



CROWN
MACHINERY



New Innovation Technology for Fish Oil Product from
Crown Machinery



Crown Machinery Enterprise Introduction

Crown Machinery Inc. is a modern innovative high-tech centrifuge R&D and manufacture enterprise with four main branches in global work located in USA , South Korea, Philippine and China. Adhering to the concept of quality is the enterprise life, innovation is the driving force for the development, Conform to the trend of the development of modern industry, Fusion concept of global economic integration, Creative thinking, Integrate liquid separation processing industry leading enterprise in the upstream and downstream resources; Gather technical force; Together with the power of the global enterprise for business purposes; Dedicated to supply the clients complete separation solution.

Our company assemble a number of skillful, talented professionals, introduction advanced of international centrifuge technology with 30 years experiences of the development and design, through adopting international advanced management method, we have developed very professional separator and centrifuge for edible oil , pharmaceutical , chemical , waste project and various liquid industry. Until now we have accumulated more than 500 clients in global world market and get wide good feedback for our products and service, as our enterprise name "Crown Machinery" described we would like to supply the products like the crown quality and service.

Nowadays, our USA branch mainly forwards the waste-water market; Manila branch mainly prompts the coconut products machinery in Asia-Pacific market; Our Korean branch also named the Hanil Science Medical Co.,Ltd. is focusing on the Bio-tech and Bio-pharmaceutical market; And Liaoyang Crown Machinery Co.,Ltd. in China works as the head-quarter of four branches to serve the machinery selection, sale, technology support and after-service job.

Up to now, we have successfully introduced many clients' final products such as coconut oil into Chinese market to achieve a mutually beneficial win-win situation. We do hope serving the client not only the products but also the wonderful experience to cooperate with us.

Welcome to contact and visit us.





Fish Oil Centrifuge

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Over the years, new techniques and centrifuges are used to adapt the requirement of new fish product and even new fish material, which is unable to process by the traditional method. Also the constant development and improvement of decaners and separators have impacted on the fish processing industry.

Crown Machinery provides specifically designed centrifuges for the task of fish oil and/or fish meal process of a variety of materials, when some of the low oil content fish meal unable to be separated by compression.



Fishery Trend

The latest figures for the global production of fish, crustaceans and molluscs published by the FAO in 2014 show that in recent years, the total amount has reached 160 million tons per year. This figure includes both the capture production which has been nearly constant with approx. 90 million tons per year, as well as the aquaculture production which currently amounts to approx. 70 million tons per year and has shown continuous growth over the last several years.

Nearly 80 percent, i.e. 130 million tons per year, are used for direct human consumption. The other 20 percent of the global production, 30 million tons per year, are by-products such as by-catch, heads, bones and skins which are separated during the various stages of industrial processing.

The amount destined for human consumption is divided into two: One half is sold live or fresh while the other half is processed into convenience seafood products, marinated or canned. Approximately 50% of the raw material to be processed for seafood is edible. This means that a quarter of the production destined for human consumption is not usable for direct human consumption. A part of this portion is used for elaborated food products such as fish soup, sauces, flavors etc., whereas the rest ends up as residuals. In total, each year there are globally approx. 50 million tons of residuals from fish production and processing which could either be a hazard when carelessly discarded into the environment or a source of additional profit when converted into something of value, e.g., fish oil and fish meal for feed, as well as for industrial use.



Recovery of Fish oil & Fish meal Process

The separation process is considered to be the standard fish meal process and was developed to recover fish meal and fish oil from whole fish or from residuals such as heads, fins, bones, etc. Fish oil was extracted and refined from the waste of the fishery process product, or as a by-product during the fish meal process.

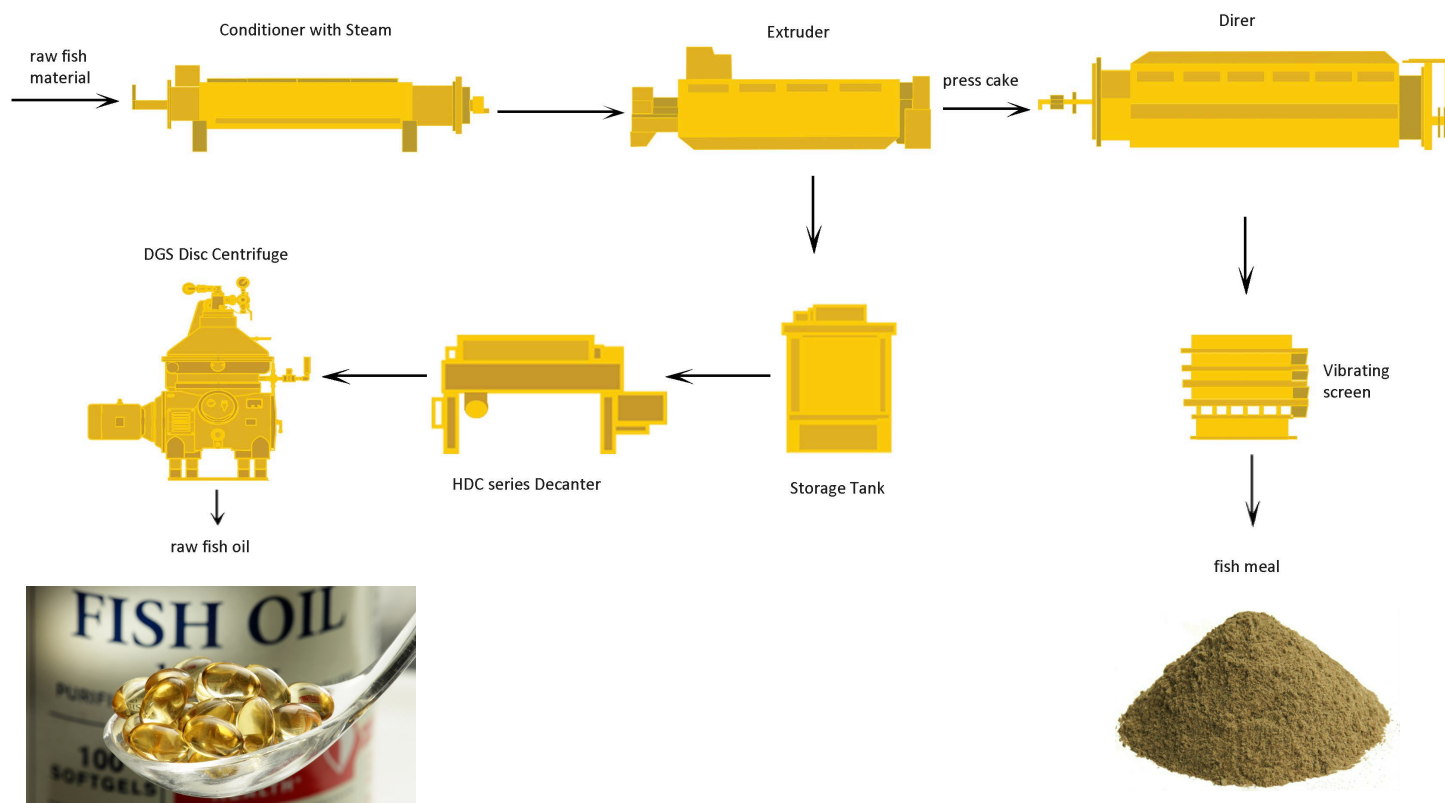
In the first process stage the raw materials are heated in 80 °C steam for 30 min so that it disintegrates and releases the fish oil. After cooking, the material passes through an extruder to be separated into a solid

Key success factors of Centrifuge

- No alteration of the product due to quick processing, even in cases of large volume
- Reduced emissions of odors or vapors due to the closed design
- High performance and separation efficiency
- High cost efficiency due to continuous and automatic operation
- High reliability and availability

phase and a liquid phase contain oil, water and fine solids. Next, the solids phase from the screens is separated further via presses into a press cake and a liquid phase. Finally the press cake is dried to obtain the fish meal.

The liquid phase from the pressing stages is separated into fish oil, stick water and solids. For this separation: A two-stage separation where a clarifying decanter centrifuge (HDC series) separates the solid material followed by a disc centrifuge (DGS series) to skim the fish oil from the stick water.





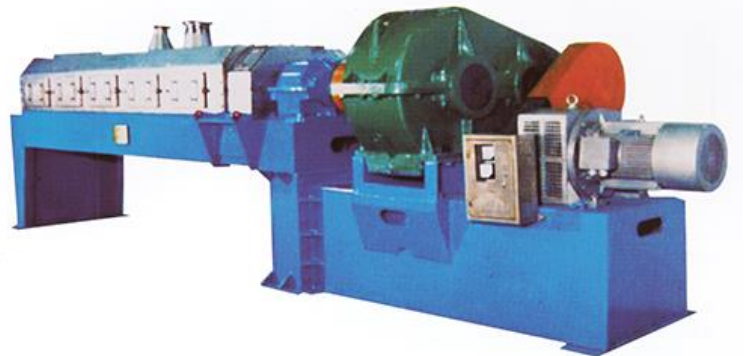
Working principle of Conditioner

Technical data

Item	unit	SG—20	SG—30	SG—50	SG—80	SG—150
Capacity	T/24H	> 20	> 30	> 50	> 80	> 150
Out-feeding temperature	°C	90 — 95 °C				
Stem pressure	Mpa	0.558Mpa				
Steam consumption	Kg/h	220	300	450	600	1100
Main shaft revolution	R/min	0.7 — 5R/min				
Heat transfer area	m ²	≈5 m ²	≈7 m ²	≈14 m ²	≈16 m ²	≈28 m ²
Power	kw	1.5	2.2	3	3	5.5
Weight	T	2.2	2.5	3.3	4.2	5.3

It is made up of columnar shell and one spiral with function of steam heating there is jacket mounted inside the columnar shell And the spiral shaft and screw are made in hollow structure inside which the steam circulates After the raw material enters into the machine from the inlet it will be heated by the steam in the jacket and propelled forward by the force of the screw During this process the raw material's size becomes less and less and less for the cooking action finally it is discharged evenly and continuously from the outlet by means of discharging device located at the

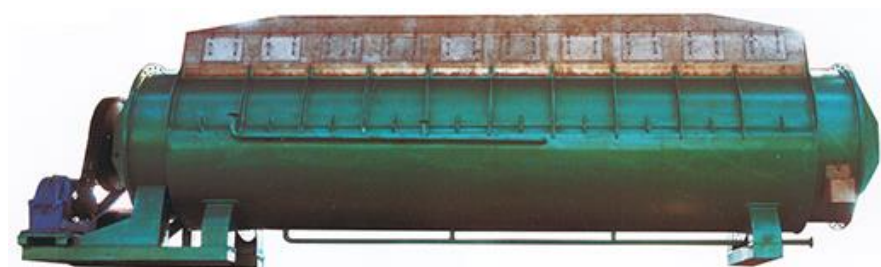
Working principle of Extrude



The space between each screw will be less and in the out-feeding direction while the spiral shaft diameter is bigger and bigger, because of which the materials in the groove between the two parallel shaft are pressurized gradually and finally the juice in the material will be squeezed out from the stainless steel sieve hole meantime the squeezed cake fall apart from the outlet and transferred to the drier by the screw conveyor The juice will be collected to the collecting vessel The sieve hole diameter range from 4.5mm to 1.0mm.

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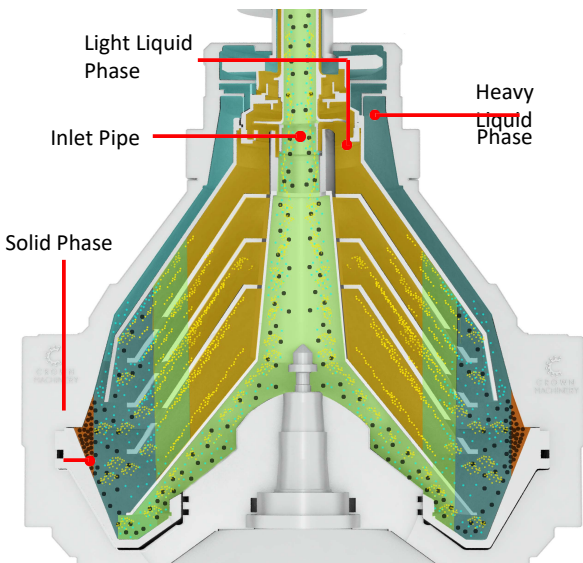
Working principle of Drier

It is consisted of horizontally placed shell and revolving shaft with function of steam heating; the heating flat plate mounted with angle-adjustable paddle welded to the shaft. By the force of the shaft revolution, fish meal is completely agitated and mixed. The gas generated during the heating action is vented by the air pipe in the steam chamber located at the top of shell. The air pipe is kept slightly vacuum to avoid steam leaking and too much cold air sucking. The steam enters in from the shaft-end in the inlet but the condensate discharged from the shaft end of the outlet.

Item	Unit	SG—20	SG—30	SG—50	SG—80	SG—100
Capacity	T/24H	>	>	>	>	>
Main Shaft Revolution	R/min	20	30	50	80	100
		12 — 13 RPM				
Steam Pressure	Mpa	0.6Mpa				
Evaporation Amount	220	330	550	800	1100	
Steam Consumption	Kg/h	300	420	720	1080	1440
Evaporation Area	m 2	24	36	60	96	120
Power	kw	15	22	37	45	55
Weight	T	8	10	14	16	18

Working principle of Disc centrifuge

Emulsion is added by a inlet pipe located in the center of the bowl. When the emulsion flows through the gap between the discs, the liquid phase of emulsion layered under the centrifugal force and form on the surface of the disc, then light liquid phase flow upward through disc, and heavy liquid phase upward flows close to the wall of bowl, and the separated liquids discharge from the outlet pipe. The solids particles automatically discharge for each batches.



Model	Bowl Speed (rpm)	Through-put Capacity (L/H)	Running Load (kw)	Dimensions (mm)		
				Width	Front-to-Back	Height
300	7302	300-500	4	950	950	1250
400	7070	1000-2000	7.5	1555	1130	1640
480	6600	3000	15	1780	1500	1900
500	6600	5000	18.5	1780	1500	1900
550	6000	10000	22	1800	1850	1900

*Actual production capacity base on the raw materials.



HDC series Decanter Centrifuge

General Description

Based on the more 30 years separator technics experience, we have developed and advanced the previous centrifuge and separator .

When separator operation is no longer feasible due to high proportions of solids in the suspension to be processed, decanter centrifuge is used, a horizontal, solids-oriented, solid-wall scroll centrifuges.

The solid bowl decanter centrifuge consists of two horizontal concentric rotating elements contained in a stationary casing. The outer rotating bowl element is tapered so that the solids discharge from a smaller radius than the liquor. The inner element is a hollow hub screw conveyor with blade tips shaped to fit closely to the contour of the bowl.

Advantage and Benefits to Choice Decanter Centrifuge

- ✓ Low Cake Moisture
- ✓ Compact design and requires
- ✓ low space Low operation cost
- ✓ High dewatering and filtration
- ✓ Capacity Low required space

Decanter Centrifuge Main Parameter

Model	HDC 300 x 1350	HDC 355 x 1600	HDC 450 x 1800	HDC 520 x 2200	HDC 650 x 2600
Bowl Dia. (mm)	300	350	450	520	650
Through-put Capacity (L/H)	1000-3000	3000-5000	50000-100000	100000-200000	200000-500000
Bowl Length Dia.(mm)	1350	1600	1800	2200	2600
L&D Ratio	1:4.5	1:4.5	1:4.0	1:4.2	1:4.0
Bowl Speed (r/min)	4200	3800	3200	3000	2800
Separation Factor	3000G	2868G	2575G	2620G	2850G
Screw Differential (r/min)	5-30 Stepless Ajustable	2-20 Stepless Adjustable	4-28 Stepless Adjustable	5-25 Stepless Adjustable	5-25 Stepless Adjustable
Motor (kw)	Main Motor11 Vice4	Main Motor15 Vice7.5	Main Motor30 Vice11	Main Motor45 Vice15	Main Motor75 Vice22
Noise db(A)	≤85	≤85	≤85	≤85	≤85

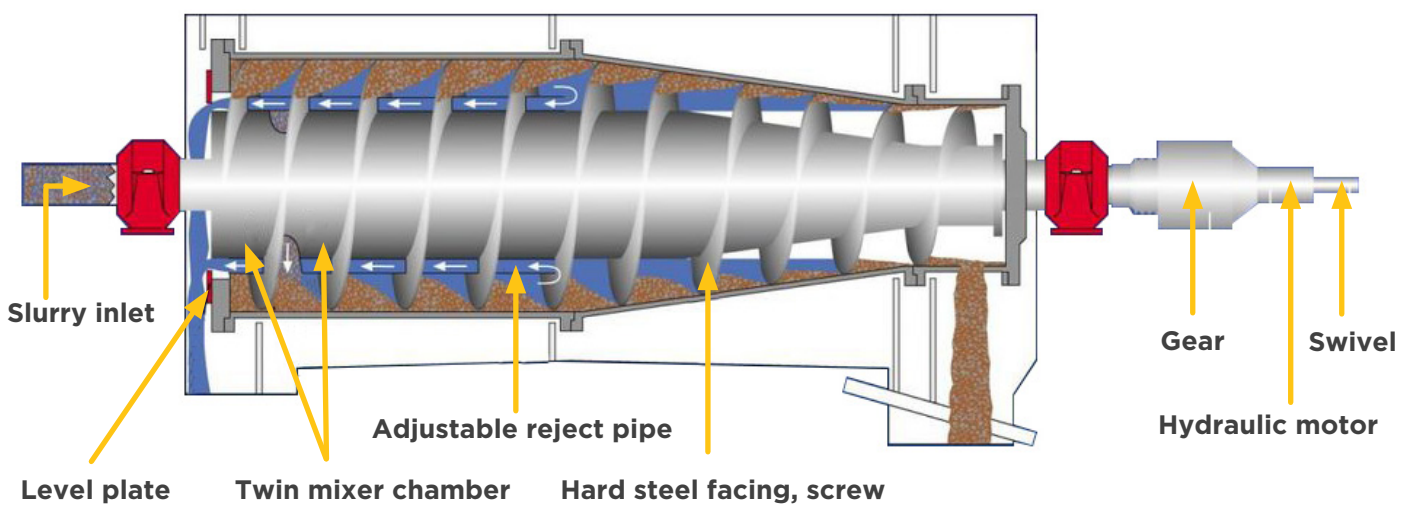
*Actual production capacity base on the raw materials.





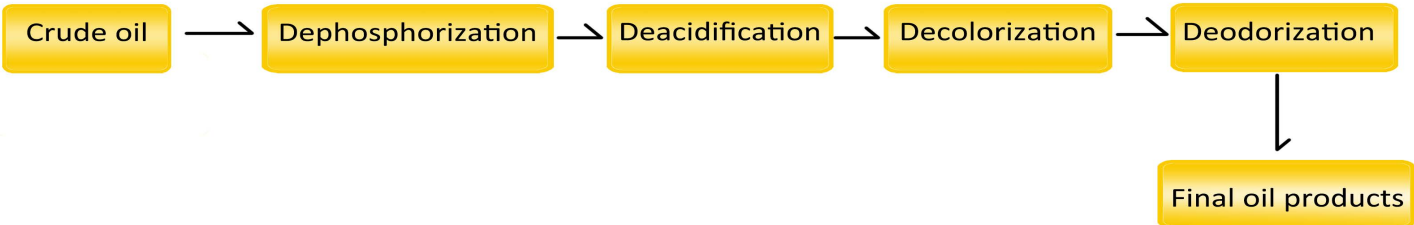
Decanter Centrifuge Separation Theorem

1. Feed slurry is introduced into the conveyor hub. As the feed accelerates to the machine speed, the slurry is delivered by centrifugal force into the rotating bowl by way of ports in the conveyor hub.
2. The solids settle through the liquid pool formed on the wall of the bowl. The solids are then conveyed, due to a slight differential between the screw conveyor and bowl, up the drying beach to the solids discharge ports.
3. The clarified liquors are discharge in the opposite direction from adjustable overflow ports.



Fish Oil Refining Process

Basic Information
Atmospheric ambient temperature: 20℃
Design : <30℃
Relative humidity: 65%
Public and auxiliary raw materials requirements
Saturated Vapor: 1.0MPa
Compressed air:
Temperature: ≤40℃
Pressure: ≥0.6MPa
Max oil content: 0.1mg/m3



Item	Power	Remark	Item	Power	Remark
Fining pot	0.75*2kw		Steam Generator		
Power: 0.75*2kw			Water tank		
Hot water alkali tank			Vortex pump		
Decolorization tank	0.75kw		Final oil product pump		
Clay pot			Installation material		
Air compressor			Crystal can		
Filter	1.1kw		Oil tank		
Cooling water pump	3kw		Wax box		
Deodorant tank			Oil pump	2.2kw	
Fine filter			Cooling water pump	2.2kw	
Trap			Oil groove		
Water seal tank		Provide by uses (2m³)	Gear oil pump	3kw	
Water ring pump	3kw		Filter		
Vacuum pump	1.1kw		Salt water tank		
Check valve			Distribution box		
Decolorization pump	0.75kw		Installation material		
Oil pump	1.5kw		Cooling system		
Decolorization box					
Distribution box					
Distributor cylinder					



Refining Process

Pressure 0.3 Mpa, the temperature is less than $20 \sim 32^{\circ}\text{C}$ (summer), the maximum Cooling water: Cooling water requirements non-corrosive, no suspended impurities, hardness of less than 10 oG ;

Drinking water: pressure 0.3 MPa, temperature $15 \sim 25^{\circ}\text{C}$, max. Hardness less than 10 oG ;
Soft water: pressure 0.3 MPa, temperature less than 50°C , max. Hardness less than 5 oG ;

Power: 3 380V \pm 5%;

Lighting and control of electricity: 220V \pm 5%, Frequency: 50Hz;

Caustic soda: Solid base, NaOH is more than 98% .





Fish Oil Filling & Packaging Machinery

Usage And Features

Soft capsule machine is mainly use for trial production of health products, drug, health care products and drugs, packaged into different sizes and the amount of soft capsules, and to stereotypes dry, machine with the advantage of increase the bioavailability of inclusive, extended validity, beautiful shape, and flexible formula.

The Whole Machine Consists Of Five Parts



Host machine

Max. Capacity : 5000pcs/h

Power : 1Kw

Voltage: AC220V 50HZ 0.18KW 3-phase

Dimension: 800X650X1100mm

Weight:200kg

Rolling size: $\Phi 64 \times 75$ mm

Rolling speed:0-5rpm (Stepless speed change)



Dryer

Drying basket size: $\phi 320 \times 450$ mm

Drying speed: 21rpm

Power: 0.09KW AC220V

Size: 500X400X420mm

Weight: 40kg



Drying System

Capacity:

100-3000pcs/plate

Dimension:

755×489×20 (mm)



Glue can

Material : 304 stainless steel

Volume: 40L

Stirring speed: ≥ 17 r/min

Power: 180w

Weight: 60kg

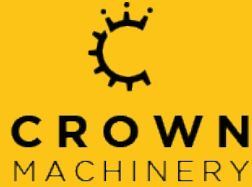


Mold

Material : Aviation aluminum alloy Dimension:

64×75 (mm) Weight: 3 kg





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