



**FLOTTWEG TRICANTERS®
FOR THE PALM OIL INDUSTRY**

Make the Most Out of Your Natural Resources!



THREE-PHASE SEPARATION

Using the Flottweg Tricanter®

Palm oil is one of the world's most widely produced vegetable oils. It is the fruit of the oil palm tree, a tropical species that originated in West Africa, but now grows as a hybrid in many parts of the world, including Asia and Central America. Palm oil is used for a variety of purposes. The world demand for palm oil has soared in the last two decades, first for its use in food, consumer products and more recently as the raw material for biofuel. Palm oil is extracted in a multiple stage process.

The Flottweg Tricanter® enables three-phase separation, i.e. the simultaneous separation of two immiscible liquids with different densities and one solid phase, provided that the solid phase is the heaviest phase. The most important difference from a decanter is the separate discharge of the two liquid phases. The Flottweg Tricanter® discharges the heavy liquid (water) via an adjustable impeller under pressure and the light liquid phase (oil) by gravity. The adjustable impeller allows adjusting the separation zone inside the bowl and so the separation efficiency of the machine during operation. This optimizes the purity of the liquids and may possibly eliminate downstream equipment. This technical feature is available for the Flottweg Tricanter® models type Z4E, Z5E and Z6E.

Flottweg Tricanter® are used for

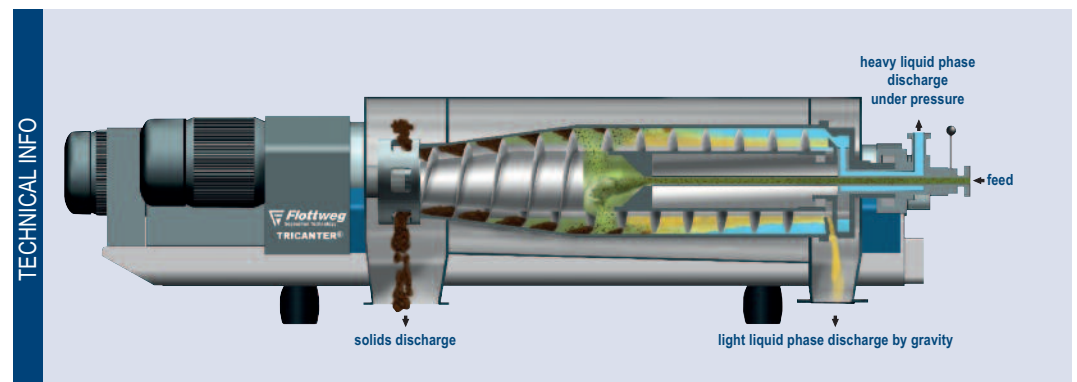
- Direct treatment of crude palm oil after the screw press
- Oil recovery out of the underflow after the sludge tank or the pre-clarifier
- Oil recovery from the waste stream of palm oil mills.

QUALITY "MADE IN GERMANY"

Flottweg is ISO 9001 certified and manufactures its products



in compliance with the latest technical standards.



The Flottweg Tricanter® (three-phase decanter)



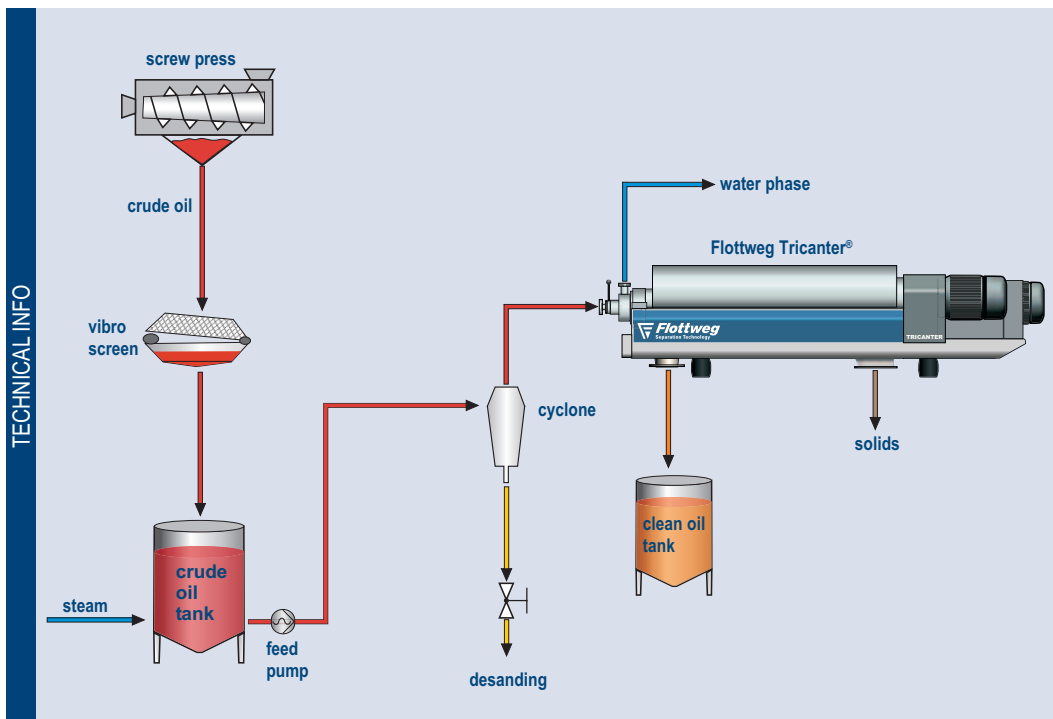
PROCESSING CRUDE PALM OIL (CPO)

Using the Flottweg Tricanter®

Crude palm oil (CPO) coming from the screw press passes through the vibration screen and is collected in the crude oil tank equipped with a heating device and optionally with a slowly rotating agitator. After the crude oil tank, a feed pump transfers the oil directly to the Flottweg Tricanter® by passing a de-sanding cyclone. In the Tricanter®, the three-phase separation takes place providing clean oil, water and solids.

Benefits

- Clean oil – no need of clarification stage
- Short processing time
- Minimum heat loss
- Virtually no alteration of the oil (low FFA)
- Minimum dilution water demand
- Minimum waste water stream
- Maximum flexibility



Flottweg CPO Process

® = registered trademark for various countries

The picture shows palm oil trees



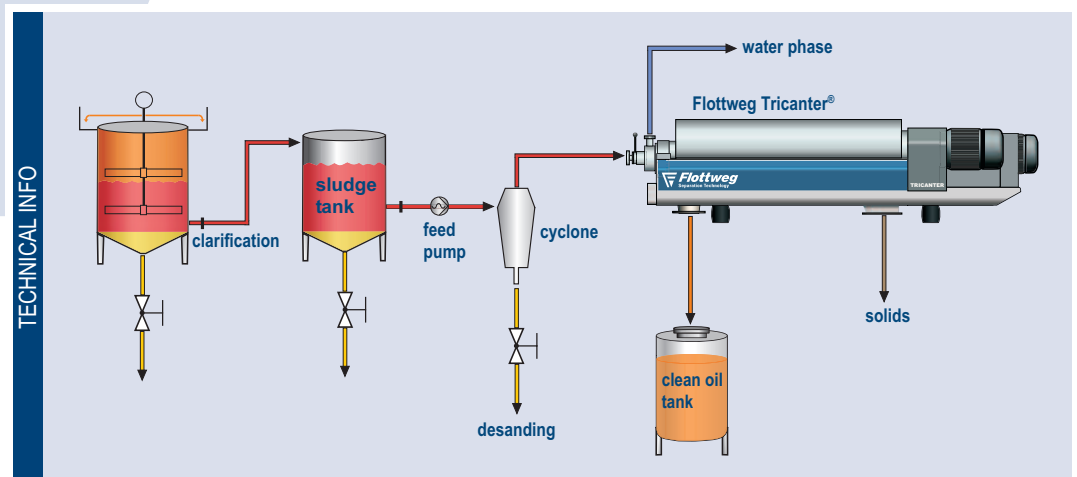
PROCESSING PALM OIL SLUDGE

Using the Flottweg Tricanter®

In the conventional palm oil process Flottweg Tricanter® are used for the recovery of palm oil from palm oil sludge. Sludge is collected in the CS-tank and prethickened in the sludge tank. Afterwards, the sludge is pumped through a de-sanding cyclone to the Tricanter®, where the sludge is separated into water, oil and solids. Changing feed conditions, especially during start up and shut down of the clarification station can be outbalanced easily by adapting the machine to the prevailing conditions. An outstanding feature to provide this kind of flexibility is Flottweg's Variable Impeller.

Benefits

- Sturdy and reliable design
- Flexible system (impeller)
- No dilution water
- Minimum oil loss
- Short downtime
- High oil quality
- Reduced labour and maintenance costs



Flottweg Tricanter® in the conventional palm oil process



SOME FACTORS

That Make the Flottweg Centrifuges Unique

Optimal performance in terms of oil yield, cake dryness, and power consumption, even under varying feed and operation conditions are achieved by:

- **Variable frequency drive (VFD)**

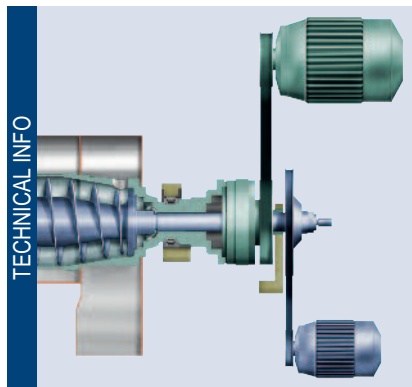
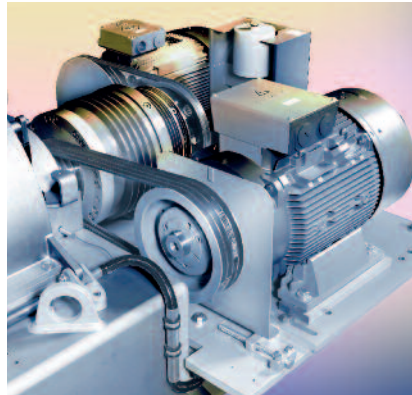
The bowl is driven via a frequency controlled motor enabling a continuously adjustable bowl speed and a fixed gear ratio for differential speed. A smooth start-up without peak loads for the grid and low energy consumption will be the benefit for our customers on top of the reduced maintenance costs.

- **Flottweg Simp Drive®**

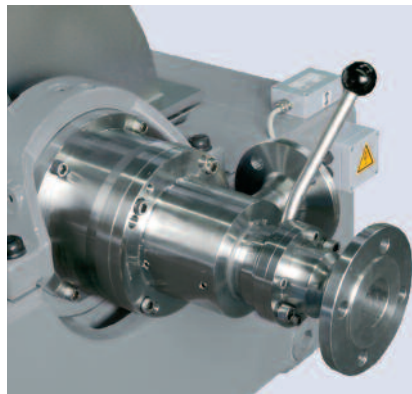
In addition to the gear drive, the scroll is driven independently from the bowl by a secondary motor and via a special gear box. This allows for a torque-dependent differential speed control which results in optimum cake dryness when using the 3-phase process. The Flottweg Simp Drive® also allows for rotation of the scroll while the bowl stands still, thus emptying the bowl content.

- **Adjustable impeller**

For optimum oil-water separation, a highly precise setting in the liquid discharge is required. The Flottweg Tricanter® with impeller enables a continuous adjustment even during operation.



Torque-dependent differential speed control via the Flottweg Simp Drive®



Adjustable impeller

® = registered trademark for various countries

The picture shows palm oil fruits



HIGH RELIABILITY AND AVAILABILITY BY:

- Manual central lubrication

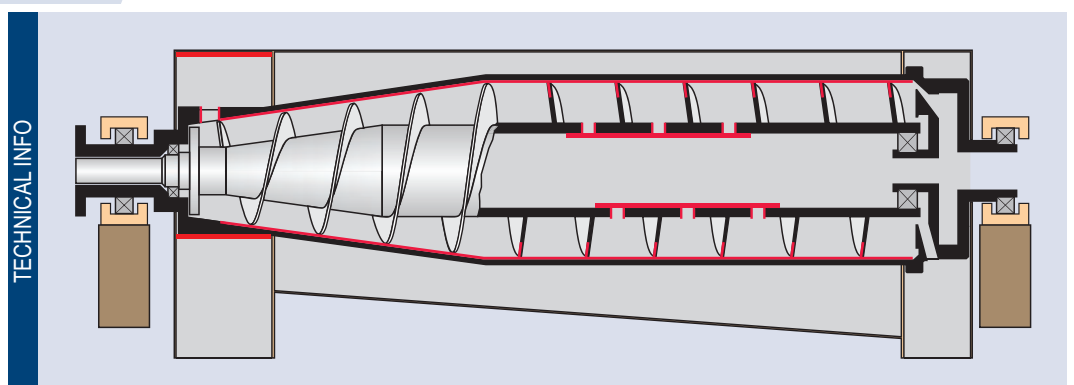
In standard execution, all Flottweg Centrifuges are provided with a manually operated central grease pump. No hassle with single grease fittings or defects caused by missed greasing of a bearing. Optionally Flottweg equips the machines with fully automatic oil-air-lubrication systems.

- Wear protection

Flottweg offers a wide range of wear protection to meet the requirements of the many different applications in which centrifuges are installed. All red coloured sections are protected by different exchangeable wear protection devices.



Manual central lubrication



Red coloured sections = exchangeable wear protection devices

In order to minimize maintenance costs for applications involving highly abrasive products, all wear protection elements, except welded hard facings or spray coatings, are field-replaceable.

Installation in Indonesia

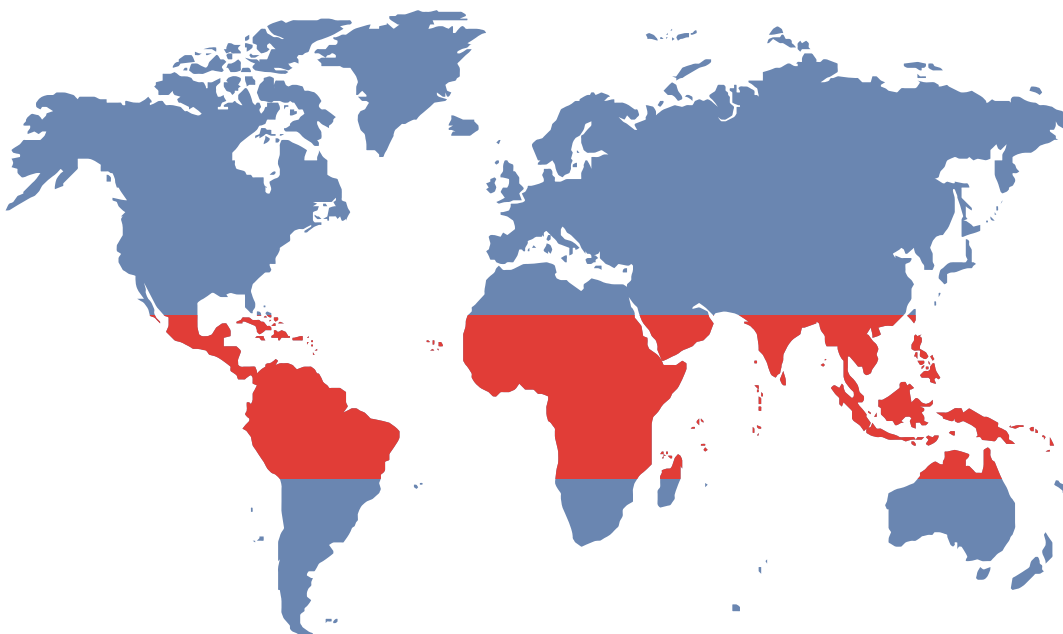


WHEREVER PALM OIL IS PRODUCED

There is Flottweg

Flottweg Tricanter® cover the whole throughput range required in the palm oil industry with capacities up to 75 t FFB/h. Since its entry into the palm oil market in 1982, Flottweg has sold hundreds of Flottweg Tricanter® into palm oil mills worldwide in South-East Asian countries as well as in Africa and South America. During that period Flottweg has earned reputation for both, the technical excellence of its machines and the reliability of its service. As part of the company's policy of continuous

development all service and sales activities are now focused in the hands of regional partners. In close cooperation with Flottweg Germany, the organizations in the different countries are continually improving customer care and service in the area.



The oil palm belt, covering the tropical countries all over the world

FLOTTWEG TRICANTER®			
Model	Z4E-4	Z5E-4	Z6E-4
Capacity m³/h (palm oil sludge)	12 – 15	22 – 30	30 – 40
Capacity tons ffb/h (palm oil sludge)	25 – 30	55 – 60	60 – 80
Capacity m³/h (crude palm oil)	6 – 8	10 – 15	16 – 20
Capacity tons ffb/h (crude palm oil)	12 – 16	20 – 30	32 – 40
Max. bowl speed rpm	3800	3500	3200
Installed power kW (bowl and scroll)	33	70	90
Gross weight (approx. kg)	3000	6400	9230

Data to be understood as guideline



Flottweg Separation Technology – Engineered For Your Success



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