

**FILM**

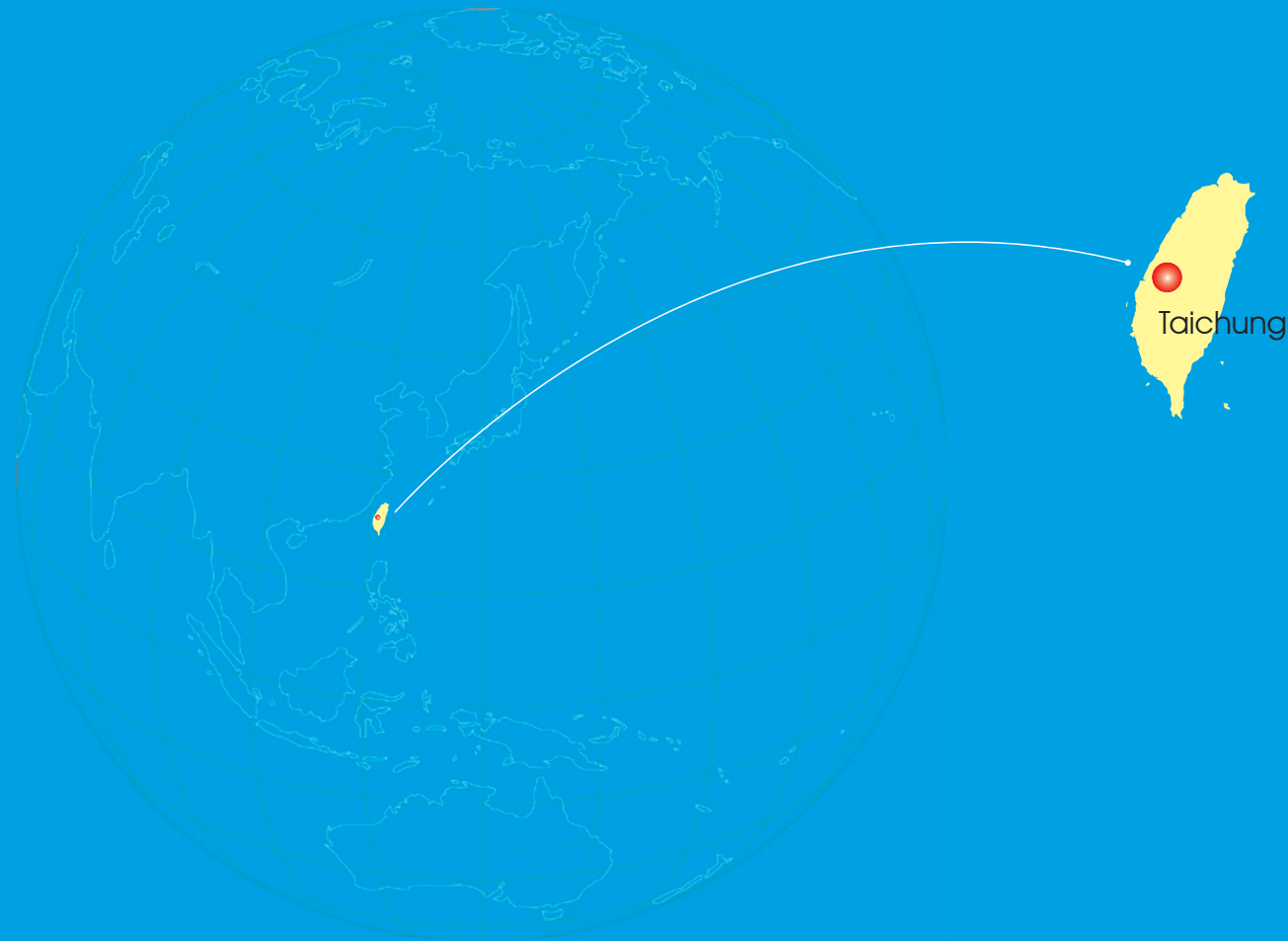
**SHEET**

**HOLLOW SHEET**



**LEADER EXTRUSION MACHINERY IND.CO.,LTD.**

# Sheet

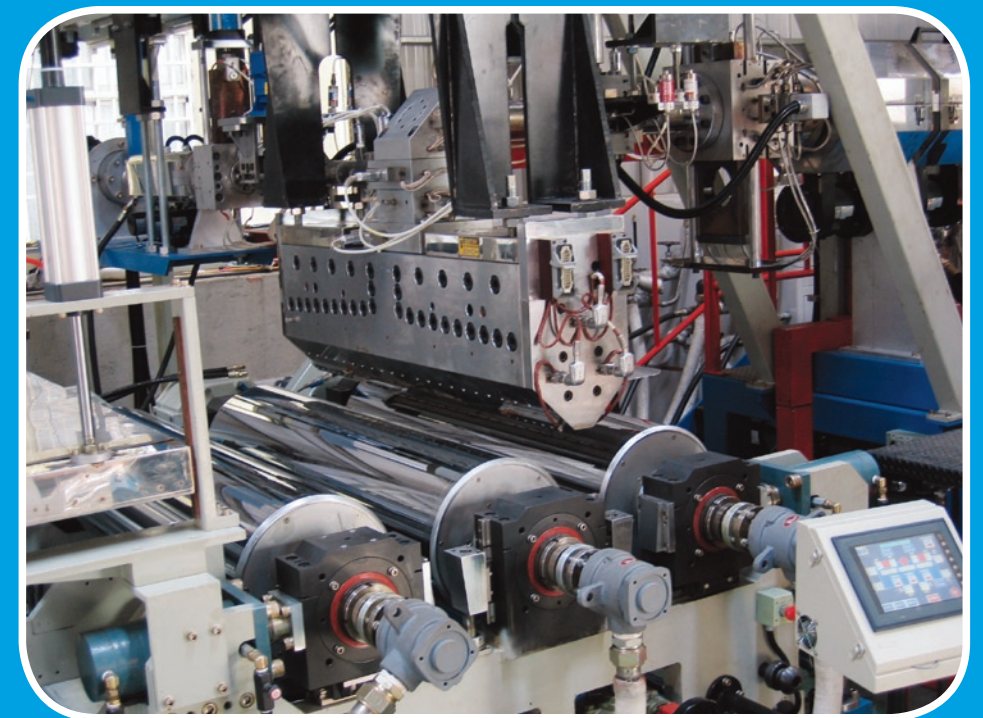


**LEADER EXTRUSION MACHINERY IND.CO.,LTD.**

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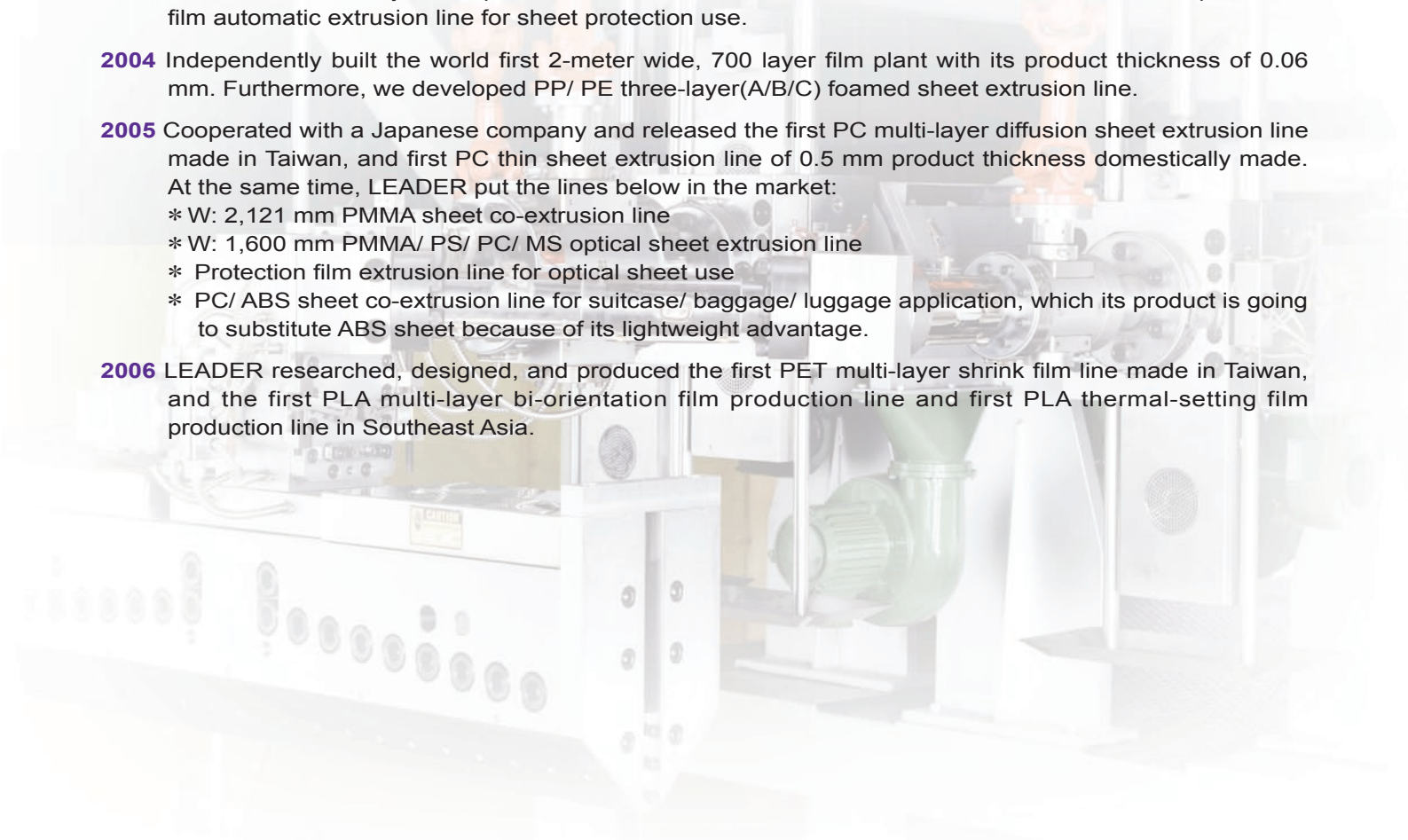
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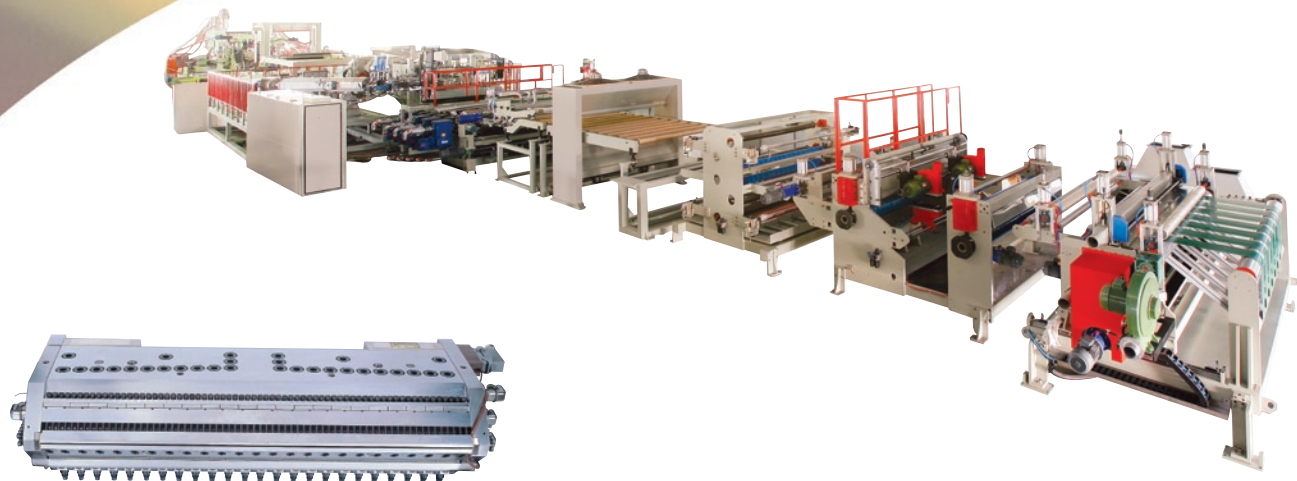


# COMPANY PROFILE

- 1989** Founded in Taichung County, we were originally a designer & manufacturer of plastic flat sheet Dies, gear box and other auxiliary parts of extrusion line.
- 1990** Invested in development of PP hollow profile extrusion line, and the whole plant of sheet, film, and coating machine. We hired foreign and domestic scholars in macromolecule and chemistry field as technical consultants. We also successfully built PVC shrink film tenter at this time.
- 1993** Succeeded in manufacturing the first domestic self-made PC, UVPC three-layer sheet co-extrusion Die, and A.B.A & A.B collective Feed Block, which were installed coordinately on a Japanese machine.
- 1995** Successfully released the first self-made widest PP hollow profile plant (W: 2,150 mm) in Southeast Asia, and officially stepped into mass production.
- 1996** Successfully developed environmental friendly LDPE coating machine to replace PVC adhesive tape.
- 1997** Achieved mass production of saleable PP/ PS sheet lines for stationery, thermoforming, and print purposes, and released A, B, C three-layer co-extrusion line in which B is PP foamed layer.
- 1998** Developed and put PE/ EVA/ LDPE five-layer film co-extrusion automatic production line in the market.
- 1999** Accomplished our mission on building the first domestic self-made PC hollow profile co-extrusion line with its width of 2,130 mm, and the product thickness range was from 4 to 20 mm. Great strides had been made in domestic PC hollow profile field.
- 2000** Launched two-extruder co-extrusion line for PC, UVPC super clear sheet of 1,220 mm × 2,121 mm width, and product thickness: 0.8mm~12mm. Meanwhile, we developed and put our new PETG multi-layer film automatic production line in the market.
- 2001** Successfully launched to market: 1. PP two-extruder, A.B.A three-layer hollow profile line which was the first self-made line in Southeast Asia. 2. World first PC/ PET/ PP share hollow profile extrusion line with product thickness range: 2 ~ 20 mm. 3. APET sheet extrusion line and PC corrugated sheet extrusion line stepped into mass production.
- 2002** Launched PC/ PET/ PMMA/ PBT/ PEN multi-layer film automatic extrusion line and PETG/ APET/ PETG three-layer sheet extrusion line which were both first plant ever made in Taiwan. We achieved PP curved hollow profile production line of width from 1,350 ~ 2,950 mm, and over 500kg/ hr output. Its special structure is approved by the Patent Office.
- 2003** LEADER successfully developed TPU/ EVA membrane automatic extrusion line, and PE/ EVA protection film automatic extrusion line for sheet protection use.
- 2004** Independently built the world first 2-meter wide, 700 layer film plant with its product thickness of 0.06 mm. Furthermore, we developed PP/ PE three-layer(A/B/C) foamed sheet extrusion line.
- 2005** Cooperated with a Japanese company and released the first PC multi-layer diffusion sheet extrusion line made in Taiwan, and first PC thin sheet extrusion line of 0.5 mm product thickness domestically made. At the same time, LEADER put the lines below in the market:
- \* W: 2,121 mm PMMA sheet co-extrusion line
  - \* W: 1,600 mm PMMA/ PS/ PC/ MS optical sheet extrusion line
  - \* Protection film extrusion line for optical sheet use
  - \* PC/ ABS sheet co-extrusion line for suitcase/ baggage/ luggage application, which its product is going to substitute ABS sheet because of its lightweight advantage.
- 2006** LEADER researched, designed, and produced the first PET multi-layer shrink film line made in Taiwan, and the first PLA multi-layer bi-orientation film production line and first PLA thermal-setting film production line in Southeast Asia.







## LEADER SHEET EXTRUSION LINES

1) **PC sheet:** Now LEADER launches production line for optical sheet (thickness: 0.5 mm↑, output: 250 kg/hr), and we plan to develop 0.125 mm thin sheet which applies PCB soft 、heat-resistant 、electric conduction sheet. Generally PC sheet thickness range is from 1 mm to 12 mm. PC corrugated sheet thickness range is from 0.8 mm to 2.5 mm. LEADER plans to develop PC light polarized film (thickness range: 0.118 mm ~ 0.136 mm) extrusion line, in which the product is used for mobile phone / liquid crystal apheliotropic film.

2) **PET 3 ~ 5 layers co-extrusion lines:** product thickness range is from 0.1 mm to 2 mm, and width range is 500 mm ~ 1,200 mm, 700 kg/hr ~ 1,200 kg/hr output.

3) **PMMA light conductive sheet:** two to three layers design, and the product thickness range from 2 mm to 12 mm, width range 500 mm ~ 1,212 mm, and 600 kg/hr output. This line is mainly aimed to replace injection machine for light conductive sheet by its overwhelming 15 times higher output.

4) **MS / PS diffuse sheet:** LEADER develops the newest know-how 、formula and technique for 1.0 mm ~ 3.0 mm thickness product. We offer production lines of 500 mm ~ 1,212 m

### KEY OF POLYCARBONATE EXTRUSION

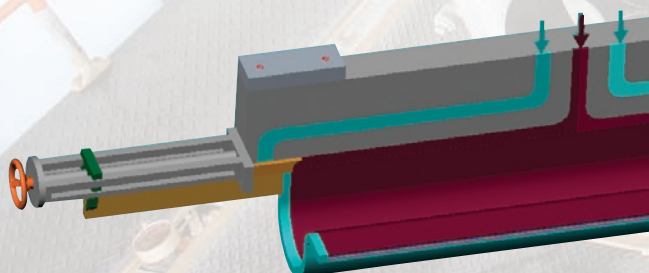
The key technology of PC extrusion is “high purity”, “low fish-eye” and “constant viscosity”.

1. Our extruder is designed by the properties of the material.

- \* High melting intensity at low shearing stress
- \* Low viscosity performance on high rpm screw

2. LEADER extrusion line features:

※ The moisture content and dehumidifying of material: By using the best dehumidifying dryer we control the moisture content to under 1,000 ppm, and at the best due point of -50°C we solve the problem of scar and gel, and prevent the material from sticking to the flow surface of adapter 、Screen Changer 、Feed Block and Die.



- ※ Screw: The retrofit design of the feeding section is for low pressure \ high temperature feeding, we forsake the traditional type such as rectangular, low tooth or lunate.
- ※ The extruder has its temperature control of 4 ~ 6 zones in order to melt the material completely. Extruder power control system: LEADER improves the safety coefficient to 1.2 times.
- ※ Venting device: LEADER enlarges the caliber of vent and heatable vacuum tube in case the material sticks to the tube.
- ※ The screw is composed of three sections and one vacuum suction screw zone. Usually we add venting to the screw over 60 mm diameter, and the length goes beyond 30D. Generally the length is 33 times the diameter, and the position of the vent is around 20D.



※ Heating operation: In order to reduce the driving torque, make sure to set the temperature from high to low. Therefore, the heater of LEADER extruder is mainly applied to enhancement of stability at high temperature.

※ The distance between Die outlet and Calender: LEADER design adopts smaller gap between Die & Calender for the sake of higher output. We offer 5 mm in width \ 3 ~ 5° taper in Die lip so that the material does not remain. The diameter of die lip curve is about 0.5 mm.

※ The entry of Die has to be rectangular. The heater in die lip only applies to warm up stage; shut the heater after starting operation is done.

※ Calender for optical grade products is mostly horizontal or horizontal-inclined type. The adjustment of the third roll is a key factor to manufacturing optical grade PC products. Generally we add a fourth roll, and the bearings of the Calender are set to tight tolerance.

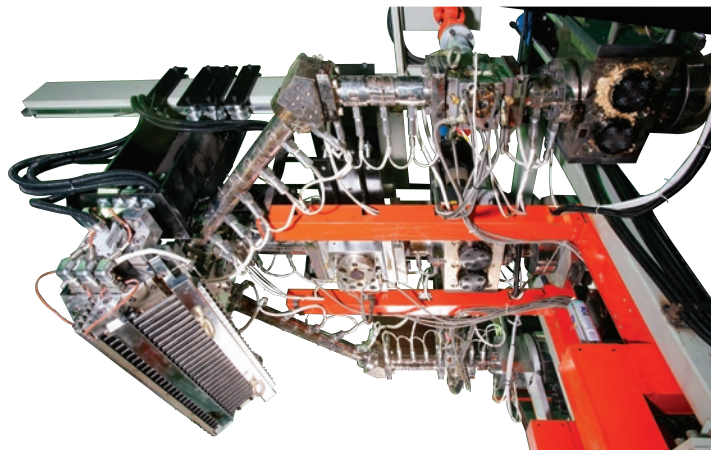




## LEADER SUPER CLEAR SHEET EXTRUSION LINE

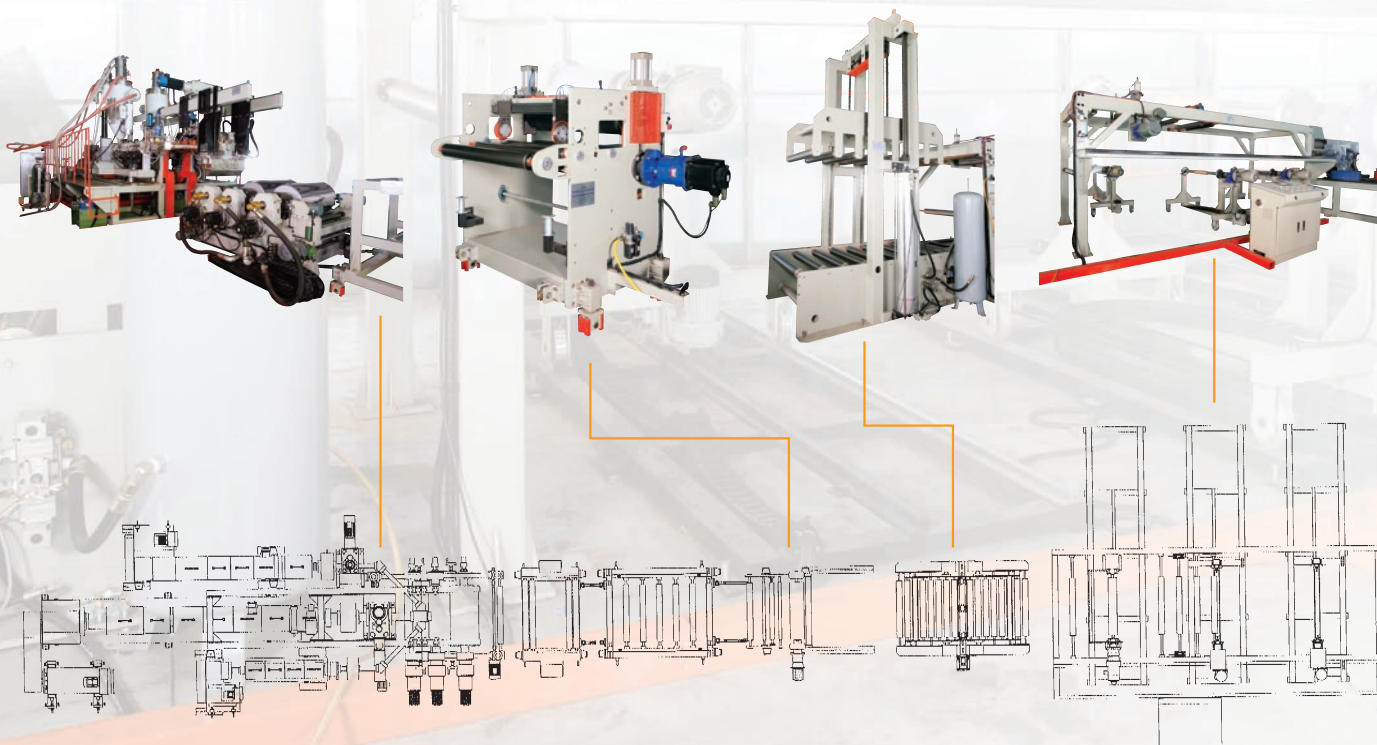
### SPECIFICATION

- Thickness range: 0.15 mm ~ 2.0 mm
- Width range: 600 mm ~ 1,500 mm
- Line speed: 50 m/min.
- Suitable material: APET, PETG, PET-C
- Outer layer: Surlyn, Adhesives, C6 PE
- Inner layer: EVOH detaching layer



### EQUIPMENT MODULE

- ※ Raw material storage 、 drying 、 metering and auto loading system. There could be maximum 4 kinds of material metering device in one line.
- ※ Extruder: In accordance with clients requirement, we offer screw diameter from  $\varphi 36$  mm ~  $\varphi 180$  mm, L/D ratio from 28 to 34. On the other hand, we install automatic screen changer 、 gear pump and static mixer for mixing the material well and maintaining average temperature.
- ※ Flow direction adjustable feed block and layer changeable option fit two to three extruders and offer best combination of thickness into multi-layer product.
- ※ Calender roller: Horizontal casting rollers with best amassment control angle, and also individual temperature control 、 relative speed control, which offer even thickness and reduce die line.
- ※ Trimmer and crusher: equipped with round knife 、 drive motor and in-line reclaimed equipment.
- ※ Motion synchronous control and special surface process reduce friction influence after casting material.
- ※ Central winding mechanism adopts two winding shafts. It adjusts the tension during winding. Both 3" and 6" paper cores are applicable to this machine.





PET sheet is widely used in thermoforming application. It is not only because of the insulating property and penetrability, but also its intensity through co-extrusion and gas-isolating character. Using PETG can make the material much easier to be mended and printed (adopt different solvent from PVC), and APET in the middle layer efficiently save the cost. That is, PET sheet is regarded as a substitution for PVC clear sheet in every application. LEADER in earnest recommends to you our PETG/APET/PETG co-extrusion line. On one hand we back up our clients to widen futurity in thermoforming field; and on the other hand we offer solutions for environmental protection and cost / price problem at the same time.

#### THERMOFORMING SHEET

Packing box: PVC, PET, PS, PP, PE, PLA, plastic vacuum covering, bubble thermal forming.

Pallet: PET (antistatic) / PVC (antistatic) / PS (antistatic, electric conduction) / PP (antistatic)



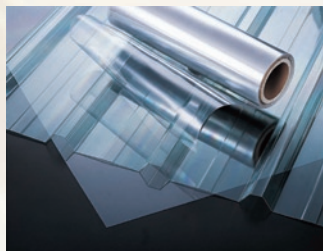




## LEADER PC SHEET/ CORRUGATED SHEET EXTRUSION LINES

### SPECIFICATION

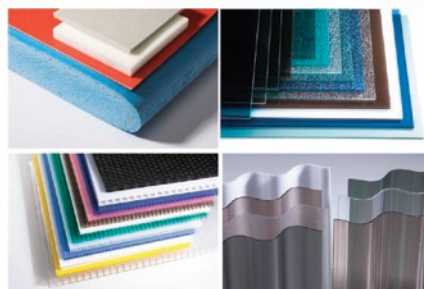
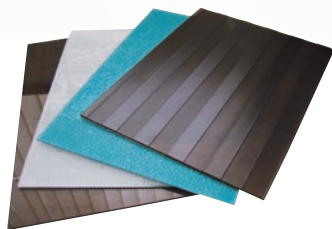
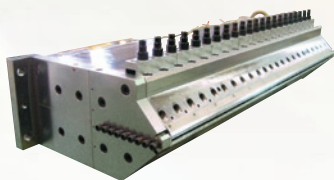
Raw Material	PC
T-Die	1,300 ~ 2,500 mm
Product Thickness	0.5 ~ 12 mm
Product Width	1,200 ~ 2,400 mm
Machine Line Speed	70 - 90 rpm/ min. depend on thickness range
Extruder	
Main Extruder Screw	Double Compression Section Venting Screw
Aux. Extruder Screw	Double Compression Section Venting Screw
Main Extruder motor	300 HP ~ 500 HP
Aux. Extruder Motor	100 HP ~ 300 HP
Electronic Control System	User Friendly Control System



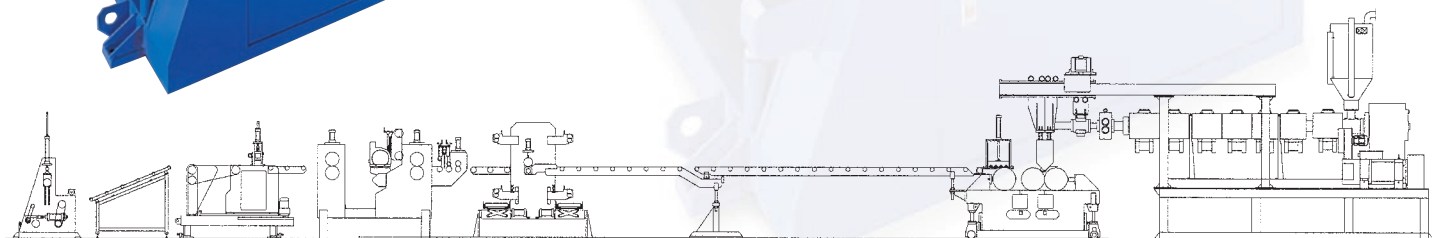
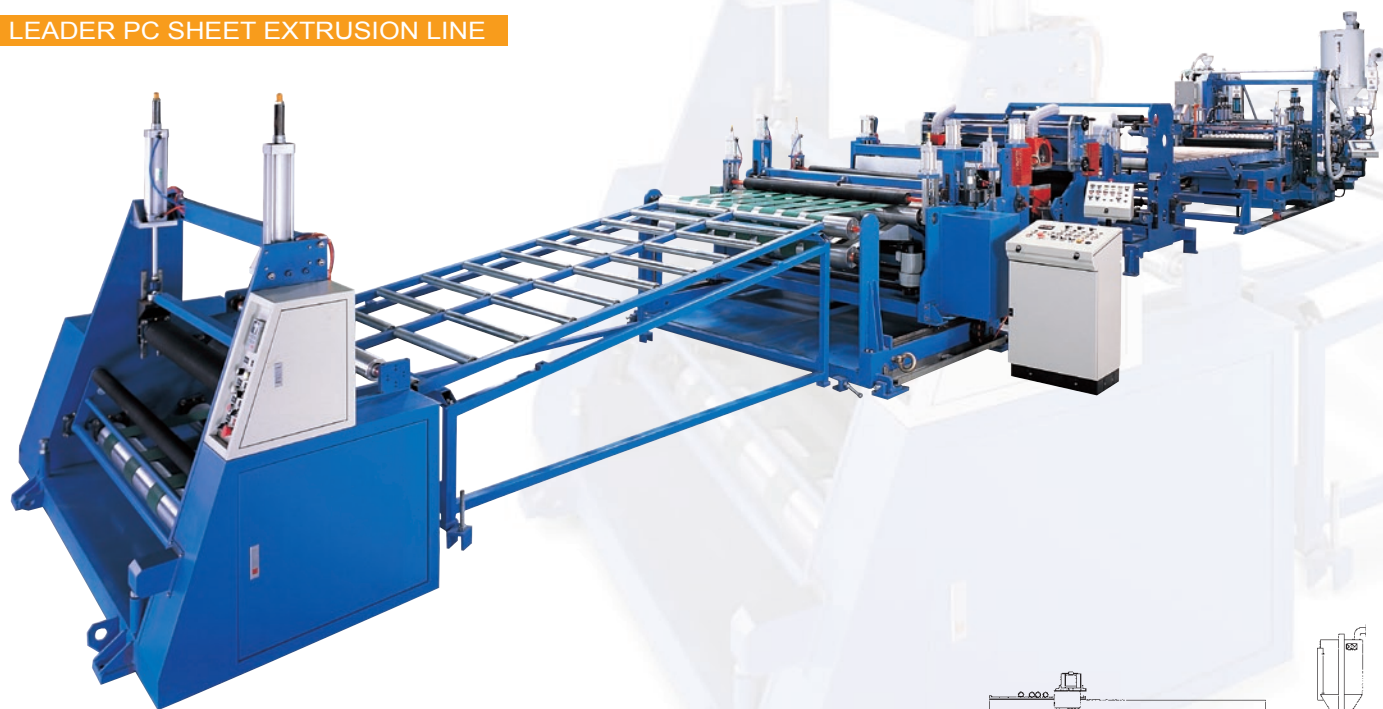
## PRODUCT APPLICATIONS

### PC/ PMMA SHEET

1. Sun proof concourse, soundproof wall, billboard, greenhouse covered, and natural light concourse.
2. Optical sheet application: Goggles, faceplate, back-lighted module, IC monitor, IC TV, billboard.



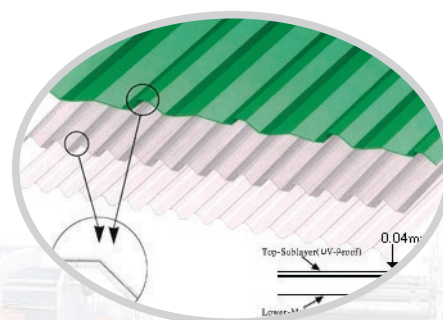
### LEADER PC SHEET EXTRUSION LINE



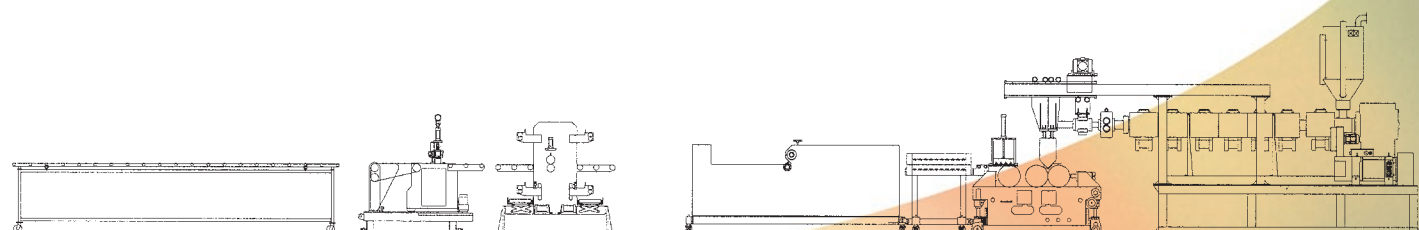
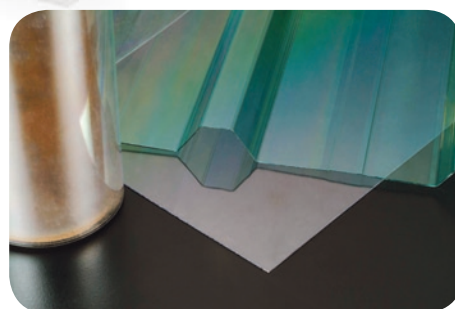


## FEATURE

1. Unique design of drill type Calender. Flat surface of sheet has high transparency.
2. Patented T-die for PC sheet. The average of sheet thickness is controlled within  $\pm 3\%$ .
3. Special design of screw, Gear Pump and Static Mixer make material mixed and melted well, which output is 15% higher than other brand of extrusion lines.
4. Unique material and size of roll. Optical thin sheet could be produced from 0.5 to 2.0 mm and will not lead to wavy line or convex and concave reflective surface.



## LEADER PC CORRUGATED SHEET EXTRUSION LINE



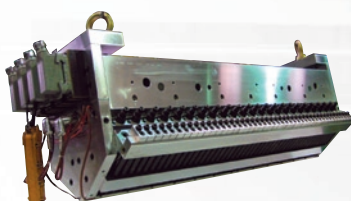
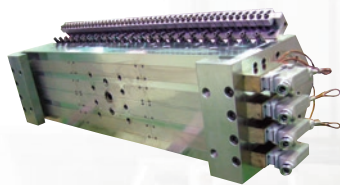




## LEADER MULTI-LAYER SHEET EXTRUSION LINE

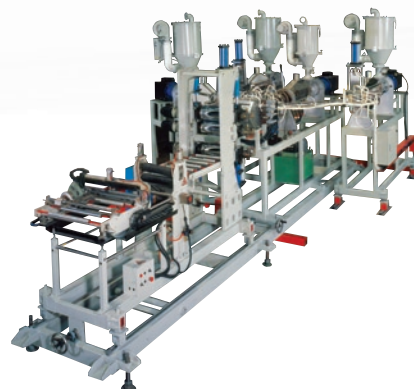
### SPECIFICATION

Raw Material	PC, ABS, PMMA, PETG, APET, PP, PE
Product Thickness	0.25 mm ~ 5 mm
Product Width	800 mm ~ 3,000 mm
Capacity	200 kg/hr ~ 1,500 kg/hr
Machine Line Speed	0 m/min ~ 50 m/min
Main Extruder Screw	φ30 mm ~ φ250 mm
Control System	Motion or Server Control System
Auto Winding System	Surface or Central Winding
Auto Cutting System	Suitable



### FEATURE

- 1) Unique multi-layer Feed Block and T-die design allow material to be extruded in the relatively close temperature and meet the requirement of average cross dispensing.
- 2) According to the viscosity and melt degree of raw material, different compression ratio and the section for mixing design keep the sheet free from overheating and keep the best melting degree.
- 3) 3 layers co-extrusion line is most suitable to the thermoplastic material.
- 4) Unique design of calender makes the surface of sheet flat and without wavy line.
- 5) Overall cleanliness and flow design without dead space are most suitable to manufacture transparent sheet products.
- 6) To meet customer's demand, LEADER designs different length of cooling and winding section equipment.



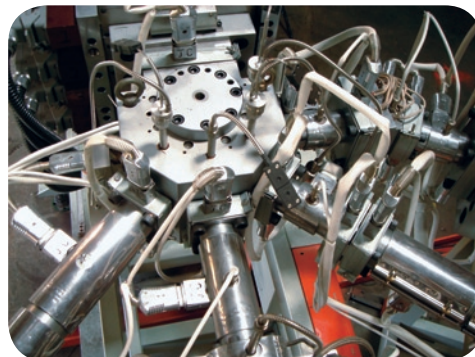
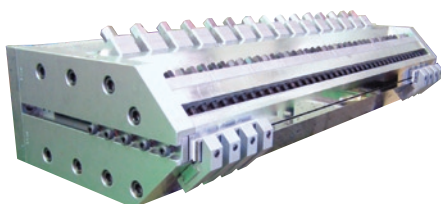
## PRODUCT APPLICATIONS

### 1. PP stationery sheet:

A. Thin Sheet: Stationery sheath, wedding photo, lamp shade, present box, hanging tablet, hanging card, billboard, furniture faceplate, 3D printing, portfolio, and card case.

B. Thick sheet: Chemical tank, mold processing

2. PP building sheet: Chemical industrial preservative engineering, water develop processing, environment, decoration sheet.





# BRIEF INTRODUCTION

LEADER Extrusion Machinery company is one of the leading companies in plastic extrusion field which specializes in the design, production, and development of extruding system. LEADER has more than 30 years' technical experience in the manufacture of plastic products, and our staffs have made research into a variety of plastics such as PC, PP, PE, PI, PET, PLA, PS, K-resin, PMMA, PBT, EVOH, Ecoplast, PA6, etc, and have developed our distinctive extruders, Dies, MDO,TDO, winders and other processing facilities.

## LEADING TECHNOLOGY

◎ Extrusion plant design:

- a.Single layer, sheet, film, corrugated sheet, hollow profile, foam and other complete set of forming system.
- b.Multi-layer (two to seven layers) co-extrusion lines, customer-oriented design.
- c.Turnkey design system.
- d.Standard design, option design, modulus design.

- ( 1 ) Precision Motor
- ( 2 ) Digital Control
- ( 3 ) Vacuum Ventilation
- ( 4 ) Vacuum Calibrator–Water cooling type: direct or indirect; Gap control type
- ( 5 ) Screen Changer
- ( 6 ) Gear Pump
- ( 7 ) 4D Static Mixer
- ( 8 ) Flexible Die Set–Automatic or Manual, fixed lip or flexible lip, adjustable “fast gap” lip, Choke bar; multi-layer dies, and double slit design.
- ( 9 ) Computer design Screw base on different material and exclusive combination.
- (10) Polishing Roll: Independent transmission, oil pump control, and freeze roll temperature control; horizontal, vertical or 45 degree; variable position of the third roll, rapid change of the rolls; special embossed rolls.
- (11) Edge Trim Cutter
- (12) Crusher
- (13) Winding Machine: Surface winding machine–pressurized type, oblique angle type and direct winding type. Central winding machine with tension control–contact control, gap control.
- (14) Feeding System: Batch type. `Continuous type–volumetric dosing system, integrated gravimetric system.
- (15) Oven: `Sheet type. `Film: Bi-orientation type. Cross elongation oven: auto clamp.
- (16) Corona Treater–Single side, double side.
- (17) MDO
- (18) Pulling Roller Unit.
- (19) Thickness Scanning System: \* β-ray (Kr 85, Sr 90) \* Eddy Current. \* Infrared rays. \* Software to control with Auto Die.
- (20) Cutting System: Longitudinal cutting, cross cutting.
- (21) Dancing Storage Roller Set with Accumulator.
- (22) Pelletizing Machine.

◎ Rear section shaping 、shrinking 、leveling 、stretching roll set: Flexible shrinkage percentage control – specific design according to the hardness 、transparency 、tension of the product, such as S-wrap, three-roller, five-roller, seven-roller and hoist type roller.

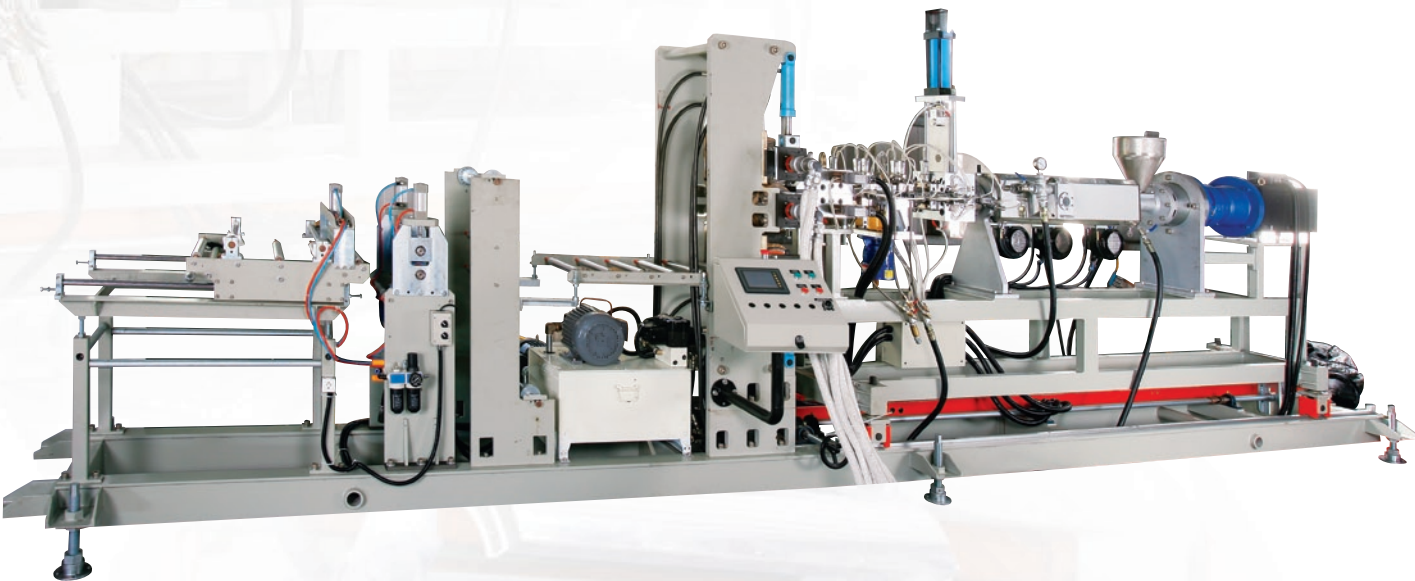
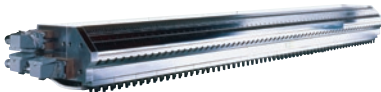
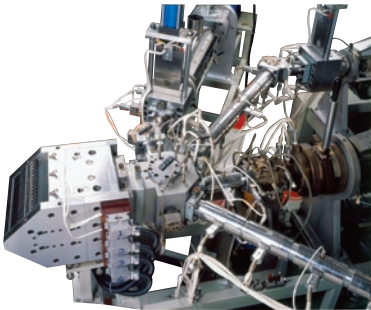
◎ Control Interface Design:

- (1) Computer display and control.
- (2) DDC design panel and control cabinet with push button and switch on/ off control.

# PRODUCT APPLICATIONS

## PE SHEET

- 1. High wear-resisting sheet: Lining of the barn, port machine, mine machine, architect machine, chute, hopper, etc.
- 2. Static resisting sheet: Mine in the pit operation, port, food processing, etc, mainly for static resisting part.
- 3. Inflammation resisting sheet: Mine in the pit operation, mainly used for easy burning part.
- 4. Color sheet: Packing industries, decoration material, fender.
- 5. Two color sheet: Easy to inspection, to find wears out.
- 6. UV-resist sheet: Outdoor barn, hopper, dock fender.



SPECIFICATIONS							
THICK SHEET EXTRUSION LINE				THIN SHEET EXTRUSION LINE			
TYPE	OPTICAL APPLICATION	COMMON SHEET	HIGH OUTPUT	PET PP-PE MULTILAYER SHEET		HIGH OUTPUT	HIGH OUTPUT
MATERIAL	PC PMMA PET	PC-PMMA PP-FILTER ABS-PE PVC RIGID AND FOAM	HIPS-PS PP-PE ABS etc.			PP-FILTER MULTILAYER SHEET	HIPS-PS PP-PE ABS etc.
THICKNESS mm	1.5~15	1.5~15	1~15	0.2~2	0.1~1	0.2~2	0.1~0.2
WIDTH mm	1200~2300 on request up to 3000	800~2300 on request up to 3000	1200~6000	800~1600		800~1600 on request up to 3000	1200~2300 on request up to 3000
POLISHING				POLISHING			
ROLLER STRUCTURE							
				AIR KNIFE SYSTEM			
ROLLER DIAMETER	400~500 mm	400~500 mm	600 mm	400~500 mm		600 mm	