performance-to-cost ratio of any in-line liquid process monitor on the market today.

Monitek Introduction

- Measures Turbidity in Liquid-Phase Samples
- Forward-Scatter & Side-Scatter (EPA) Methods
- User-Defined Units (eg. NTU, mg/l, FTU, EBC, JTU)
- Manufactured & Supported From Massachusetts, USA
- Backed by 40 Years of Experience in Tough Applications

Rapid Return-On-Investment

- Never Miss Unexpected Turbidity Spikes
- Guaranteed Contractual Compliance
- Automate Custody Transfer Validation
- Meet Environmental Regulations



MONITORING SOLUTIONS FOR PALM OIL REFINERY

The Importance Of Viscosity Measurement In Edible Oil Process Control

The viscosity of edible oils is a parameter used to describe quality. Liquid viscosity is also important regarding design of process equipment for the edible fat- and oil industry. Rheological data are required for process piping design, pressure drop determination and in design of heat transfer equipment.

Rheological properties are also of interest when modifying fats and oils, either the method used is fractionation, chemical, hydrogenation, enzymatic, blending or combinations of the mentioned methods. Blending can as an example be used in industrial applications to provide oils with improved composition related to stability, nutrition and functionality endowed with the characteristics requested by consumer preferences. Another aspect is related to authenticity of edible oils and fats, and methods available to detect or verify food authenticity. This is of course important both from a nutritional- and economical point of view. Fats and oils have a huge contribution in our diet as cooking or frying oils, salad oils or in food products formulations.

APPLICATION SOLUTIONS

VISCOSITE™ IN-LINE VISCOSITY

ViscoSite monitors viscosity in liquid samples.

Whether you are blending asphalts or foods, refining oil or petrochemicals, or manufacturing consumer products, pharmaceuticals, or industrial polymers – precise, real-time viscosity measurements are critical to assuring product consistency and quality. Galvanic's ViscoSite viscometers are dual component systems consisting of the transmitter and the sensor.

GALVANIC
APPLIED SCIENCES