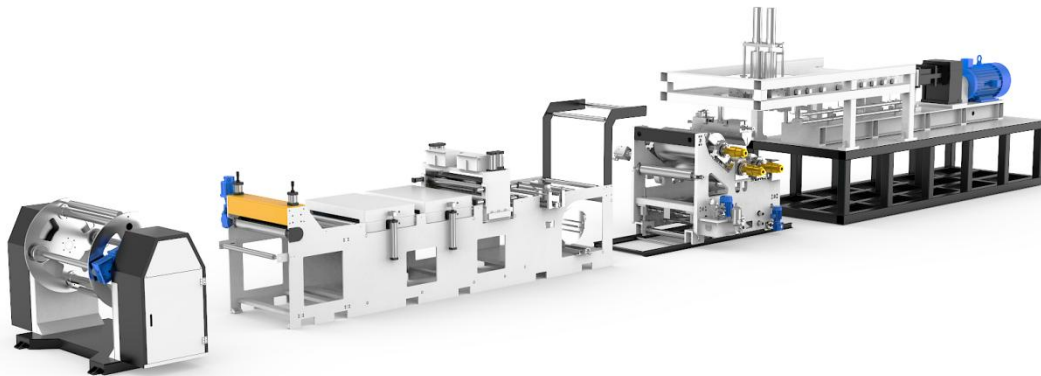


PP 3-layer Co-extrusion Sheet Production Line

(TZNZ120/65PP)

----Technical Agreement



Equipment model: TZNZ - 120/65PP

A. Overview :

Machine structure :	The main machine adopts 120 single screw extruder; the auxiliary machine adopts 65 single screw extruder
Conditions of use:	380V/3P/50Hz
Raw materials:	P Particles and regular crushed materials
Production process :	PP sheet co-extrusion production line (a kind of sheet product extruded by extruder , filtered extraction, die extrusion and calendaring cooling molding , and can be extruded into sheet products, and can be oiled and dried synchronously , and rolled up to a certain specification on the reel at the back end.
Effective mold width :	80 0mm
Product thickness range:	$\delta = 0.2 - 2.0$ mm
Roller width:	1000mm
Extrusion output:	40 0 - 500 Kg/h (depending on product specifications)
Device Color:	According to supplier's standard (can be specified by customer, if not specified, according to standard)
Model advantages:	1. Automated production line, the entire production line is

more intelligent, easy to operate and reduces manpower.

- Note: Fully automatic winder is optional (automatic slicing, automatic roll changing, automatic wrapping, automatic meter counting, no manual operation required, saving labor)

B. Working conditions (provided by the customer) :

Production Site	Production area required: 30m (length) × 6m (width) × 5m (height)
power supply	Three-phase, 380V, 50 Hz
Cooling water	No dissolved or suspended minerals such as phosphorus, sulfur, iron, etc.
lubricating oil	ExxonMobil
compressor	Compressed air supply
Remark	shall prepare auxiliary facilities and make preliminary preparations for equipment installation according to the foundation installation drawing provided by the supplier ; water, electricity and gas lines shall be laid to the designated locations according to the requirements of the installation drawing, and all materials required for production and tools such as unloading and shifting shall be prepared.

C. Energy consumption

Installed power	≈ 300KW (actual power consumption percentage: 70%)
Cooling water	≈ ≤30 °C , 2-4Kg/CM2 G
Compressed air	≈ 1.5/m3/ h , 0.5 ~ 0.8Mpa
Support staff	1 -2 people

D. Equipment List:

120 single screw extruder (main machine)	1 unit
65 single screw extruder (auxiliary machine)	1 unit
500KG horizontal drying mixer (for	1 unit

main machine)


100KG high speed dry mixer (for 1 unit

main machine)

- 1. Spiral feeder 2 units
- 2. Hydraulic screen changer 2 sets
- 3. Melt metering pump 2 sets
- 4. Connecting flow channel 2 sets
- 5. Allocator 1 set
- 6. Mould 1 set
- 7. - roll calender 1 unit
- 8. Roller temperature control system 1 set
- 9. Cooling bracket 1 set
- 10. - side trimming device + waste edge winding device 1 set
- 11. Online oiling + drying device 1 set
- 12. Traction device 1 set
- 13. Double station winder 1 unit
- 14. Complete line electrical power system 1 set
- 15. sweet production line software control system 1 set
- 16. Spare parts 1 set

E. Technical Parameters

1. 120 single screw extruder (main machine)

Reference images	Technical Parameters
	Screw barrel specifications : Φ 120 mm -1:36 suitable for PP/PS material special screw
	Screw barrel material : 38CrMoAlA high quality alloy nitrided steel
	Screw tempering hardness : HB260-290
	Nitriding treatment: HV 900- 9 8 0
	Nitriding layer depth: 0.4-0.7
	Main engine drive motor: 132 KW Siemens/Dongguan motor or equivalent first-line brand motor
Main engine transmission gear reducer: Guomao , Dongli or equivalent first-line brand reducer	

Main engine transmission connection mode: elastic plum blossom connection

Barrel heating method : ceramic heating, with stainless steel wind cover

Barrel constant temperature mode : fan cooling, power 0.25KW

Total heating power of the main unit : ≈ 50KW

Control method : PLC touch screen integrated control system,

Self-protection system : motor overload protection function, screw pressure protection function

Uses and advantages:

- 1) Raw material plasticizing and extrusion function.
- 2) special design structure of the screw makes the plasticization and extrusion of more stable, while reducing energy consumption.

2. 65 single screw extruder (auxiliary machine)

Reference images



Technical Parameters

Screw barrel specifications : Φ 65 mm -1:33 **suitable for PP/PS material special screw**

Screw barrel material : 38CrMoAlA high quality alloy nitrided steel

Screw tempering hardness : **HB260-290**

Nitriding treatment: HV 900- 9 8 0

Nitriding layer depth: 0.4-0.7

Main engine drive motor: 37 KW **Siemens/Dongguan motor or equivalent first-line brand motor**

Main engine transmission gear reducer: Guomao , Dongli or equivalent first-line brand reducer

Main engine transmission connection mode: elastic plum blossom connection

Barrel heating method : ceramic heating, with stainless steel wind cover

Barrel constant temperature mode : fan cooling, power 0.2KW

Total heating power of the main unit : ≈ 35 KW

Control method : PLC touch screen integrated control system,

Self-protection system : motor overload protection function, screw pressure protection function

Uses and advantages:

- 3) Raw material plasticizing and extrusion function.
- 4) special design structure of the screw makes the plasticization and extrusion of more stable, while reducing energy consumption.

3. Horizontal dry mixer (for main machine)

Reference images



Technical Parameters

Mixer capacity : 500kg

Mixing method : Ribbon mixing

Heating method : electric heating (medium thermal oil or water)

Barrel material: SUS stainless steel

Uses and advantages

- 1) Raw material mixing and drying function.
- 2) The quality of the sheets produced after the raw materials are stirred and dried at the front end is better.

4. High speed dry mixer (for auxiliary machine)

Reference images



Technical Parameters

Mixer capacity : 100kg

Stirring method : paddle stirring

Heating method : Spin heating

Barrel material: SUS stainless steel

Uses and advantages

- 3) Raw material mixing and drying function.
- 4) The quality of the sheets produced after the raw materials are stirred and dried at the front end is better.

5. Spiral feeder

Reference images



Technical Parameters

Feeder structure : spiral feeding

Spiral material: SUS stainless steel

power : 4KW

Control mode : automatic feeding,

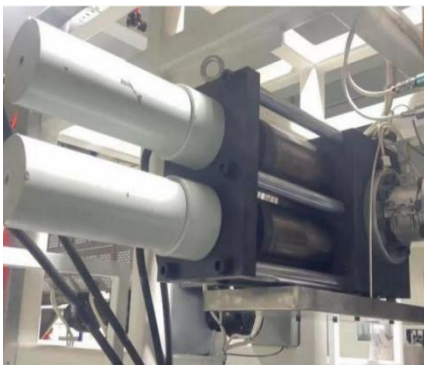
Uses and advantages

- 1) raw materials and feeding after drying .
- 2) No need for manual loading, automatic production is realized

(automatic stop when full , automatic loading when insufficient).

6. Hydraulic screen changer

Reference images



Technical Parameters

Screen changer structure: double station (non-stop screen change)

Model: 170/80

Drive system: hydraulic drive

Drive power: 4KW

Heating method : heating rod heating

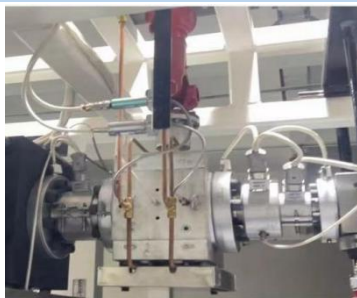
Hydraulic system: equipped with oil tank, oil pump, reversing valve, oil cylinder, hydraulic circuit, etc.

Uses and advantages

- 1) Raw material melt filtering and extraction function .
- 2) The dual-station design enables screen changing without stopping the machine , thus reducing the energy consumption and time caused by screen changing .
- 3) Equipped with a complete set of hydraulic system and electronic control system, the screen changer can be controlled with one button .

7. Melt metering pump

Reference images



Technical Parameters

Model: 200/100cc

Melt pressure sensor: Italian before the pump GEFRAN , after the pump and before the grid, use Xinda

Drive power: 11/4KW

Melt flow control: variable frequency speed regulation (HOLIP inverter) , meeting production capacity and synchronizing with the host

Drive connection: Universal coupling

Uses and advantages

- 1) Raw material melt metering function.
- 2) automatic control synchronized with the host , visualize accurate output data , and monitor output and pressure values in real time, so as to accurately control output and understand equipment status in real time.

8. Connecting flow channel

Reference images



Technical Parameters

Connection method: Active docking
With heater and pressure sensor

Uses and advantages

- 3) Raw material melt extrusion flow function.

9. Allocator

Reference images

Technical Parameters

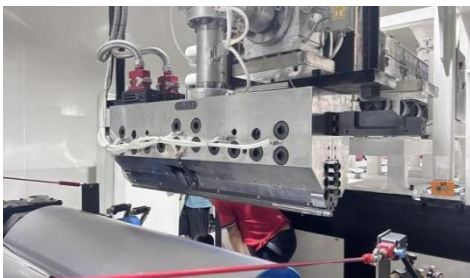
Distribution : ABA/AB/B/A (10%/80%/10%)
Docking method : runner docking
Installation method : Place on the top of the mold
Installation method: removable

Uses and advantages

- 4) Raw material melt extrusion distribution function.

10. mold (Jctimes die)

Reference images



Technical Parameters

Mold type: flat sheet mold

Installation method : hanger installation
Production material: PP/PS
Mold structure: hanger type runner
Mould material: 2311
Effective width of mold: 800mm
Product thickness: 0.2-2.0mm

Manufacturing process: Overall hardening treatment, high-precision polishing and chrome plating

Uses and advantages

- 1) Sheet extrusion capabilities.
- 2) Special mold steel material, high-precision polished chrome-plated flow channel, multi-zone temperature control and heating structure, better control of flow rate, adjustable width and thickness , 90-degree hanger structure, flexible adjustment .

11. - roll calender

Reference images



Technical Parameters

Calender structure: L-type three-roller

1 # roller : 350 * 1000mm
2 # / 3 # roller : 500 * 1000mm

Roller technology: The roller surface is treated with medium frequency

quenching of alloy steel to improve the uniformity of the roller material and increase the rigidity and toughness of the roller; the special inner spiral flow channel ensures the roller surface temperature. The inner hole is processed by boring and grinding, and the inner channel is turned and ground before being matched with the outer tube sleeve. **Spindle process:** The spindle is subjected to overall stress relief and tempering treatment after welding.

Roller mirror polishing roughness : $\leq Ra0.0125 \mu m$

Chrome plating on roller surface: chrome plating hardness $\geq HRC62$, chrome plating thickness: $\geq 0.08mm$

Roller support: solid steel plate

Driving power: 5.5KW Inovance servo motor

Roller gap adjustment: The rollers are opened and closed by hydraulic drive. The gap is adjusted manually by worm gear

Bearings of three rollers : NSK (Japan)

Rotary joint: Fujian Minxuan, single inlet and single outlet on both sides

Safety measures: with mechanical fixed limit and Italian Pizzato pull-wire emergency stop switch

Uses and advantages

- 1) Sheet calendering, cooling and shaping functions.
- 2) The roller adopts a special surface and internal threaded flow channel to ensure the cold-strip shaping effect of the roller surface .
- 3) three rollers are all servo- controlled and synchronized with the main machine to achieve closed-loop automatic control.

12. Roller temperature control system

Reference images



Technical Parameters

Temperature control system: roller-specific temperature control machine

Applicable output: 600kg/h

Cooling medium: water

Temperature control accuracy: $\pm 1 ^\circ C$

Cooling unit: three sets of independent temperature control water supply units

Water switch: stainless steel

Uses and advantages

- 1) Roller cooling and temperature control function.
- 2) PLC control, **integrated** temperature controller with heat exchanger and heating device; large water flow, precise temperature control, can meet production capacity.

13. Cooling bracket

Reference images



Technical Parameters

Cooling bracket structure: integrally welded

Roller material: Aluminum roller, surface anodized, polished

Roller size : $\Phi 80 \times 1000\text{mm}$

Uses and advantages

- 1) Sheet shaping rear bracket + cooling function
- 2) The roller has sliding properties

14. Two-side trimming device + waste edge winding device

Reference images



Technical Parameters

Trimming device: 2 sets (on both sides)

Cutting method: disc cutting knife

Scrap take-up unit: 2 sets of rotor blades, easy to adjust

Scrap winding machine: Independent control , torque motor

Uses and advantages

- 1) Sheet edge trimming + waste edge collection function
- 2) Cutting method: disc rolling cutter, Winding method: torque motor

15. Online oiling + drying device

Reference images



Technical Parameters

Coating roller material: rubber roller

Fuel tank material: stainless steel

Oven material: stainless steel

Oiling method: dripping

coating method : double-sided or single-sided oil coating

Heating method : heating rod

Oven unit : 2 groups

Oven size : 800 * 1000mm

Heating power: 24KW × 2

Temperature control method: Temperature controller

Uses and advantages

- 1) The sheet surface can be coated with liquid and dried online
- 2) It can realize online oiling and drying. Ensure the process of back-end forming of sheet products

16. Traction device

Reference images



Technical Parameters

Traction method: roller type

Roller material: Upper roller: rubber roller ; Lower roller: mirror steel roller

Roller size (quantity): Φ 170 * 1000mm (2 pieces)

Drive mode : 2.9KW Inovance servo motor

Speed control : servo control, can be synchronized with the three-roll calender or work alone

Uses and advantages

- 1) Sheet running traction function
- 2) Servo drive can achieve closed-loop synchronization with the host machine, ensuring smooth production of the entire production line without jamming, incoordination or errors.
- 3) Can work synchronously with the host or be controlled separately

17. Double station winder

Reference images



Technical Parameters

Winding station: double station

Winding mode: servo winding, with metering device. Synchronous with the host machine, can also be controlled independently

Winding motor: Inovance servo motor

Control mode: PLC

Drive control mode: servo drive

Length control: Automatic meter counter

Rolling specification: product width 1000mm ,

Maximum roll diameter : 500mm

Winding motor: 2.4KW servo motor,

Flip motor: 0.75KW servo motor

Uses and advantages

- 1) Sheet back-end rewinding and packaging function
- 2) With meter counting function, it can be synchronized with the host machine to ensure automatic control of the production line.
- 3) Independent PLC control system, can be synchronized with the host or controlled independently.

18. Complete line electrical power system

Reference images



Technical Parameters

- PLC: Siemens, Germany
- Touch screen: Siemens, Germany
- Control cabinet: vertical cabinet
- Main inverter : Inovance
- Three-roller traction control : Inovance servo controller
- Air switch: Chint
- Low voltage circuit breaker: Chint
- Switching power supply : Taiwan Mean Well
- Roller pull wire safety switch: Pizzato, Italy

Uses and advantages

- 1) Whole line electrical control station
- 2) The main components are all branded accessories to ensure quality and stability, reducing failures during production

19. sweet production line software control system

Reference images



Technical Parameters

- Control system: Siemens
- Display interface: Chinese/English (language setting optional)
- With emergency stop

Uses and advantages

- 1) The whole line PLC automation control system,
- 2) sweet production line software control system, data controllable

20. Spare parts

Mould special tools	1 set
Copper Shovel	1
Feed strong magnet	1 set
Contactors	2
Relay	2
Round Knife	2 pieces

F. Service Commitment

The free warranty period for the whole equipment is 12 months after qualified commissioning, and lifelong maintenance service is provided.

During the warranty period, we provide free door-to-door service as needed, and after the warranty period, we charge the labor and accessories costs at a preferential price.

The contractor can assign two technicians to the ordering party to install and debug the equipment . The ordering party shall make preliminary preparations for the equipment installation according to the foundation installation drawing provided by the contractor and actively cooperate with the contractor's personnel. Water, electricity and gas lines shall be laid to the designated location according to the requirements of the installation drawing.