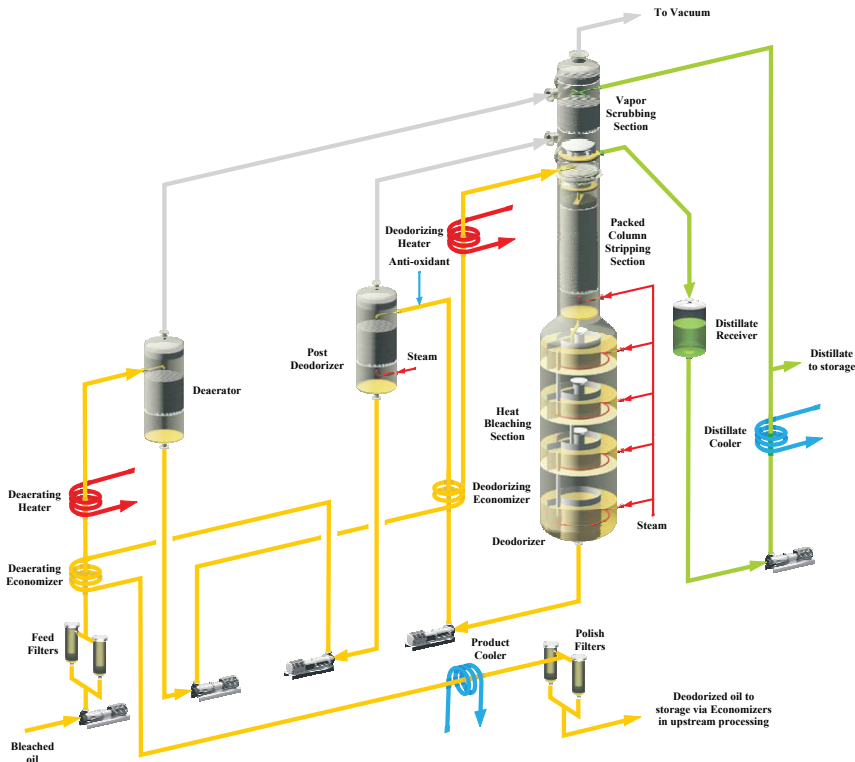




# MaxEfficiency Deodorizing System



- Maximum deodorizing efficiency with thin film stripping in packed column
- Maximum heat recovery and top oil quality with Post-Deodorizing
- Maximum control for optimizing tocopherol and minimizing trans with thin film stripping
- Maximum protection against air contact with packed column Deaerator, Double Shell
- Packed Column and steam sealed manways

## MAXIMUM DEODORIZING EFFICIENCY & CONTROL

### Process Basics

The incoming oil is heated by outgoing deodorized oil and sprayed into the Deaerator where dissolved air and moisture are reduced to a minimum. The oil is then heated to full temperature by hot deodorized oil in the Deodorizing Economizer and high-pressure steam in the Final Heater. The hot oil flows down through the stripping section of the Deodorizer, agitated by counter current stripping steam. Almost all free fatty acids and other unwanted volatile matter are evaporated and removed from the oil in a few minutes. Next, the stripped oil enters the heat bleaching section where, over time, and with the aid of steam agitation, color bodies and other heat sensitive compounds are volatilized and removed or rendered inactive. The double shell of the packed column minimizes heat loss and serves as a vapor outlet for the heat bleaching section.

The deodorized oil is pre-cooled by deaerated oil and then sprayed into the Post Deodorizer where the final "off-flavor" compounds are removed. After this the oil is cooled to storage temperature by the incoming oil and, when possible, oil entering the degumming/neutralizing and bleaching systems.

The system operates under deep vacuum (1 - 3 mbar) generated by either a traditional vacuum system or an ice condensation system.

The heating steam for the Final Heater is supplied by a self-contained high pressure steam generating system.

The entire system operates with a minimum of air contamination secured by separate steam supply and vapor discharge for the stripping and heat bleaching sections combined with steam sealed manways.

## Features and advantages

- Maximum deodorizing efficiency and control, minimum heat loss and “zero” risk of air exposure to structured packing due to Double Shell Packed Column (DSPC)
- Maximum column efficiency and minimum pressure in heat bleaching due to separate vapor outlet for heat bleaching section through double shell column
- Maximum heat recovery with pre-cooling in high efficiency economizer before final stripping in Post Deodorizer
- Maximum air removal in packing enhanced Deaerator ensures minimum fouling in Deodorizing Economizer
- Zero air leakage into the deodorizer ensured by steam sealed manways and sight glasses.
- Optional automation for up to six stock-changes per day
- Optional final heating or pre-cooling under vacuum
- Plant sizes from 50 to 1,200 TPD (metric tons per 24 hours)

## Utility Consumption

### Typical figures per metric ton of oil heated to 100°C by deodorized oil in Deaerating Economizer:

Electric Power:	2 - 4 kWh depending on plant size. Add about 2.5 kWh for ice condensation
Steam (10 barg):	60 kg with surface condensers; 20 kg with ice condensation
Heating Energy:	105,000 kJ + 3,500 kJ/% FFA
Cooling Water (30°C):	9 m <sup>3</sup> at $\Delta T$ 6°C 4 m <sup>3</sup> at $\Delta T$ 6°C with ice condensation
Citric Acid:	0.05 kg (optional as anti-oxidant)

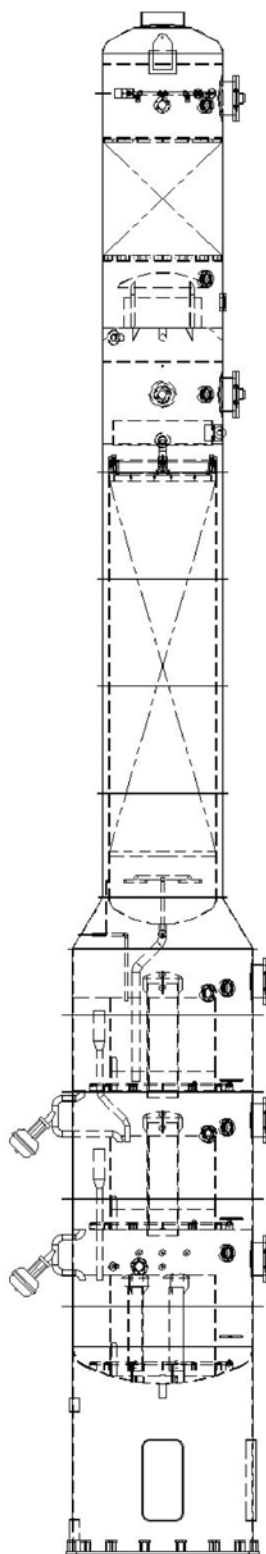
**Note:** Cooling water is amount circulated per metric ton of oil.

## Equipment Space Requirements

50 – 200 TPD:	Two levels, each 50 m <sup>2</sup> with 6 m elevation
200 – 600 TPD:	Two levels, each 75 m <sup>2</sup> with 8 m elevation
600 – 1200 TPD:	Two levels, each 120 m <sup>2</sup> with 8 m elevation

The deodorizer will require a total elevation of 27 - 34 m including 4 access platforms connected by ladders.

**Note:** Control room, MCC, HP steam generator and refrigeration system (for ice condensation) are not included.



**Ice Condensation**



**Smart Deodorizer Design**

- Integrated Scrubber with minimum pressure drop
- Inlet Flash Chamber for minimum entrainment
- Double Shell Packed Column for thermal insulation, removable packing assembly and securing against accidental air leaks
- Extra deep packing bed for maximum removal of volatiles
- Multiple heat bleaching trays for variable retention time
- External hermetic drain valves for easy access
- Steam sealed manways for minimum air leakage

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