PALM OIL EQUIPMENT

CROWN
MACHINERY

CROWN MACHINERY

CATALOGUE

PALM OIL EXTRACTION EQUIPMENT

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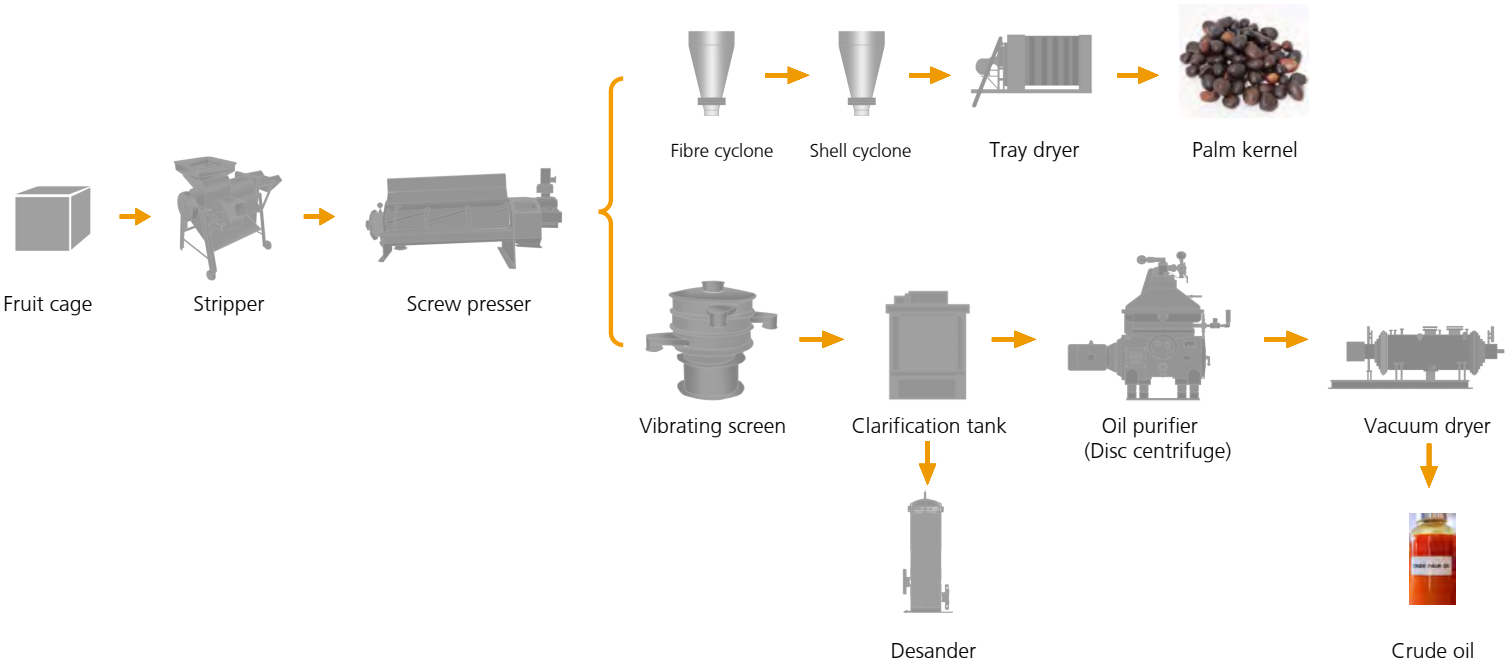
Technologies for
Palm oil Extraction

Palm oil extraction & Clarification Centrifuge

Palm oil is a very productive crop. It offers a far greater yield at a lower cost of production than other vegetable oils. Global production of and demand for palm oil is increasing rapidly. Global production of palm oil has doubled over the last decade. Worldwide demand for palm oil is expected to double again by year 2050 to 240 million tones. To help improve production efficiency and optimize profits, Crown Machinery has developed customized solutions for flexible process management, which minimize water and energy consumption. In addition to providing advanced individual machines, we can supply entire process lines, or even design and implement complete, customized installations.

Crown Machinery offers process technology for the recovery and refining of palm oil, as well as oil refining for press oil clarification, degumming, neutralization, dewaxing, fractionation and soapstock splitting. Our technologies are also used for the production of high-quality biodiesel.

Crown Machinery centrifugal separation technology, concentration equipment guarantee maximum yields at any scale of production.



Red palm oil process

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Oil product Overview

Red Oil Extraction

Digested fruit is continuously conveyed through the cage towards an outlet restricted by a cone, which creates the centrifugal force to separate the oil and the water from the mixture. Oil-bearing cells that are not ruptured in the digester will remain unopened if or centrifugal extraction system is employed. It can effectively break open the unopened oil cells and release more oil. These centrifuge act as an additional digester and are efficient in oil extraction.

Palm Kernel Oil

The residue from the press consists of a mixture of fibre and palm nuts. The fibre is then pressed in spindle presses to recover a second grade (technical) oil that is used normally in soap-making. The nuts are usually dried and sold to other operators who process them into palm kernel oil. For this reason it makes economic sense to recover the fibre and to shell the palm nuts.

The traditional oil extraction method is to fry palm kernels in old oil or simply heat the dried nuts. The fried kernels are then pounded or ground to a paste.Then again, you can use centrifuge to efficiently separate the water and palm kernel oil.

Oil Purification and Recovery

The main point of clarification is to separate the oil from its entrained impurities. The fluid coming out of the press is a mixture of palm oil, water, cell debris, fibrous material and 'nonoily solids'. Because of the non-oily solids the mixture is very viscous. Hot water is therefore added to dilute it. To prevent increasing FFA through autocatalytic hydrolysis of the oil, the moisture content of the oil must be reduced to 0.15 to 0.25 %. Centrifuge can help you solve that problem.

Equipment range for Palm oil extraction process

Oil separation selection

DECANTER CENTRIFUGE

Decanter Centrifuges are popular solid-and-liquid separators used in multiple industries for a wide array of products. Decanters are used for the extraction of liquids from large proportions of solids. It makes use of medium-low speed suspension to process larger capacities of solids as compared to a Basket Centrifuge.

DISC STACK CENTRIFUGE

Disc Stack Centrifuge is a high-speed, mechanical centrifuge used for the separation and purification of mixtures comprising of solids and liquids.

These machines can be used in a wide range of applications. For example, it can be used in extracting procedures for oil, for basic oil and water separation, and for filtration or the removal of impurities of any solid or liquid product.

TUBULAR SEPARATOR

Tubular Separator is Crown Machinery's most popular product to date. The company has been continuously improving its design for about 30 years already.

It is a high-speed centrifuge used in a variety of biological processes: from cellular harvesting up to the separation and purification of chemicals, food, blood, and even medicine.

FILTER CENTRIFUGE

Filter Centrifuge widely used in the F&B Industry apply for oil extracting machines, separate the liquid from pomace through its basket-shaped filter. It works on the principle of centrifugal force which is a high-speed revolution of solids within a metal basket and liquid is secreted out from the fast-shrinking solids revolving inside. It is also used in the Pharmaceutical and Biotechnological Industries

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Decanter Centrifuge Specification

Series HDC

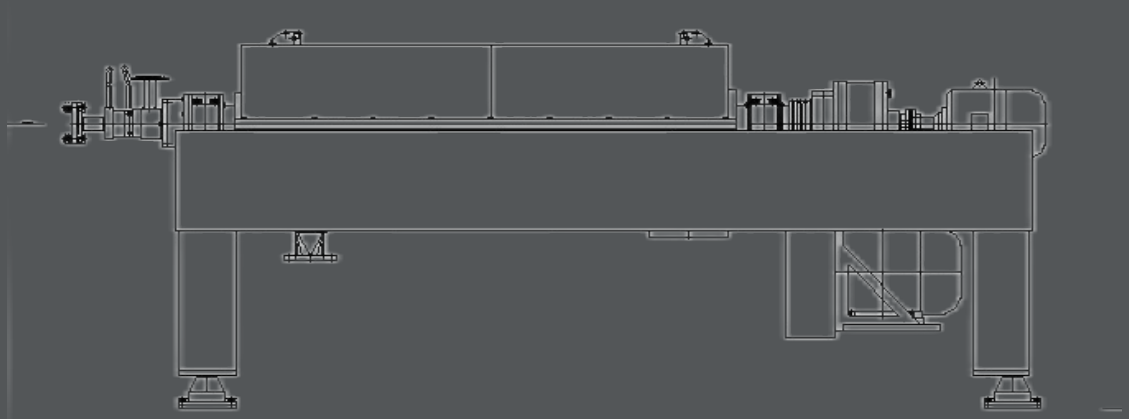
Parm/Model	250*1000	355*1460	450*1800	500*2000	550*2200	650*2800
Bowl Dia. (mm)	250	355	450	500	550	450
Bowl Length (mm)	1000	1460	1800	2000	2200	2800
L&D Ratio	1:4.0	1:4.1	1:4.0	1:4.0	1:4.0	1:4.3
Bowl Speed (r/rim)	4800	3800	3500	2500	2400	2400
Throughput (m^3/h)	1~5	1~20	3~35	5~35	5~40	20~110
Motor power (kW)	Main motor 11 Vice motor 4	Main motor 15 Vice motor 7.5	Main motor 37 Vice motor 11	Main motor 45 Vice motor 15	Main motor 55 Vice motor 22	Main motor 75 Vice motor 22
Weight (kg)	1500	2500	3200	3500	3500	8500
Dimension L*W*H (mm)	2400*750*960	2790*1300*880	3300*1600*920	3469*1600*1120	4395*1370*1655	4300*1900*1350

* Throughput indicate the water output and it may change depending on the dealing material and configuration

HDC : Two Phase

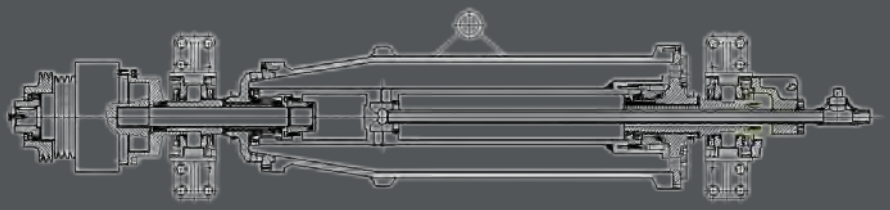
Scroll discharge Decanter Centrifuge

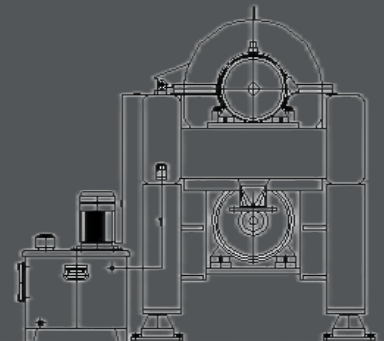
Front



Scroll discharge Decanter Centrifuge

Bowl





Oil centrifuge Specification

Series DGS

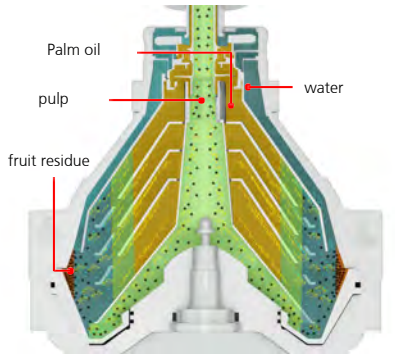
Parm/Model	300	400	500	550
Bowl Dia. (mm)	270	360	470	550
Bowl Speed (r/min)	7302	7070	6600	5800
Capacity (T/D)	10~12	30~50	100~150	200~350
Motor power (kW)	4 (Y112M-4-B5)	4 (Y132M-4-5B)	15 (Y160L-4-B5)	22 (Y180M-4-B5)
Weight (kg)	550	1200	1600	2300
Dimension L*W*H (mm)	950*950*1250	1530*1150*1500	1800*1200*1750	1965*1550*2045

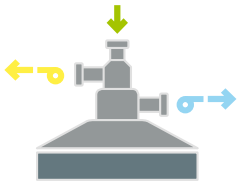
* Capacity indicate the water output and it may change depending on the dealing material and configuration

DGS : Three Phase

Oil Separation centrifuge - oil-water-residue

The oil centrifuge is used to separate liquid and solid mixtures with different densities, as palm oil products, separate the mixture into water, oil and residue.



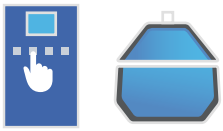


DGS

Automatic discharge

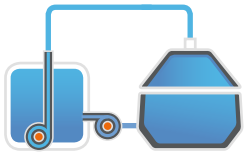
Pulp Palm oil / light phase Water / Heavy phase

Accessory equipment



Electric Cabinet

Monitoring and adjustment of power, parameters setting and safety devices.

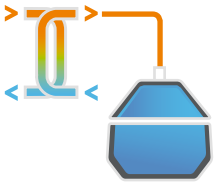


CIP System

Control the system clean the separation components automatically.

Counter pressure valve

Controls the pressure of the liquid phase outlet and of separation interphase.



Heating System

Regulates the temperature of inlet product.

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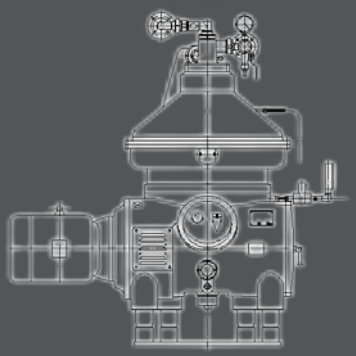
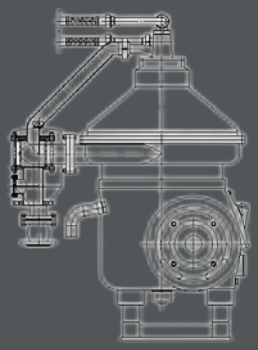
Figure

Oil Centrifuge

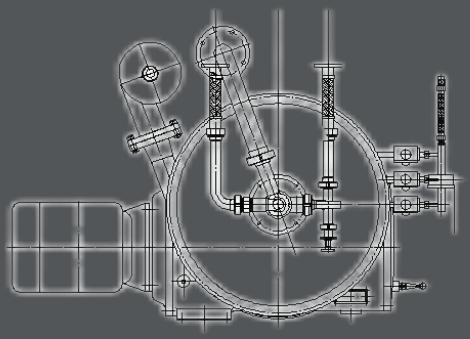
Type DHS 500 Oil clarification type

Front



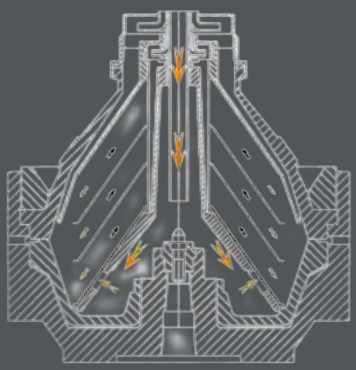


Overhead



Oil Centrifuge

Bowl



Working Principle

- Disc centrifuge has a main frame that consist a horizontal drive shaft with clutch and brake, worm gear, lubricating oil bath and vertical bowl spindle in the lower position.
- The bowl is mounted on top of the spindle, fixed by the upper parts, the gasket, the collecting parts, and frame hood. The material feed into the bowl, by the effects of centrifugal force the liquid phase pumped out of machine through outlet pipe, meanwhile the solid phase adhere on the bowl wall, then were discharged automatically by operation water. The electric motor is of the variable frequency drive type or of controlled torque type. All parts in contact with material are made of stainless steel.

Tubular Separator Series

Series TS

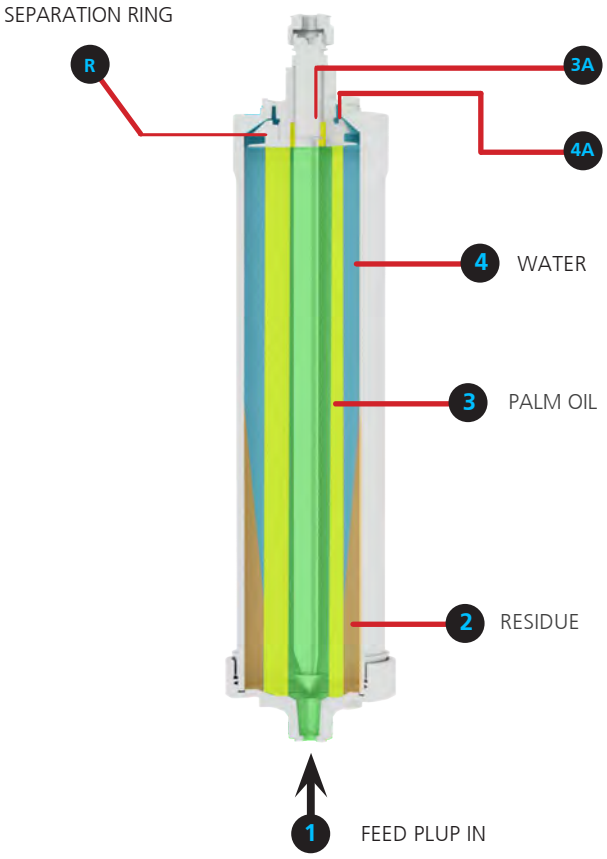
Parm/Model	75	105	125	150
Bowl Dia. (mm)	75	105	125	150
Bowl Volume (L)	2.2	6	8	10
Bowl Speed (r/rim)	19000	16300	15000	13400
Motor power (kW)	1.5	2.2	3	3
Weight (kg)	300	500	530	550
Dimension L*W*H (mm)	450*760*1120	600*900*1600	600*900*1600	600*900*1600

* TS: Three Phase

Functional category

SEPARATION TYPE

The Crown Machinery's TS series tubular separator can be configured as a three phase solutions (Liquid-Liquid-Solid). If any solids are present, they will collect on the wall of the centrifuge tube while the two separated liquids are discharged at the top of the tube by the dedicated outlets.



Separation principle

The feed mixture enters the bottom of the bowl (1) and sediment collects on the walls of the bowl (2). Liquids separate rapidly by specific gravity, and separating ting (R) directs liquids into OIL & WATER streams (3) and (4) which exit bowl in separate trays at (3A) and (4A).

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