



**POLYSOLUTIONS**

保利卡基(河源)塑胶科技有限公司  
上海昌辉塑胶有限公司

A POLYGROUP™ COMPANY

**Polysolutions (He Yuan) Limited**

# **Our Mission**

**Quality**

**Integrity**

**Harmony**

**Win-Win**

# Company Profile

Polygroup was established in the sixties of the twentieth century, specializing in PVC related products, Christmas trees & decorative lights, research & development, manufacturing, sales & marketing. Polygroup's manufacturing facilities having 12 sets of calendars. Having a work-force of over 20,000 employees, with a well established sales & marketing and distributions network worldwide in USA, European etc. countries, and the yearly turnover of over USD 400 million.

In September of 2006, Polysolutions (Shanghai Changhui) Co., Ltd. was founded with an area of 5,400 square meters and factory built-up area of 3,800 square meters. The company has one five-roll calendar production line with an annual capacity exceeding 4,200 tons per year. -Shanghai Production Line.

In January of 2008, Polygroup had the establishment of Polysolutions (He Yuan) Ltd. with a total investment of 60 million RMB, covering an area of approximate 10,800 square meters, a factory built-up area of 9,600 square meters, consisting of 1 x Five-roll calendar production line and with a annual capacity of up to 7,200 tons. This set-up is especially to support the Southern domestic market and do the betterment meeting export requirements. -Guangdong Production Line.

Our company mainly engaged in a variety of PVC rigid film's R&D, manufacturing, domestic/oversea sales & marketing, economical and technical consultation.

**Staff & Management**-Our company's production, technical, sales & marketing team is China's 1<sup>st</sup> pioneer team who has been involving in PVC rigid film manufacturing for over 20 years. As a member of Polygroup, we have rich experiences in know-how technology and equipments maintaining.

**Equipment Structure**-Our precision/key production machineries are imported from Germany and Japan respectively and other less precision machineries are locally sourced. This integration balanced the cost, meanwhile, ensuring the products of high quality.

**Product's Formulation**-Based on Germany's advanced formulation, further enhancement of our product quality with the implementation of Mainland China & Taiwan's technology. With this, we are able to offer good quality product at competitive pricing.

## **Low Cost & Quality & Competitive Price**

-Our factories are located in South China and Guangdong Province, which is the highest concentration of the calendars over the world, PVC resin and other raw materials consumption of the largest areas.

-In these areas, we can purchase raw materials at most favorable price and enjoy better know-how technology as well as the equipments maintaining technology.

-Both Shanghai and Guangdong two production lines enjoy a good geographical location at China's most active economy zone of Yangtze River Delta and Pearl River Delta which is also the important transportation hub in China.-Conveniently of Transportation ensured the on-time delivery and lower cost of transportation.

"Quality, Integrity, Harmony, and Win-Win" is our company's mission & vision ensuring high quality and competitive pricing products, related technologies and services to our valuable domestic and oversea customer.

# Our Products (6Types)

## 1. i-card OL001 – Overlay Film

➤ **Description:**

i-card OL001 Overlay Film, mainly used to protect the printing surface.

➤ **Technical Data:**

i-card OL001			
<b>Specification &amp; Tolerance</b>	<b>Thickness Range</b> (mm)	0.08~0.10	±10%
		0.11~0.15	±8%
	<b>Width Range</b> (mm)	250~500	±0.5 mm
		501~1300	±1 mm
	<b>Length Range</b> (mm)	300~600	±0.5 mm
		601~1200	±1 mm
	<b>Squareness</b>	1m*1m	≤ 1.2  mm
<b>Appearance</b>	<b>Surface</b>	Matt Finishing (No Deficiency), Flatness, No Wrinkle	
	<b>Luster %</b>		≤45
	<b>Roughness</b>	Ra μm	0.5~1.8
		Rz μm	5~20
	<b>Impurity</b>	<b>Grain Dia.</b> 0.3-0.5mm	≤15/ m <sup>2</sup>
		>0.5mm	Not Allowed
	<b>Fluorescence</b>	Without Fluorescence & Films won't Shine in the Ultraviolet Radiation	
<b>Mechanical Characteristic</b>	<b>Tensile Strength</b> (Mpa)		≥30
	<b>Tensile Impact Strength</b> (KJ/m <sup>2</sup> )		≥480
	<b>Vicat Softening Point</b> (°C)		66±3
	<b>Heating Shrinkage Rate</b> % (140°C×10min)		≤  40
	<b>Surface Tension</b> (Dyne/ cm <sup>2</sup> )		—
	<b>Density</b> (g/cm <sup>3</sup> )		1.25±0.05

## 2. i-card PVCX002 –PVC Credit Card Core Film

➤ **Description:**

i-card PVCX002 Credit Card Core Film, mainly used for banking cards.

➤ **Technical Data:**

i-card PVCX002			
<b>Specification &amp; Tolerance</b>	<b>Thickness Range</b> (mm)	0.25~0.35	±4%
		0.36~0.70	±3%
	<b>Width Range</b> (mm)	250~500	±0.5 mm
		501~1300	±1 mm
	<b>Length Range</b> (mm)	300~600	±0.5 mm
		601~1200	±1 mm
<b>Squareness</b>	1m*1m	≤  1.2  mm	
<b>Appearance</b>	<b>Surface</b>	Matt Finishing (No Deficiency), Flatness, No Wrinkle	
	<b>Luster %</b>	Thickness: 0.25~0.70mm	≤20
	<b>Roughness</b>	Ra μm	0.7~1.6
		Rz μm	5~16
	<b>Impurity</b>	<b>Grain Dia.</b> 0.3-0.5mm	≤15/ m <sup>2</sup>
		>0.5mm	Not Allowed
<b>Fluorescence</b>	Without Fluorescence & Films won't Shine in the Ultraviolet Radiation		
<b>Mechanical Characteristic</b>	<b>Tensile Strength</b> (Mpa)		≥38
	<b>Tensile Impact Strength</b> (KJ/m <sup>2</sup> )		≥500
	<b>Vicat Softening Point</b> (°C)		72±3
	<b>Heating Shrinkage Rate %</b> (140°C×10min)		≤ 10
	<b>Surface Tension</b> (Dyne/ cm <sup>2</sup> )		≥ 35
	<b>Density</b> (g/cm <sup>3</sup> )		1.36±0.05

### 3. i-card PVCP003 –PVC Common Card Core Film

➤ **Description:**

i-card PVCP003 PVC Common Card Core Film, mainly for documents cards, VIP cards, etc..

➤ **Technical Data:**

i-card PVCP003				
<b>Specification &amp; Tolerance</b>	<b>Thickness Range</b> (mm)	0.12~0.25	±5%	
		0.26~0.50	±4%	
		0.51~0.81	±3%	
	<b>Width Range</b> (mm)	250~500	±0.5 mm	
		501~1300	±1 mm	
	<b>Length Range</b> (mm)	300~600	±0.5 mm	
		601~1200	±1 mm	
<b>Squareness</b>	1m*1m	≤  1.2  mm		
<b>Appearance</b>	<b>Surface</b>	Matt Finishing (No Deficiency), Flatness, No Wrinkle		
	<b>Luster %</b>	Thickness: 0.12~0.81mm	≤20	
	<b>Roughness</b>	Ra μm	0.7~1.6	
		Rz μm	5~16	
	<b>Impurity</b>	<b>Grain Dia.</b> 0.3-0.5mm	≤15/ m <sup>2</sup>	
		>0.5mm	Not Allowed	
<b>Fluorescence</b>	Without Fluorescence & Films won't Shine in the Ultraviolet Radiation			
<b>Mechanical Characteristic</b>	<b>Tensile Strength</b> (Mpa)		≥ 35	
	<b>Tensile Impact Strength</b> (KJ/m <sup>2</sup> )		≥ 450	
	<b>Vicat Softening Point</b> (°C)		77±3	
	<b>Heating Shrinkage Rate %</b> (140°C×10min)	Thickness: 0.12~0.25mm	≤  20	
		Thickness:0.26~0.50mm	≤  10	
		Thickness:0.51~0.81mm	≤  8	
	<b>Surface Tension</b> (Dyne/ cm <sup>2</sup> )		≥ 35	
<b>Density</b> (g/cm <sup>3</sup> )		1.36±0.05		

## 4. i-card IC004 – IC Card Core Film

➤ **Description:**

i-card IC004 IC Card Core Film, mainly for telephone, social security, residence permit foreign personnel and access control cards.

➤ **Technical Data:**

i-card IC004			
<b>Specification &amp; Tolerance</b>	<b>Thickness Range</b> (mm)	0.30~0.50	±4%
		0.51~0.81	±3%
	<b>Width Range</b> (mm)	250~500	±0.5 mm
		501~1300	±1 mm
	<b>Length Range</b> (mm)	300~600	±0.5 mm
		601~1200	±1 mm
	<b>Squareness</b>	1m*1m	≤  1.2  mm
<b>Appearance</b>	<b>Surface</b>	Matt Finishing (No Deficiency), Flatness, No Wrinkle	
	<b>Luster %</b>	Thickness: 0.30~0.81mm	≤20
	<b>Roughness</b>	Ra μm	0.7~1.6
		Rz μm	5~16
	<b>Impurity</b>	<b>Grain Dia.</b> 0.3-0.5mm	≤15/ m <sup>2</sup>
		>0.5mm	Not Allowed
<b>Fluorescence</b>	Without Fluorescence & Films won't Shine in the Ultraviolet Radiation		
<b>Mechanical Characteristic</b>	<b>Tensile Strength</b> (Mpa)		≥38
	<b>Tensile Impact Strength</b> (KJ/m <sup>2</sup> )		≥500
	<b>Vicat Softening Point</b> (°C)		78±3
	<b>Heating Shrinkage Rate</b> % (140°C×10min)	Thickness: 0.30~0.50mm	≤ 8
		Thickness: 0.51~0.81mm	≤ 6
	<b>Surface Tension</b> (Dyne/ cm <sup>2</sup> )		≥35
	<b>Density</b> (g/cm <sup>3</sup> )		1.36±0.05

## 5. i-card ICC005 – Contactless Film

➤ **Description:**

i-card ICC005 Contactless Film, mainly for ID card, e-passport, access control and transportation card, etc..

➤ **Technical Data:**

i-card ICC005				
<b>Specification &amp; Tolerance</b>	<b>Thickness Range</b> (mm)	0.10 ~ 0.20	±6%	
		0.21 ~ 0.30	±5%	
		0.31 ~ 0.50	±4%	
	<b>Width Range</b> (mm)	250 ~ 500	±0.5 mm	
		501 ~ 1300	±1 mm	
	<b>Length Range</b> (mm)	300 ~ 600	±0.5 mm	
		601 ~ 1200	±1 mm	
<b>Squareness</b>	1m*1m	≤ 1.2  mm		
<b>Appearance</b>	<b>Surface</b>	Matt Finishing (No Deficiency), Flatness, No Wrinkle		
	<b>Roughness</b>	Ra μm	0.7~1.6	
		Rz μm	5~16	
	<b>Impurity</b>	Grain Dia. 0.3-0.5mm	≤15/ m <sup>2</sup>	
		>0.5mm	Not Allowed	
<b>Fluorescence</b>	Without Fluorescence & Films won't Shine in the Ultraviolet Radiation			
<b>Mechanical Characteristic</b>	<b>Properties</b>		<b>Standard Opacity</b>	<b>High Opacity</b>
	<b>Tensile Strength ( Mpa )</b>		40	
	<b>Tensile Impact Strength ( KJ/m<sup>2</sup> )</b>		550	
	<b>Vicat Softening Point °C ( B50 )</b>		70±2	
	<b>Heating Shrinkage</b> <b>Rate %</b> (140°C×10min)	Thickness: 0.10 ~ 0.20 mm	≤ 30	
		Thickness: 0.21 ~ 0.30 mm	≤ 20	
		Thickness: 0.31 ~ 0.50 mm	≤ 10	
	<b>Surface Tension ( Dyne/ cm<sup>2</sup> )</b>		≥35	
<b>Density ( g/cm<sup>3</sup> )</b>		1.32±0.05	1.36±0.05	

## 6. i-card SIM006 – PVC/ABS Film

➤ **Description:**

i-card SIM006 High Temperature SIM Card Core Film, for mobile phone SIM, fuel cards etc..

➤ **Technical Data:**

i-card SIM006			
<b>Specification &amp; Tolerance</b>	<b>Thickness Range</b> (mm)	0.30~0.50	±4%
		0.51~0.81	±3%
	<b>Width Range</b> (mm)	250~500	±0.5 mm
		501~1300	±1 mm
	<b>Length Range</b> (mm)	300~600	±0.5 mm
		601~1200	±1 mm
	<b>Squareness</b>	1m*1m	≤  1.2  mm
<b>Appearance</b>	<b>Surface</b>	Matt Finishing (No Deficiency), Flatness, No Wrinkle	
	<b>Luster %</b>	Thickness:	≤20
		0.30~0.81mm	
	<b>Roughness</b>	Ra μm	0.7~1.6
		Rz μm	5~16
	<b>Impurity</b>	Grain Dia. 0.3-0.5mm	≤15/ m <sup>2</sup>
		>0.5mm	Not Allowed
<b>Fluorescence</b>	Without Fluorescence & Films won't Shine in the Ultraviolet Radiation		
<b>Mechanical Characteristic</b>	<b>Tensile Strength (Mpa)</b>		≥ 40
	<b>Tensile Impact Strength (KJ/m<sup>2</sup>)</b>		≥ 500
	<b>Vicat Softening Point (°C)</b>		90±2
	<b>Heating Shrinkage Rate % (140°C×10min)</b>	Thickness:0.30~0.50mm	≤  10
		Thickness:0.30~0.50mm	≤  8
	<b>Surface Tension (Dyne/ cm<sup>2</sup>)</b>		≥ 35
	<b>Density (g/cm<sup>3</sup>)</b>		1.30±0.05

## **Production Equipments**

### **(Germany Five-roll Calendar)**

- Equipped with the Most Advanced Siemens S7 Programmable Logic Control System
- PC-controlled Precision Weighting Scale
- One Set of Planet Extruder and a Single Bolt Extruder
- Germany T Company-Five-roll Calendaring System with Two Special Matt Rollers.
- High Speed Horizontal Cutting Device
- Japan FUJI- Double Rollers Equipped with Fully Automatic Roll Switching System
- Film Anti-static and Dust-free Cleaning Device



## Technological Processes

Calendaring has been used for production of PVC film. PVC-resin and kinds of additives, respectively, through precise measurement, enter to mixers for the treatments of mingling. Firstly, the mixture go to high-speed (heating) mixer then through low-speed (cooling) mixer, after precisely-mixed then put into material funnel. Secondly, passing through the planet and single bolt extruders to certain the materials became plastic like substances, meanwhile discharging the gas. Thirdly, Calendar the plastic like substances get past the processes of dragging, drawing, cooling, rolling or sheeting, slitting the PVC sheets to required sizes accordingly, so as to get finished products.

PC-controlled precision weighting system, adapting direct feeding materials, thus the heating processes have been substantially reduced and energy saving at the same time. Calendaring system and appended devices are the key factors in increasing the flexibility of producing larger range thickness of the sheets material, meanwhile, having better production capacity, keeping the material sheet level and ensuring the quality of products, eventually.

## Quality Assurance

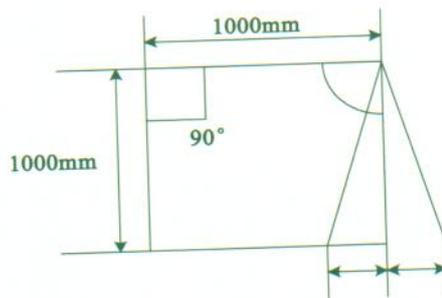
### ◆ Checking Piece by Piece by using Film Anti-static and Dust-free Cleaning Device



#### I. Specification Test:

- **Thickness:** According to National Standard GB/T6672, monitoring by  $\beta$  thickness tester and measuring by using electronic digital micrometer outside diameter scale, accuracy to 0.001mm.
- **Length & Width:** According to National Standard GB/T6673, using precise length scale, accuracy to 0.1mm.

- **Squareness:** Use 90° ruler, calculating the exact length to 0.1mm.



Squareness Tolerance  $\leq |1.2|$  mm

## II. Appearance Test:

- **Surface:** At the distance of 40cm to the sample, detecting with your eyes in natural light or standard light.
- **Luster Degree:** Angle to 85° of the sample, take 2 points from the horizontal direction and 2 points from longitudinal direction respectively by using KGZ-1B Luster Instrument.
- **Roughness:** Take 2 points from the horizontal direction and 2 points from longitudinal direction respectively, test by using TR200 measurer, calculating the average.
- **Impurity:** At the distance of 40cm to the sample, detecting with your eyes in natural light or standard light, precise to individual area.
- **Fluorescence:** At the distance of 30cm to the sample, detecting with your eyes with the ultraviolet light on the sample.

## III. Mechanical Properties Test:

- Conditioning of sample and testing environment in accordance with the national standard GB2918.
- **Tensile Strength:** According to the national standard GB/T1040.3-2006, adapting the experimental speed of 100mm/min, test by using electronic rally measurer. Take 5 samples of each horizontal direction and longitudinal direction respectively by punching mold, place them in 23°C environment for more than 4 hours, test and average the figures as result.
- **Tensile Impact Strength:** Test in accordance with the national standard GB/T 13525-1992.
- **Vicat Softening Temperature:** According to the national standard GB/T1633-2000, test with XRW-300MB hot deformation, vicat temperature tester. Sample size at 2\*2cm, thickness at range of 3-6.5mm, pull strength at 10N, acceleration of heating temperature at 50°C/h, the testing probe pierce into the sample of 1mm±0.0mm, sensor take the temperature of the oil is the vicat softening temperature.
- **Heating Shrinkage:** According to the national standard GB/T 15267 - 5.5.4, place the films into the constant temperature oven under the condition of 140°C\*10min.
- **Density:** Use TG328A (s) analytical balance scale.

## Packaging, Warehousing & Distribution

### ❖ Logo

Attach to each product with Product Identification with indication of product serial #, name of the product, batch #, specification, weight, production date, manufacturer / address, etc..

### ❖ Packaging

PVC sheets wrapped with inner layer of polyethylene membrane, bound up with shrink film and use PET or polypropylene string to fasten the items to the pallet. PVC sheets' surface needs to be packed to face the same direction.

### ❖ Warehousing

Products stored at below 40°C, dry and cool warehouse without pressure, is not near the heat source.

### ❖ Distribution

Ocean Shipping suitable packaging is good for all means of transportation.

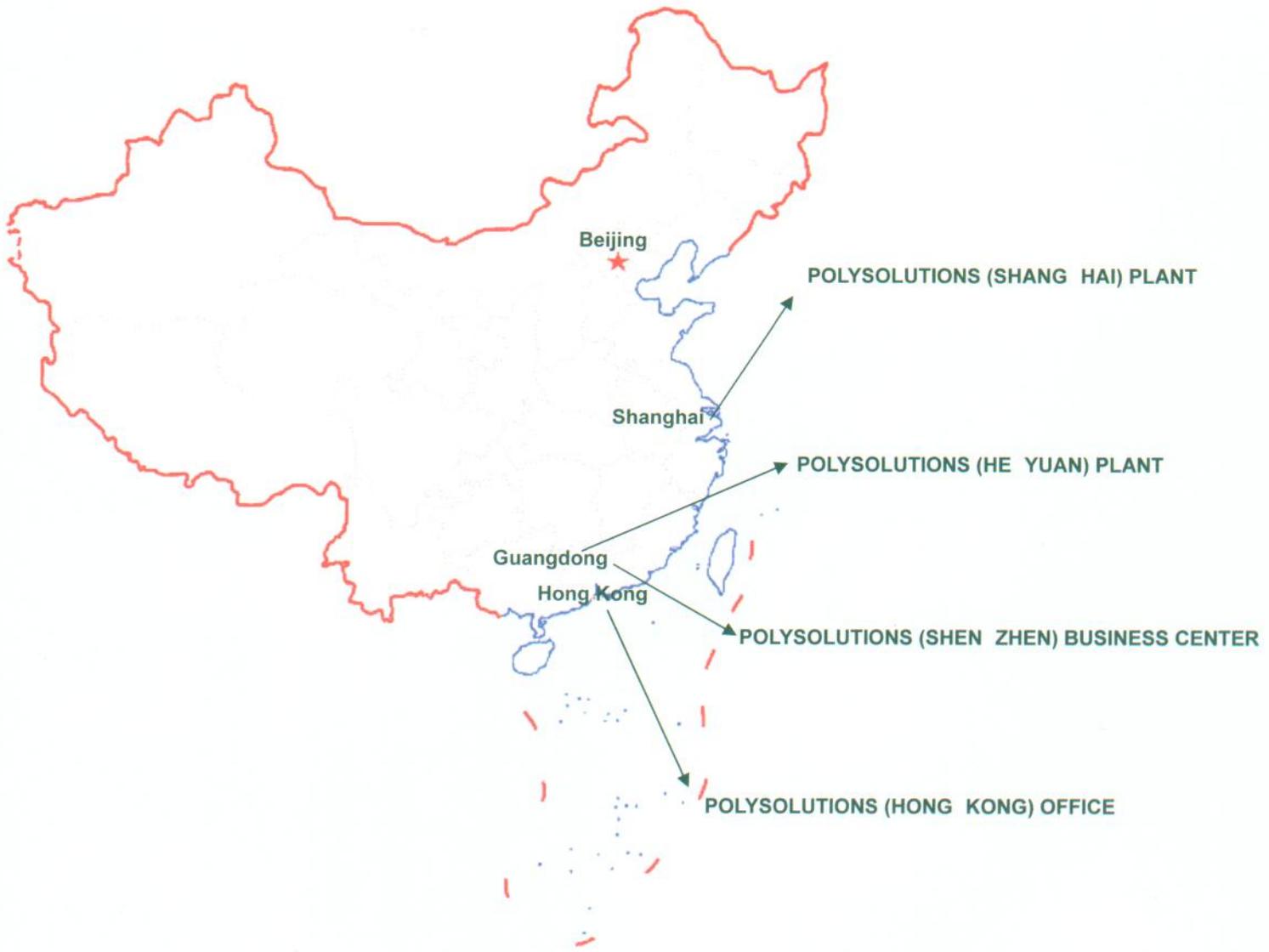


## **Certifications**

Polysolutions manufactures PVC-Rigid-Film of international quality.

Shanghai & Heyuan Production sites as well as the manufacturing process are certified according to ISO9001:2008.

- ✧ Properties of PVC-Rigid-Film Passed SGS Testing
  
- ✧ Achievement of RoHS Report issued by SGS
  
- ✧ To Comply with REACH



## Contact Us



### **Polysolutions (He Yuan) Limited**

#### **Shenzhen Business Center**

Add.: 8/F., Building A, Zhongmin Times Square  
No.12 Sungang Road, Shenzhen  
518029, P.R.China

Te l . : +86-755-25832156

F a x : +86-755-25832139

Web.: [www.polysolutions.com](http://www.polysolutions.com)

Email: [info@polysolutions.com](mailto:info@polysolutions.com)