



Refining of Edible Oils

Commercial deodorization is the removal of odiferous and flavor compounds from an edible oil. Alternatively, it could be defined with more precision as the *simultaneous removal* of odiferous and flavor compounds from an edible oil, *along with removal of any free fatty acids present in the oil, at absolute pressures between 2-6mm and temperatures of 180-270°C.*

We define the **refining process** as the removal of free fatty acids, phosphatides, color bodies, trace metals, odors and flavors from an edible oil.

Two primary methods of refining exist: Caustic Refining and Physical Refining.

- **Caustic refining** involves contacting a fat or oil with caustic soda and the subsequent removal of soap and phosphatides by centrifuge. After drying and bleaching the oil is deodorized at temperatures ranging from 180°C (*in batch vessels*) to 240°C (*in continuous columns*).
- **Physical refining** involves the *initial* removal of phosphatides, followed by bleaching and *simultaneous removal of free fatty acids, odors and flavors in a stripping column operating at 250-270°C.*

Physical refining seem a preferred method of refining edible oils since both effluent and effluent treatment costs are eliminated. However, physical refining has nutritional disadvantages. Conjugated fatty acids, linked to coronary heart disease, increase with both deodorizer temperature and residence time. To deal with this problem another refiner design is available.

Ely Energy holds the sole rights to a patented **Dry Refining Process** (*DRP, US Patent No. 6,111,120*) that quantitatively removes (*by filtration*) free fatty acids in a substantially water free environment. Phosphatides and other minor constituents are not removed by the *DRP*. The neutralized and bleached oil is then deodorized in a new generation thin film deodorizer (*TFD*). The process allows using an inert gas as a stripping medium to avoid the need of a seal pit and costly treatment of the seal pit effluent. These technologies allow for an effluent free, environmentally friendly refining process with greatly reduced capital and operating costs.

The performance values of this design include the following:

1. Nutritionally high quality oil
2. Acceptable capital cost
3. No effluent - rather uses nitrogen as the sparge gas

Please contact us for more information...

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US Patent: 6,111,120