TECHNOLOGY WITH INNOVATION

SOPA

PROCESS ROUTE AND EQUIPMENT SELECTION FOR REFINERY

DVC PROCESS TECHNOLOGISTS

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CONSERVE ENERGY, SAVE ENVIRONMENT

Key Process parameter in Degumming - Hydration Time

- Degumming – Elimination of phosphatides i.e. gums as they are responsible for high refining losses and they decompose, darken the oil due to their thermal instability.
- Efficient dispersion of hydration reagent – water.
- Adequate hydration time at water degumming stage is required for proper interaction between oil & water that ensures complete precipitation of hydratable gums.
- Sufficient hydration time makes certain that **crude oil with Higher gums content** can also be processed with ease.
- Proper removal of gums in water degumming stage results in **higher gums (lecithin) recovery.**

Long Mix Refining Benefits

- Long retention time ensures that no free phosphoric acid is left, consequently consumption of caustic is reduced.
- Less caustic consumption prevents the undesirable saponification of neutral oil hence excess oil loss is prevented .
- Better retention of oil after caustic addition facilitates the colour removal which improves the oil quality.

Appropriate Retention Time After Acid Mixing

- Retention of 20 – 50 minutes is given after the Acid Mixing based on the NHP content present in the water degummed oil.
- For oils containing low NHP content, minimum 20 min retention is provided.

MOC of Retention tank in Longmix Process after Lye Addition

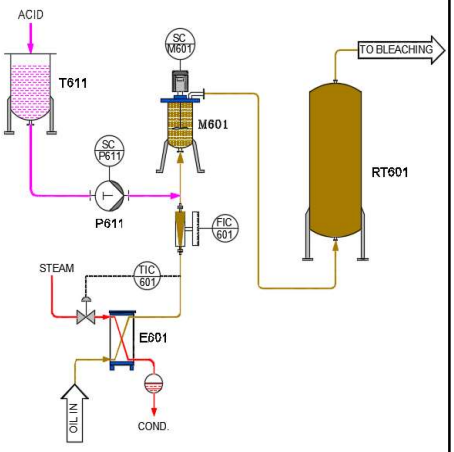
- Sufficient retention time in the acid addition stage results into complete treatment of NHP with phosphoric acid and therefore all the phosphoric acid gets consumed leaving no free acidity behind.
- As there is no free acidity present in oil, corrosion won't happen, hence MOC of Retention tank can be Carbon Steel.

Selection of Centrifugal Separator

- Flat Belt driven mechanism.
- Self Cleaning.
- Compact Design.
- Low requirement of flush water results high TFM soap-stock.
- Automated with Fine tuner by Electro pneumatic Actuator
- No Seal Breakage
- Ease of maintenance

Importance of Pre-treatment

- Premature/damaged seeds processed in Solvent extraction Plant produces oil with greenish tinge in colour – due to chlorophyll
- Pre-treatment consists of treatment of oil with phosphoric acid before bleaching - which helps in the removal of the green coloring component.
- Pre-treatment also eliminates residual Phosphatide and soap content

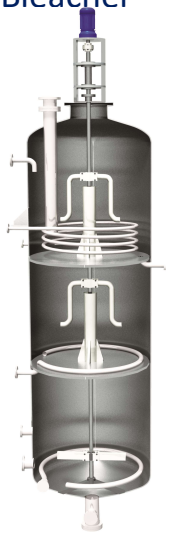


Features of DVC's HIBLEACH® Bleacher

- HIBLEACH Bleacher provides true retention of 50 minutes in order to achieve better quality bleached oil.

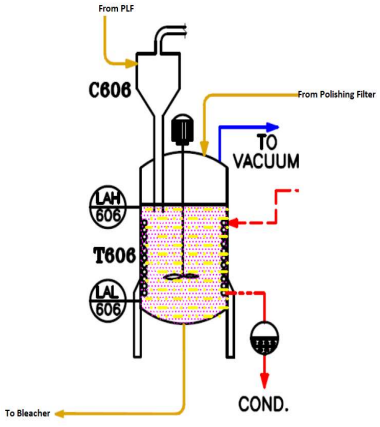
Mechanical & Steam Agitation in HIBLEACH® Bleacher

- Sparge steam arrangement for wet bleaching effect
- Mechanical agitation for proper contact of bleaching earth with oil thus reducing earth consumption. The process can be used to bleach dark color oils without settling.
- Special overflow arrangement between bleacher compartments to ensure true retention in the bleacher.



Cloudy Oil Tank Should be kept under Vacuum

- Keeping cloudy oil tank under vacuum will prevent the deterioration of the oil colour.



Role of Deodorization Operating Pressure

- Vacuum system designed at 1.5 torr suction pressure.
- This produces better quality deodorized oil with enhanced shelf life.

LOWTRANS® Deodorizer

- This dual temperature zone deodorization, removes FFA, tocopherols and other components while keeping a check on trans fatty acid isomer content in final oil.
- Trans fatty acid isomer content < 0.5%
- Efficient stripping in Dual Controlled temperature zones

DUALSCRUB® - A Unique Two Stage Scrubbing Technology

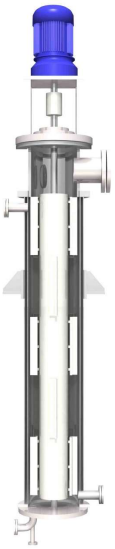
- Maximum separation between FFA and tocopherols streams.
- No extra processing cost
- Higher tocopherol yield in alkali refined soybean, sunflower and rapeseed oil.
- Adds premium value to both the products yielded from the two stages of scrubbing
- DUALSCRUB® can be installed in existing systems too.

Thermic fluid heater vs HP steam heater

- HP Steam heater (Thermosyphon Heater) preferable over thermic fluid heater as there is no health hazard in case of leakages in HP Steam heater.
- Power consumption is less.
- No requirement of thermic fluid top up or replacing the thermic fluid.
- Lower maintenance and operating costs.

SCR® Scrapped Surface Heat Exchanger in Lecithin Drying

- Used in production of edible/ pharma grade/ Export quality lecithin.
- Falling Film evaporation
- Complete hermetically sealed system protects products from contamination.
- Highly robust and maintenance free
- No damage to the product
- Cleanable in Place (CIP)



Location of Acid oil Plant

- Reuse of spent acid water for optimum pH discharge of effluent --- results in reduction of sulphuric acid consumption.
- Scrubbing of acidic fumes, before discharge to atmosphere for keeping the environment free from toxic material and prevents corrosion of building.
- Located inside the refinery building, refinery operator can supervise the plant. Thus no need to keep separate supervisor.
- Soap-stock generated by the plant is at 65 deg C and directly goes to the tank T300 which is well insulated. This retains the heat and lowers the additional heat load.

Design of Acidulation Tank

- MOC of the acidulation tank - Carbon steel with FRP coating which is suitable for using concentrated sulphuric Acid, results in the reduction of effluent load.
- FRP/Polymer tanks often get punctured & bulged if it comes in contact with concentrated sulphuric acid. In this case the whole tank needs to be changed.
- In case of the Carbon steel tank with FRP Coating, the FRP coating can be replaced, thus no need to replace the whole tank.

THANK YOU FOR YOUR ATTENTION

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