

# Vegetable Oil Processing and Beyond.....

Technology and Plants for  
Edible Oils/Oleochemicals/Value Added Products Processing  
Plants, Technical Equipments & Services





# Finest Technology & Process Engineering For The Edible Oil Industry

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# Introduction

MUEZ-HEST INDIA PVT. LTD is a Leading Project Engineering Company established in the year 1995, and a prominent name in the field of Edible / Non Edible Oil Processing Plants and Allied Value Added Product Plants, Oleo-chemicals Plants, Fat Modification Plants, Technology, Oil Testing Facility, Pilot Testing to validate the process and Services on Turnkey Basis. We have supplied more than 270 plants all over India and abroad which are performing successfully. Our customizable technologies are helping clients to meet their requirements of Hydrogenation Plant, Dry Fractionation Plant, Inter-Esterification, Bakery Shortening, Margarine, Lecithin Plant, Lecithin Powder Plant, Reactors and Special Equipment.



As leading technology providers, we are committed to offer you the world class projects and services. We have our own in house R&D Centre duly recognized by the DSIR, Ministry of Science and Technology, Government of India, wherein we undertake innovative projects & Develop prototype equipment which are scaled up, on successful trial performances.

Further, we also undertake expansion of existing plants with latest technology (into fully automatic PLC version if desired) and energy audit to minimize cost of production, enhance the quality & quantity of Edible/Cooking Oil/Ice Cream/Bakery and Pastry fat.

At MUEZ-HEST our ability and willingness to provide complete services, coupled with high quality project management and training, ensures that all your needs are handled under one roof. The services provided to the industry include:

- Process Design and Engineering
- Inspection, Supply, Installation & Commissioning on turnkey basis.
- After Sales and troubleshooting Services.
- Third Party Audit.



## 10 Facts of Muez-Hest

- i. World class Edible Oil Processing Technology
- ii. More than 270 Projects Worldwide
- iii. Over 2 decades of Transformation through Technology
- iv. Passion for excellence
- v. Cost efficient, Energy effective and Environment friendly projects
- vi. Synergy of Science and Technology in Engineering
- vii. Cradle for Innovation and Research
- viii. Imagination to implementation
- ix. Talent, Trust and Technology
- x. Scale, Sophistication and Speed of Design and Manufacturing

## Our Client

			
			
			
			
			<b>&amp; many more</b>



## Our Strength & Capabilities

- Technology
- Engineering
- Manufacturing
- Turnkey Installation
- Commissioning
- Technical Assistant & Services
- Tailor Made Solution
- Research & Analytical Laboratory
- Proto-validation
- Contract Research
- Third Party Audit

## Our Global Presence





# Solvent Extraction Plant

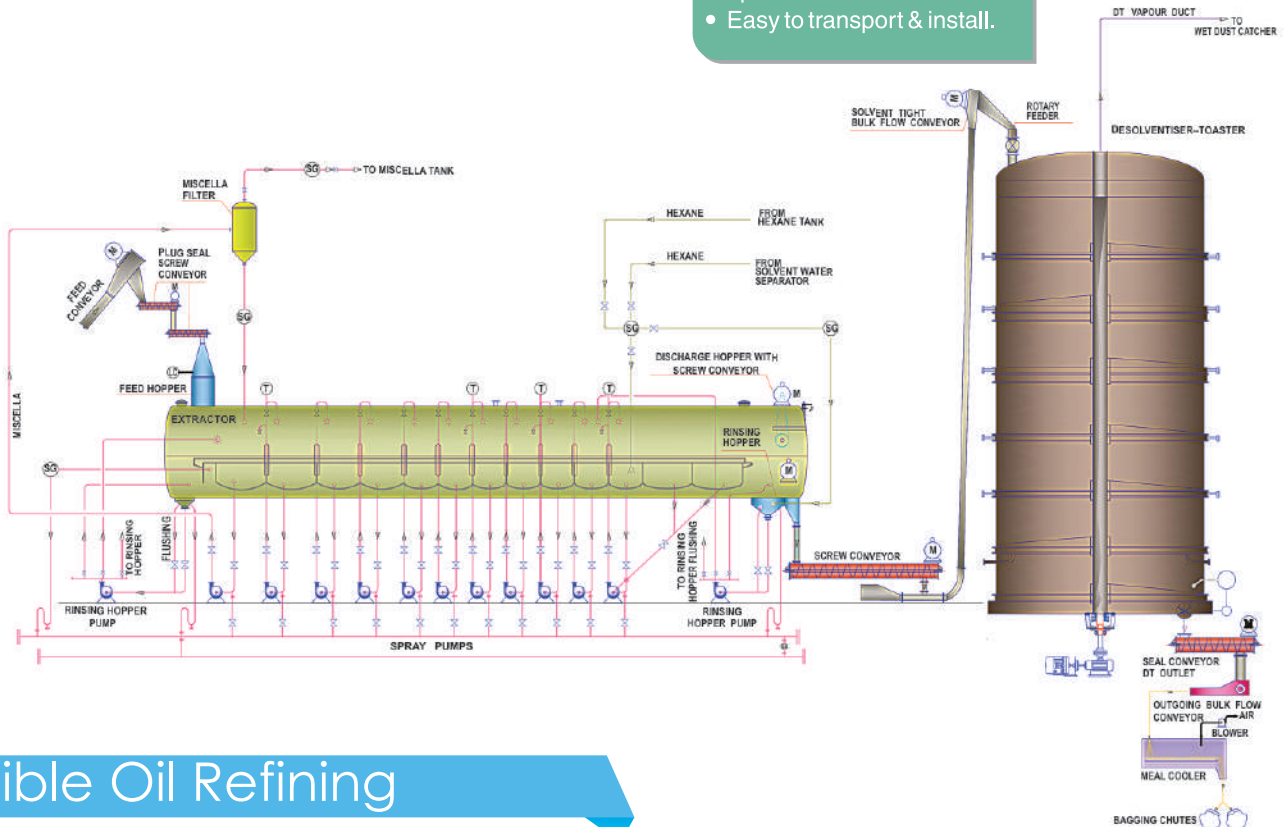
MUEZ-HEST Solvent Extraction Plants are used for extraction of oil from oil bearing seeds and cakes.

Solvent extraction consists of four main operations,

- Extraction of oil from oil bearing seeds/ cakes.
- De-solventising of de-oiled seeds / cake.
- Distillation, to separate the solvent from the Miscella.
- Recover the solvent for reuse.

## Highlights

- Continuous operation.
- Lower Solvent Losses.
- Low Power Consumption.
- Zero Effluent.
- Zero sediment in the final oil.
- Long Extraction time ensuring low residual oil.
- Simple, rugged design for low maintenance & reliable operator.
- Easy to transport & install.



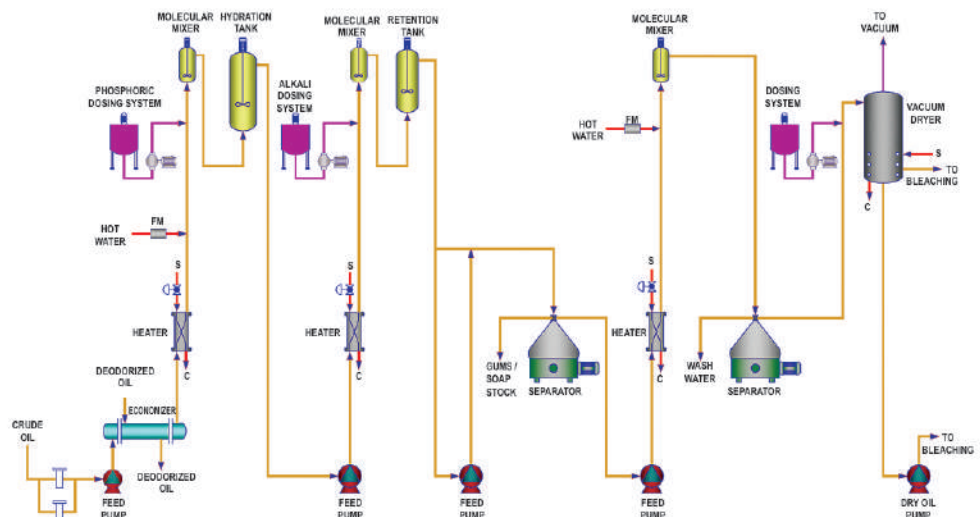
# Edible Oil Refining

## Refining of Oils & Fats

The refining of FATS and OILS is comprised of Water Degumming, Gum Conditioning, Alkali refining water washing & vacuum drying.

FATS and OILS containing gums and FFA (Free Fatty Acid) are required to be removed by Refining Process for producing quality refined oil.

MUEZ-HEST provides a highly EFFECTIVE WATER DEGUMMING & DRY DEGUMMING PLANT which involves few critical stages- mixing of water phosphoric acid / citric acid and crude oil, by using HIGH SHEAR ROTATING MIXER and PRECIPITATION TANK. The process design is well established and very effective for various FATS and OILS.



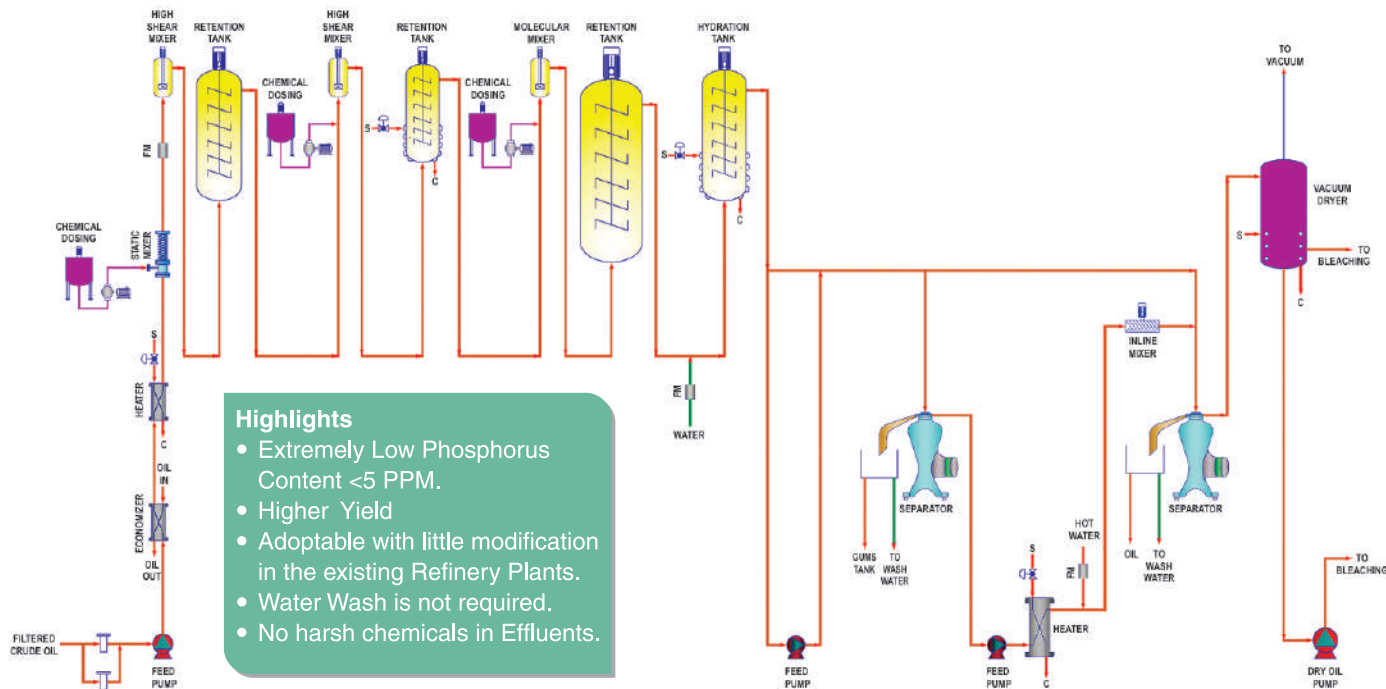




# Enzymatic Degumming

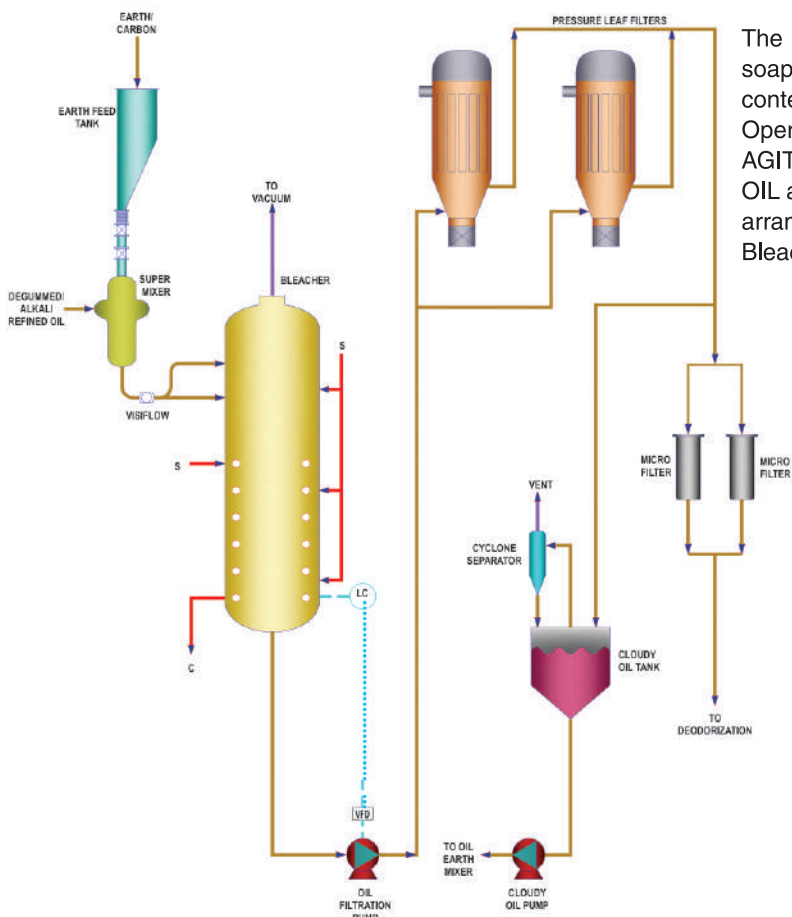
We have done the TOTAL ENGINEERING of the ENZYMATIC DEGUMMING TECHNOLOGY & successfully implemented and commissioned the plants on commercial scale. The enzymatic degumming process has significantly checked the CONTENT of PHOSPHORUS level in every oil.

(For Soybean / Sunflower / Ricebran Oil)



# Bleaching with PLF

The OIL received from previous stages contains traces of soap/iron/few ppm of PHOSPHOLIPIDS and CAROTENES, these contents are undesirable and required to be removed in Bleaching Operation, MUEZ-HEST's bleaching machines includes STEAM AGITATED bleacher comprises of an acid treatment, a separate OIL and EARTH mixing DEVICE with MECHANICAL MIXER (this arrangement ensures effective Mixing of Bleaching agents), Main Bleaching vessel and Hermetic filters.



**Highlights**

- Lowers bleaching earth consumption to obtain the consistent & continuous bleaching result.
- Accurate and easy metering of oil and earth for obtaining quickly bleached oil of the desired colour
- Uniform holding time of the oil-earth mixture in the bleacher.
- Oil filtration in hermetic leaf filters with stainless steel frame and wire cloths, requires no maintenance.
- No formation of decomposed residues.
- No decantation/settling during bleaching, due to highly effective agitation arrangement.
- A safety filter is provided for removal of possible earth traces after main filtration.
- Oil content in spent cakes less than 22%.
- Maintenance free bleacher.



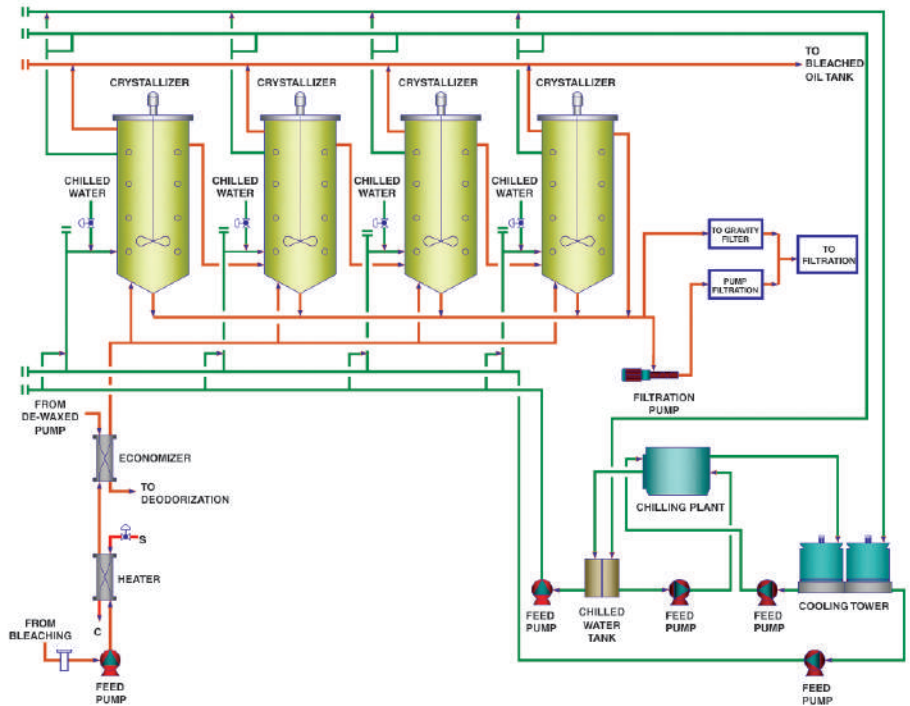
# De-waxing / Winterization

A very simple requirement of this process is to produce CLEAR, BRILLIANT refined oil to meet required specifications of CLOUD POINT.

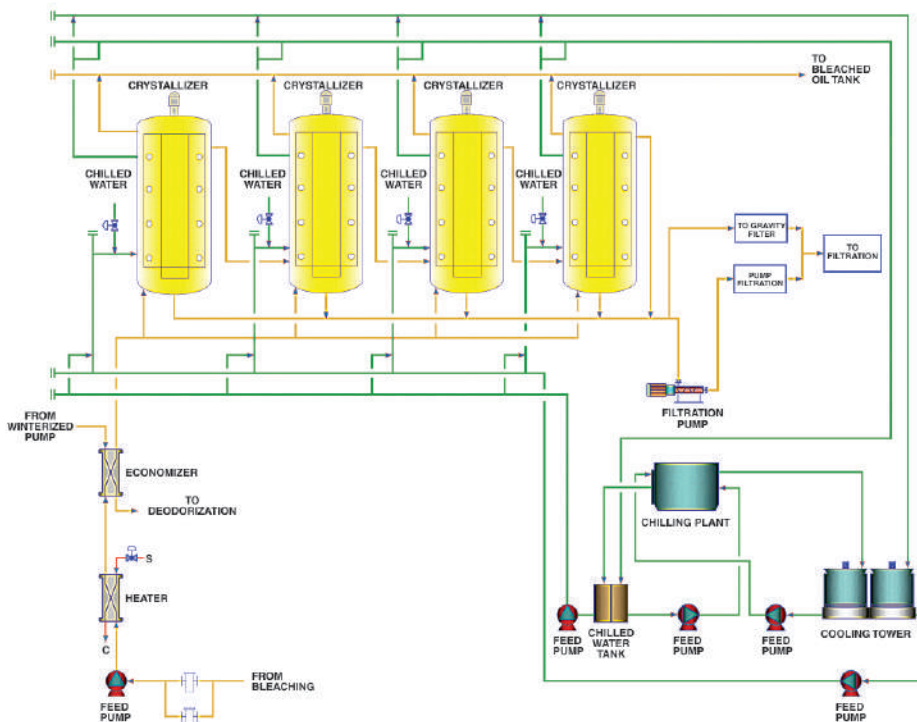
MUEZ-HEST developed a Perfect and Highly Effective Crystallization / Winterization and Filtration process. It is composed of HOMOGENIZER, CRYSTALLIZER and WINTERIZER EQUIPMENTS with SEQUENTIAL COOLING cycle.

### Highlights

- '0' cloud point for 24hrs.
- Crystallizer RPM adjust by VPD.
- High Heat Transfer area.
- Temperature controlled by each crystallizer of program logic.
- Filtration followed by automatic filter (Horizontal Pressure Leaf Filter).
- Continues operation with batch operation facility.



## DEWAXING



## WINTERIZATION

### Highlights

- Latest Technology crystallizer.
- Low power consumption.
- Temperature controlled by program logic.
- Crystallizer RPM adjust by VPD.
- No overflow chances.
- Continuous operation with batch operation facility.



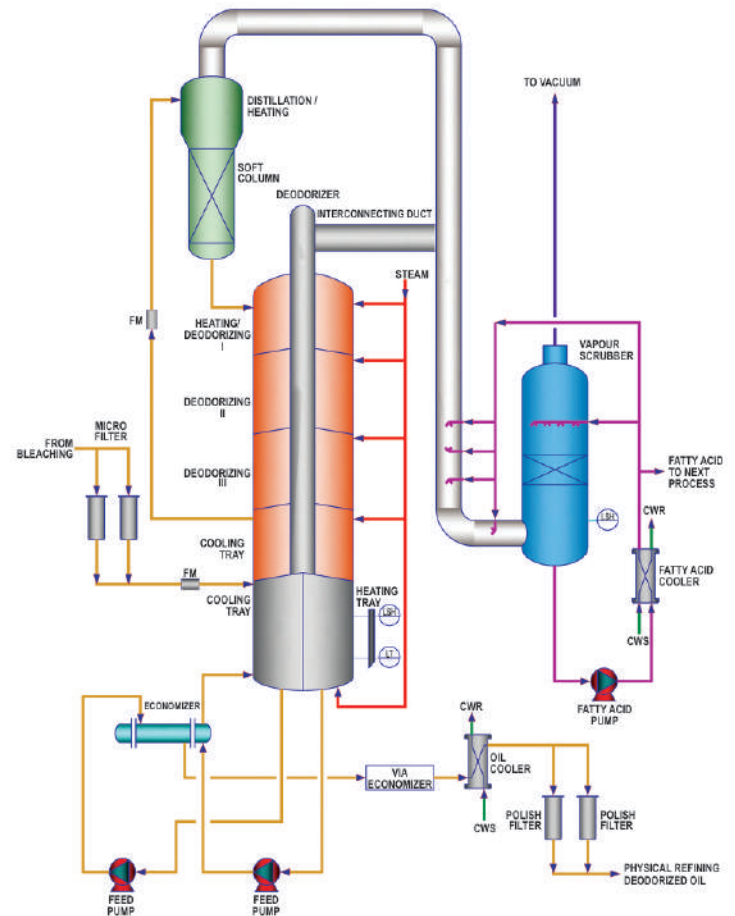


# Physical Refining / Deodorization

Physical Refining process is used to remove free Fatty Acid, using Steam Distillation method at high temperature and under high vacuum and it is followed by Deodorization and an extra technical facility is added before deodorization for removal of free fatty acid.

Deodorization process is used to remove unacceptable odour by steam distillation. The odoriferous compound are stripped off with the help of live injected steam into heated oil under high vacuum.

- Highlights**
- Maximum Heat Recovery
  - Zero percentage of Contamination
  - No Trans-Isomer generation
  - Quick & Maximum Flexibilities in feed material
  - Large Surface Area Exposed to Vacuum
  - Low Steam Consumption
  - Suitable temperature for addition of antioxidant
  - No packing/ filling material inside
  - No short circuit of oil in process
  - Practically - No Maintenance

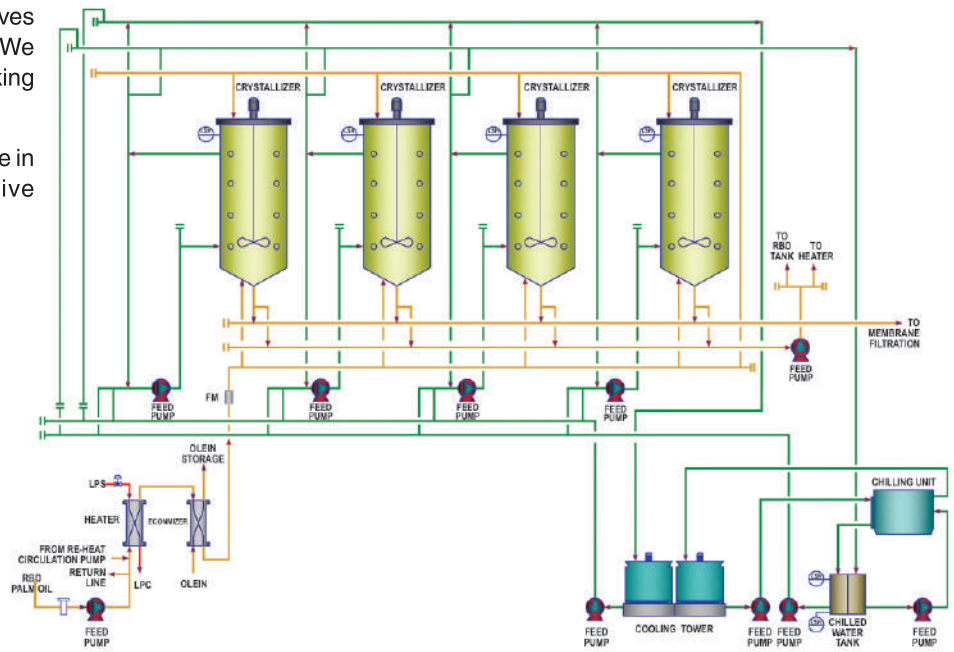


# Dry Fractionation

MUEZ-HEST has developed and is specialized to provide a LOW OPERATING COST FRACTIONATION PLANT, which gives high yield of Olein and low yield of Stearin. We provide PLC (automation) for efficient working and reliability of the dry fractionation plant.

The crystallization process of stearin is done in Muez-Hest developed highly effective crystallizers.

- Highlights**
- High Yield of Olein
  - Low Cloud Point
  - Low Power Consumption
  - Low Steam Consumption
  - Some Plant Can Produce Super Olein and Top Olein Also.



# Fat Modification

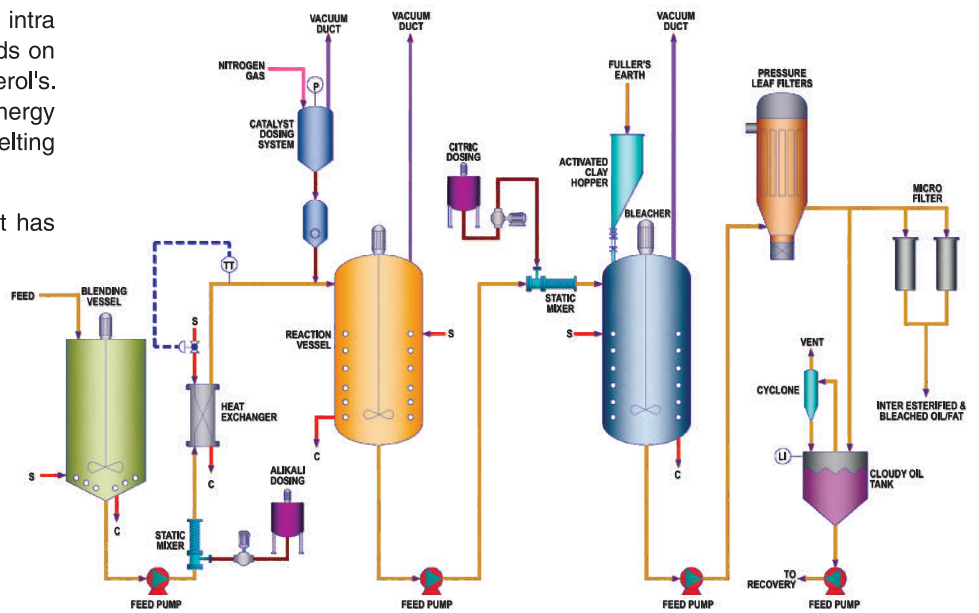
## Interesterification

Basically Inter-esterification in oils is the intra and intermolecular exchange of fatty acids on the glycerol backbone of triacylglycerols. Inter-esterification can offer a real synergy between the textural properties and melting properties of the two constituting fats.

Muez-Hest developed Reactor and Plant has many benefits.

### Highlights

- Low consumption of Catalyst.
- Low Time Cycle of Batch.
- Very High and Smooth Product Quality.
- 100% safe Technology for Catalyst Dosing.
- Low Steam and Power Consumption

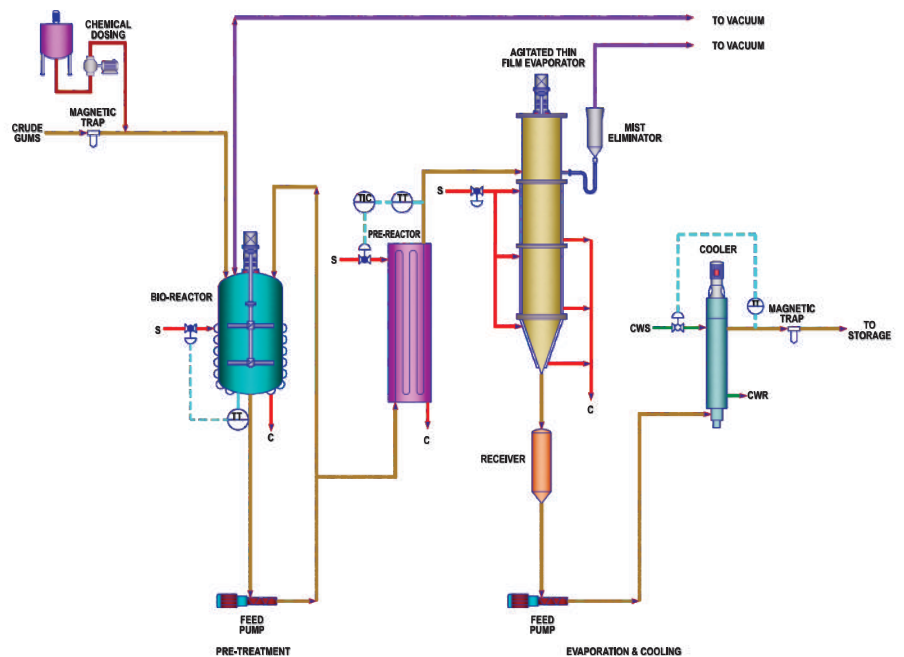


# Value Addition

## Lecithin Plant

Gums Obtained after water degumming process of oils and fats (Soybean Oil, Sunflower Oil & Rice Bran Oil) will be converted into edible grade lecithin. MUEZ-HEST provides the technology for making even pharma grade lecithin.

MUEZ-HEST Offers Technology and Plants for Standard Lecithin, Bleached Lecithin, Modified Lecithin and many more.



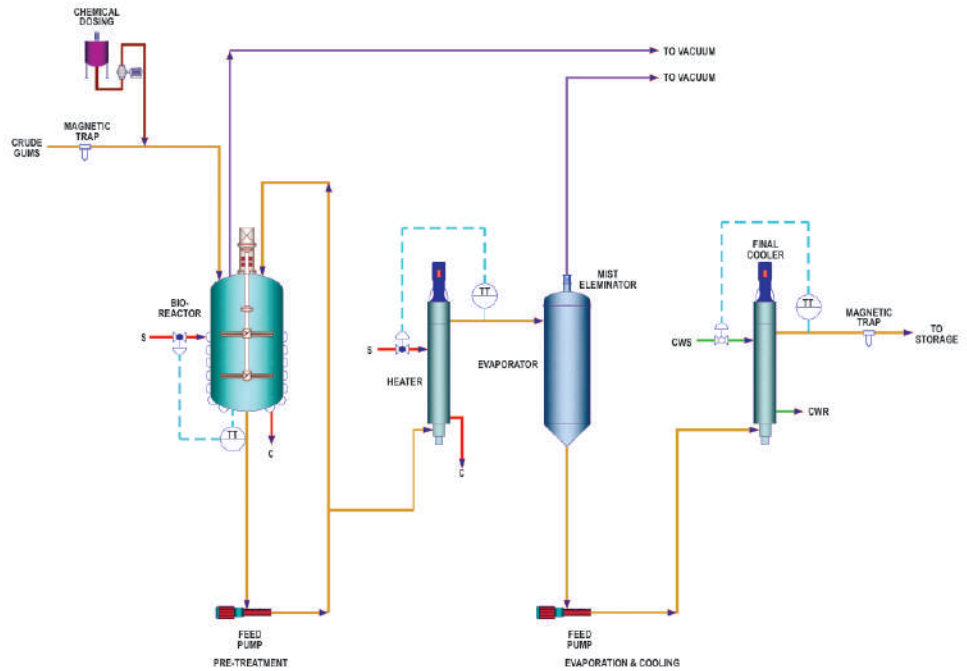
LATEST TECHNOLOGY





### Highlights

- Low power consumption.
- Maximum Energy saving.
- Higher quality of product.
- Bio reactor limpet coil facility.
- Agitated thin film evaporator technology.



## TRADITIONAL

## Bakery Shortening/Margarine/Mayonnaise

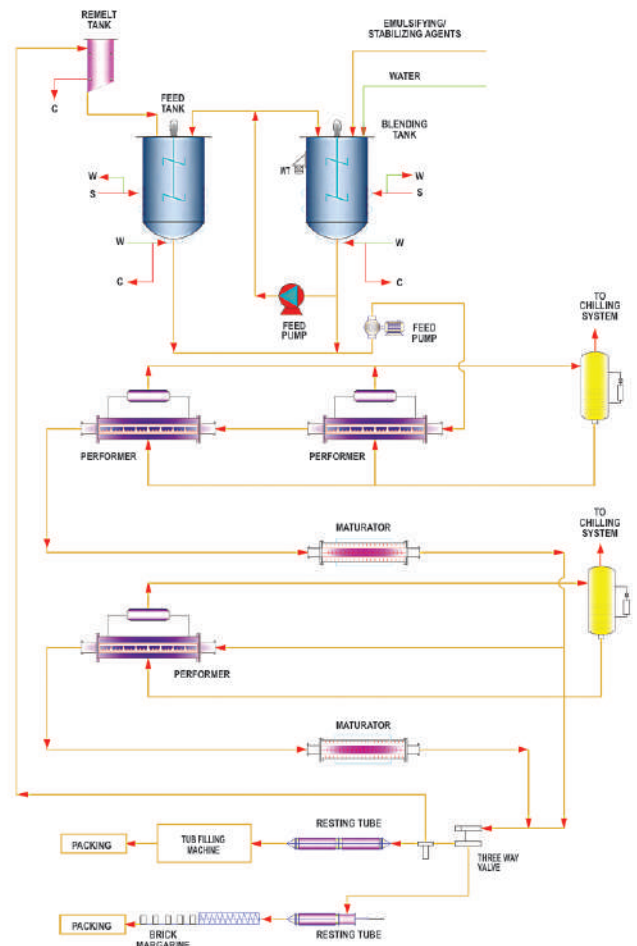
Bakery Shortening, Margarine, Mayonnaise is a Fat modification Process to get the desired Fat for crispy, Fluffy and delicious Bakery Product. Muez-Hest offers Bakery shortening, Margarine, Mayonnaise Plant which is designed to meet International Standards.

### Uses of Margarine/Shortening

- Creams
- Cakes
- Breads
- Short pastry/Puff pastry
- Biscuits

### Highlights

- Complete Formulation/ Recipe
- Flexible Pipe line arrangement for different application.
- Combination of Fats and oils, based on availability of oil in Existing Plant.
- Best Engineering & Technology.

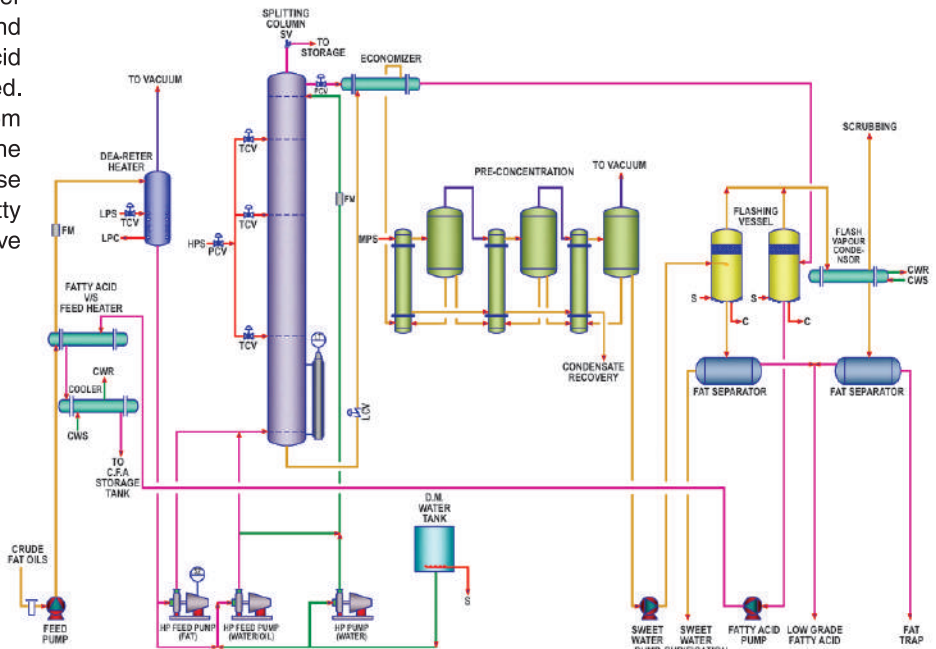




# Oleochemicals

## High Pressure Splitting With Pre Concentration

The splitting reaction of oil and water takes place under high temperature and high pressure. Three hydroxyl (OH group) of water added to triglyceride under high pressure and temperature then three molecule of Fatty Acid and one molecule of Glycerol is manufactured. The Crude Fat enter in the splitting tower from bottom to top counter current phase, while the water travels downwards as a dispersed phase through the interface mixing of fat and fatty acids. Splitting Degree of 99% and above reached consistently.

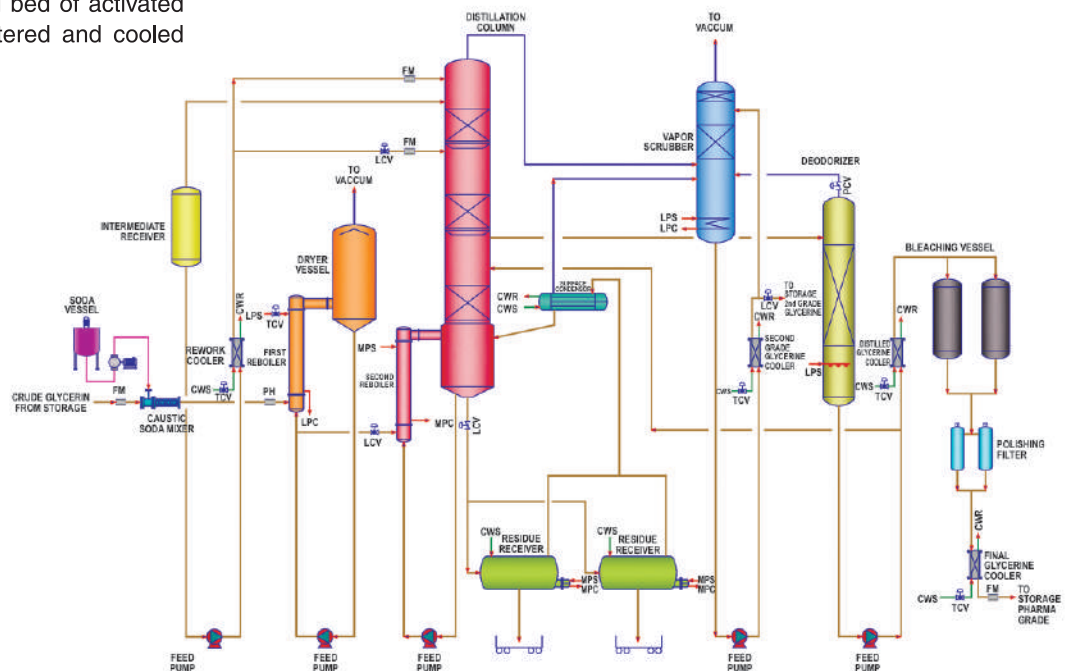


### Highlights

- High productivity
- More oil/fat splitting degree
- High quality product output
- Less contamination
- Low maintenance
- Low steam Consumption

## Glycerine Distillation

The Crude glycerine (80 to 85%) is distilled under high Vacuum and suitable temperature. After distillation, the glycerine is cooled down to bleaching temperature. The bleaching is done by passing through the fixed bed of activated carbon, then glycerine is filtered and cooled down to filling temperature.



### Highlights

- Continuous operation
- Less Chemical dosing
- Low Glycerine losses
- Best Colour
- High Yield





# Fractional Distillation (Three Column System)

Fractional Distillation facilitates the separation of Fatty Acid mixtures into composite cuts or even individual components.

The fatty acids are fractionated in vacuum columns having structured packing which allow high separation efficiency and low pressure drop. Falling film are provided to gently evaporate the liquid phase and vapors are condensed in surface condenser. The operation depend on the particular fractionation separation.

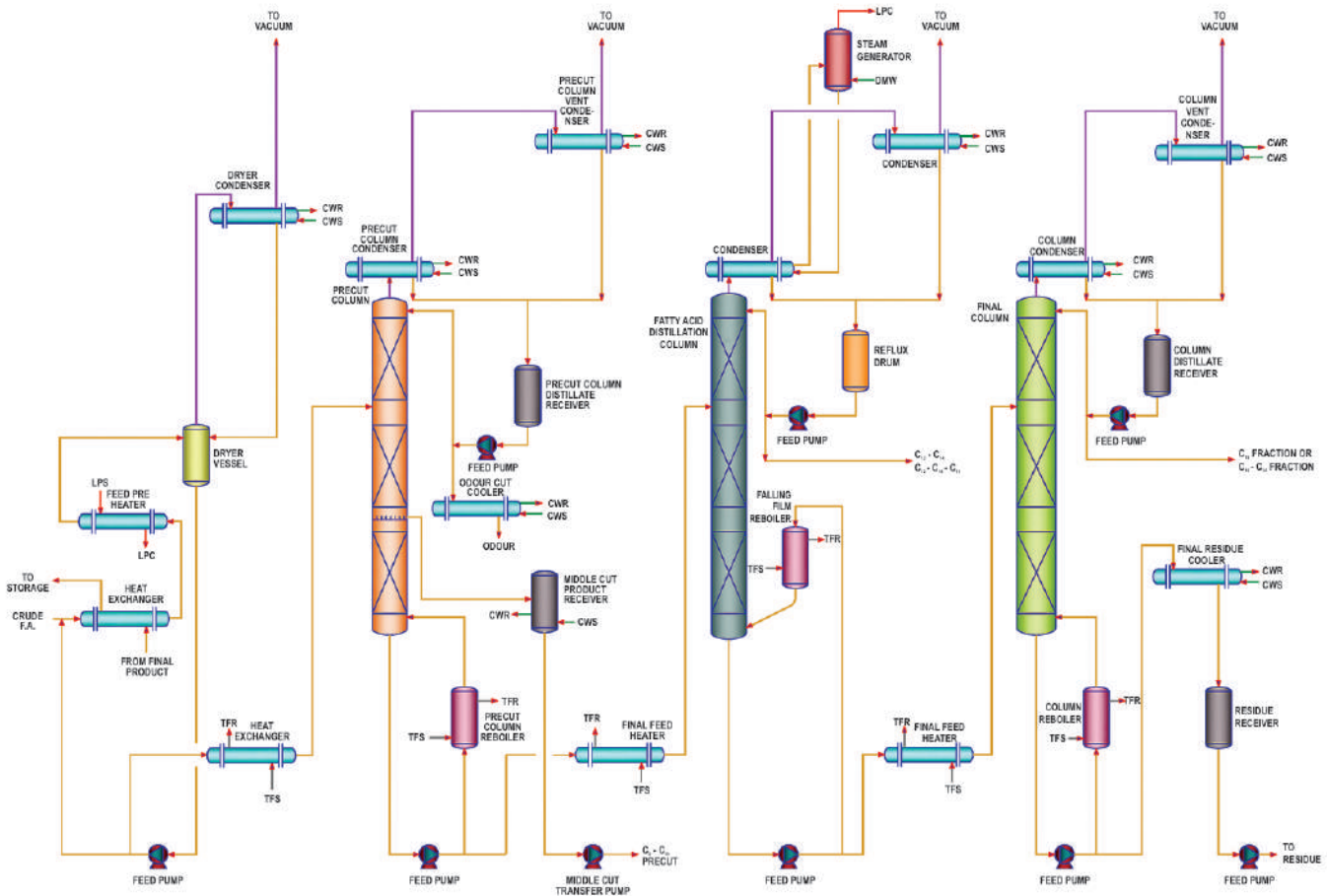
Crude fatty acids is dried, degassed and then evaporated in fractionation column 1 under a residual vacuum. Fraction 1 is take out from the column top. The bottom product of column 1 is transferred to the feed point of column 2 and evaporated under vacuum. The surface condenser of column 2 is for heat recovery by steam generation followed by a final condenser.

First Pre-cut Column separate fatty acid chain: C8 - C12

Second Column separate fatty acid chain: C14 - C12 or C12 - C14 - C16

Third Column separate fatty acid chain: C16 - C18

- Highlights**
  - Specific Designs as per Client.
  - Optimized Heat recovery.
  - High purity of fatty acid fractions.





## R&D Facility

### Research & Analytical Laboratory

We are the first engineering company having a well-equipped Research, Development and Innovation Centre, which has been approved by Department of Scientific and Industrial Research (DSIR, Govt. of India, and New Delhi).

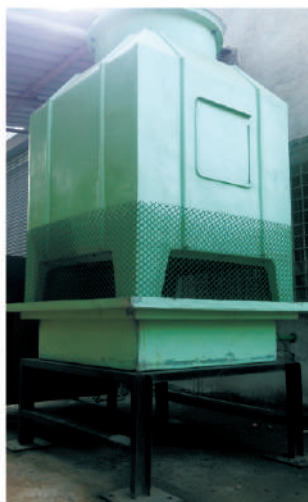
MHRDC was established as Food Research & Analytical Service Centre to Food Processing, Oil Milling, Agriculture and Allied Value Added Industries.

We have well equipped lab with sophisticated calibration instruments like GC (Gas Liquid Chromatography), Spectrophotometer (UV-Visible), Cloud and Pour Point Apparatus, Kjeldahl Apparatus, Soxhlet Apparatus, Karl Fisher, Flash & Fire Point Apparatus, Brookfield Viscometer, Lovibond Tintometer etc. for oils, fats and foods Analysis with high accuracy and precision.



### Proto-validation

Muez-Hest Research & Development centre has been developing Continuously Process Technologies and Value Engineering for Oils, Fats and Food. We work on concept to commercialization with proto validation to meet customer's specific requirements.





# Tailor Made Equipments



Autoclave



Bleacher



Crystallizer



Deareator Heater



Decanter



Deodorizer



Distillation Column



Economiser/Heater



Fat Separator



Fatty Acid  
Vapour Scrubber



High  
Shear  
Mixer



Hydration  
Tank



Intermediate  
Receiver



Oil Earth Mixer



Pressure  
Leaf Filter  
(PLF)



Soft Column



Splitting Column



Super Heater



Micro  
Security  
Filter



Heat Exchanger





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Note: The specifications and processes explained in this brochure are subject to change for improvements and adoption of newer technologies. The information provided should be taken as a reference source without any liability on our part.