Oil Palm: Fractions & Derivatives

Palm Kernel Oil process

Key:
- Green: Process
- Red: Product

Oil Palm Fruit → Oil Palm Mill → Crude Palm Oil

Crushing → Palm Kernel

Palm Kernel Expeller

Crushing → Crude Palm Kernel Oil

Refining → RBD Palm Kernel Oil

Fractionation

60% RBD Palm Kernel Olein

40% Palm Kernel Stearin

Hydrogenation → RBD Palm Kernel Olein

Hydrogenation → Hydrogenated Palm Kernel Olein

Distillation

Palm Kernel Fatty Acid Distillates

Oleochemicals

Hydrogenation → Hydrogenated Palm Kernel Stearin

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Mill Process
Fresh Fruit Bunches (FFBs) are sterilized and stripped. The fruit is pressed to separate the oil from the ‘cake’ (a mixture of kernel and fibre). The oil is then purified and clarified.

Crushing
The kernel is cracked to remove the palm kernel shell (Palm Kernel Expeller or PKE) and the kernel is crushed and pressed to produce Palm Kernel Oil or PKO.

Refining (RBD: Refinined, Bleached & Deodorised)
Oil is refined to remove colour, odour and flavour.

Fractionation
Liquid Palm Olein and solid Palm Stearin are separated. This is achieved by using crystallisation techniques followed by a membrane filter process.

Interesterification (IE)
Oils are reformulated to produce different properties. Carbon chains are separated from the glycerine anchor and reattached in a different formation to create oils with improved properties for specific uses in the food industry.

Hydrogenation
A means of increasing the melting point of oils using Hydrogen gas.

Glycerolysis
The process of creating emulsifiers by adding glycerine. Emulsifiers facilitate the mixture of oil and water.

Distillation
A method of separating mixtures based on differences in volatility of components in a liquid mixture.
RBD Palm Oil
Melting point: 35°C
Properties: balanced fatty acid composition
Uses: bakery fats, biscuit fat, foodservice frying oils

RBD Palm Olein
Melting point: 20°C
Properties: liquid at room temperature
Uses: snack food manufacture, cooking oils

RBD Palm Stearin:
Melting point: 48°C
Properties: solid at room temperature
Uses: pastry fats, margarines, soap manufacture

Double Olein (or Super Olein)
Melting point: 10°C
Properties: liquid frying oil, a good replacement for hydrogenated fat, good resistance to oxidation
Uses: foodservice frying oils

Palm Mid Fraction
Melting point: 25-30°C
Properties: solid at low temperature but melts quickly
Uses: ganache type confectionery fillings, biscuit fillings, frying oil

Double Stearin
Melting point: 60-62°C
Properties: very hard, easy to flake or powder
Uses: soup dry mixes, cake dry mixes

Mid Stearin
Melting point: 30°C
Properties: mid range melting point
Uses: hard Stock for margarine

Palm Kernel Expeller (PKE)
Properties: good source of fibre and minerals including phosphorous, copper, zinc and manganese
Uses: animal feed
**Products**

**RBD Palm Kernel Oil**
- Melting point: 26-28°C
- Properties: highly saturated fat, semi-solid at room temperature, good melting properties, good lathering properties
- Uses: confectionery, ice cream, soap formulas

**RBD Palm Kernel Olein**
- Melting point: 22-25°C
- Properties: low melting point, generally hydrogenated
- Uses: coffee whiteners

**RBD Palm Kernel Stearin**
- Melting point: 32-33°C
- Properties: low melting point, good oxidative stability
- Uses: confectionery, biscuit cream, ice cream, chocolate coatings

**Palm Fatty Acid Distillate (PFAD)**
- Uses: animal feed, detergents

**Palm Kernel Fatty Acid Distillates (PKFAD)**
- Uses: animal feed, detergents

**Oleochemicals:**
- Properties: a replacement for petrochemicals
- Uses: detergent, biofuel

**Hydrogenated Palm Kernel Oil (HPKO)**
- Melting point: 36°C
- Properties: high in saturates, rapid melt down for good flavour release
- Uses: ice cream, confectionery, chocolate coatings, soap, cosmetics, biofuel

**Emulsifier**
- Properties: facilitates the mixture of oil and water, significantly improving the texture of many foods. Also helps to maintain quality and freshness, preventing the growth of mould which would happen if the oil and fat separate.
- Uses: margarine, low fat spread, biscuits, cakes, ice cream, bread, etc.
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<th>Properties</th>
<th>Uses</th>
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<td>Hydrogenated Palm Olein</td>
<td>42ºC</td>
<td>good melting properties</td>
<td>dairy fat alternatives</td>
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<tr>
<td>Hydrogenated Double Olein</td>
<td>36ºC</td>
<td>good melting properties</td>
<td>confectionery fillings</td>
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<tr>
<td>Hydrogenated Palm Oil</td>
<td>42ºC-65ºC</td>
<td>high melting point</td>
<td>distilled emulsifier manufacture, flaked and powdered Fats</td>
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<tr>
<td>Hydrogenated Palm Kernel Olein</td>
<td>41ºC</td>
<td>High Stability, able to powder</td>
<td>confectionery coatings, coffee creamers and whiteners</td>
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<tr>
<td>IE Palm</td>
<td>42ºC</td>
<td>improved crystallisation</td>
<td>dry mixes</td>
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<td>IE Palm Olein</td>
<td>38ºC</td>
<td>improved crystallisation</td>
<td>confectionery, biscuit filling fats</td>
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<td>IE Palm Stearin</td>
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<td>flaked fats</td>
<td>pizza dough</td>
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