

# A & S THAI WORKS CO., LTD.

- **A & S Thai Works Co., Ltd.** is a leading designer and manufacturer of fishmeal and rendering plants. Since 1986, we have delivered, installed and commissioned more than 260 complete plants. As of 2022, most are still running.
- **Installation included in the price**  
ASTW has gained extensive experience from delivering all plants as turnkey installations, sometimes under the most challenging conditions. Of 180 employees, 40 technicians are trained to perform installations and service.
- **Highest quality and specifications**  
ASTW supply machinery built to the absolute highest specifications, using thicker steel plates than the competition and highest quality brand name component suppliers. Never buy a drier with less than 12mm steel thickness of the discs.
- **LFP and OFP, Lean Fish and Oily Fish Plants**  
ASTW invented the LFP – Lean Fish Plant – for Asian operations in 1986 and have improved the technology ever since. OFP – Oily Fish Plants have been developed and improved for operation in different climatic zones and different species of fish. Our concept is simplicity and reliability.
- **Good maintenance – absolute importance**  
ASTW supply service technicians and spare parts on shortest possible notice as good maintenance is of absolute importance to ensure continuous and problem free operation with any fishmeal and rendering plant. Our location: 20 minutes from Bangkok International Airport Suvarnabhumi.
- **3 Year Warranty**  
ASTW give a 3 Year Warranty for plants in SE Asia.
- **Lowest overhead – lowest price**  
ASTW can offer the lowest price for the best quality due to low overhead and costs as we have design, manufacturing, installation and after sales service all in one place, all under one roof.
- **Environment – no smell**  
ASTW solves environmental and smell problems due to wide experience gained from supplying several plants to Australia, a country with some of the strictest environmental regulations in the world.
- **Energy saving**  
ASTW supply equipment to save energy, supplying waste heat evaporators and pre-heaters, vacuum driers and direct condensate return systems.
- **Original Stord**  
ASTW (A & S Thai Works Co., Ltd.) was established in 1984 by, and uses the original technology from, Stord Norway. Until 1998, we were operating under the name Stord Bartz Thailand and later Atlas Stord Thailand.



## ASTW Fishmeal Plants and Machinery

### WHAT IS FISHMEAL?

Fishmeal is dried and sterilized fish powder used for animal feed. Fishmeal has the most complete, balanced and nutritious protein content of all food and feed stuffs available and is used as a protein ingredient in animal feeds, mostly for chicken, pig, shrimp and fish.

Fishmeal for human consumption is being made in small quantities for high protein additives (Europe) or food additive (Asia), and although its nutrition is superb, the fish powder smells strongly from fish and has a sand like consistency and is not that popular to eat.

### WHAT DOES A FISHMEAL PLANT DO?

The job of a fishmeal plant is mainly to remove the water from raw fish and also to separate as much fish oil as possible (OFP plants only). The fishmeal plant does not remove or add protein, what “goes in is what comes out”, but a good fishmeal plant retains the protein and nutrition qualities in the fish.

Raw fish is easy perishable (becomes rotten), can be stored for only a short time under normal temperature and should be kept as cool as possible and processed as soon as possible.

Fish contains nearly 70% water which makes it heavy to transport. Yield ratio is about 4 kg fish to make one kg fishmeal. During the fishmeal processing the fish is sterilized, the water is removed (only 6-10% moisture is left) and the end product is a fine, light brown powder with high protein content, low oil and moisture content and very long storage time.



# ASTW Fishmeal Plants and Machinery

A & S Thai Works Co., Ltd (ASTW) is the largest manufacturer of high quality fishmeal plant in Asia. Based in Bangkok, Thailand, the company operates a sophisticated production facility producing complete fishmeal processing plants. With more than 30 years of experience, ASTW has manufactured more than 260 plants for installation in South East Asia, Pacific region, Middle East, Australia and New Zealand.

The plants are a modern design using the Rotary Disc Drier technology that can operate continuously for years and provides easy operation, low energy consumption, low maintenance and long life. ASTW also provides excellent after sale service and carry a supply of spare parts in stock. ASTW Rotary Drier design is based on Norwegian technology.

- **1 year warranty**

ASTW Rotary Disc Driers come with 1 years warranty for drier body, gear, bearings and even the motor.

- **Inspection Certificate**

ASTW Rotary Disc Driers are inspected and certified to British Standard BS (PD) 5500, European Standard PED and Australian Standard AS 1210. International approval, inspection and certification is provided by Lloyd's Register International (Thailand) Limited.

- **Service team**

Complete installation and commissioning is available using our highly experienced service teams, along with full operating documentation for each plant.

- **Spare Parts**

Genuine spare parts are carried in stock for all ASTW manufactured equipment. Contact our sales and marketing team for assistance.

## LFP – Lean Fish Plants

- Developed and manufactured for operation in Asia by A & S Thai Works.
- For trawler fish and fish waste with less than 3% oil content. The plant can process almost all kinds of raw materials.
- The heavy duty version can withstand wear from sand, shell and stone in the fish.
- Simple design and very easy operation using a “Rotary Disc” drier and accessories including feeding unit, meal cooler, hammer mill, bagging unit and scrubber deodorizer.



LFP 160 installed at Straits Fish Meal (Kedah) Sdn. Bhd., Malaysia 2012.



# ASTW Fishmeal Plants and Machinery

More than 2,000 units of this famous European designed Rotary Disc, steam heated drier have been delivered worldwide. ASTW research and development continues to make enhancements to the driers, presses, pre-heaters, and ancillary equipment. The enhancements in design continue to improve efficiency, reliability and lifetime cost of the plants.

## • Advantages:

Absolutely the **best quality fishmeal machinery** on the market today designed to process raw fish, fish waste and tuna-waste. The Rotary Disc drier is easy to operate and maintain by semi-skilled operators.

### **Uncompromised quality and reliability**

ensures continuous and profitable operation for many years with only a minimum of maintenance. A heavy duty version is available and can withstand wear from sand, shell and stone in the fish.

**Produces high quality** fishmeal and fish oil (OFP), and does not burn and destroy the protein like direct fired or hot oil driers.

## OFP - Oily Fish Plants

- For fish, fish waste and tuna waste with more than 3% oil content.
- The OFP plant uses the same components as the LFP plant but with addition of a cooker, press, solid/liquid decanter separator, oil separator, plus pumps and tanks.
- A simplified version is available with less automation and more reliance on unskilled labor. Automation can be added later if required.
- A Waste Heat Evaporator (WHE) can be included or added later to save 40% steam.



OFP 168+336 installed at PCF Yuzhno-Kyrliskiy Ryibocombinat Co., Ltd. Russia 2018

# ASTW Lean Fish Plants



LFP 24 installed at PT. Aneka Tuna Indo in Pasuruan, Indonesia 2011  
Capacity: 24-30 tons raw material input/24 hrs



LFP 24 installed at Bahr Al-Arab Factory in Umm Al-Quwain, UAE 2012  
Capacity: 24-30 tons raw material input/24 hrs



LFP 55 installed at Qaswa Feed & Allied Products, Karachi, Pakistan 2014  
Capacity: 55-60 tons raw material input/24



LFP 90 (plant no.2) installed at Thanh Hoa Agricultural JSC, Vietnam 2013  
Capacity: 90-100 tons raw material input/24 hrs



LFP 120 installed at Thai Charoen Fishmeal Plant, Thailand 2013  
Capacity: 120-140 tons raw material input/24 hrs



3 x LFP 160 installed at QL Endau Marine Products, Johor, Malaysia 2011  
Capacity: 160-180 tons raw material input/24 hrs



# ASTW Oily Fish Plants



OFP 24 installed at Agri Business Company Sidi Daoud in Tunis, Tunisia 2010  
Capacity: 24-30 tons raw material input/24 hrs



OFP 24 installed at Netuno Alimentos S/A in Recife, Brazil 2007  
Capacity: 24-30 tons raw material input/24 hrs



OFP 55 installed at Soltuna Limited, Honiara, Solomon 2007  
Capacity: 55-60 tons raw material input/24 hrs



OFP 55 installed at Sardimar S.A., San Jose, Costa Rica 2004  
Capacity: 55-60 tons raw material input/24 hrs



OFP 90 installed at Intermarket International, Karachi, Pakistan 2011  
Capacity: 90-100 tons raw material input/24 hrs



OFP 120 installed at Travel Investment and Seafood Corporation (TRISECO), An Giang, Vietnam 2011.  
Capacity: 120-140 tons raw material input/24 hrs.

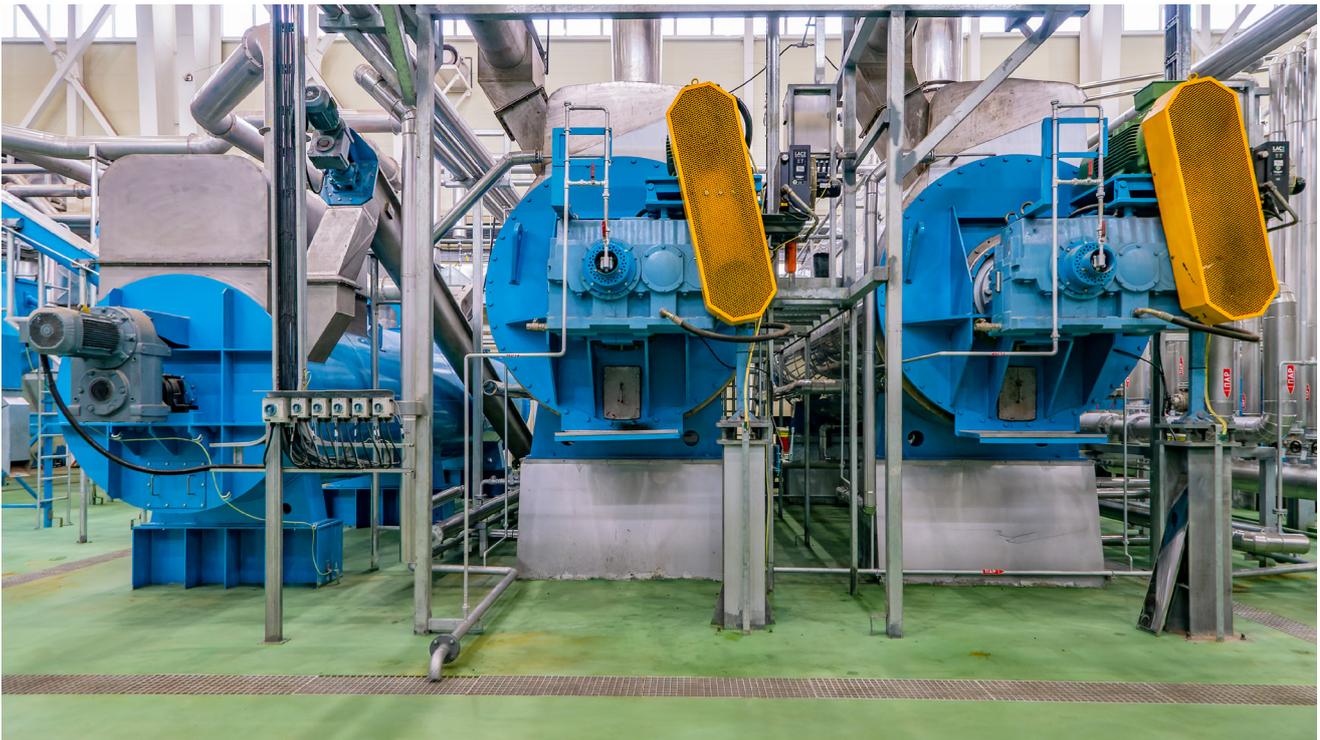


OFP 90 installed at SEAPAC (Kingfisher), Samutsakorn, Thailand 2005  
Capacity: 90-100 tons raw material input/24 hrs



Fishmeal plants from ASTW

# ASTW Oily Fish Plants



OFP 504 installed at PCF Yuzhno-Kyrylskiy Rybocombinat Co., Ltd., Russia 2018. Capacity: 504 tons raw material input/24 hrs

Oily fish Plants

Highest Quality Fishmeal Machines



[www.fishmealmachine.com](http://www.fishmealmachine.com)

Fishmeal plants from ASTW

# ASTW Oily Fish Plants



OFP 504 installed at PCF Yuzhno-Kyriilskiy Ryibocombinat Co., Ltd., Russia 2018. Capacity: 504 tons raw material input/24 hrs



# ASTW Oily Fish Plants



OFP 504 installed at PCF Yuzhno-Kyrylskiy Ryibocombinat Co., Ltd., Russia 2018. Capacity: 504 tons raw material input/24 hrs

# Technical specification

## Technical Specification: ASTW LEAN FISH PLANTS (LFP)

Plants Size	Capacity tons input per 24 hr	Steam consumption ton/hr	Recommended boiler size ton/hr at 10 bar	Electric consumption in kW Installed/load 70%
<b>LFP 24</b>	24-30	0.9	1.2	60/42
<b>LFP 55</b>	55-60	2.0	2.5	107/75
<b>LFP 90</b>	90-100	3.4	4.0	142/99
<b>LFP 120</b>	120-140	4.5	6.0	180/126
<b>LFP 160</b>	160-180	6.0	8.5	235/165

\* All figures are approximate.

## Technical Specification: ASTW OILY FISH PLANTS (OFP)

Plants Size	Capacity tons input per 24 hr	Steam Consumption ton/hr with stick water in drier	Steam Consumption tons/hr with WHE waste heat evaporator	Electric Consumption in kW Installed/load 70%
<b>OFP 24</b>	24-30	0.9	0.4	160/112
<b>OFP 55</b>	55-60	2.0	1.2	195/136
<b>OFP 90</b>	90-100	3.4	2.0	260/182
<b>OFP 120</b>	120-140	4.5	2.7	275/192
<b>OFP 160</b>	160-180	6.0	3.6	300/210

\* All figures are approximate.

### What we need to know from you

*(Please fill in the enclosed questionnaire and fax or mail to us so that we better understand your requirements.)*

- Describe type and size of fish or fish waste, oil content and time from catch to processing
- To estimate the plant size, multiply with 1.4 your daily average catch in tons input per 24 hours.
- Describe the location, near city, sea or river.
- Describe supply of boiler, electric power available, voltage and frequency.
- A & S Thai Works will supply engineering, layout, installation, commissioning and service.

### A & S Thai Works also supply single components:

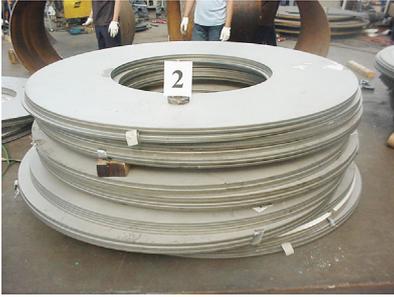
Accessories:

- Cookers
  - Rotary Disc Driers
  - Air cooled condensers
  - Screw conveyors
  - Meal coolers
  - Scrubber deodorizer
  - Screw presses
  - Fish hogger
  - Shell and tube condenser
  - Hammer mill
  - Waste heat evaporator
- Refurbishment    • Repairs    • Replacement of disc rotors    • Spare Parts



# What's high quality?

## Fishmeal Rotary Disc Driers



Thick steel Plates with Certificate

**Avesta**



Welding with MIG flux core /CO2 the best method for quality welding.



Special high grade rotor pipe from Europe made in one piece.



Special forged shaft from Europe, same steel as a tool spanner.



Stainless cladding on all area with high wear.



High grade steam joints with carbon rings and special High-temp SKF roller bearings.



Highest quality Gearboxes from SEW/METSO, Germany and Cyclo, Sumitomo with high safety factor.



Approved by Quality control certified by Lloyd's Register.



Very good finish, painting and stainless cladding for insulation.



Our Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor. Rotary Disc Driers after 20 years of operation and still in Good condition.

(\*South East Asia only, otherwise 1 year warranty)





A & S Thai Works



# Rotary Disc Dryer from ASTW



AST/TST 30.0 installed at Straits Fish Meal (Kedah)Sdn. Bhd. in Malaysia 2012.

Disc dryer are the most used dryer in the fishmeal industry worldwide, using clean steam for heating, not hot oil that which is no more accepted.

ASTW dryer have been developed and improved continuously since 1986 when the first LFP dryer was installed in Thailand. Many dryer are still in operation after 20 years. Since 1986, we have produce 260 dryer and currently make about 15 dryer per year.

ASTW make the most heavy duty dryer with 12mm mild steel discs with stainless anti-wear U-caps, 19mm stator shell and 6mm stainless cladding on exposed areas. We can also deliver dryer with stainless steel discs. As a customer you pay for wear allowance, safe operation and long lifetime.

### ASTW disc driers have more distance between the discs for :

- Better material flow and easy operation.
- Less wear and long lifetime.
- Low electric consumption.
- More efficiency.

ASTW dryer always have steam jackets as it is very effective heating surface and increase the efficiency of the dryer. Note that steam pressure should be maximum 6 bar. Higher pressure will burn and destroy the protein in the fishmeal. Inspected and certified to British Standard BS/PD 5500 cat. 2, European PED and Australian AS1210.

ASTW rotary disc driers come with 3 years warranty for South East Asia.

Type	Input capacity tons/24 hrs.	Heating Surface
AST/TST 4.4	24	44
AST/TST 8.0	44	80
AST/TST 10.0	55	100
AST/TST 16.0	90	160
AST/TST 24.0	120	240
AST/TST 30.0	160	300
AST/TST 40.0	220	400



# Rotary Disc Dryer from ASTW



Rotary disc dryer type AST/TST 4.4 SS/V/FG  
raw material input 24 tons per 24 hrs (Thailand)



Rotary disc dryer type AST/TST 4.4  
raw material input 24 tons per 24 hrs (Nicaragua)



Rotary disc dryer type AST/TST 10.0C  
raw material input 55 tons per 24 hrs (Pakistan)



Rotary disc dryer type AST/TST 10.0C  
raw material input 55 tons per 24 hrs (Indonesia)



Rotary disc dryer type AST/TST 16.0  
raw material input 90 tons per 24 hrs (Vietnam)



Rotary disc dryer type AST/TST 24.0  
raw material input 120 tons per 24 hrs (Thailand)



Rotary disc dryer type AST/TST 30.0  
raw material input 160 tons per 24 hrs (Pakistan)



Rotary disc dryer type AST/TST 40.0  
raw material input 220 tons per 24 hrs (New Zealand)



**ASTW**

[www.fishmealmachine.com](http://www.fishmealmachine.com)

# Cooker/Preheater



Cooker type PH 90 installed at Vinh Hoan 1 feed Co., Ltd in Dong Trap province, Vietnam.

## Cooker/Preheater

- The cooker is indirect steam heated in the rotor screw and jacket to cook/preheat the raw material to 95 deg C.
- Variable speed gear motor by frequency inverter and variable steam pressure control the cooking/preheating process.
- The cooker rotates very slowly to avoid breaking up the fish to a “soup” before pressing.
- The raw material must have 95 deg C temperatures for good pressing.

Type	Capacity (tons/hr)	Inner Dia.	Length (FL./FL.)	Drive RPM (kW)	Remark: Component to use for Oilly Plant type (OFP)
PH 55	3.0	700	3000	3.7 2-4	OFP 24/ OFP 55
PH 90	4.0	700	6000	5.5 0.8-4.8	OFP 90
SS 25/8	7.0	700	8000	5.5 0.8-4.8	OFP 120
SS 45/9	12	796	9000	7.5 0.8-4.8	OFP 160
SS 75/12	18	900	12000	15 0.8-4.8	
SS 100/15	25	1000	15000	22 0.8-4.8	
SS 130/14	40	1300	14000	30 0.8-4.8	

## Oil separation area

### Oil separation system

Separator purifier (also called fish oil polisher or cleaner)

The fish oil from the decanter still contains a little water and solids, and this “dirty” fish oil is heated in the tank and then pumped (controlled) to the separator for cleaning.

The separator has three outlets, clean fish oil which is pumped to the tank, water which is pumped to the drier, and once in a while the separator automatically “blows” and cleans itself from solids which is also pumped to the drier. All pumps are controlled by float level switches and adjustable timers.



Separator purifier with stainless steel oil processing tanks.

Using a **3-phase decanter centrifuge separates fish oil** pumped to tank, stick water (pumped to tank) and meat sludge (pumped straight to the drier).

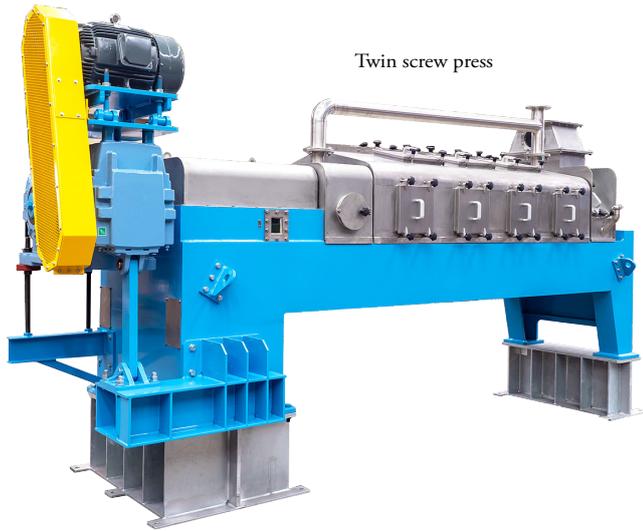
Each pump is started by a float level switch and stopped by an adjustable timer. The decanter needs to be flushed with hot water during startup and especially during close down so that all liquids and deposits are removed before the decanter is stopped.

Decanters are high speed machines that need special care, cleaning, lubrication and relative frequent change of bearings (Every 1 - 1.5 years or so) by qualified technicians.

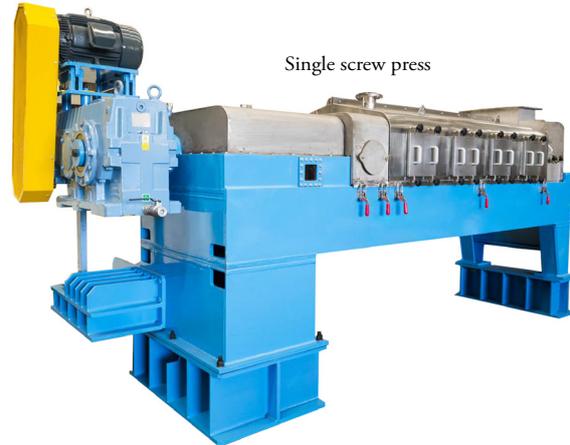


Three phase decanter type Alfa Laval, to separate sludge, oil and stick water from the press water.

# Presses



Twin screw press



Single screw press

In oily fish plants the raw fish must be properly cooked to 95 °C and pressed to separate: solids (press cake) which goes to the drier and liquids (press water) which must be further separated in a 2 or 3-phase decanter and separated to: fish oil, stick water, and meat sludge (to drier).

*Note that the fish or fish waste must go through a fish hogger (pre-breaker) before cooking to ensure that no large pieces of fish can get stuck and block the press.*

### There are two types of presses:

Twin screw presses have two counter rotating screws that prevent rotation of the raw material. Invented by Stord Bartz of Norway 50 years ago, this is the world known ultimate press for fishmeal production and with a very sturdy design that lasts 30 years or more. The “negative” side of the press is that it has a complex (but very reliable) design that gives a relatively high price.

The other type is the single screw press that has one screw, a much simpler design and therefore a lower price. The problem with only a single screw is a greater chance that the material “rotates” and don’t move forward, “blocking” the press.



Twin Screw Press AST/BS 49 Short rendering  
(Installed at Scone, Australia for Primo Quality Meats)

However, ASTW has modified the design so that the single screw presses perform almost as good, and often just as good as the twin screw presses. The simple design makes the single screw presses much cheaper than the twin screw presses but just as sturdy and with the same long life time.

### Sizes of presses for fishmeal production:

All presses are of solid stainless steel design and come with a variable speed gear motor controlled by a frequency inverter (included).

Operating capacity should be about 50 – 75% of maximum capacity.

### Single Screw Presses:

Max. capacity in tons input/hr:  
1.5 – 3.0 – 4.0 – 7.0

### Twin Screw Presses:

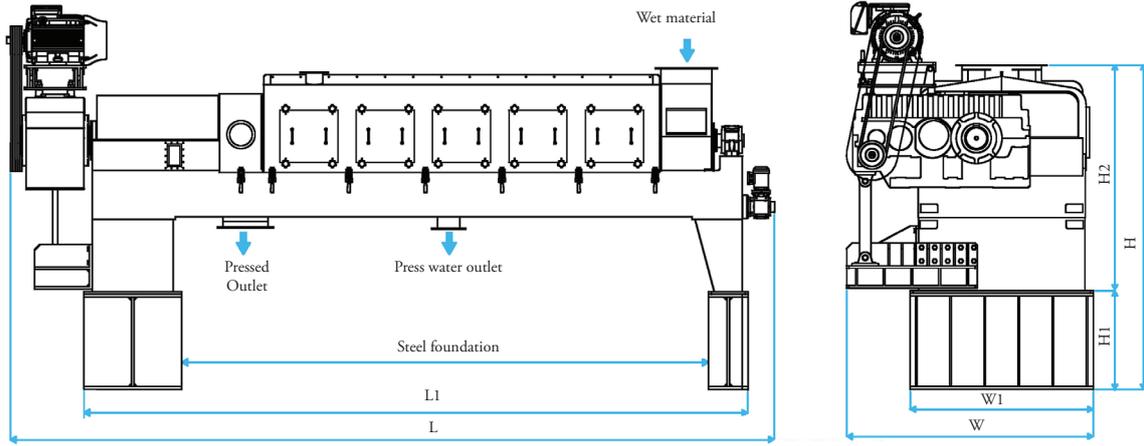
Max. capacity in tons input/hr:  
3 – 7 – 10 – 18 – 25



SINGLE SCREW PRESS TYPE AST/TP 41-1

# Presses

## Twin screw press

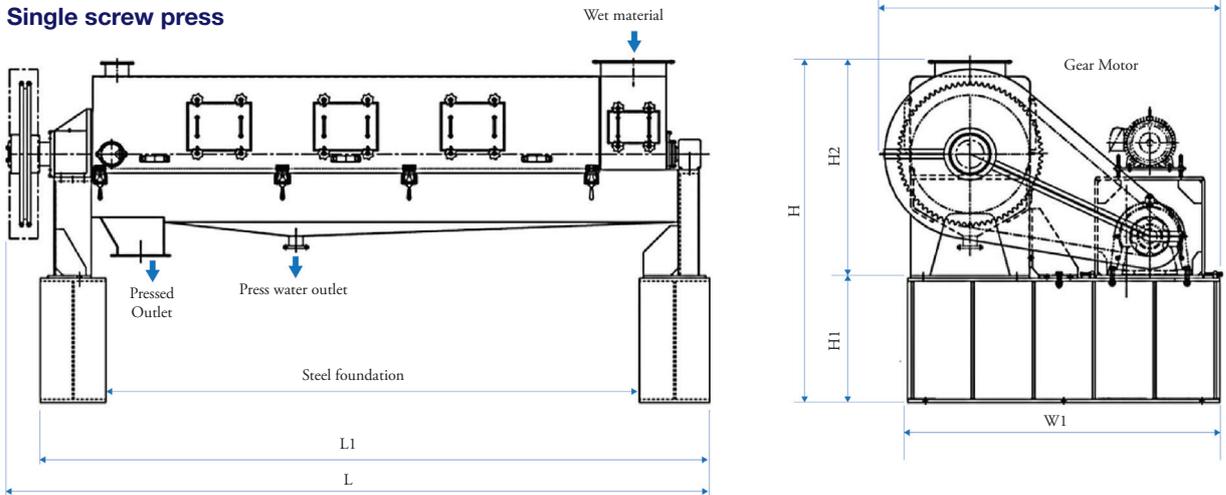


Dimensions: mm.

Type	Nominal capacity raw material tons / hour	H	H1*	H2	W	W1	L	L1	Net weight / kg
AST/BS 24	3.5	1850	850	1000	2000	1850	3500	3300	5500
AST/BS 35	7.0	3215	850	2365	1635	1650	5290	4300	7000
AST/BS 41	10	2760	850	1910	2300	2200	5500	4780	10000
AST/BS 49	18	3060	850	2210	2950	2600	6000	5660	18000
AST/BS 56	25	3280	850	2430	2700	2665	8500	7000	24000

\*H1 – Depend on layout

## Single screw press

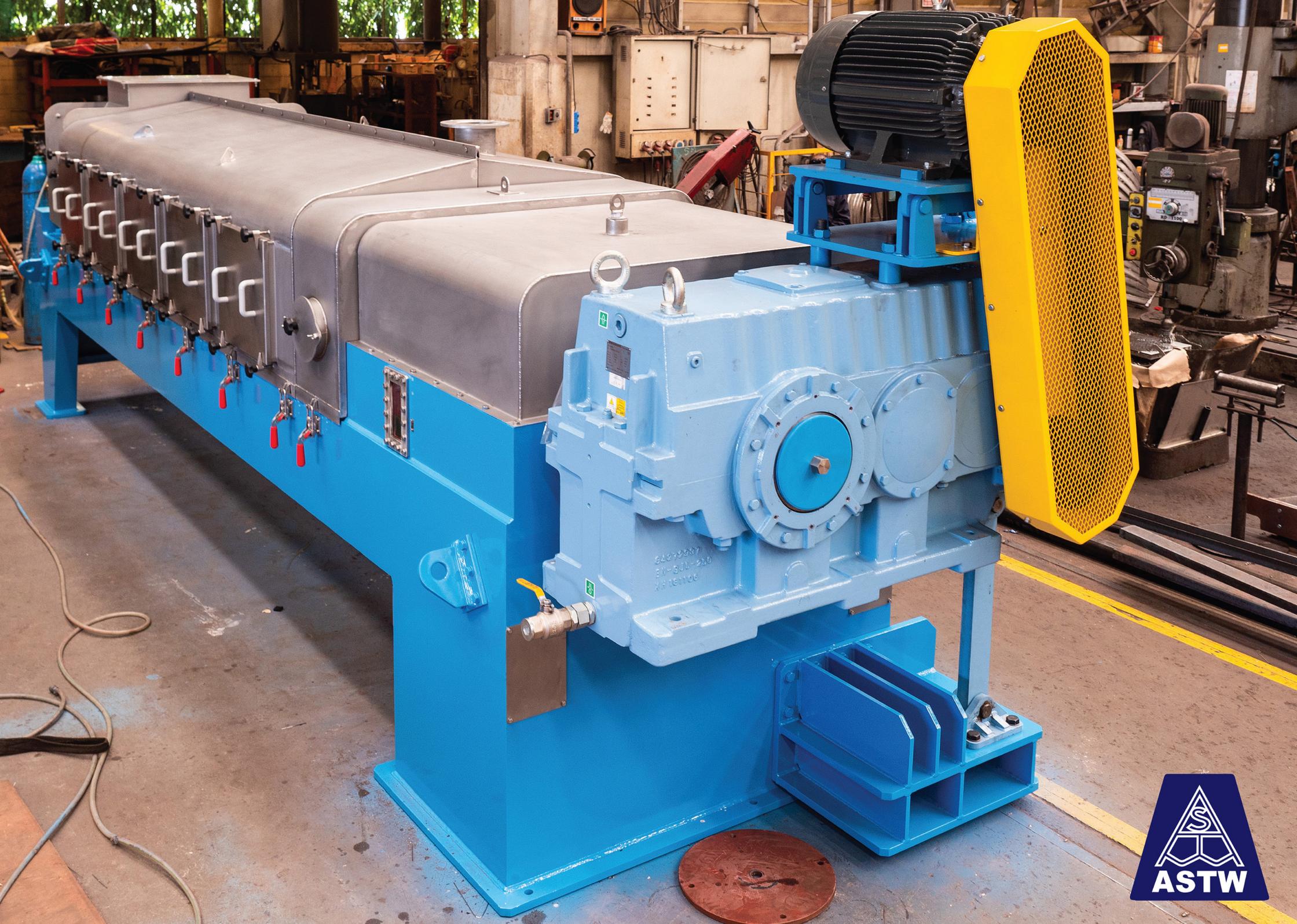


Dimensions: mm.

Type	Nominal capacity raw material tons / hour	H	H1*	H2	W	W1	L	L1	Net weight / kg
AST/TP 24-1	1.5	1770	800	970	1850	1600	3400	3250	2500
AST/TP 32-1	3.0	1850	800	1050	2050	1850	3500	3365	3500
AST/TP 41-1	4.0	2200	800	1400	2160	2000	4500	4287	4500
AST/TP 49-1	7.0	2500	800	1650	2450	2560	6000	5550	6000

\*H1 – Depend on layout





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## Fishbin, fish hogger, feeding unit from ASTW



### Fish bin

Raw material bin where the fish is dumped coming from processing or port. One or two bottom screw conveyors transport the raw fish to an inclined conveyor and then to the hogger (OFP Plants) or to feeding unit (LFP Plants).



### Fish hogger

Hogger to reduce the size of larger pieces of fish and fish waste so that it can cook properly and not block the press.

Hopper under the hogger with an inclined screw conveyor to transport the raw material to the feeding unit.

A level switch is installed in the hopper under the hogger and will stop the screw conveyors to the hogger when full.



### Feeding unit

Feeding unit with adjustable speed screw conveyor by frequency inverter which controls the capacity of the plant and volume of raw material entering the machinery per minute. A second level switch stops the conveyor from the hogger when the feeding unit is full and starts again by an adjustable timer.

## Meal coolers, cooling screw conveyors from ASTW



### Meal coolers

For plant size larger than 60 tons input per 24 hours. Using air is the best way to cool fishmeal. Avoids “burning”, protects the quality of protein and makes grinding easier.

Complete with stainless blower, ducting and cyclone with rotary airlock. No fishmeal dust should be carried over if the fishmeal is not over dried.

Cooling of fishmeal is very important as it stops the heat deterioration of the protein, reduces the reaction of the fish oil left in the fishmeal and makes the fishmeal particles brittle and easier to grind.



### Cooling screw conveyors

For plant size under 60 tons input per 24 hours. Combined screw conveyor and meal cooler in one unit. Cooling screw conveyors is mounted after the drier and cools down the fishmeal by airflow, connected to a cyclone and blower, the outlet can be inside or outside the factory.

It is important to air-cool the fishmeal just after drying. The reason are to avoid oxidation and self-heating of the fishmeal and to make the fishmeal particles more free-flowing and brittle before grinding.

The fishmeal also heats up during grinding so there is a meal cooler after the hammer mill just before bagging.

# Rotary strainer and meal feeder, hammer mill, bagging unit from ASTW



## Rotary strainer and meal feeder

Rotary strainer separator for stone, steel scrap, rope and plastic, mounted on top of the meal feeder.

Meal feeder, buffer hopper and screw conveyor for feeding to the hammer mill.



## Hammer mill

Milling in the hammer mill. The feed mills request the fishmeal to be ground quite fine in a hammer mill.

The requirements from different feed mills can vary.

The hammer mill hits and cracks the fishmeal particles with “hammers” mounted on a rotor, and when the particles are fine enough they fall down through a screen.

The hammers are made from hardened steel and changeable to use all 4 sides. The manufacture tolerances of the hammers must be small to avoid vibration in the hammer mill.

A magnet is mounted inside the mill to pick up mild steel scrap.



## Bagging unit

Bagging unit with hopper and built in screw conveyor for electric start/stop operation. Complete with gear motor and weighing machine capacity.



# Air cooled condenser, shell and tube condenser and Water scrubber-deodorizer from ASTW



Air cooled condenser (QL Endau Fishmeal Sdn. Bhd.) Johor, Malaysia.

The hot vapor exhaust from the drier is quite smelly and must be treated by condensing (cooling) to water, by air cooled condenser is cooled by air and shell and tube condenser cooled by water. The remaining gas is treated in a scrubber using water or a chemical solution of sodium hypochlorite and water.

If seawater or river water is available, a water scrubber-condenser is used. Otherwise an air-cooled condenser is used. If the rest gas from the water/chemical scrubber still has some smell, it can be channeled to the burner and burnt in the boiler. This is an automatic damper system that directs the gas to the free air stack when the burner does not operate.



Shell and tube condenser type 215 m2 .

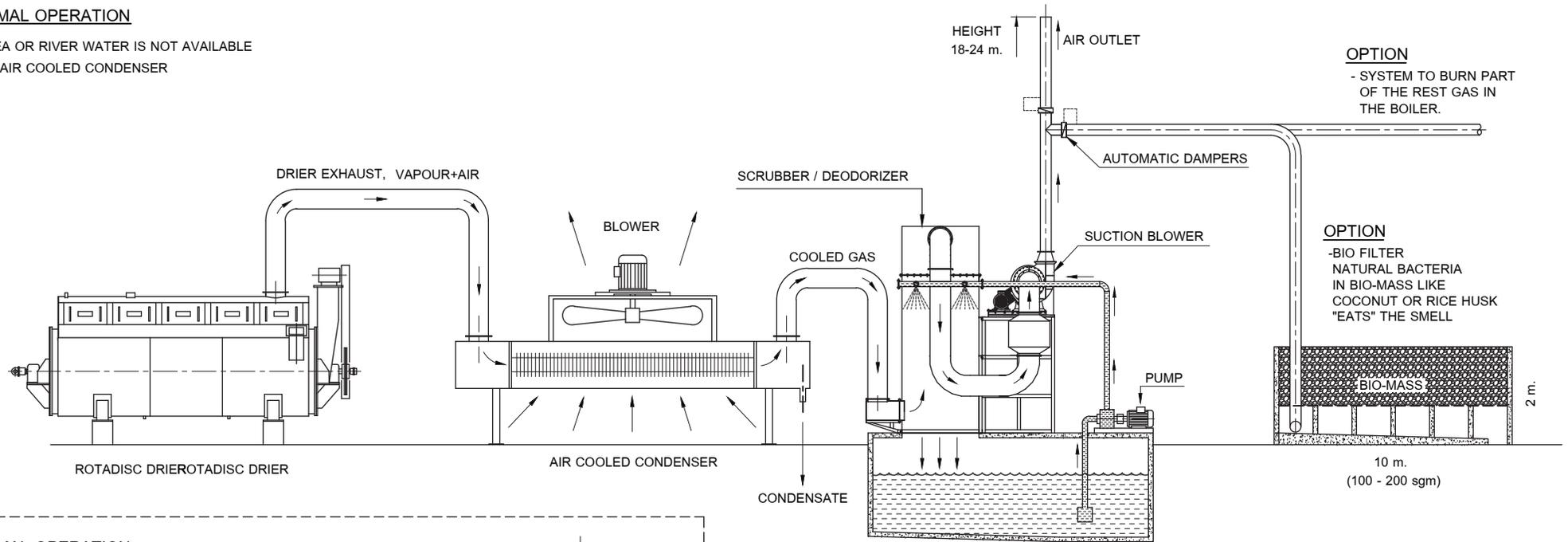


Air cooled condenser and Water scrubber-deodorizer.



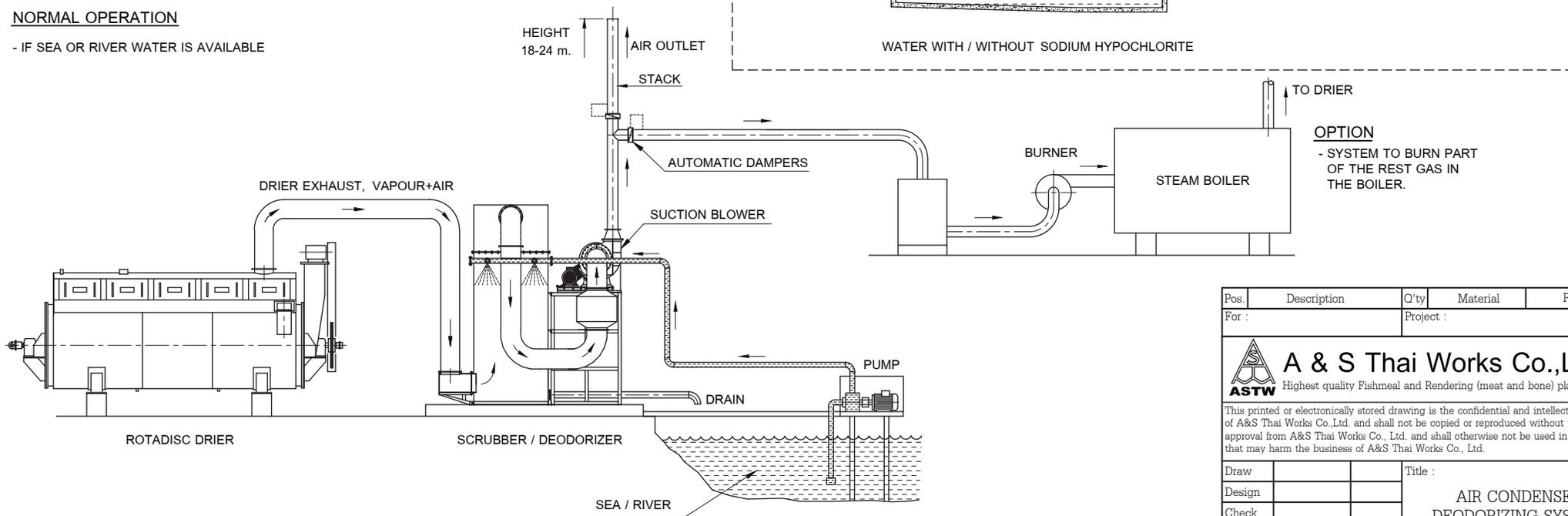
**NORMAL OPERATION**

- IF SEA OR RIVER WATER IS NOT AVAILABLE  
USE AIR COOLED CONDENSER

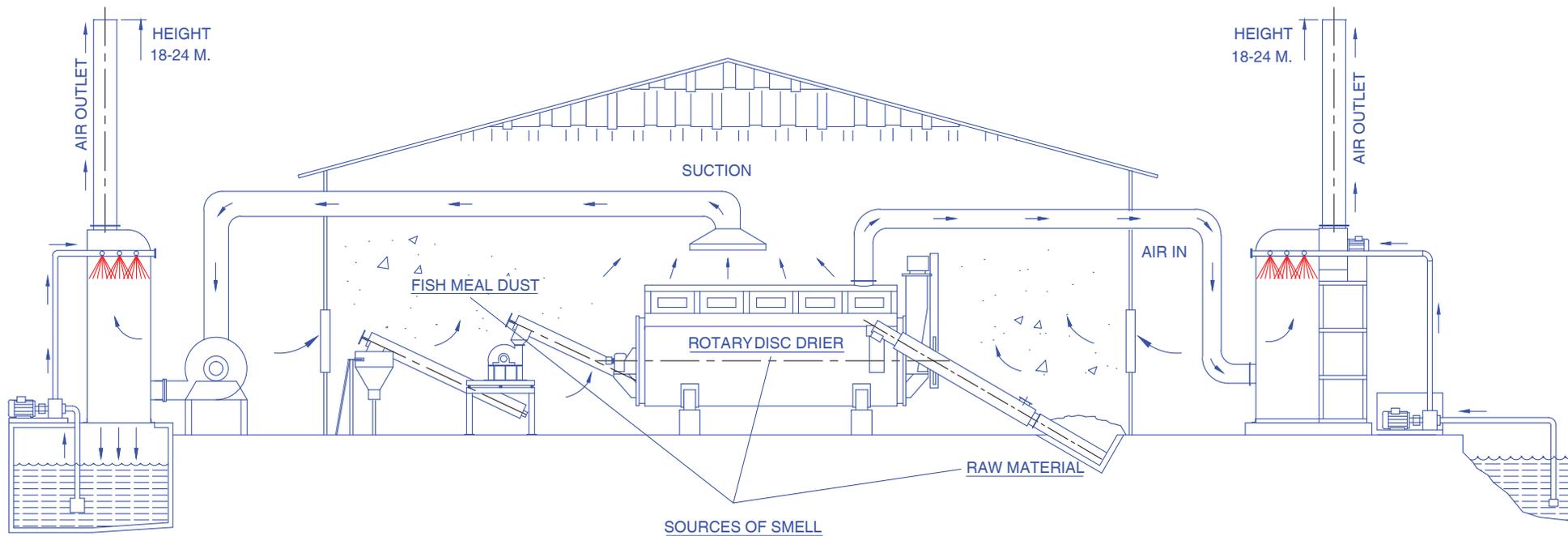


**NORMAL OPERATION**

- IF SEA OR RIVER WATER IS AVAILABLE



Pos.	Description	Q'ty	Material	Remark
For :	Project :			
 <b>A &amp; S Thai Works Co.,Ltd.</b> Highest quality Fishmeal and Rendering (meat and bone) plants				
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Draw			Title :	
Design			AIR CONDENSER DEODORIZING SYSTEM	
Check				
Approve				
Scale	Ref.drawing no.	Drawing no.		



WATER SCRUBBER / DEODORIZER  
for  
NEGATIVE PRESSURIZED BUILDING

WATER SCRUBBER / DEODORIZER  
for  
DRIER VAPOUR EXHAUST

For :		Project :			
 <b>A &amp; S Thai Works Co.,Ltd.</b> Highest quality Fishmeal and Rendering (meat and bone) plants		Title :			
		<b>DEODORIZING</b> for <b>FISHMEAL PLANT</b>			
		Scale	Ref. Drawing No.	Std. View	Drawing No.
					<b>L4-0014</b>
			Rev. <b>A</b>		

# Waste Heat Evaporator from ASTW



WHE - Waste Heat Evaporator with 3 x 10 cum tanks. (Primo Scone, Australia)

## Waste Heat Evaporator (WHE) for fishmeal plants

The only purpose of the WHE is to save energy and lower the steam consumption.

The WHE can reduce the steam consumption by about 50 %, this is important if the boiler fuel is expensive, like diesel oil, heavy fuel oil or natural gas.

The WHE is mostly used for OFP (Oily Fish Plants) with cooker and press where the stick water and fish oil is separated anyway, but can also be used for lean fish to save energy. The WHE come in 1-stage if there is little stick water (tuna waste) and 2-stage if there is more stick water (sardine). Calculation will show what is needed.

The Rotary Disc Drier is a drier for solids (fishmeal). The WHE is a drier for stick water, coming from the decanter and separator.

The stick water contains dissolved protein (like sugar is dissolved in water). This protein is valuable and must be recovered for higher protein % and better price, also called whole fishmeal. If the stick water is thrown away it is very polluting.

The WHE does not use steam from the boiler, but use the wasted vapor from the disc drier that would normally be thrown away.

The disc drier will evaporate water at normal boiling point 100 deg C. The WHE will evaporate water under vacuum where the boiling point is only 60 deg C. (that is the whole secret with the WHE : vacuum!)

The design of a WHE is basically a stainless heat exchanger with tubes, a circulation pump for the stick water which is pumped around and around, a vacuum pump plus two in and out feed pumps, and a condenser.

When the WHE has run for a while, the stick water will concentrate to a thick syrup that is pumped into the drier and mixed with the fishmeal.

WHE requires skilled operators and good maintenance and must often be cleaned by flushing with caustic soda.

The WHE can be installed after the OFP fishmeal plant is installed.

# ASTW direct condensate return system (save tank) from ASTW



Rotary disc drier with save tank installed at Straits Fish Meal (Kedah) Sdn. Bhd. in Malaysia 2012.

### Direct condensate return system, Save up to 12% of your boiler fuel oil consumption and save boiler feed water and boiler chemicals.

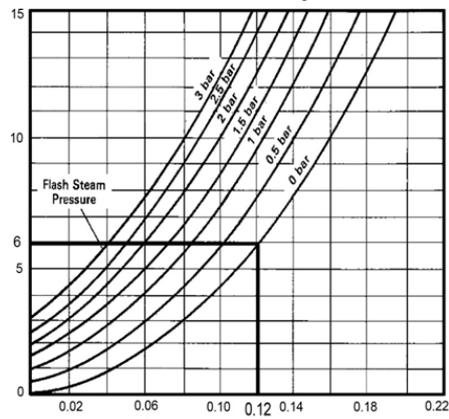
- For all types of driers, cookers and sterilizers that use indirect heating.
  - The system pumps the pressurised hot condensate directly into the boiler in a completely closed system and without loss of flash steam.
  - Example (see chart): a drier operating at 6 bar steam pressure will lose 12% flash steam after the steam trap when condensate boils to reduce the temperature from 164°C to 100°C.
  - Automatic operation; if the pump stops, the system automatically switches over to normal steam trap operation.
- Single or multiple boiler installation.



### The system comes in a compact unit and consists of :

- Receiver tank (certified for 10 bar).
  - High temperature, high pressure pump.
  - Flow controllers and level switch.
  - Automatic bypass systems using a steam trap.
  - Electric control panel.
  - Safety high water level switch for the boiler.
  - Installation and commissioning included.
  - Weight 1,275 kg. Volume 8.0 m<sup>3</sup>.
  - Dimension: W 2.0 x D 2.0 x H 1.90 (m)
- Note: One unit is required for each drier.

Flash steam (fuel oil) saved at various pressures.



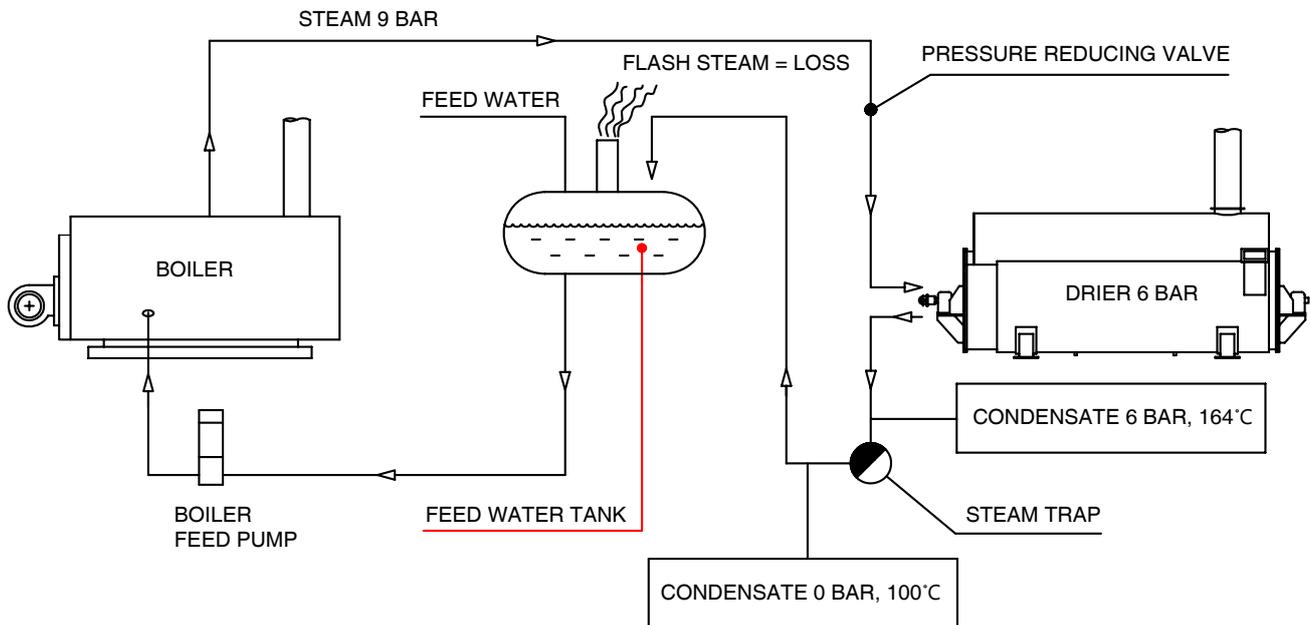
Kg Flash per Kg Condensate (0.12=12%)



# ASTW direct condensate return system

## Saves up to 12% of boiler fuel cost.

### Normal system



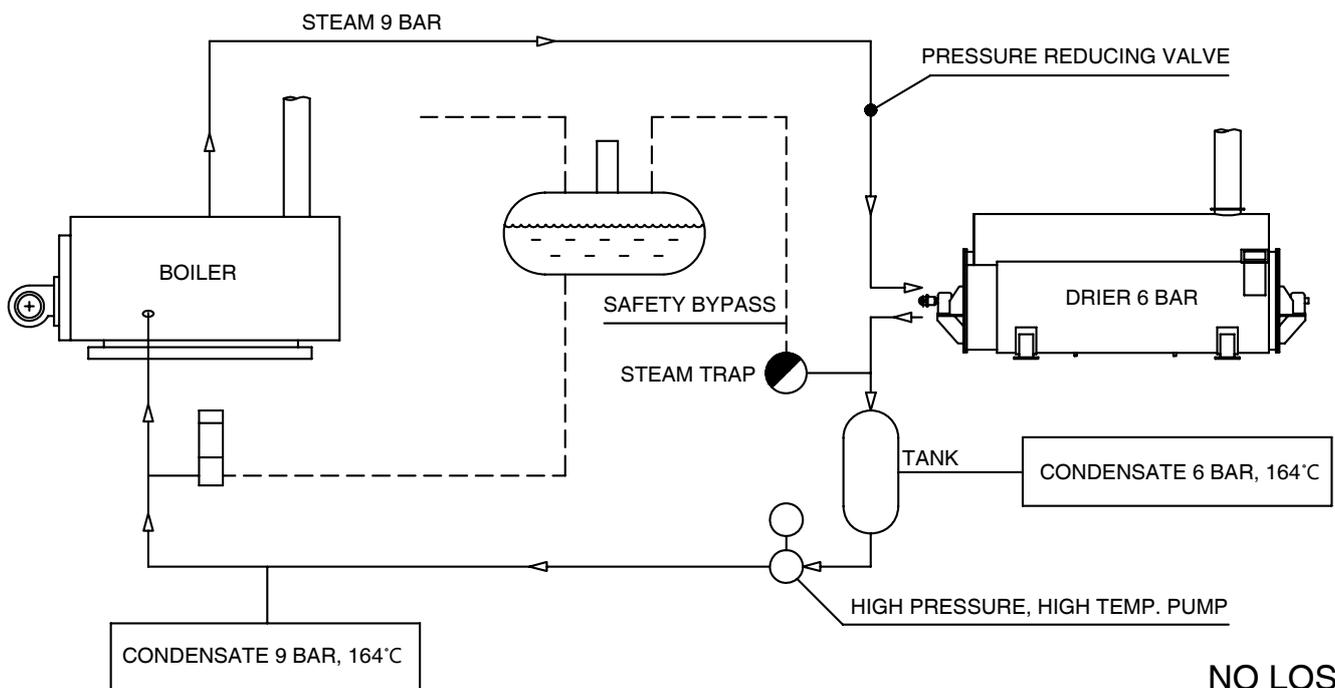
164 - 100° C  $\approx$  12 % FLASH STEAM

The condensate boils off flashsteam to reduce the temperature by 64° C

THERMAL CALCULATION :

$$: \frac{100 \% \times 64 \text{ KCAL}}{560 \text{ KCAL}} \approx \underline{\underline{12 \% \text{ LOSS}}}$$

### Condensate recovery system



NO LOSS

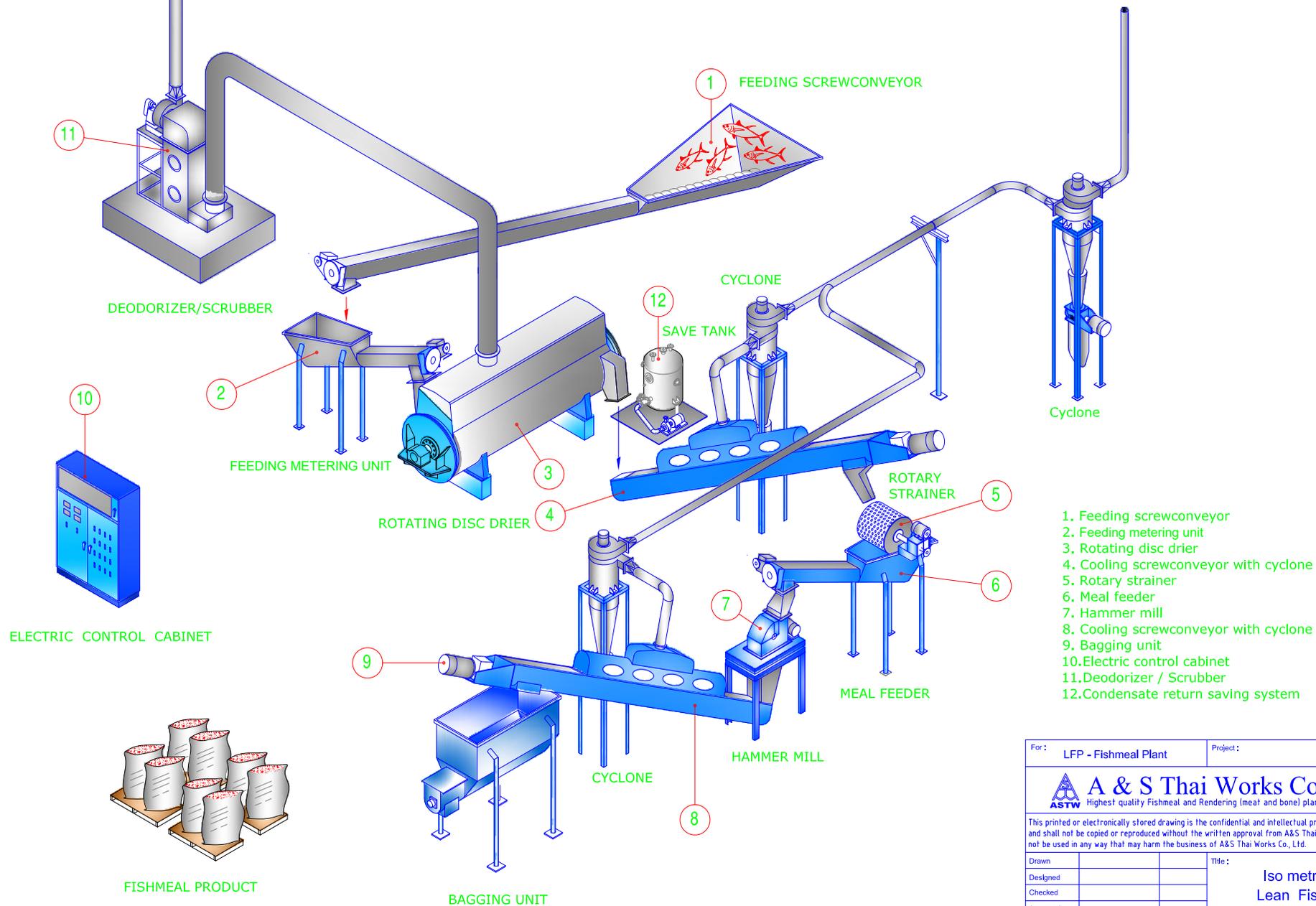




**ASTW**



# LFP-Lean Fish Plants



- 1. Feeding screwconveyor
- 2. Feeding metering unit
- 3. Rotating disc drier
- 4. Cooling screwconveyor with cyclone
- 5. Rotary strainer
- 6. Meal feeder
- 7. Hammer mill
- 8. Cooling screwconveyor with cyclone
- 9. Bagging unit
- 10. Electric control cabinet
- 11. Deodorizer / Scrubber
- 12. Condensate return saving system

For: LFP - Fishmeal Plant		Project:	
 <b>A &amp; S Thai Works Co.,Ltd.</b> Highest quality Fishmeal and Rendering (meat and bone) plants			
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Drawn		Title:	
Designed		Iso metric view for Lean Fishmeal Plant	
Checked			
Approved			
Scale	Ref. Drawing No.	Std. View	Drawing No.
-	-		CT3-2499
			Rev. B

# Lean Fish Plant type LFP 24

Capacity 24 tons raw material input per 24 hours ~ 1 ton/ hr.



LFP 24 installed at Bahr Al-Arab Factory in UAE , 2012



- Fishmeal plant type LFP 24 for lean fish, fresh fish, fish/waste and tuna/waste with maximum oil content 3.0% which gives maximum oil content in the fishmeal 12-15%.
- Complete installation, commissioning and startup.
- Capacity 24 tons raw material input per 24 hours = 1,000 kg/hr.
- Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor. (\*South East Asia only, otherwise 1 year warranty).



1. Heavy/duty screw conveyor to be built into the bottom of fish bin.
2. Feeding unit, hopper combined with screw conveyor to ensure correct feeding of raw material into the drier AST/TST 4.4.
- 3-4. Combined screw conveyor from drier to rotary strainer.
5. Hammer mill type M3 to grind the meal before bagging. With cooling chamber
6. Bagging unit with hopper and built in screw conveyor for electric start/stop operation.



# Technical data for LFP 24 Lean Fishmeal plant

## Capacity

24-30 tons input / 24 hrs.

Expect some variation based on type and condition of the raw material.

## Raw materials

- a. Fresh and clean fish
- b. Fish-waste and tuna-waste with maximum oil content 3.0%  
which gives maximum oil content in the fishmeal 12-15%.

## 3 years warranty

ASTW Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor.

(\*South East Asia only, otherwise 1 year warranty)

## Inspection Certificate

ASTW Rotary Disc Driers are inspected and certified to British Standard BS (PD) 5500, European Standard PED and Australian Standard AS 1210. International approval, inspection and certification is provided by Lloyd's Register International (Thailand) Limited.

## Service Team

Complete installation and commissioning is available using our highly experienced service teams, along with full operating documentation for each plant.

## Spare Parts

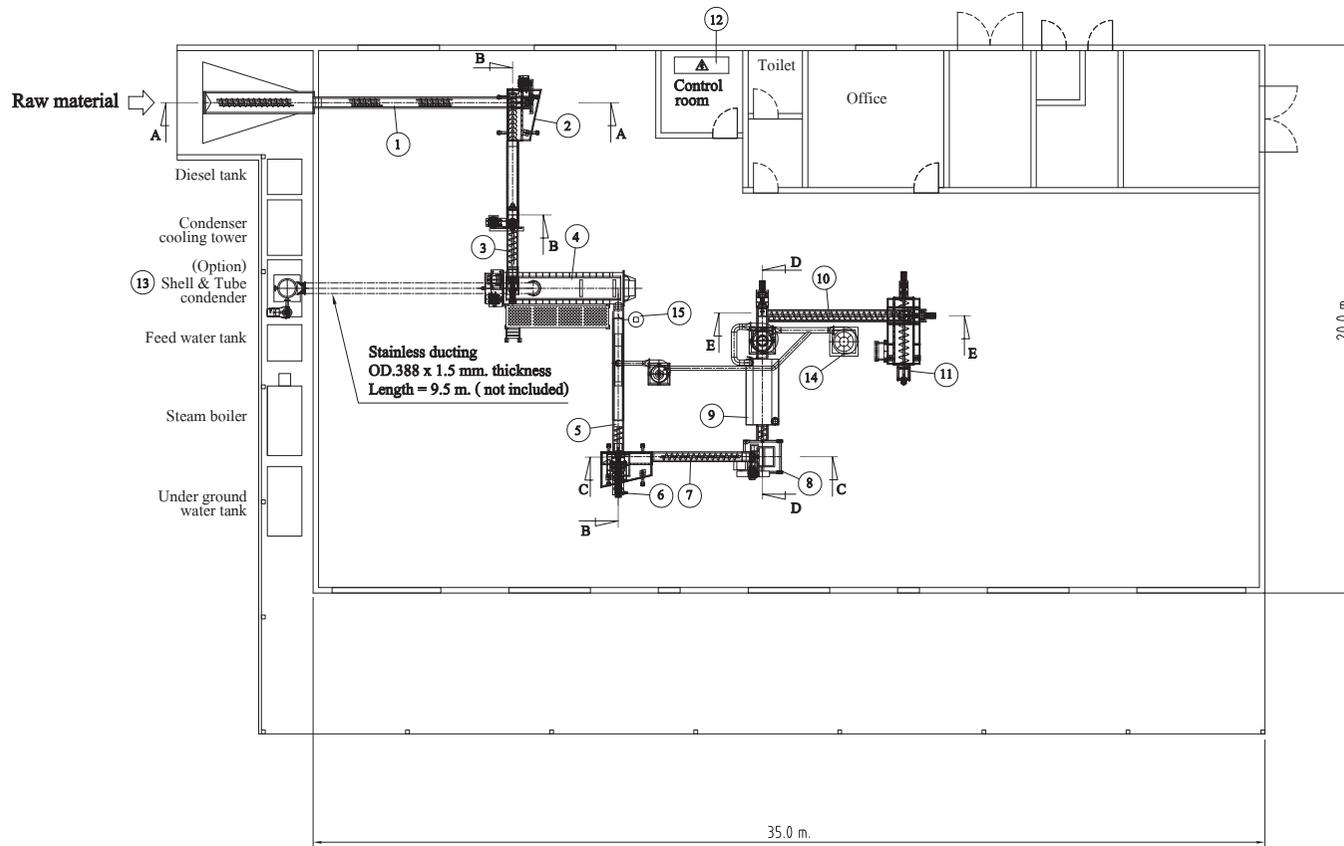
Genuine spare parts are carried in stock for all ASTW manufactured equipment.

Contact our Sales & Marketing team for assistance.

## Technical Data :

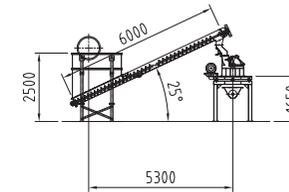
Steam consumption at 6 bar. Recommended boiler size 1.2 tons/hr. (max. 10 bar)	0.9 tons/hr.
Fuel consumption - heavy oil 65 liters/ton steam. (Diesel oil 60 liters/ton steam)	60 liters/hr.
Electric Load kW. (70%)	42 kW. (56 HP)
Electric installed kW. Note : KVA = kW/power factor for motor 0.8 (60/0.8 = 75 KVA)	60 kW. (80 HP)



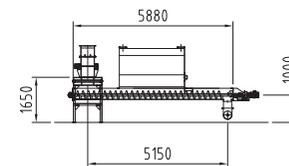


**Item / Description**

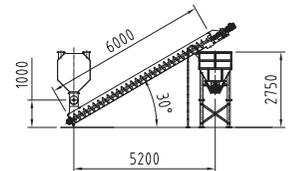
1. Raw material bin with feeding screwconveyor (Ø300 x 12000)
2. Feeding unit (Ø300 x 5000)
3. Screwconveyor to Drier (Ø250 x 2400)
4. Rotating disc drier TST 4.4 C
5. Cooling screwconveyor with cyclone and blower No.1 (Ø300 x 6000)
6. Rotary strainer
7. Meal feeder (Ø200 x 6000)
8. Hammer mill M7
9. Plenum chamber with screwconveyor (Ø300 x 5880)
10. Screwconveyor to bagging unit (Ø300 x 6000)
11. Bagging unit with screwconveyor (Ø350 x 2400)
12. Electric control cabinet
13. Shell & Tube condenser and stainless ducting (not included)
14. Cyclone, Ø776
15. Dosing pump



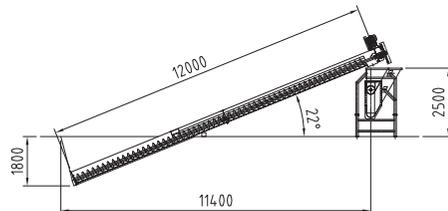
**Side view C-C**



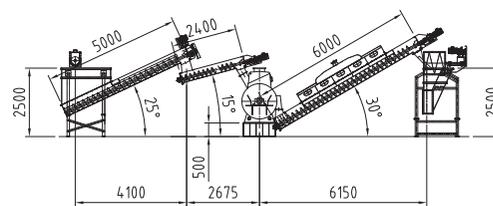
**Side view D-D**



**Side view E-E**



**Side view A-A**



**Side view B-B**

For: LFP-24, Fishmeal plant		Project:	
 <b>A &amp; S Thai Works Co.,Ltd.</b> Highest quality Fishmeal and Rendering (meat and bone) plants			
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Drawn		Title:	
Designed		LFP-24 PLANT LAYOUT	
Checked			
Approved			
Scale	1:250	Ref. Drawing No.	Rev.

# Lean Fish Plant type LFP 55

Capacity 55 tons raw material input per 24 hours ~ 2.3 tons/ hr.



LFP 55 installed at A-ONE FISHMEAL and QASWA FEED & ALLIED PRODUCTS in Karachi, Pakistan 2011.



- Fishmeal plant LFP 55 for lean fish, fresh fish, fish-waste and tuna-waste with maximum oil content 3.0% which gives maximum oil content in the fishmeal 12-15%.
- Complete installation, commissioning and start up.
- Capacity 55 tons raw material input per 24 hours = 2,290 kgs/hr.
- Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor.  
*(\*South East Asia only, otherwise 1 year warranty).*

1. Inclined screw conveyor for transport of raw fish into the feeding unit.
2. Fishmeal drier type Rotary disc AST/TST 10.0 with condensate return system (save tank).
3. Combined screw conveyor from drier to rotary strainer.
4. Hammer mill type M7 to grind the meal before bagging.
5. Bagging unit with hopper and built in screw conveyor for electric start/stop operation.
6. Air cooled condenser, to be mounted before the water scrubber which will use water in a closed system.



# Technical data for LFP 55 Lean Fishmeal plant

## Capacity

55-60 tons input / 24 hrs.

Expect some variation based on type and condition of the raw material.

## Raw materials

- a. Fresh and clean fish
- b. Fish-waste and tuna-waste with maximum oil content 3.0% which gives maximum oil content in the fishmeal 12-15%.

## 3 years warranty

ASTW Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor.

(\*South East Asia only, otherwise 1 year warranty)

## Inspection Certificate

ASTW Rotary Disc Driers are inspected and certified to British Standard BS (PD) 5500, European Standard PED and Australian Standard AS 1210. International approval, inspection and certification is provided by Lloyd's Register International (Thailand) Limited.

## Service Team

Complete installation and commissioning is available using our highly experienced service teams, along with full operating documentation for each plant.

## Spare Parts

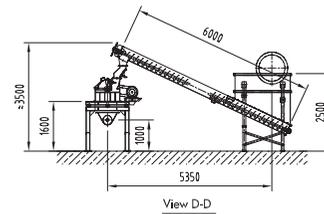
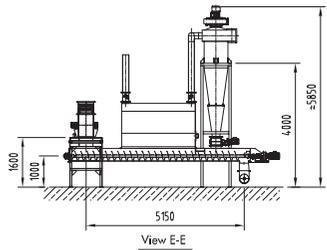
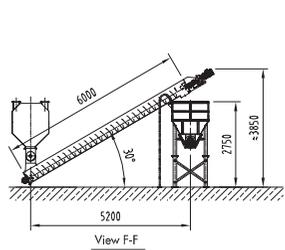
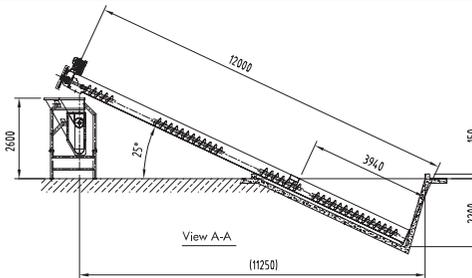
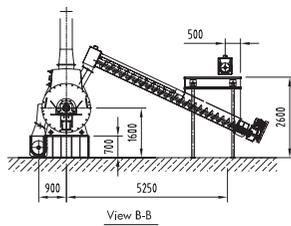
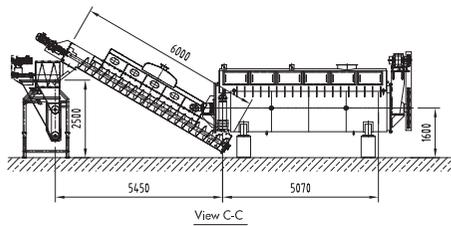
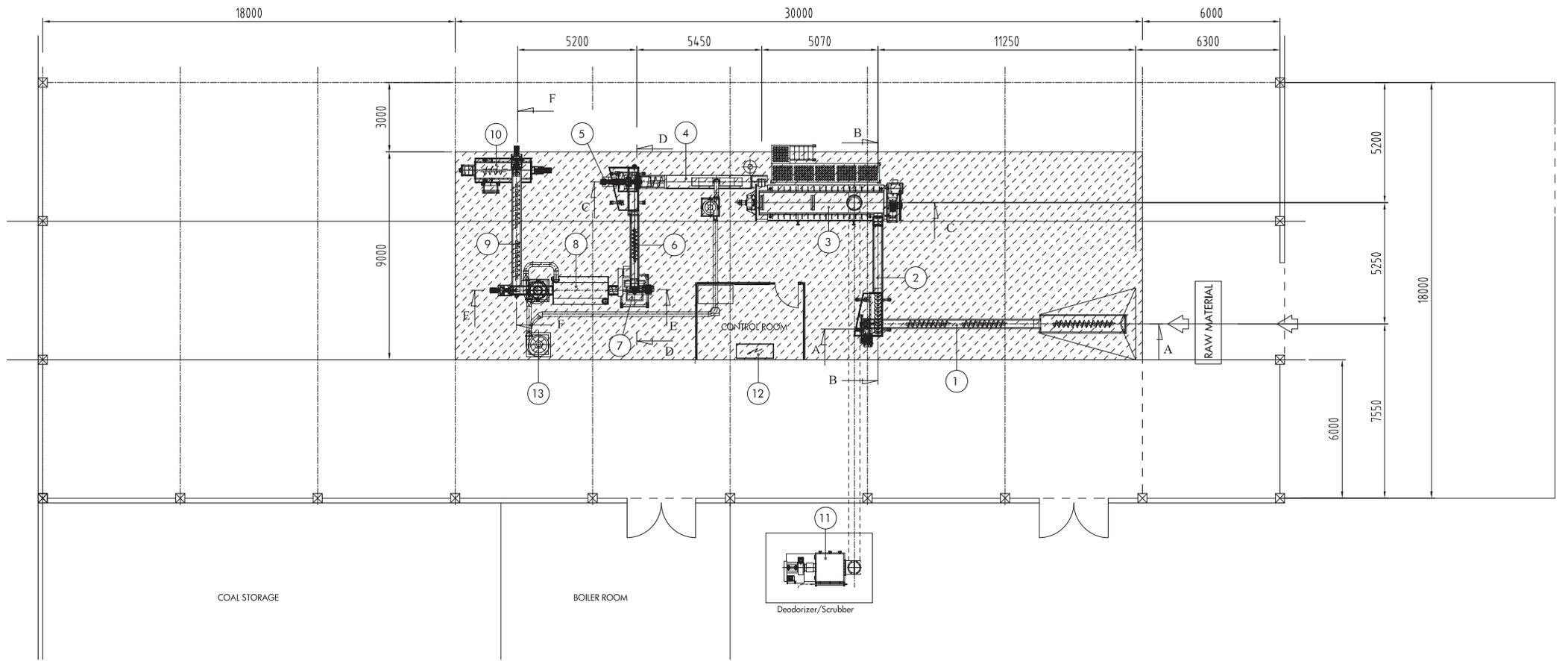
Genuine spare parts are carried in stock for all ASTW manufactured equipment.

Contact our Sales & Marketing team for assistance.

## Technical Data :

Steam consumption at 6 bar. Recommended boiler size 2.5 tons/hr. (max. 10 bar)	2.0 tons/hr.
Fuel consumption - heavy oil 65 liters/ton steam. (Diesel oil 60 liters/ton steam)	138 liters/hr.
Electric Load kW. (70%)	75 kW. ( 100 HP)
Electric installed kW. Note : KVA = kW/power factor for motor 0.8 (107/0.8 =134 KVA)	107 kW. (143 HP)





**PLANT LAYOUT LFP-55**

1. RAW MATERIAL BIN WITH FEEDING SCREWCONVEYOR (Ø300 x 12000)
2. FEEDING UNIT (Ø300 x 5000)
3. ROTATING DISC DRIER TST 10.0 C
4. COOLING SCREWCONVEYOR WITH CYCLONE AND BLOWER NO.1 (Ø450 x 6000)
5. ROTARY STRAINER
6. MEAL FEEDER (Ø250 x 6000)
7. HAMMER MILL M7
8. PLENUM COOLING CHAMBER SCREWCONVEYOR (Ø300 x 5880)
9. SCREWCONVEYOR TO BAGGING UNIT (Ø300 x 6000)
10. BAGGING UNIT (Ø350 x 2400)
11. DEODORIZER / SCRUBBER (1200 X 1200) WITH SUCTION PUMP
12. ELECTRIC CONTROL CABINET
13. CYCLONE Ø776

For: Fishmeal plant		Project:	
<b>A &amp; S Thai Works Co., Ltd.</b> Highest quality Fishmeal and Rendering (meat and bone) plants			
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Drawn		Title	LFP-55
Designed		PLANT LAYOUT	
Checked			
Approved			
Scale	Ref. Drawing No.	Std. View	Drawing No.
-	-	↻	

# Lean Fish Plant type LFP 90

Capacity 90 tons raw material input per 24 hours ~ 3.75 tons/ hr.



LFP 90 Installed at Thanh Hoa Agricultural JSC., Thanh Hoa, Vietnam 2012.



- Fishmeal plant type LFP 90 for lean fish, fresh fish, fish-waste and tuna-waste with maximum oil content 3.0% which gives maximum oil content in the fishmeal 12-15%.
- Complete installation, commissioning and start up.
- Capacity 90 tons raw material input per 24 hours = 3,750 kgs./hr.
- Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor. (\*South East Asia only, otherwise 1 yearwarranty).

1. Screw conveyor from feeding unit to drier.
2. Fishmeal drier type AST/TST 16.0.
3. ASTW system for saving approx. 10-12% on steam consumption.(Save tank)
4. Meal cooler type MC 1.5 / 6.0.
5. Rotary strainer separator for stone, steel scrap, rope and plastic and meal feeder combined hopper and screw conveyor for buffer-storage of fishmeal and for correct feeding to the hammer mill type M21.
6. Combined screw conveyor and meal cooler from hammer mill to bagging unit. scrubber which will use water in a closed system.



# Technical data for LFP 90 Lean Fishmeal plant

## Capacity

90-100 tons input / 24 hrs.

Expect some variation based on type and condition of the raw material.

## Raw materials

Fresh and clean lean fish, fish-waste and tuna-waste with maximum oil content 3.0 % which gives maximum oil content in the fishmeal 12-15%.

## Process

LFP = Lean Fish Processing, drying without oil extraction, thereafter cooling, grinding, cooling again and bagging of the fishmeal.

Note that for oily fish a normal cooker, press and equipment for oil-extraction can be added later.

## 3 years warranty

ASTW Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor.

(\*South East Asia only, otherwise 1 year warranty)

## Inspection Certificate

ASTW Rotary Disc Driers are inspected and certified to British Standard BS (PD) 5500, European Standard PED and Australian Standard AS 1210. International approval, inspection and certification is provided by Lloyd's Register International (Thailand) Limited.

## Service Team

Complete installation and commissioning is available using our highly experienced service teams, along with full operating documentation for each plant.

## Spare Parts

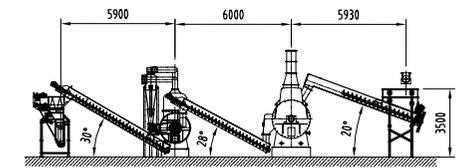
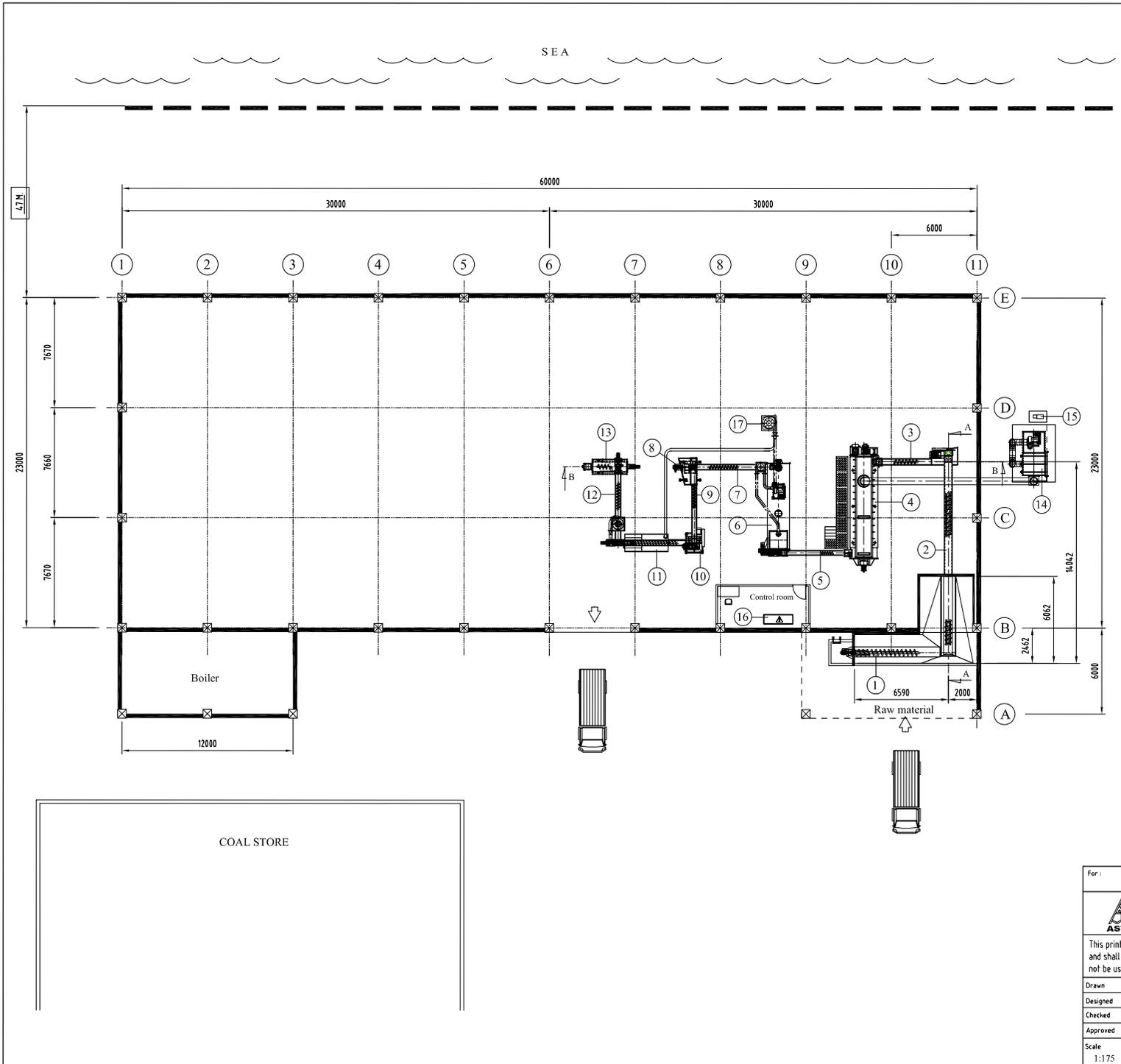
Genuine spare parts are carried in stock for all ASTW manufactured equipment.

Contact our Sales & Marketing team for assistance.

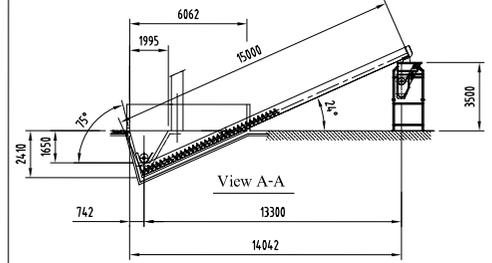
## Technical Data :

Steam consumption at 6 bar. Recommended boiler size 4.0 tons/hr. (max. 10 bar)	3.4 tons/hr.
Fuel consumption - heavy oil 65 liters/ton steam. (Diesel oil 60 liters/ton steam)	270 liters/hr.
Electric Load kW. (70%)	99 kW. ( 132 HP)





View B-B



View A-A

Item / Description

1. Fishbin screwconveyor (Ø350 x 6000)
2. Inclined screwconveyor (Ø350 x 15000)
3. Feeding unit (Ø350 x 6000)
4. Rotary disc drier TST 16.0 C
5. Screwconveyor to meal cooler (Ø300 x 5000)
6. Meal cooler type : MC-1.5/6.0
7. Screwconveyor from meal cooler (Ø300 x 6000)
8. Rotary strainer
9. Meal feeder (Ø250 x 6000)
10. Hammer mill M21
11. Cooling plenum chamber with screwconveyor (Ø350 x 6000)
12. Screwconveyor to bagging unit (Ø300 x 6000)
13. Bagging unit with screwconveyor (Ø350 x 3000)
14. Deodorizer/Scrubber (1500 x 1500)
15. Sea water pump
16. Electric control cabinet
17. Cyclone, Ø776

For: Fishmeal plant		Project: PT. Holi Mana Jaya, Indonesia	
<b>A &amp; S Thai Works Co., Ltd.</b> Highest quality Fishmeal and Rendering (meat and bone) plants			
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Drawn	SUR	11. 2.15	Title: <b>LFP-90          PLANT LAYOUT</b>
Designed			
Checked			
Approved			
Scale	Ref. Drawing No.	Std. View	Drawing No. <b>L3-0423</b> Rev. <b>D</b>
1:175	-		

# Lean Fish Plant type LFP 120

Capacity 120 tons raw material input per 24 hours ~ 5 tons/ hr.



LFP 120 installed at Thai Chareon Feedmill Co., Ltd, Thailand 2013.



- Fishmeal plant LFP 120 for lean fish, fresh fish, fish-waste and tuna-waste with maximum oil content 3.0% which gives maximum oil content in the fishmeal 12-15%.
- Complete installation, commissioning and start up.
- Capacity 120 tons raw material input per 24 hours = 5 tons/hr.
- Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor. (*\*South East Asia only, otherwise 1 year warranty*).

1. Metal detector drop type complete with knife gate valve and electric control cabinet.
- 2.-3. Feeding unit, hopper combined with screw conveyor to ensure correct feeding of raw material into the drier ASTW/TST 24.0
4. Meal cooler type MC 2.0/6.0 for air-cooling of the hot Fishmeal after drying to reduce oxidation and make the grinding easier.
5. Meal bins & mixer system.
6. Air cooled condenser & Shell and tube condenser.



# Technical data for LFP 120 Lean Fishmeal plant

## Capacity

120-140 tons input / 24 hrs.

Expect some variation based on type and condition of the raw material.

## Raw materials

- a. Fresh and clean fish
- b. Fish-waste and tuna-waste with maximum oil content 3.0% which gives maximum oil content in the fishmeal 12-15%.

## 3 years warranty

ASTW Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor.

(\*South East Asia only, otherwise 1 year warranty)

## Inspection Certificate

ASTW Rotary Disc Driers are inspected and certified to British Standard BS (PD) 5500, European Standard PED and Australian Standard AS 1210. International approval, inspection and certification is provided by Lloyd's Register International (Thailand) Limited.

## Service Team

Complete installation and commissioning is available using our highly experienced service teams, along with full operating documentation for each plant.

## Spare Parts

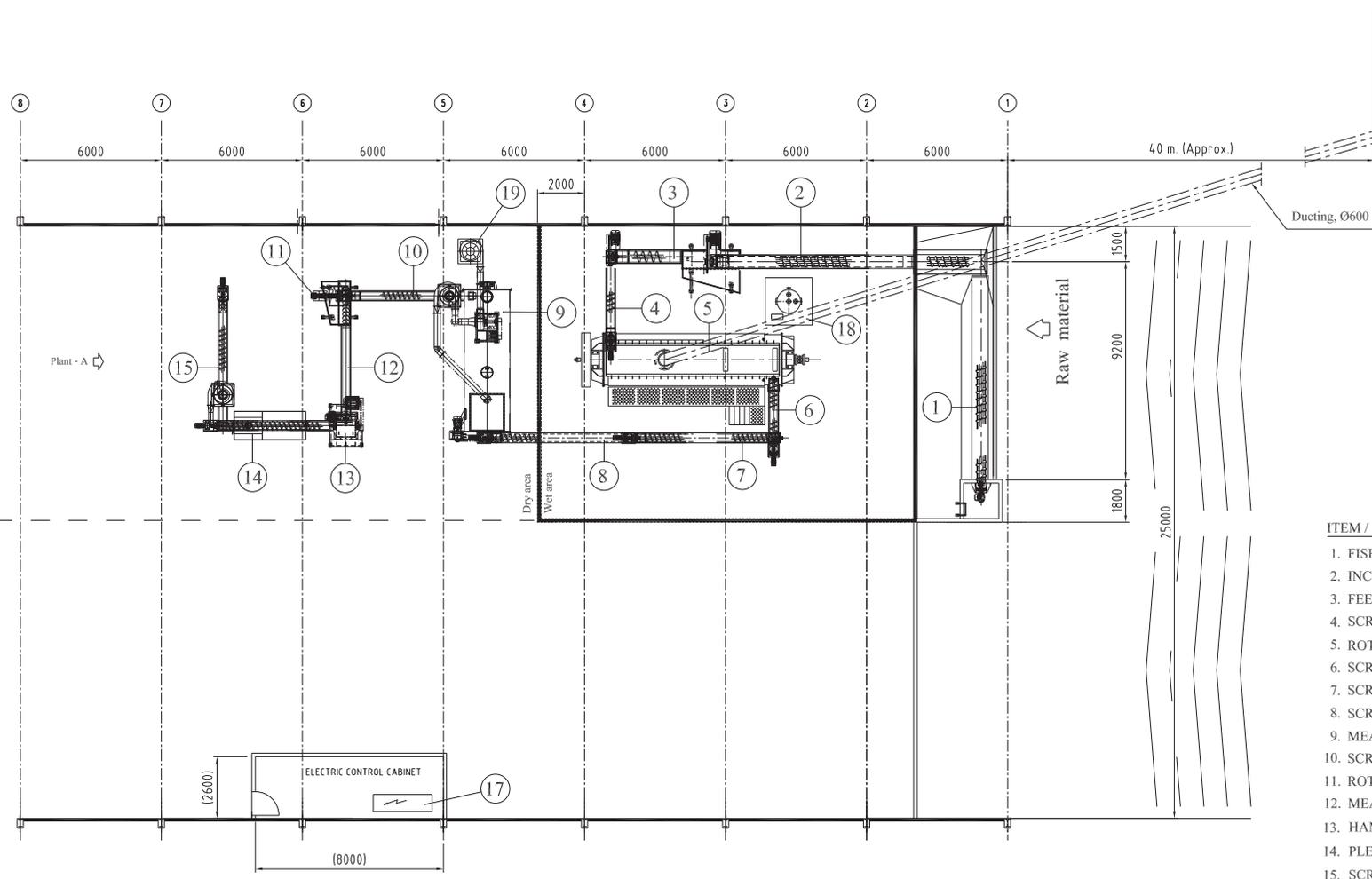
Genuine spare parts are carried in stock for all ASTW manufactured equipment.

Contact our Sales & Marketing team for assistance.

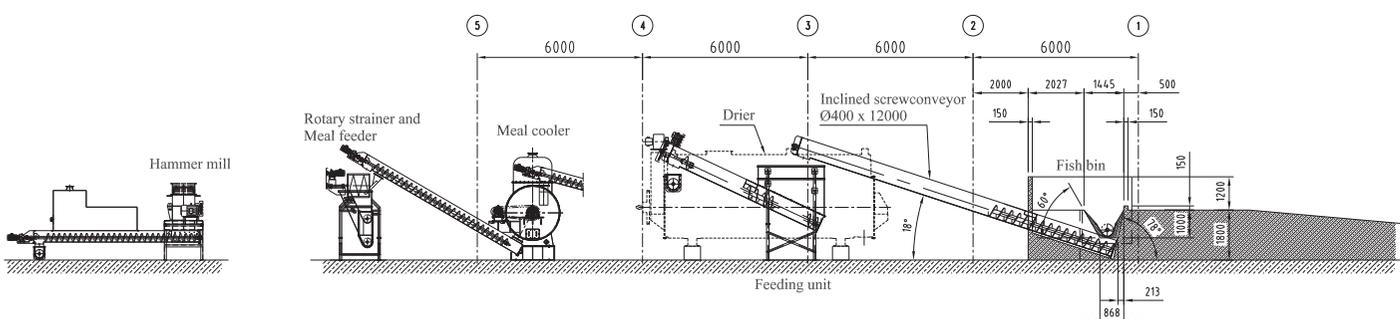
## Technical Data :

Steam consumption at 6 bar. Recommended boiler size 6 tons/hr. (max. 10 bar)	4.5 tons/hr.
Fuel consumption - heavy oil 65 liters/ton steam. (Diesel oil 60 liters/ton steam)	300 liters/hr.
Electric Load kW. (70%)	126 kW. (168 HP)
Electric installed kW. Note: KVA = kW/power factor for motor 0.8 (180/0.8 =225 KVA)	180 kW. (240 HP)





- ITEM / DESCRIPTION
1. FISHBIN SCREWCONVEYOR (Ø400 x 8800)
  2. INCLINED SCREWCONVEYOR (Ø400 x 12000)
  3. FEEDING UNIT (Ø400 x 6000)
  4. SCREWCONVEYOR TO DRIER (Ø350 x 4000)
  5. ROTATING DISC DRIER TST 24.0C
  6. SCREWCONVEYOR TO MEAL COOLER NO.1 (Ø300 x 2400)
  7. SCREWCONVEYOR TO MEAL COOLER NO.2 (Ø300 x 6500)
  8. SCREWCONVEYOR TO MEAL COOLER NO.3 (Ø300 x 6500)
  9. MEAL COOLER TYPE: MC-2.0/6.0
  10. SCREWCONVEYOR FROM MEAL COOLER (Ø300 x 6000)
  11. ROTARY STRAINER
  12. MEAL FEEDER (Ø300 x 6000)
  13. HAMMER MILL M33
  14. PLENUM CHAMBER WITH SCREWCONVEYOR (Ø300 x 6000)
  15. SCREWCONVEYOR TO BAGGING (Ø300 x 6000)
  16. DEODORIZER / SCRUBBER (1800 x 1800)
  17. ELECTRIC CONTROL CABINET
  18. CONDENSATE SAVING SYSTEM
  19. CYCLONE, Ø776



Side view detail

Pos	Description	Qty	Material/Drawing no.	Remarks
For	LFP-120, Fishmeal plant		Project :	
<b>A &amp; S Thai Works Co.,Ltd.</b> Highest quality Fishmeal and Rendering (meat and bone) plants				
Drawn			Title :	
Designed			<b>PLANT LAYOUT</b>	
Checked				
Approved				
Scale	Ref. Drawing No.	Std. View	Drawing No.	Rev.
-	-			

# Lean Fish Plant type LFP 160

Capacity 160 tons raw material input per 24 hours ~ 6.7 tons/ hr.



LFP 160 installed at Fidiatqa International in Karachi, Pakistan 2011.



- Fishmeal plant LFP 160 for lean fish, fresh fish, fish-waste and tuna-waste with maximum oil content 3.0% which gives maximum oil content in the fishmeal 12-15%.
- Complete installation, commissioning and start up.
- Capacity 160 tons raw material input per 24 hours = 6.7 tons/hr.
- Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor. (\*South East Asia only, otherwise 1 yearwarranty).

1. Feeding unit with hopper and screw conveyor for controlled and accurate feeding of raw material into the fishmeal drier AST/TST 90.0
2. ASTW system for saving approx. 10-12% on steam consumption. (Save tank)
3. Mealcooler type MC 2.0 / 6.0 for air-cooling of the hot fishmeal after drying to reduce oxidation and make the grinding easier.
4. Rotary strainer & meal feeder, Hammer mill M33 and Bagging unit.
5. Electric control main cabinet.
6. Air cooled condenser.



# Technical data for LFP 160 Lean Fishmeal plant

## Capacity

160-180 tons input / 24 hrs.

Expect some variation based on type and condition of the raw material.

## Raw materials

- a. Fresh and clean fish
- b. Fish-waste and tuna-waste with maximum oil content 3.0% which gives maximum oil content in the fishmeal 12-15%.

## 3 years warranty

ASTW Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor.

(\*South East Asia only, otherwise 1 year warranty)

## Inspection Certificate

ASTW Rotary Disc Driers are inspected and certified to British Standard BS (PD) 5500, European Standard PED and Australian Standard AS 1210. International approval, inspection and certification is provided by Lloyd's Register International (Thailand) Limited.

## Service Team

Complete installation and commissioning is available using our highly experienced service teams, along with full operating documentation for each plant.

## Spare Parts

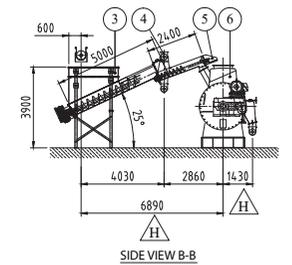
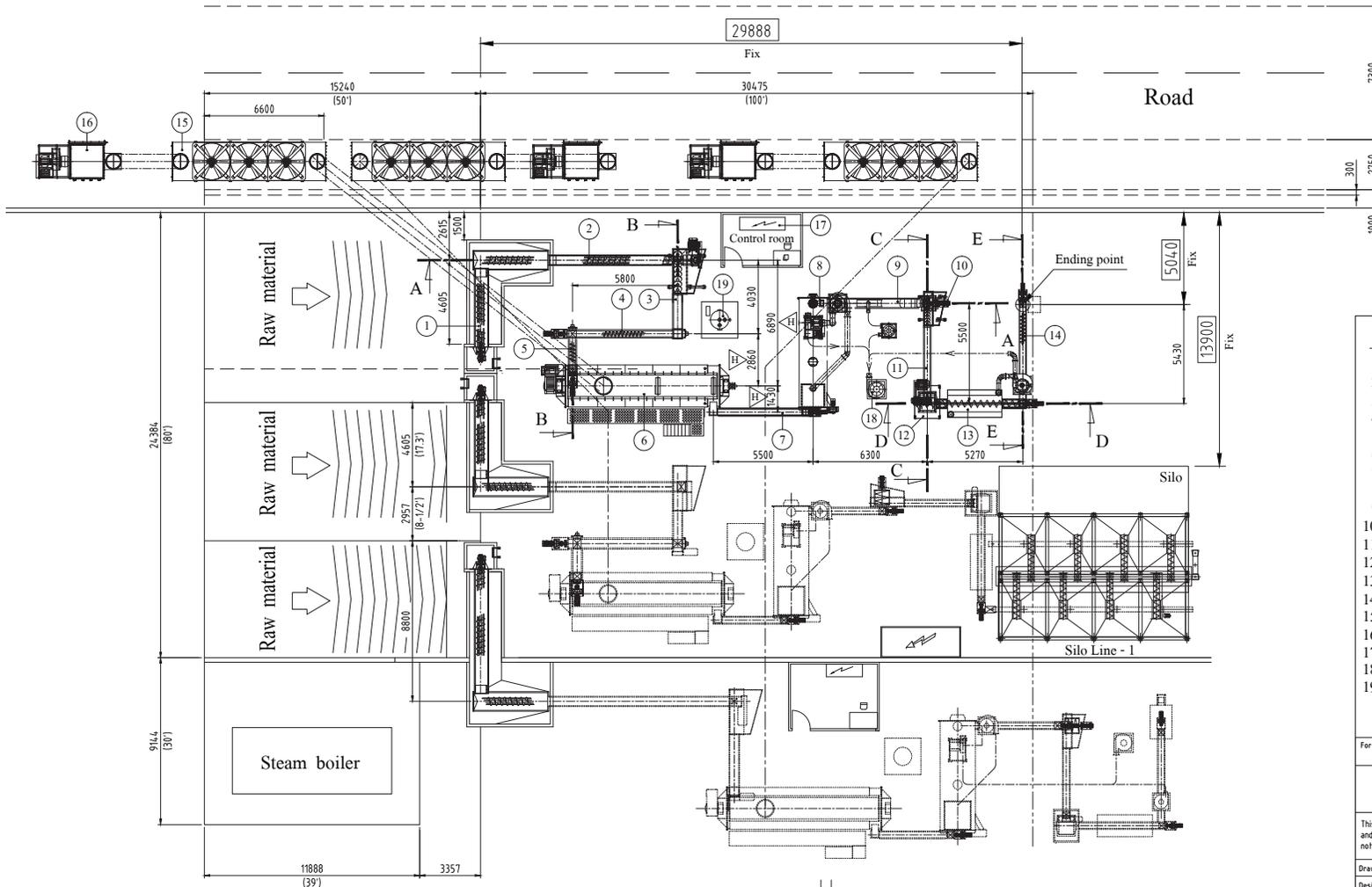
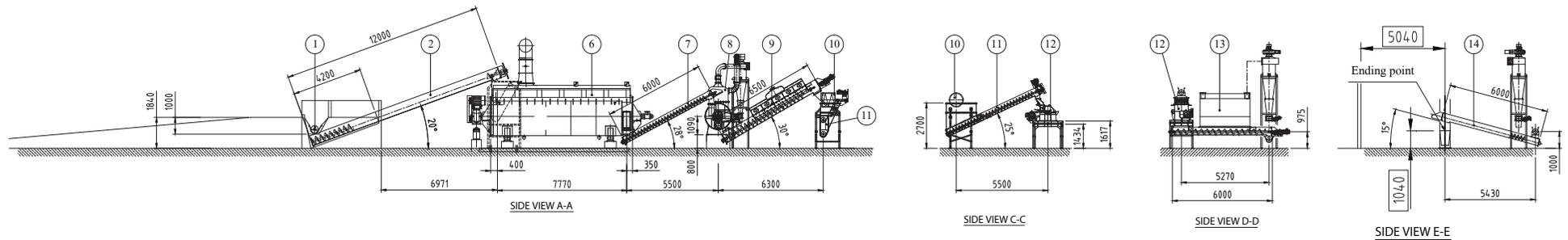
Genuine spare parts are carried in stock for all ASTW manufactured equipment.

Contact our Sales & Marketing team for assistance.

## Technical Data :

Steam consumption at 6 bar. Recommended boiler size 8.5 tons/hr. (max. 10 bar)	6 tons/hr.
Fuel consumption - heavy oil 65 liters/ton steam (Diesel oil 60 liters/ton steam)	400 liters/hr.
Electric Load kW. (70%)	165 kW. ( 220HP)
Electric installed kW. Note : KVA = kW/power factor for motor 0.8 (235/0.8 =300 KVA)	235 kW. (313HP)



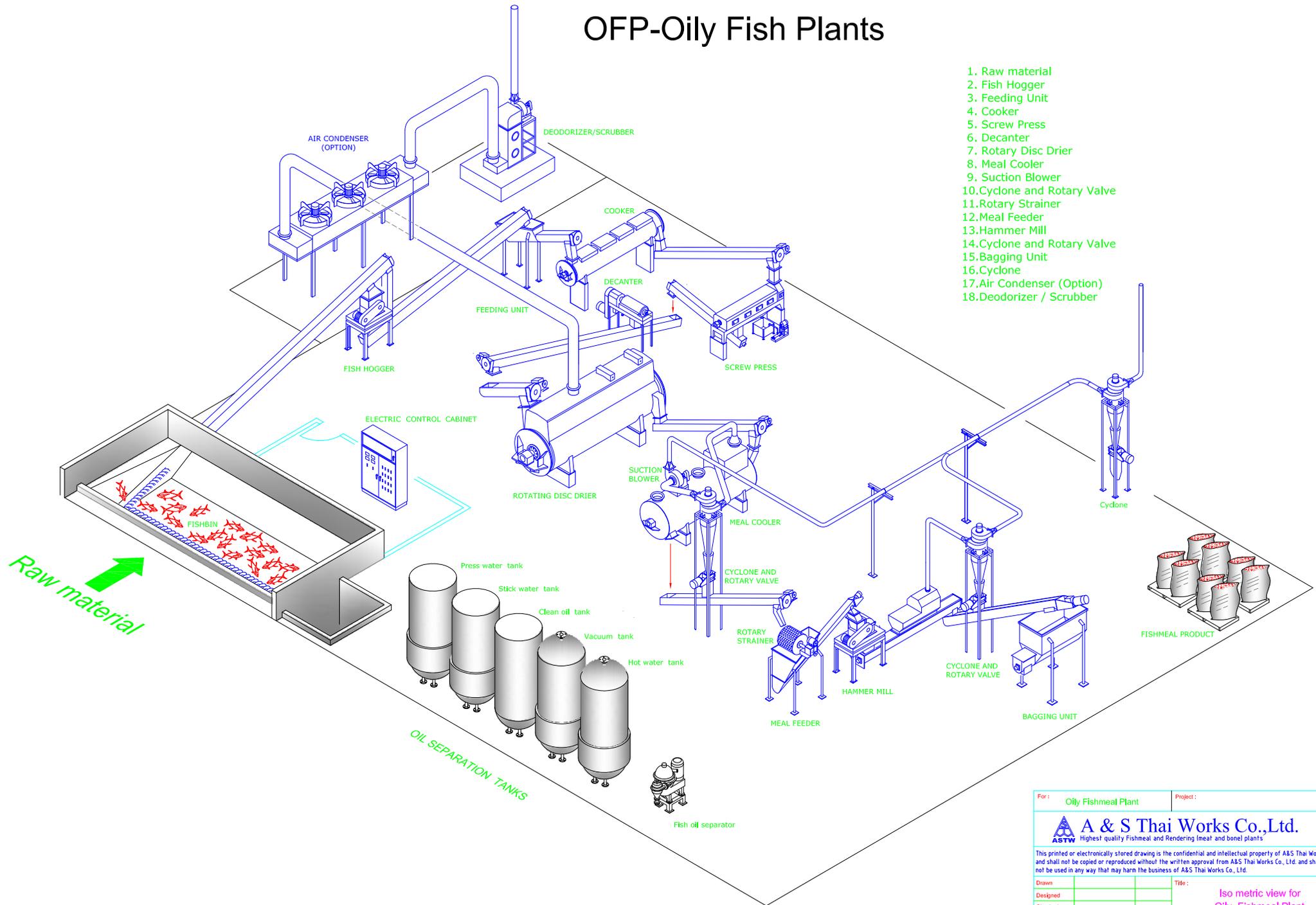


- Item / Description**
1. Fishbin screw conveyor (Ø450x4300)
  2. Inclined screw conveyor (Ø450 x 12000)
  3. Feeding unit (Ø450 x 5000)
  4. Screw conveyor to drier no.1 (Ø300 x 6400)
  5. Screw conveyor to drier no.2 (Ø300 x 2400)
  6. Rotating disc drier TST 90.0 C
  7. Screw conveyor to meal cooler (Ø300 x 6000)
  8. Meal cooler type : MC-1.5/6.0 (Existing)
  9. Cooling screw conveyor with cyclone and blower (Ø450 x 6500)
  10. Rotary strainer
  11. Meal feeder with screw conveyor (Ø300 x 6000)
  12. Hammer mill type : M33 (Existing)
  13. Cooling plenum chamber with screw conveyor (Ø350 x 6000)
  14. Screw conveyor to bagging unit or silo (Ø300 x 6000)
  15. Air - cooled condenser
  16. Deodorizer / Scrubber (1800 x 1800)
  17. Electric control cabinet
  18. Condensate return saving system
  19. Cyclone, Ø970

For :	LFP-160, Fishmeal plant	Project :	
<b>A &amp; S Thai Works Co.,Ltd.</b> Highest quality Fishmeal and Rendering (meat and bone) plants			
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Drawn		Title :	LFP-160
Designed			PLANT LAYOUT
Checked			
Approved			
Scale	Ref. Drawing No.	Std. View	Drawing No.
			Rev.

NOTE :  
- ALL DIMENSIONS ARE IN MILLIMETERS

# OFP-Oily Fish Plants



1. Raw material
2. Fish Hogger
3. Feeding Unit
4. Cooker
5. Screw Press
6. Decanter
7. Rotary Disc Drier
8. Meal Cooler
9. Suction Blower
10. Cyclone and Rotary Valve
11. Rotary Strainer
12. Meal Feeder
13. Hammer Mill
14. Cyclone and Rotary Valve
15. Bagging Unit
16. Cyclone
17. Air Condenser (Option)
18. Deodorizer / Scrubber

For:	Oily Fishmeal Plant	Project:		
 <b>A &amp; S Thai Works Co.,Ltd.</b> Highest quality Fishmeal and Rendering (meat and bone) plants				
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Drawn		Title:	<b>Iso metric view for Oily Fishmeal Plant</b>	
Designed				
Checked				
Approved				
Scale	Ref. Drawing No.	Std. View	Drawing No.	Rev.
			CT3-2560	B

# Oily Fish Plant type OFP 24

Capacity 24 tons raw material input per 24 hours ~ 1 ton/ hr.



OFP 24 installed at Taybat Feed & Poultry, Yemen 2006.



Air-cooled condensers

Water Scrubber/Deodorizer.

- Fishmeal plant type OFP 24, oily fish with oil content more than 3% which gives oil content in the fishmeal approx. 10%. All types of oily and lean fish and fish waste. (Large fish must be cut into small pieces by pre-breaker)
- Complete installation, commissioning and start up.
- Capacity 24 tons raw material input per 24 hrs. = 1,000 kg/hr.
- Rotary Disc Driers come with 1 year warranty for drier body, gear, bearings and even the motor.

1. Fish bin, inclined screw conveyor to transport raw material to the fish hogger/feeding unit.
2. Pre breaker (fish hogger) to cut large fish and fish waste into small pieces.
3. Fishmeal drier type rotary disc drier AST/TST 4.4.
4. Cooker/preheater for raw fish.
5. Oil separation area (mild steel processing tanks).
6. Air-cooled condensers, to be mounted before the water scrubber which will use water in a closed system. Deodoriser (scrubber), to condensate the exhaust vapor and reduce the smell from the vapor gas from the drier, complete stainless steel design.



# Technical data for OFP 24 Oily Fishmeal Plant

## Capacity

24-30 tons with stickwater evaporated in the drier.

(Expect some variation based on type and condition of the raw material.)

Up to 30 tons with use of waste heat evaporator or throw away the stickwater.

## Raw materials

- Oily fish with oil content more than 3% which gives oil content in the fishmeal approx. 10%
- All types of oily and lean fish and fish waste.
- Tuna waste from canning, meat, heads and bone.
- Tuna intestines, raw or cooked.
- Some cooking juice from the canning plant can be added for separation.

Note: Larger fish and fish waste must be cut into small pieces by a prebreaker (hogger).

## 3 years warranty

ASTW Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor.

(\*South East Asia only, otherwise 1 year warranty)

## Inspection Certificate

ASTW Rotary Disc Driers are inspected and certified to British Standard BS (PD) 5500, European Standard PED and Australian Standard AS 1210. International approval, inspection and certification is provided by Lloyd's Register International (Thailand) Limited.

## Service Team

Complete installation and commissioning is available using our highly experienced service teams, along with full operating documentation for each plant.

## Spare Parts

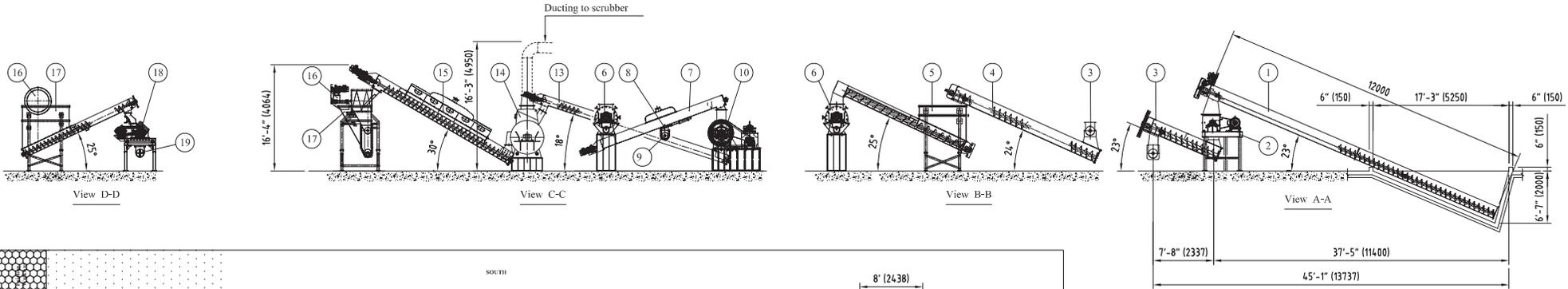
Genuine spare parts are carried in stock for all ASTW manufactured equipment.

Contact our sales and marketing team for assistance

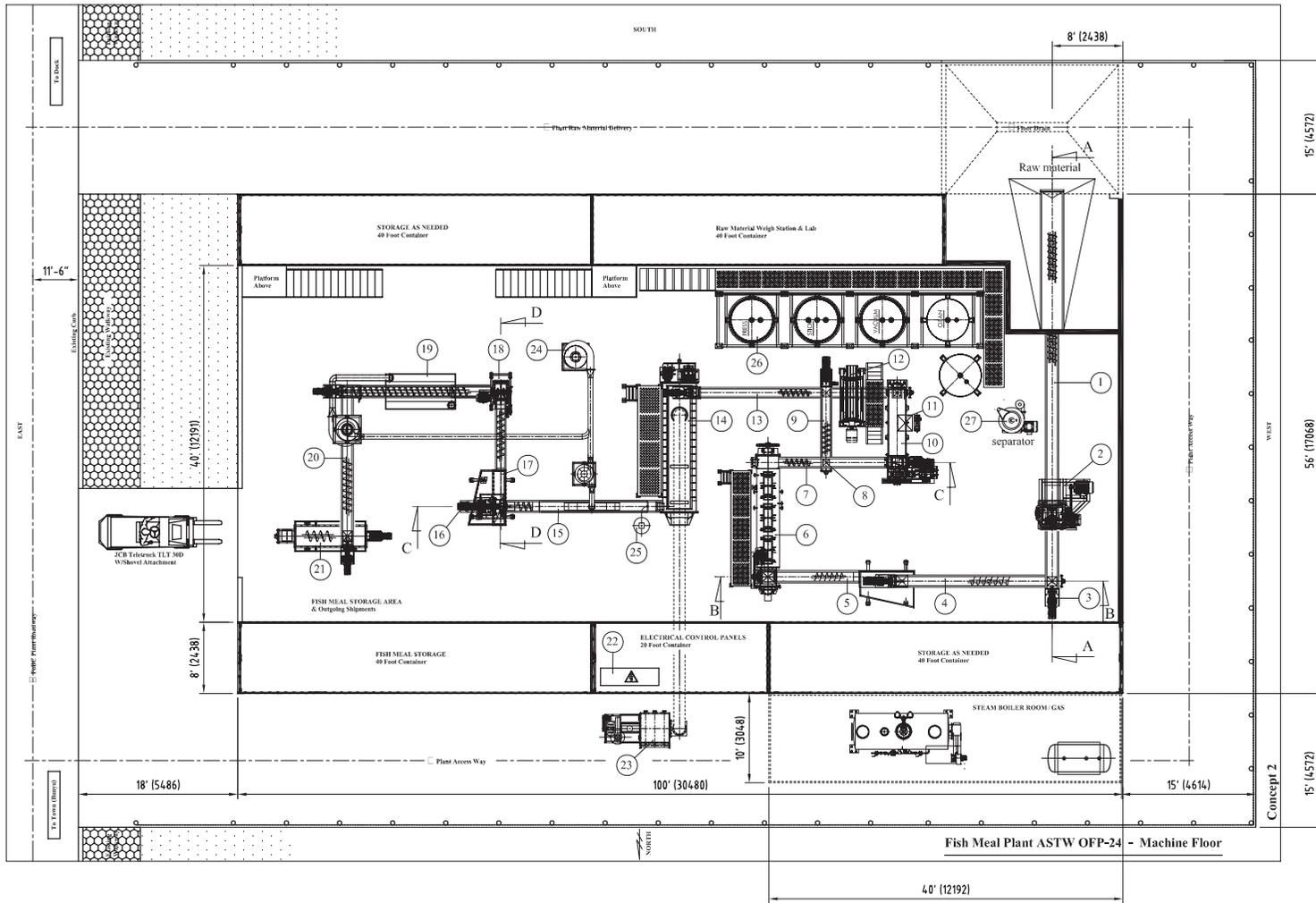
## Technical Data :

Steam consumption at 6 bar. Recommended boiler size 8.5 tons/hr. (max. 10 bar)	6 tons/hr.
Fuel consumption - heavy oil 65 liters/ton steam (Diesel oil 60 liters/ton steam)	400 liters/hr.
Electric Load kW. (70%)	165 kW. ( 220HP)
Electric installed kW. Note : KVA = kW/power factor for motor 0.8 (235/0.8 =300 KVA)	235 kW. (313HP)





- Item / Description for Fishmeal plant OFP-24**
1. Raw material bin with feeding screwconveyor (Ø300 x 12000)
  2. Fish hogger
  3. Screwconveyor to feeding unit no.1 (Ø300 x 2800)
  4. Screwconveyor to feeding unit no.2 (Ø300 x 6000)
  5. Feeding unit (Ø300 x 5000)
  6. Cooker PH-55
  7. Strainer screwconveyor (Ø250 x 5000)
  8. Knife gate valve, 250 x 250
  9. By-pass screwconveyor (Ø250 x 3000)
  10. Screw press TP 32-1
  11. Press water tank and pump
  12. 3-phase Decanter
  13. Screwconveyor to Drier (Ø250 x 7500)
  14. Rotating disc drier TST4.4 C
  15. Cooling screwconveyor with cyclone and blower (Ø450 x 6000)
  16. Rotary strainer
  17. Meal feeder (Ø250 x 4500)
  18. Hammer mill M3
  19. Plenum cooling chamber with screwconveyor (Ø300 x 6000)
  20. Screwconveyor to bagging unit (Ø300 x 6000)
  21. Bagging unit with screwconveyor (Ø350 x 2400)
  22. Electric control cabinet
  23. Deodorizer / Scrubber (900 x 900)
  24. Cyclone, Ø776
  25. Dosing pump
  26. Fishoil processing tanks
  27. Clarifier separator



For:	OFP - 24, Fishmeal plant	Project:	
 <b>A &amp; S Thai Works Co.,Ltd.</b> Highest quality Fishmeal and Rendering (meat and bone) plants			
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Drawn		Title:	
Designed		OFP-24	
Checked		Fishmeal plant layout	
Approved			
Scale	Ref. Drawing No.	Std. View	Drawing No.
None	-		
			Rev.

# Oily Fish Plant type OFP 55

Capacity 55-60 ton input per 24 hour = 2,300 kg./ hr.



OFP 55 Installed at PT . Gema Ista raya, Indonesia 2013.



- Fishmeal plant type OFP 55, oily fish with oil content more than 3% which gives oil content in the fishmeal approx. 10%. All types of oily and lean fish and fish waste and fish waste. (Large fish must be cut into small pieces by pre-breaker)
- Complete installation, commissioning and start up.
- Capacity 55 tons raw material input per 24 hrs. ~ 2,300 kg/hr.
- Rotary disc driers come with 1 year warranty for drier body, gear, bearings and even the motor.

1. Heavy duty screw conveyor to be built into the bottom of fish bin.
2. Inclined screw conveyor to transport raw material to the feeding unit.
3. Cooker/preheater for raw fish type PH 55 the cooker is indirect steam heated in the rotor screw and jacket, the cooker rotates very slowly to avoid breaking up the fish to a "soup" before pressing.
4. Screw press type TP 32-1.
5. Cooling screw to rotary strainer and meal feeder.
6. Air-cooled condensers, to be mounted before the water scrubber which will use water in a closed system. Deodoriser (scrubber), to condensate the exhaust vapor and reduce the smell from the vapor gas from the drier, complete stainless steel design



# Technical data for OFP 55 oily fishmeal plant

## Capacity

55-60 tons input / 24 hrs. with stickwater evaporated in the drier.

(Expect some variation based on type and condition of the raw material.)

Up to 70 tons with use of waste heat evaporator or throw away the stickwater.

## Raw materials

- Oily fish with oil content more than 3% which gives oil content in the fishmeal approx.10%
- All types of oily and lean fish and fish waste.
- Tuna waste from canning, meat, heads and bone.
- Tuna intestines, raw or cooked.
- Some cooking juice from the canning plant can be added for separation.

Note : Larger fish and fish waste must be cut into small pieces by a prebreaker (hogger).

## 3 years warranty

ASTW Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor.

(\*South East Asia only, otherwise 1 year warranty)

## Inspection Certificate

ASTW Rotary Disc Driers are inspected and certified to British Standard BS (PD) 5500, European Standard PED and Australian Standard AS 1210. International approval, inspection and certification is provided by Lloyd's Register International (Thailand) Limited.

## Service Team

Complete installation and commissioning is available using our highly experienced service teams, along with full operating documentation for each plant.

## Spare Parts

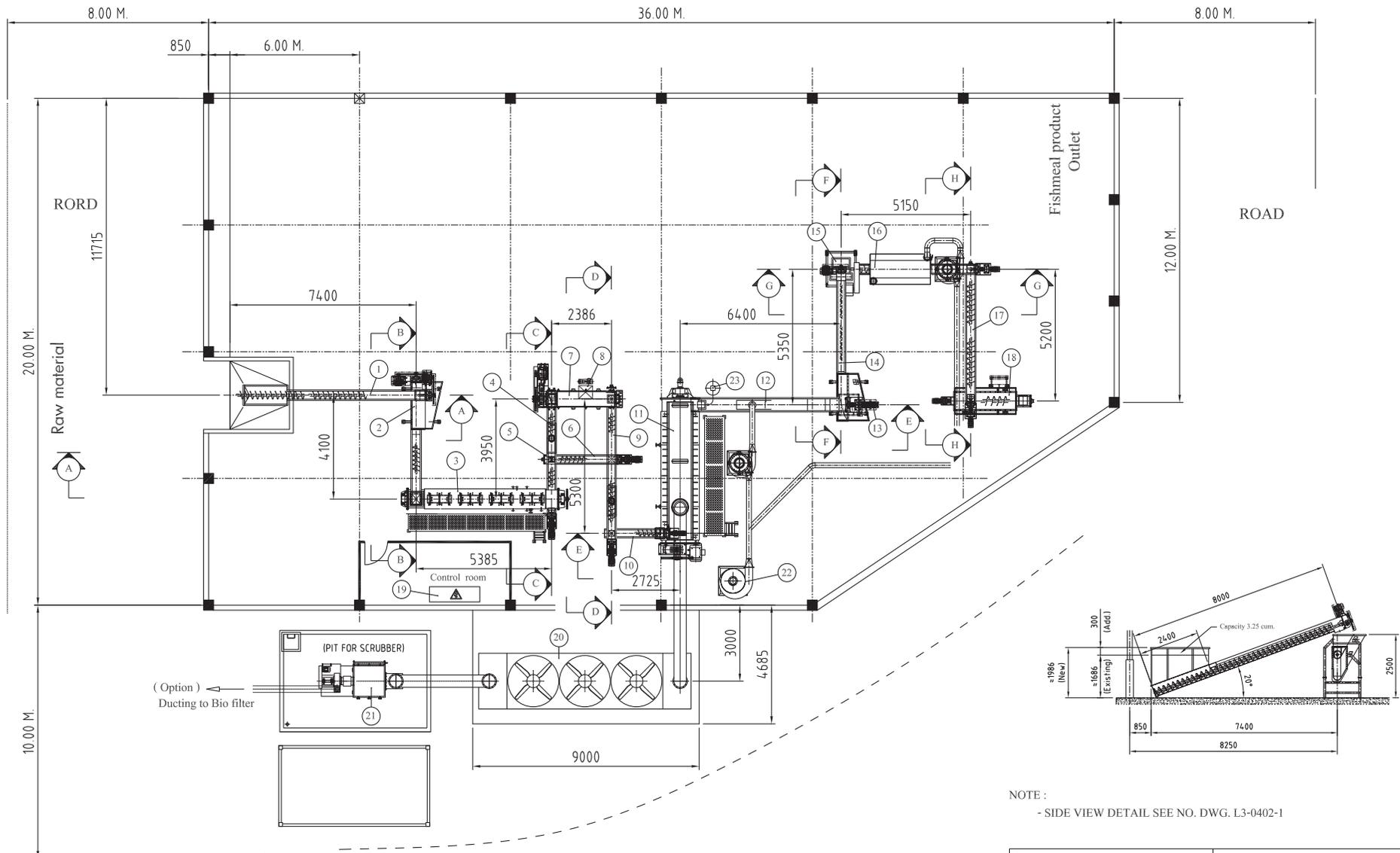
Genuine spare parts are carried in stock for all ASTW manufactured equipment.

Contact our sales and marketing team for assistance.

## Technical Data :

Steam consumption at 6 bar. Recommended boiler (max. 10 bar)	2 tons/hr.
Fuel consumption - heavy oil 65 liters/ton steam. (Diesel oil 60 liters/ton steam) Note: If the stick water is not evaporated in the drier, the plant capacity will increase and the steam consumption reduce up to 40%, but the fishmeal will have 3-5% lower protein content.	138 liters/hr.
Electric Load kW. (70%)	136 kW. (181 HP)
Electric installed kW. Note : KVA = kW/power factor for motor 0.8 (195/0.8 = 243 KVA)200 KVA)	195 kW. (260 HP)





- |   |   |
|---|---|
| <p><b>Item / Description</b></p> <ol style="list-style-type: none"> <li>1. Inclined screwconveyor (Ø300 x 8000)</li> <li>2. Feeding unit (Ø300 x 5000)</li> <li>3. Cooker PH-55</li> <li>4. Strainer screwconveyor (Ø250 x 5000)</li> <li>5. Knife gate valve, 250 x 250</li> <li>6. By-pass screwconveyor (Ø250 x 2800)</li> <li>7. Screw press TP 32-1</li> <li>8. Press water tank and pump</li> <li>9. Screwconveyor to Drier (Ø250 x 6000)</li> <li>10. Screwconveyor to Drier (Ø250 x 2440)</li> <li>11. Rotating disc drier TST10.0 C</li> <li>12. Cooling screwconveyor with cyclone and blower No.1 (Ø450 x 6000)</li> </ol> | <ol style="list-style-type: none"> <li>13. Rotary strainer</li> <li>14. Meal feeder (Ø250 x 6000)</li> <li>15. Hammer mill M7</li> <li>16. Plenum cooling chamber with screwconveyor (Ø300 x 5880)</li> <li>17. Screwconveyor to bagging unit (Ø300 x 6000)</li> <li>18. Bagging unit with screwconveyor (Ø350 x 2400)</li> <li>19. Electric control cabinet</li> <li>20. Air - cooled condenser (Ø2000 x 3 )</li> <li>21. Deodorizer / Scrubber (1200 x 1200) with pit for scrubber</li> <li>22. Cyclone, Ø970</li> <li>23. Dosing pump</li> </ol> |
|---|---|

NOTE :  
- SIDE VIEW DETAIL SEE NO. DWG. L3-0402-1

For : OFP - 55, Fishmeal plant		Project :	
<b>A &amp; S Thai Works Co.,Ltd.</b> Highest quality Fishmeal and Rendering (meat and bone) plants			
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Drawn		Title :	
Designed		OFP-55 PLANT LAYOUT	
Checked			
Approved			
Scale 1:12.5	Ref. Drawing No. -	Std. View 	Drawing No. Rev





# Oily Fish Plant type OFP 90

Capacity 90-100 ton input per 24 hour = 3.75 ton/ hr.



OFP 90 (Catfish –Pangasius) installed at Vinh Hoan Corporation in Dong Thap Province, Vietnam 2008.



- Fishmeal plant type OFP 90, oily fish with oil content more than 3% which gives oil content in the fishmeal approx. 10%. All types of oily and lean fish and fish waste. (Large fish must be cut into small pieces by pre breaker)
- Complete installation, commissioning and start up.
- Capacity 90 tons raw material input per 24 hrs. ~ 3,750 kg/hr.
- Rotary disc driers come with 1 year warranty for drier body, gear, bearings and even the motor

1. Fish bin, inclined screw conveyor to transport raw material to the feeding unit.
2. Fish pre-breaker (hogger) to cut large fish and fish waste into small pieces.
3. Cooker/preheater for raw fish type PH 90 the cooker is indirect steam heated in the rotor screw and jacket, the cooker rotates very slowly to avoid breaking up the fish to a “soup” before pressing.
4. Screw press type AST/TP 41-1.
5. Screw conveyor from Meal cooler type MC 1.5/6.0. to rotary strainer and meal feeder.



# Technical data for OFP 90 Oily Fishmeal Plant

## Capacity

90-100 tons input / 24 hrs. with stick water evaporated in the drier.

(Expect some variation based on type and condition of the raw material.)

Up to 100 tons input / 24 hours with use of waste heat evaporator or throw away the stick water.

## Raw materials

- Oily fish with oil content more than 3% which gives oil content in the fishmeal approx. 10%
- All types of oily and lean fish and fish waste.
- Tuna waste from canning, meat, heads and bone.
- Tuna intestines, raw or cooked.
- Some cooking juice from the canning plant can be added for separation.

Note: Larger fish and fish waste must be cut into small pieces by a prebreaker (hogger).

## 3 years warranty

ASTW Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor.

(\*South East Asia only, otherwise 1 year warranty)

## Inspection Certificate

ASTW Rotary Disc Driers are inspected and certified to British Standard BS (PD) 5500, European Standard PED and Australian Standard AS 1210. International approval, inspection and certification is provided by Lloyd's Register International (Thailand) Limited.

## Service Team

Complete installation and commissioning is available using our highly experienced service teams, along with full operating documentation for each plant.

## Spare Parts

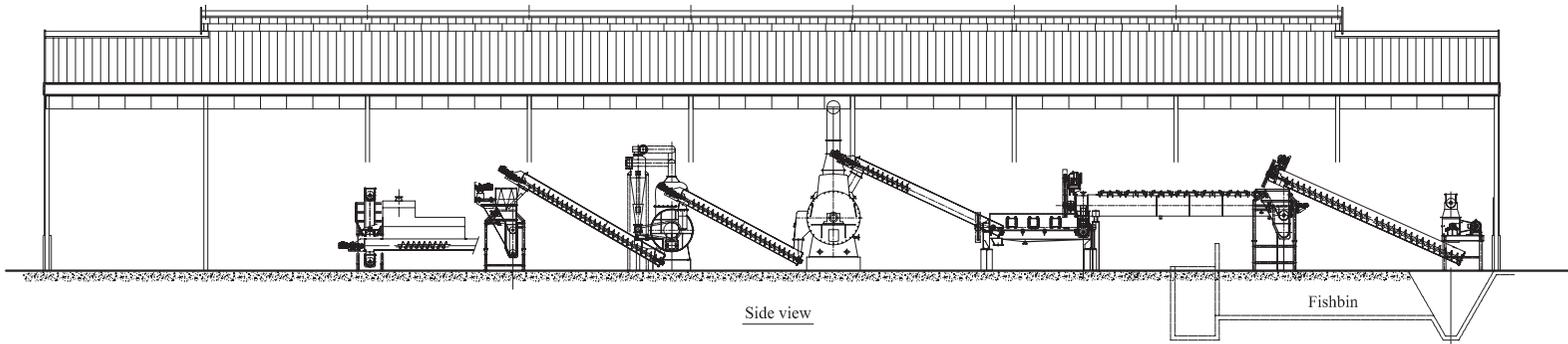
Genuine spare parts are carried in stock for all ASTW manufactured equipment.

Contact our sales and marketing team for assistance.

## Technical Data :

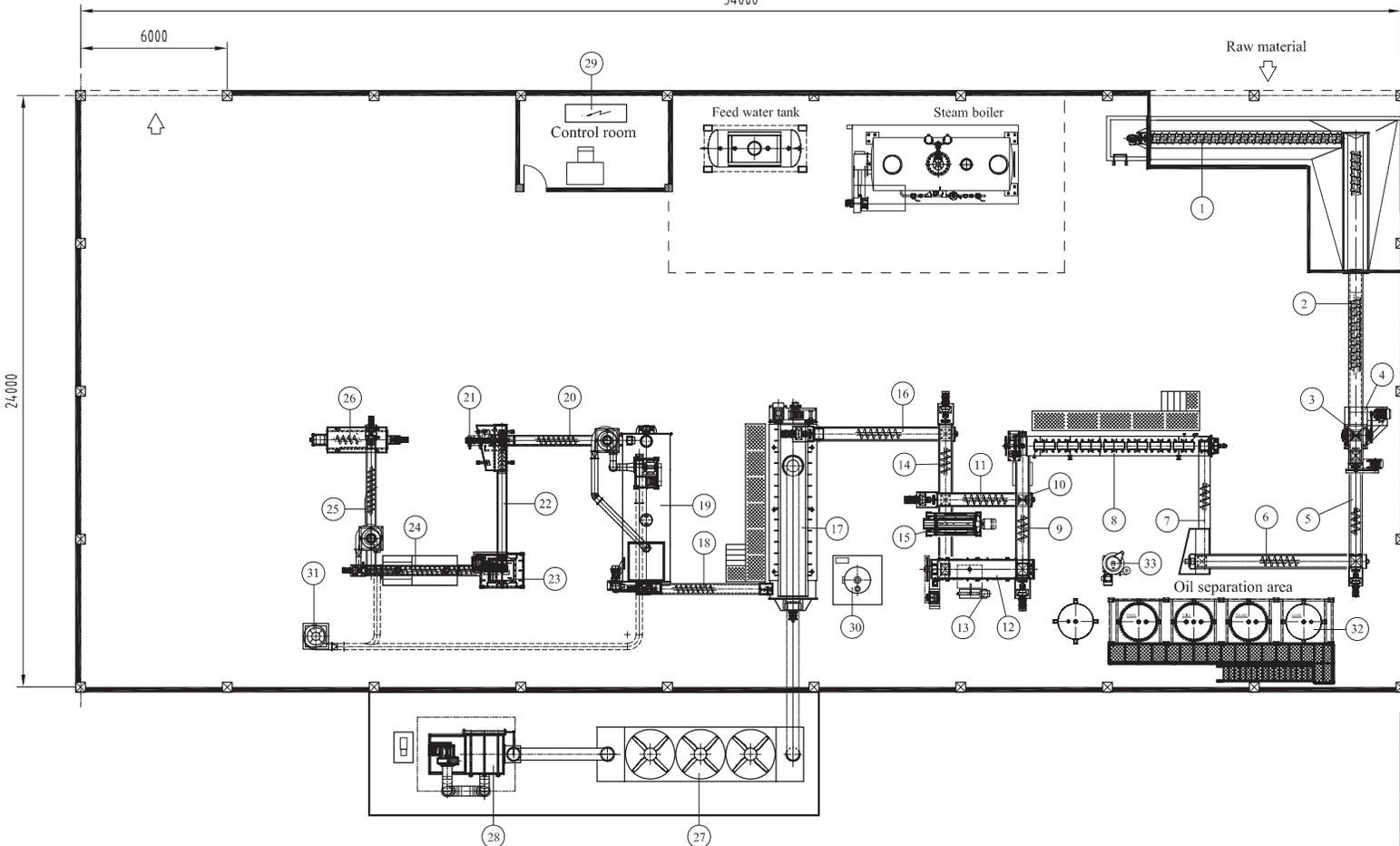
Steam consumption at 6 bar. Recommended boiler (max. 10 bar)	2 tons/hr.
Fuel consumption - heavy oil 65 liters/ton steam. (Diesel oil 60 liters/ton steam) Note: If the stick water is not evaporated in the drier, the plant capacity will increase and the steam consumption reduce up to 40%, but the fishmeal will have 3-5% lower protein content.	240 liters/hr.
Electric Load kW. (70%)	182 kW. ( 245 HP)
Electric installed kW. Note: KVA = kW/power factor for motor 0.8 (260/0.8 = 325 KVA)	260 kW. (350 HP)





54,000

Fishbin



**PLANT LAYOUT OFF-90**

1. FISHBIN SCREWCONVEYOR
2. INCLINED SCREWCONVEYOR
3. KNIFE GATE VALE
4. FISH HOGGER
5. SCREWCONVEYOR FROM FISH HOGGER
6. SCREWCONVEYOR TO FEEDING UNIT
7. FEEDING UNIT
8. COOKER PH-90
9. STRAINER SCREWCONVEYOR
10. KNIFE GATE VALVE
11. BY-PASS SCREWCONVEYOR
12. SCREWPRESS TP-41-1
13. PRESS WATER TANK WITH MONO PUMP
14. TEARING AND MIXING SCREWCONVEYOR
15. 3-PHASE DECANTER WITH PUMP
16. SCREWCONVEYOR TO DRIER
17. ROTARY DISC DRIER TST 16.0 C
18. DR.-MC. SCREWCONVEYOR
19. MEAL COOLER WITH SUCTION FAN AND CYCLONE AND ROTARY VALVE
20. SCREWCONVEYOR FROM MEAL COOLER
21. ROTARY STRAINER
22. MEAL FEEDER SCREWCONVEYOR
23. HAMMER MILL M21
24. PLENUM COOLING CHAMBER SCREWCONVEYOR
25. SCREWCONVEYOR TO BAGGING UNIT
26. BAGGING UNIT WITH SCREWCONVEYOR
27. AIR-COOLED CONDENSER
28. DEODORIZER/SCRUBBER
29. ELECTRIC CONTROL CABINET
30. CONDENSATE SAVING SYSTEM
31. CYCLONE
32. FISHOIL PROCESSING TANKS
33. FISHOIL SEPARATOR

For: OILY FISH PLANT		Project: -	
<b>A &amp; S Thai Works Co., Ltd.</b> <small>Highest quality Fishmeal and Rendering (meat and bone) plants</small>			
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Drawn		Title: OFF-90 OILY FISH PLANT	
Designed			
Checked			
Approved			
Scale: 1:175	Ref. Drawing No: -	Std. View:	Drawing No: L3-0451 Rev: A

# Oily Fish Plant type OFP 120

Capacity 120 tons raw material input per 24 hours ~ 5 tons/ hr.



- Fishmeal plant OFP 120, oily fish with oil content more than 3% which gives oil content in the fishmeal approx. 10%. All types of oily and lean fish and fish waste. (Large fish must be cut into small pieces by pre breaker)
- Complete installation, commissioning and start up.
- Capacity 120 tons raw material input per 24 hours (5 tons/hr.)
- Rotary disc driers come with 1 year warranty for drier body, gear, bearings and even the motor.

1. Fish pre-breaker (hogger) to cut large fish and fish waste into small pieces.
2. Feeding unit, hopper combined with screw conveyor to ensure correct feeding of raw material into the drier AST/TST 24.0.
3. Cooker/preheater for raw fish type SS 25/8, normal capacity is 7 tons/hour.
4. Oil separation area (one set of 5 mild steel processing tanks).
5. Screw conveyor from meal cooler type MC 2.0 / 6.0 to rotary strainer and meal feeder.
6. Hammer mill type M33 to grind the meal before bagging and combined screw conveyor from hammer mill to bagging unit.



# Technical data for OFP 120 Oily Fishmeal Plant

## Capacity

120-140 tons input / 24 hrs. with stick water evaporated in the drier.

(Expect some variation based on type and condition of the raw material.)

140 tons input / 24 hours with use of waste heat evaporator or throw away the stickwater.

## Raw materials

- Oily fish with oil content more than 3% which gives oil content in the fishmeal approx. 10%
- All types of oily and lean fish and fish waste.
- Tuna waste from canning, meat, heads and bone.
- Tuna intestines, raw or cooked.
- Some cooking juice from the canning plant can be added for separation.

Note: Larger fish and fish waste must be cut into small pieces by a prebreaker (hogger).

## 3 years warranty

ASTW Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor.

(\*South East Asia only, otherwise 1 year warranty)

## Inspection Certificate

ASTW Rotary Disc Driers are inspected and certified to British Standard BS (PD) 5500, European Standard PED and Australian Standard AS 1210. International approval, inspection and certification is provided by Lloyd's Register International (Thailand) Limited.

## Service Team

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## Spare Parts

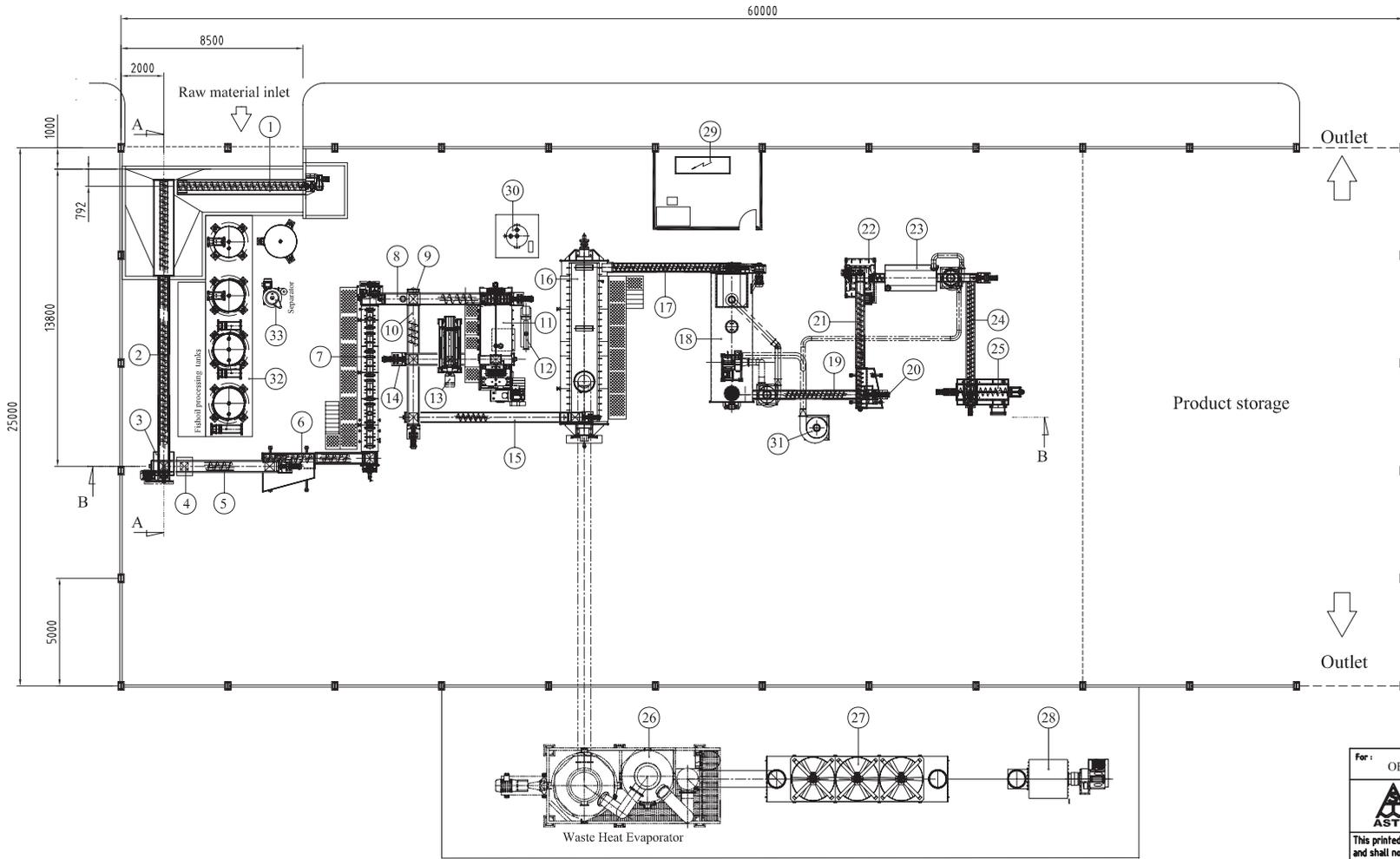
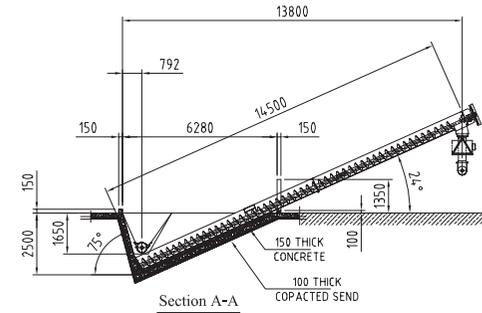
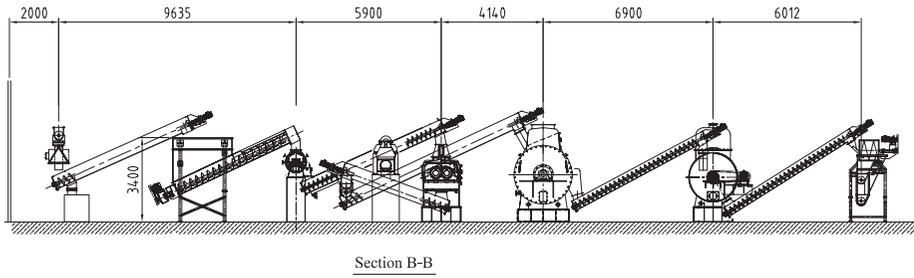
Genuine spare parts are carried in stock for all ASTW manufactured equipment.

Contact our sales and marketing team for assistance.

## Technical Data :

Steam consumption at 6 bar. Recommended boiler size 6 tons/hr. (max. 10 bar)	4.5 tons/hr.
Fuel consumption - heavy oil 65 liters/ton steam. (Diesel oil 60 liters/ton steam)	300 liters/hr.
Electric Load kW. (70%)	126 kW. (168 HP)
Electric installed kW. Note: KVA = kW/power factor for motor 0.8 (180/0.8 =225 KVA)	180 kW. (240 HP)





- Item / Description
1. Fishbin screw conveyor (Ø400x6000)
  2. Inclined screw conveyor (Ø400 x 14500)
  3. MD. Metal detector
  4. Knife gate vane (400 x 400)
  5. Screw conveyor to Feeding unit (Ø400 x 6000)
  6. Feeding unit (Ø400 x 5000)
  7. Cooker type : 25 / 8
  8. Strainer screw conveyor (Ø400 x 6200)
  9. Knife gate valve (400 x 400)
  10. By-pass screw conveyor (Ø400 x 6000)
  11. Twin screw press type : BS-35
  12. Press water tank and feed pump
  13. 3-Phase Decanter
  14. Tearing & Mixing screw conveyor (Ø400 x 4500)
  15. Screw conveyor to drier (Ø400 x 8000)
  16. Rotating disc drier TST 24.0
  17. Screwconveyor to meal cooler (Ø300 x 6000)
  18. Meal cooler type : MC-2.0/6.0
  19. Screwconveyor from meal cooler (Ø300 x 6000)
  20. Rotary strainer
  21. Meal feeder with screw conveyor (Ø250 x 6000)
  22. Hammer mill type : M33
  23. Cooling plenum chamber with screw conveyor (Ø300 x 5880)
  24. Screw conveyor to bagging unit (Ø300 x 6000)
  25. Bagging unit with screw conveyor (Ø350 x 3000)
  26. WHE 2-Stage waste heat evaporator
  27. Air cooled condenser
  28. Deodorizer / Scrubber (1800 x 1800)
  29. Electric control cabinet
  30. Condensate return saving system
  31. Cyclone, Ø970
  32. Fishoil processing tanks
  33. Fishoil separator

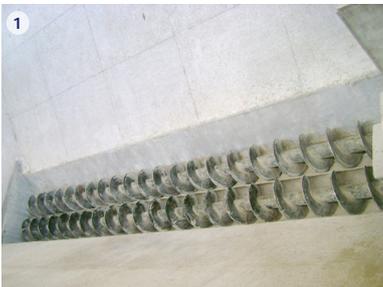
For:	OFP-120, Fishmeal plant	Project:	-
 <b>A &amp; S Thai Works Co.,Ltd.</b> Highest quality Fishmeal and Rendering (meat and bone) plants			
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Drawn	SUR	24 . 9 . 16	Title :
Designed			OFP - 120 PLANT LAYOUT
Checked			
Approved			
Scale	Ref. Drawing No.	Drawing No.	Rev.
-	-	-	-

# Oily Fish Plant type OFP 160

Capacity 160 tons raw material input per 24 hours ~ 6.7 tons/ hr.



OFP 160 installed at Kanpa Int'l Sales, An Pakistan 2005



- Fishmeal plant OFP 160, oily fish with oil content more than 3% which gives oil content in the fishmeal approx. 10%. All types of oily and lean fish and fish waste. (Large fish must be cut into small pieces by pre breaker)
- Complete installation, commissioning and start up.
- Capacity 160 tons raw material input per 24 hours (6.7 tons/hr.)
- Rotary disc driers come with 1 year warranty for drier body, gear, bearings and even the motor.



1. Fish bin, Inclined screw conveyor to transport raw material to the Fish hogger / feeding unit.
2. Fishmeal drier type AST/TST 90.0
3. Meal cooler type MC 2.0 / 9.0 to rotary strainer
4. Twin Screws press type AST/BS 41
5. Rotary strainer and meal feeder, Hammer mill to Bagging unit
6. Air cooled condenser



# Technical data for OFP 160 Oily Fishmeal Plant

## Capacity

160 tons input / 24 hrs. with stick water evaporated in the drier.

(Expect some variation based on type and condition of the raw material.)

180-200 tons input / 24 hours with use of waste heat evaporator or throw away the stickwater.

## Raw materials

- Oily fish with oil content more than 3% which gives oil content in the fishmeal approx. 10%
- All types of oily and lean fish and fish waste.
- Tuna waste from canning, meat, heads and bone.
- Tuna intestines, raw or cooked.
- Some cooking juice from the canning plant can be added for separation.

Note: Larger fish and fish waste must be cut into small pieces by a prebreaker (hogger).

## 3 years warranty

ASTW Rotary Disc Driers come with 3 years warranty\* for drier body, gear, bearings and even the motor.

(\*South East Asia only, otherwise 1 year warranty)

## Inspection Certificate

ASTW Rotary Disc Driers are inspected and certified to British Standard BS (PD) 5500, European Standard PED and Australian Standard AS 1210. International approval, inspection and certification is provided by Lloyd's Register International (Thailand) Limited.

## Service Team

Complete installation and commissioning is available using our highly experienced service teams, along with full operating documentation for each plant.

## Spare Parts

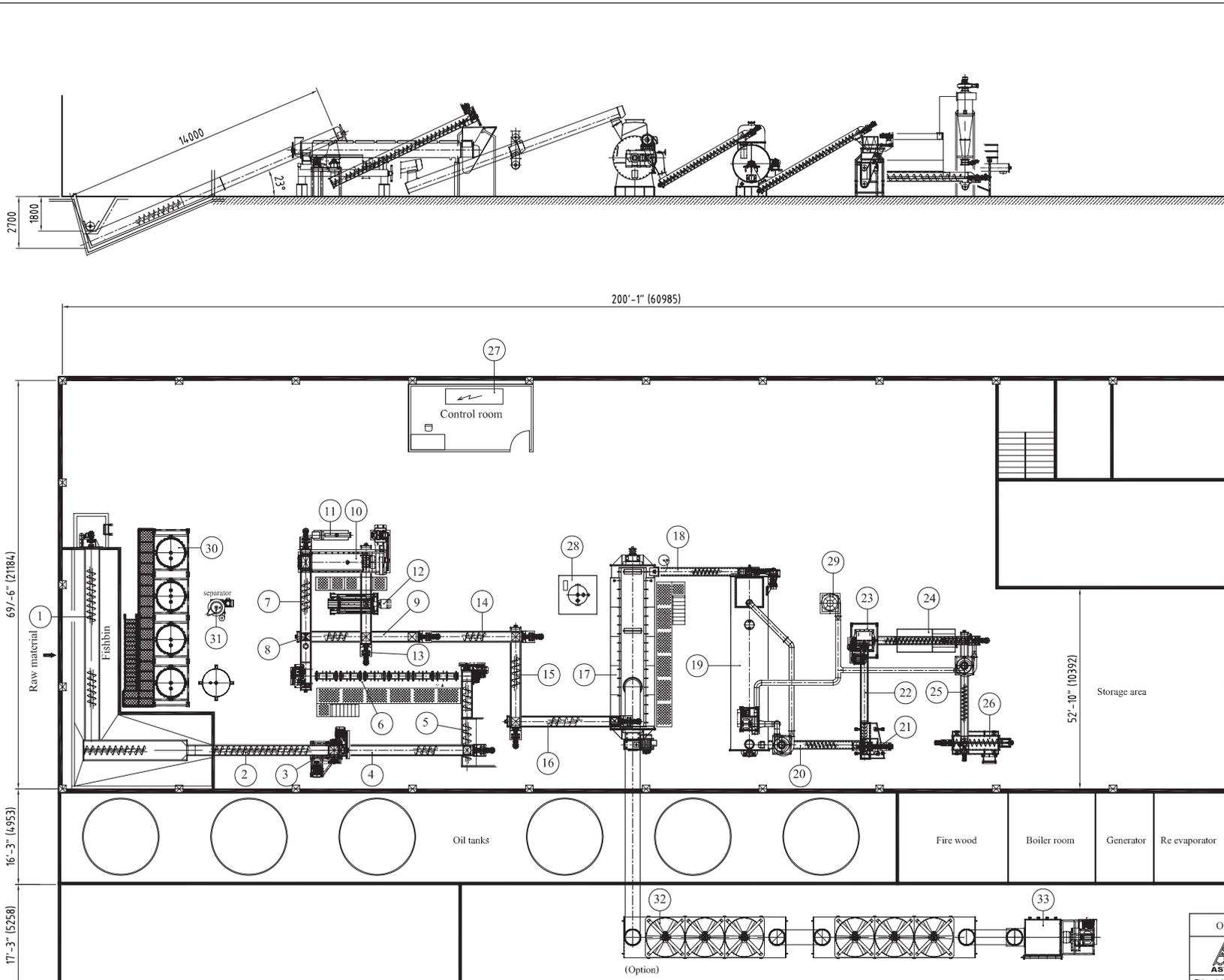
Genuine spare parts are carried in stock for all ASTW manufactured equipment.

Contact our sales and marketing team for assistance.

## Technical Data :

Steam consumption at 6 bar. Recommended boiler (max. 10 bar)	6 tons/hr.
Fuel consumption - heavy oil 65 liters/ton steam. (Diesel oil 60 liters/ton steam) Note: If the stick water is not evaporated in the drier, the plant capacity will increase and the steam consumption reduce up to 40%, but the fishmeal will have 3-5% lower protein content.the fishmeal will have 3-5% lower protein content.	300 liters/hr.
Electric Load kW. (70%)	252 kW. ( 336 HP)
Electric installed kW. Note: KVA = kW/power factor for motor 0.8 (360/0.8 = 450 KVA)	360 kW. (480 HP)





- Item / Description
1. Fishbin screwconveyor (Ø450 x 10000)
  2. Inclined screwconveyor (Ø450 x 14000)
  3. Fish hogger
  4. Screwconveyor to feeding unit (Ø450 x 8000)
  5. Feeding unit (Ø450 x 5000)
  6. Cooker SS - 45/9
  7. Strainer screwconveyor (Ø400 x 6600)
  8. Knife gate valve, 400 x 400
  9. By-pass screwconveyor to drier no.1 (Ø400 x 6200)
  10. Twin screw press type : BS 41
  11. Press water pump and pump
  12. 3-phase decanter
  13. Tearing and mixing screwconveyor to drier no.2 (Ø400 x 4500)
  14. Screwconveyor to drier no.3 (Ø400 x 6200)
  15. Screwconveyor to drier no.4 (Ø400 x 5200)
  16. Screwconveyor to drier no.5 (Ø400 x 6000)
  17. Rotating disc drier TST 90.0 C
  18. Screw conveyor to meal cooler (Ø300 x 5000)
  19. Meal cooler type : MC-2.0/9.0
  20. Screwconveyor from meal cooler with cyclone and blower (Ø300 x6000)
  21. Rotary strainer
  22. Meal feeder with screw conveyor (Ø300 x 6000)
  23. Hammer mill type : M33
  24. Cooling plenum chamber with screw conveyor (Ø350 x 6000)
  25. Screw conveyor to bagging unit or silo (Ø300 x 6000)
  26. Bagging unit with screwconveyor (Ø350 x 3000)
  27. Electric control cabinet
  28. Condensate return saving system
  29. Cyclone, Ø970
  30. Fishoil processing tanks
  31. Fishoil separator
  32. 2 x Air - cooled condenser (option)
  33. Deodorizer / Scrubber (1800 x 1800)

OFP-160, Fishmeal plant		Project :	
<b>A &amp; S Thai Works Co.,Ltd.</b> Highest quality Fishmeal and Rendering (meat and bone) plants			
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Drawn		Title : OFP-160	
Designed		PLANT LAYOUT	
Checked		(Option - B)	
Approved			
Scale	Ref. Drawing No.	Std. View	Drawing No.
			Rev.



# How to Choose a Fishmeal Plants

## LFP : Lean Fish Plants

Plant size	Capacity (ton./24 hrs.)	Description
LFP 24	24-30 tons	If the producer has 10-12 tons of lean fish or fish waste per day at low cost and no plan to extend the capacity later on. Imagine that with 12 tons of fish per day free of charge the producer can pay back the complete plant within 6 months. Mostly bought by small seafood producers with fish waste.
LFP 55	55-60 tons	Most sold plant in Asia for medium sized seafood producers and small fishing ports.
LFP 90	90-100 tons	Most sold plant with medium size capacity, suitable for larger seafood producers and medium size fishing ports. Some customers who bought LFP 55 later regretted that they did not buy LFP 90 as they got access to more fish than they were aware of.
LFP 120	120-140 tons	This plant is starting to be big and most used size for large seafood producers and fishing ports in Asia.
LFP 160	160-180 tons	Most sold plant and the largest single line plant size available in Asia. But in large fish meal nations like Norway, Denmark, Peru and Chile, plant size capacity range from 600-4000 tons fish per day and the fresh fish is immediately processed to ensure top quality fish meal.

## OFP : Oily Fish Plants

Plant size	Capacity (ton./24 hrs.)	Description
OFP 24	24-30 tons	Installed mostly in small seafood processing plants that have oily fish.
OFP 55	55-60 tons	Many OFP 55 plants sold as it is the smallest OFP plant with full industrial capacity.
OFP 90	90-100 tons	Medium –large size OFP plants mostly used by tuna, sardine and cat fish.
OFP 120	120-140 tons	Processors in Asia. These plants start to be big and are installed near major fishing ports and at large seafood processors. 3-phase decanter for oil separation and oil clarifier separator. Optional Waste Heat Evaporator (WHE) is feasible and can be installed to reduce the steam consumption by up to 40%
OFP 160	160-180 tons	The largest size OFP supplied in Asia. With an optional Waste Heat Evaporator (WHE) the capacity can increase up to 240 tons/24 hrs. and the steam consumption reduce at the same time by 40%. 3 or 2-phase decanter and oil clarifiers are always installed with these large plants.



# Questionnaire for fish meal industry

Please fill out the enclosed questionnaire and fax or mail to us so that we can offer you a suitable plant for your operation.

## A & S Thai Works Co., Ltd.

99/199 Theparak Rd., km.22. Bangsaothong, Samutprakarn 10540 THAILAND

Phone: +662 3131 540 | Fax:+662 3131 550 Email: sales@asthaiworks.com

Sales & Marketing Manager: +66 89 813 0183 | wichai@asthaiworks.com



www.fishmealmachine.com

Company name:	<input type="text"/>		
Contact person:	<input type="text"/>		
Address:	<input type="text"/>		
City:	<input type="text"/>	Zip Code:	<input type="text"/>
Country:	<input type="text"/>		
E-mail:	<input type="text"/>	Website:	<input type="text"/>
Phone:	<input type="text"/>	Fax:	<input type="text"/>
Business :	<input type="text"/>		

Do you have an existing fishmeal plant:  Yes  No

Capacity input tons/24 hr.: \_\_\_\_\_ Type of machinery: \_\_\_\_\_

Preferred working hr/day:  8 hrs.  10 hrs.  12 hrs.  16 hrs.

Describe type and size of fish:  Lean fish  Oily fish

Tuna waste  Fish waste  Trawler fish with sand/shell

Intestines  Shrimp waste  Oil content in fish.....%

Requested capacity of fishmeal plant in input per 24 hours in tons/24 hrs.:

Lean Fish Plant  LFP 24  LFP 55  LFP 90  LFP 120  LFP 160

Oily Fish Plant  OFP 24  OFP 55  OFP 90  OFP 120  OFP 160

If you need any new accessories, please describe:

<input type="checkbox"/> Fish hogger	<input type="checkbox"/> Mealcooler	<input type="checkbox"/> Waste Heat Evaporator
<input type="checkbox"/> Cooker	<input type="checkbox"/> Rotary Strainer & meal feeder	<input type="checkbox"/> Air cooled condenser
<input type="checkbox"/> Screw Presses	<input type="checkbox"/> Hammer mill	<input type="checkbox"/> Water Scrubber deodorizer
<input type="checkbox"/> Rotary Disc Drier	<input type="checkbox"/> Screw conveyor	<input type="checkbox"/> Shell & Tube Condenser

Describe the location of your plant:

Near population  Near sea  Near river

No sea or river water available for deodorizer(use air cooled condenser)

When do you plan to expand or modernize your factory?

2022  2023  2024  2025

**A & S Thai Works Co., Ltd.**

**99/199 Moo1**

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**Bangsaothong**

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**[www.asthaiworks.com](http://www.asthaiworks.com)**