SN 62 series of a high moisture plant protein meat production line

SN62 Series HMMA+TVP Production

Proposal / Solution

(100~300kg/h for HMMA & 300~600kg/h for TVP)

(Specially we can provide related artificial meat product formulations)

SHANGHAI OMEGA MACHINERY

I/ Company Profile

公司简介COMPANY PROFILE

坐标 LOCATION：

原元康机械集团公司
OMEGA MACHINERY GROUP

Head office in Shanghai, branch in Nanjing and Anhui

总占地面积 TOTAL AREA：

26000㎡

车间面积 WORKSHOP AREA：

21000㎡

员工总人数 TOTAL NUMBER OF EMPLOYEES：

160人以上，工程技术人员占比40%

MORE THAN 160 STAFF, TECHNICIAN ABOUT 40%

技术能力
TECHNICAL SKILLS
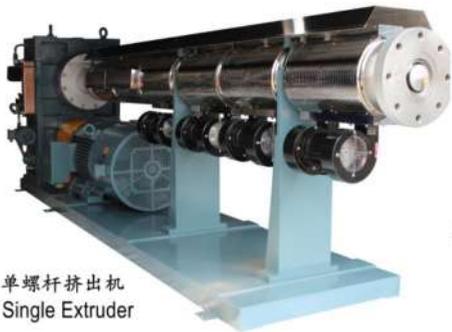
人员配额Staff quantity

30余人More than 30 people

主要职能main function

工艺部、技术开发部、质检部Technology Department,
Technology Development Department, Quality Inspection
Department

装配能力
ASSEMBLY CAPACITY

人员配额Staff quantity

30余人More than 30 staff

主要职能main function

设备装配、调试、安装试机Equipment assembly, debugging, installation test machine

单螺杆挤出机
Single Extruder

平行双螺杆挤出机
Parallel twin screw extruder

原元康机械集团公司
OMEGA MACHINERY GROUP

中国国内双金属机筒螺杆研发企业
Bimetallic barrel and screw R&D enterprise in China

中国挤出机核心部件研发第一品牌
Extruder core components R&D first brand in China

Our Diesel Injection Furnace and Centrifuge Equipment used for bimetallic barrel molding is protected by the State Patent

SHANGHAI OMEGA MACHINERY

II/ Introduction by

1/ Definition

Vegetable protein meat TVP (textured vegetable protein) is made of vegetable protein as raw material and processed by a special process. It is a category of food with similar characteristics with livestock, poultry, and fish meat in terms of structure, flavor and chewiness.

2/ Development process of plant protein

1)   Version 1.0: Raw processing materials of soy products such as tofu

2)   Version 2.0: Tissue protein produced by dry method

3)   Version 3.0: Vegetable protein meat developed from the tissue protein of high-humidity processing method

At present, our company has obtained stable,reliable production technology and product development and application in the field of HMMA production of version 3.0.

3/ Classifications

1)Product types that can be processed in terms of different raw materials

   a) Grain tissue protein,

   b) Legume tissue protein,

   c) Mixed (in material) tissue protein.

2) Processable product types in terms of final moisture

   a) Dry tissue protein: ordinary tissue protein (granules, bars, rods, blocks),

   b) Drawing protein

   c) Wet tissue protein: high moisture tissue protein.

4/   Application fields of HMMA

1) Meat product processing: high temperature ham sausage, low temperature ham sausage and enema, canned luncheon meat, flavored meatballs, flavored meat patties, dumplings stuffing with stuffed buns, and reconstituted meat particles wrapped in meat sauce.

2) Snack food : dried meat, meat strips, meat floss, etc.

3) Catering: dine-in catering, catering ingredients, barbecue ingredients,

4) Vegetarian: religious and healthy people, monasteries, vegetarian restaurants.

5/   Product features of HMMA

1) Fibrous feeling and strong chewing feeling

2) Repeated quick freezing and thawing without losing water

3) Resistant to cooking, high temperature and high pressure

4) Simple and convenient to use

Because the products produced by the high-humidity method are more meat-like and easy to use, they are the future development direction and main force of tissue protein, and will gradually replace dry tissue protein.

6/ HMMA Characteristics available by our machines:

| Item	Meat		Pork		Chicken		Fish
	Block shape	Strip shape	Block shape	Strip shape	Block shape	Strip shape	Strip shape
Flavor	√	√	√	√	√	√	√
Color	√	√	√	√	√	√	√
taste	√	√	√	√	√	√	√
Color+taste	√	√	√	√	√	√	√

7/ Total machine system consists of following parts:

1)   Raw material mixing and dosing system:including raw material dosing, mixing, transportation and processing.

2)   Loss-in-weight feeding system:provide accurate and stable feeding for the extruder.

3)   Material conditioning device: pre-treatment of materials which can be filled with steam, liquid, ingredients etc.

4)   Twin-screw extrusion system: the core equipment.According to different material formulas,it can realize material processing through different combinations of building block/segmented screws.

5)   Temperature control molding device: temperature-controllable molding of the materials processed by the extruder, and change about silk-like structure of HMMA through adjusting process parameters.

High-precision temperature control device: Provide high-precision temperature

control conditions for the extruder and the former.

6) Vapor-liquid filling system: Provide high-precision, stable and reliable vapor-liquid supply for the conditioner and main machine processing part.
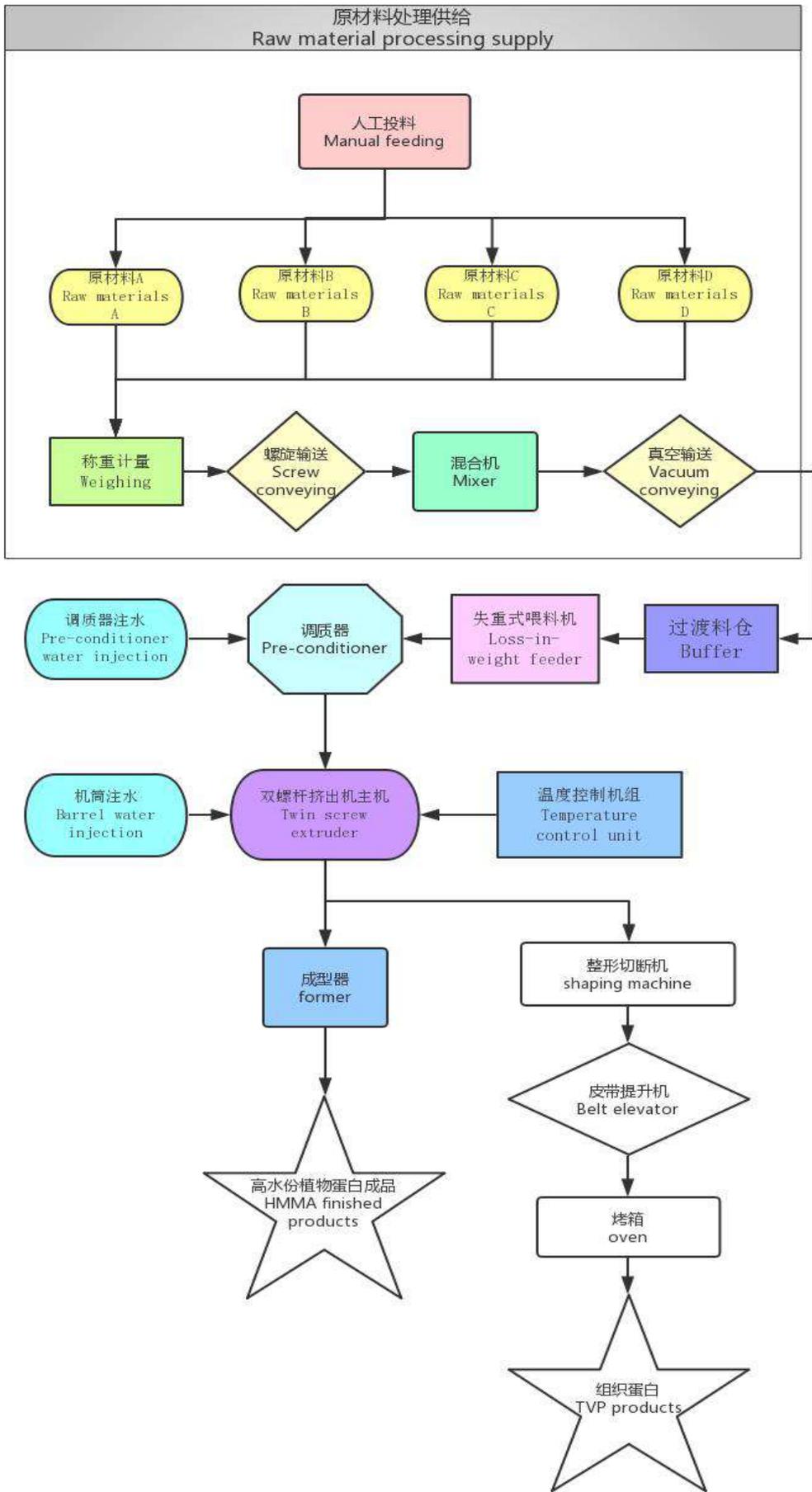
7) All other auxiliary equipments.
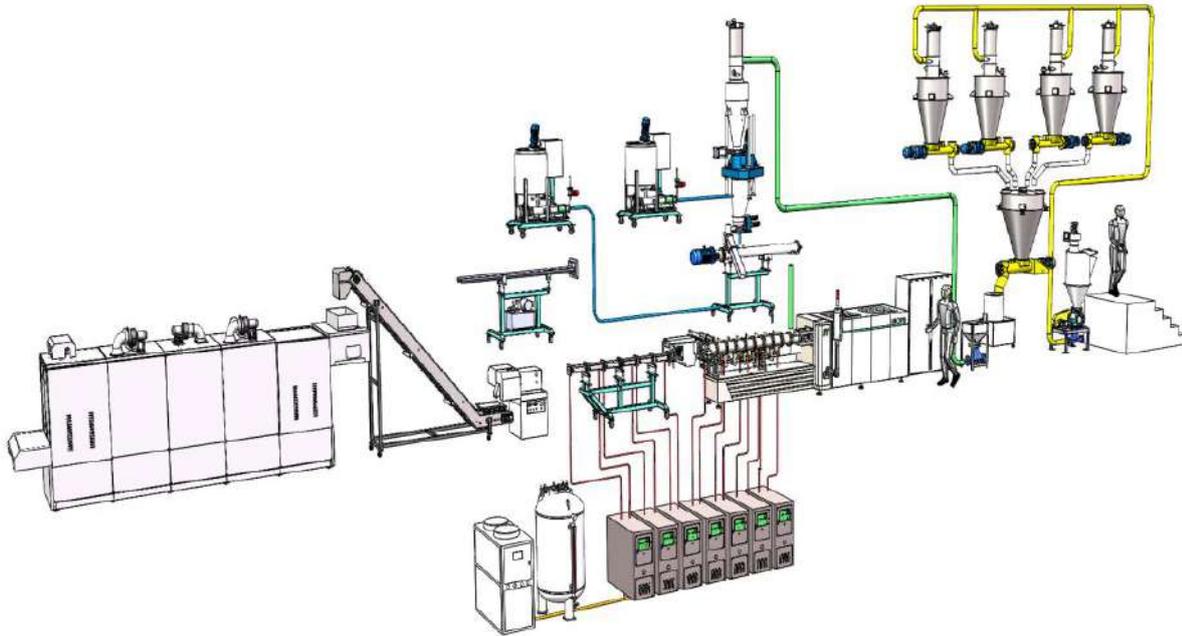
Production line structure diagram
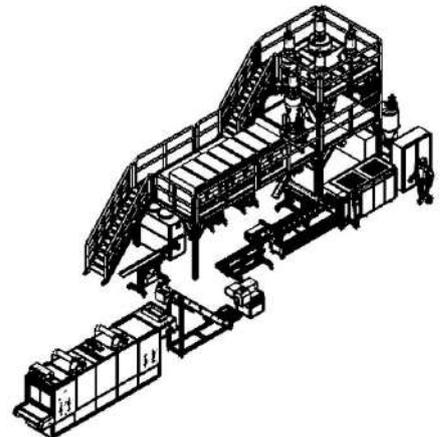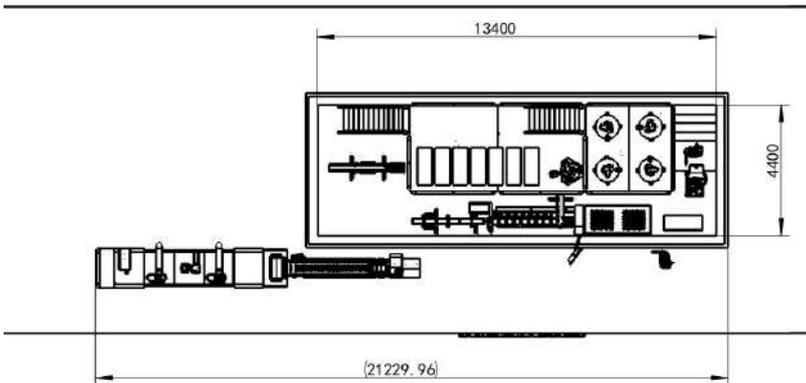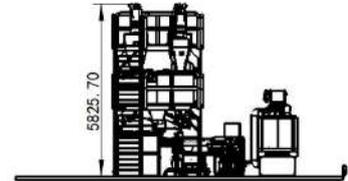

Some equipments of the production line

III/ Samples

IV/ Flow Chart

原材料处理供给
Raw material processing supply

人工投料
Manual feeding

原材料A
Raw materials A

原材料B
Raw materials B

原材料C
Raw materials C

原材料D
Raw materials D

称重计量
Weighing

螺旋输送
Screw conveying

混合机
Mixer

真空输送
Vacuum conveying

调质器注水
Pre-conditioner water injection

调质器
Pre-conditioner

失重式喂料机
Loss-in-weight feeder

过渡料仓
Buffer

机筒注水
Barrel water injection

双螺杆挤出机主机
Twin screw extruder

温度控制机组
Temperature control unit

成型器
former

整形切断机
shaping machine

高水份植物蛋白成品
HMMA finished products

皮带提升机
Belt elevator

烤箱
oven

组织蛋白
TVP products

V/ Sketch

VI/ Brand List

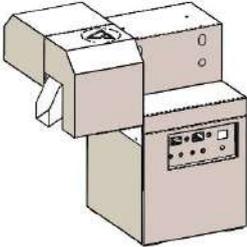|	Components	Brand
1	PLC/HMI	DELTA
2	Control cabinet	RITTAL
3	Frequency inverter	DELTA
4	Main motor	SIMENS
5	Bearing	NSK
6	Low-voltage electrical components	SCHNEIDER
7	Load cell	METTLER TOLEDO
8	Temperature, pressure sensor	GEFRAN
9	Water injection screw pump	NETZSCH
10	Temperature control meters	WEST

VII/ Information

No.	Descriptions	Pictures	Information	Remarks
1	**Automatic dosing system**	SNZP-I-4	**Components:** 1. Platform 2. manual dust-free feeding station TLZ-1 (for 25kg packaging bags) 3. One-to-four vacuum conveyor ZKS-3 4. Raw material silos (280L) with screw conveyor included-4 sets 5. Weighing batching bin (500L) with unloading conveyor 6. Weighing control system **Parameters:** 1. Voltage: 380V,50Hz 2. Total power: 7kw 3. Size: 3000x3000x6000mm with stairs excluded 4. Weighing module brand: METTKER TOLEDO 5. Batching accuracy: ±0.5% 6. Batching capacity: 800kg/h 7. Material of silo: the parts that contact food is made of SUS304	1 set (optional)
2	**Batch mixer**	BFJ-III	1. Voltage: 380V,50Hz 2. Motor power: 7.5kw 3. Spindle speed: 285r/min 4. Single mixing powder volume: 50kg/batch 5. Output: 400-600kg/h 6. Material:the parts that contact food is made of SUS304 7. Dimension: 1410x760x1350mm	1 set

3	**Vacuum conveyor**	QVC-3	1. Conveying capacity: 300-1500kg/h 2. Silo volume: 12.0L 3. Working pressure: 0.4-0.6Mpa 4. Compressed air consumption: 720NL/min 5. Material: the parts that contact food is made of SUS304	1 set
4	**Buffer**	LC-100	1. Effective volume: 100L 2. Dimensions: 600x600x1250mm 3. Outlet size: DN150 4. pneumatic working 5. Configuration: upper material level sensor and lower material level sensor 6. Material: The parts that contact food is made of SUS304 7. Working pressure: 0.4-0.6Mpa	1 set
5	**Loss-in-weight Feeding silo especially for HMMA**	SNWL-III-120SNWL-III-120	1. Effective volume: 120L 2. Material: The parts that contact food is made of SUS304 3. Three-point load cell: 300kg 4. Weighing accuracy: ±0.5% 5. Silo mixing motor: 0.75kw 6. Spherical bucket stirring motor: 0.45kw 7. Feeding motor: 0.75kw 8. Screw diameter: 2-44mm 9. Loss-in-weight metering control system PLC+HMI remote/local intelligent control	1 set
6	**Single-shaft/ axis pre-conditioner**	SNTZ-III-168	1. Diameter: 168mm 2. Tempering length: 2000mm 3. Voltage: 380V,50Hz 4. Motor power: 4.0kw 5. Spindle speed: 0-600r/min 6. Material: the parts that contact food is made of SUS304 7. Dimension: 2900x1350x1500mm	1 set

No.	Name	Image	Specifications	Qty
7	**Quantitative water injection device**	SNZS-II-150	1. Effective volume: 150L 2. Heating power: 9kw 3. Mixing power: 0.37kw 4. Water injection pressure 3bar 5. Water injection volume: 0.035-0.35m³/h 6. Screw pump power 0.75kw 7. Flow detection, temperature detection 8. Dimension:700x1200x1800mm 9. Material:the parts that contact food is made of SUS304 contact material SUS304	1 set
8	**High-precision and high-sensitivity temperature control unit**		The deeply optimized PID control algorithm provides high-precision temperature control for extruder barrel and former. Components: 1/ 4 sets of oil temperature controllers Model: MTC-HH-250B 1) Power: 15KVA 2) Temperature control accuracy: display 0.1℃, ±1℃ 3) Medium flow: heat transfer oil 4) Dimension: 870x275x750mm 5) Voltage: 380v/50Hz 6) The maximum temperature is 190℃ 2/ 3 sets of water temperature controllers Model: MTC-LH-60A Power: 13.5KVA Temperature control accuracy: display 0.1℃, ±1℃ Medium flow: water 4) Dimension: 640x207x550mm 5) Voltage: 380v/50Hz 6) The highest temperature: 120℃	7 units
9	**Water cooling unit**	QX-10AD	1. Cooling capacity: 28kw 2. Temperature range 5-35℃ 3. Power of the whole machine: 9.6kw 4. Voltage/frequency: 380v/50Hz 5. Cooling water tank 1m³	1 set

10	**Twin screw extruder**	 SN62-40	1. Main motor power: 90kw 2. Power of the whole machine: 145kw 3. Voltage/frequency: 380v/50Hz 4. Screw diameter: 62mm 5. Length to diameter ratio: 1:40 6. Barrel heating zone: 10 sections and 8 zones for temperature control 7. Temperature control method: mold temperature controller 8. Dimension: 1200x6500x1650mm Round closed temperature control barrel Combined building block type screw contains: 1/ large pitch conveying 2/ Conveying transition elements 3/ middle pitch elements 4/ small pitch elements 5/ Left and right twisting wide kneading elements 6/ left and right rotation narrow kneading elements 7/ Left and right rotation shearing element High-strength dedicated distribution gearbox	1 set
11	**Control cabinet**		Rittal Cabinet 1. PLC\HMI\Delta 2. Inverter: Delta 3. Low-voltage electrical part brand: Schneider 4. Temperature sensor: Gefran 5. Pressure sensor: Gefran	1 set

12	**Screw/worm disassembly device**	SNBC-I	1. Hydraulic station power 2.2kw 2. Voltage: 380v/50Hz 3. Effective pull-out length: 2000mm 4. Pressure:1.6Mpa 5. Dimension:2600x1000x1200mm	1 set
13	**Temperature control molding device**	SNCXQ-III	Rectangular temperature control forming device 1. Section size: 10x110mm 2. Number of sections: 8 sections 3. Single section length: 400mm 4. Material: SUS304 5. Size: 3300x1000x1200mm Dedicated temperature control detection system	1 set
14	**Shaping machine**		Pulling and cutting for TVP products	1 set
15-1	**Belt hoister**	TSJ-II-400	1.Voltage: 380V/50Hz 2.Total power:0.37kw 3. Width of conveyor belt:400mm 4. Frame material:SUS201 Dimension: 1935x740x1365mm It can be used for big size TVP granules	1 set
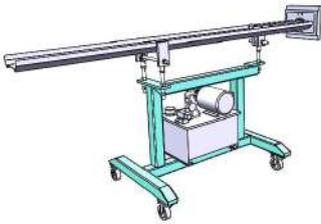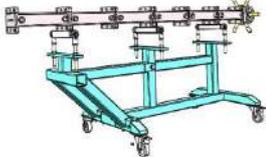
15-2	Air conveyor (optional)	FSJ-1.1	Power: 1.1 kw Pipeline diameter:Φ141mm Capacity: 600-800kg/h Weight: 50Kg It can be used for small size TVP granules	1 set
16	Electric dryer	SN-D8F5	1. Voltage/frequency: 380v/50Hz 2. Total power: 75.5kw 3. Number of layers: 5 layers 4. Number of heating pipes: 90 5. Center distance of mesh belt: 1020mm 6. Mesh belt material: SUS304 7. Output: 450-650kg/h 8. Dimensions: 8630x1575x2530mm 9. Insulation material: aluminum silicate board	1 set
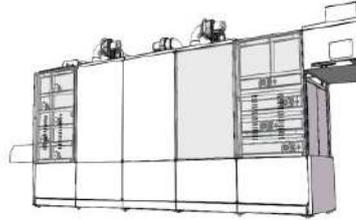
Remark: The above information and pictures are for reference only,and it is subject to the actual size of the equipment.

VIII/ Contract Terms and Conditions

1/ Payment Term: 60% paid by T/T as advance payment with the balance to be paid before shipment by T/T.

2/ Delivery Time: Within 100 working days.

3/ Demonstration can be arranged to clients before shipment and machines can be shipped after the equipment is approved satisfactory.

4/ Seller will dispatch 2 experienced engineers to go for on-site installation, debugging and training. Buyer shall cover the visa application cost, roundtrip air flight tickets, food and accommodations along with usd100/day/person.

Welcome any questions to be discussed, if an inquiry confirmed, our company will show buyer our Quotation file ASAP.

Reporter: SHANGHAI OMEGA MACHINERY

Report date: Sep. 8, 2021