

TGI SINCE 1964

# TAIWANGLASS

2016 ANNUAL BRIEF

台玻集團2016年簡報

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## 生產基地 Production Facilities

台灣玻璃工業股份有限公司 TGI 1964年成立 Establishment

TAIWAN GLASS IND. CORP.

### 平板玻璃 Flat Glass

#### 台灣台中廠 TF

TAIWAN TAICHUNG FACTORY

1983年投產

浮板玻璃 / 加工玻璃 / Float Glass / Processed Glass  
電子級超薄玻璃 / Electronic Grade Ultra-Thin Glass

#### 台灣鹿港平板廠 TF-4

TAIWAN LUKANG FLAT GLASS FACTORY

2006年投產

浮板玻璃 / Float Glass

#### 台灣彰濱廠 TC

TAIWAN CHANGPIN FACTORY

2011年投產

低輻射玻璃 / 加工玻璃

Low-E Glass / Processed Glass

#### 台玻東元真空節能玻璃股份有限公司 TVIG

TG TECO VACUUM INSULATED GLASS CORP.

2013年投產

低輻射真空玻璃 / Low-E Vacuum Glass

#### 台玻青島玻璃有限公司 QFG

TG QINGDAO GLASS CO., LTD.

1993年成立

浮板玻璃 / 加工玻璃

Float Glass / Processed Glass

#### 青島壓花玻璃有限公司 QRG

QINGDAO ROLLED GLASS CO., LTD.

1993年成立

彩色壓花玻璃 / Color Rolled Glass

#### 台玻長江玻璃有限公司 CFG

TG CHANGJIANG GLASS CO., LTD.

1994年成立

浮板玻璃 / 加工玻璃 / 低輻射玻璃

Float Glass / Processed Glass / Low-E Glass

#### 台玻昆山玻璃有限公司 TKG

TG KUNSHAN GLASS CO., LTD.

2004年成立

浮板玻璃 / Float Glass

#### 台玻成都玻璃有限公司 CDG

TG CHENGDU GLASS CO., LTD.

2002年成立

浮板玻璃 / 加工玻璃 / 低輻射玻璃

Float Glass / Processed Glass / Low-E Glass

#### 台玻華南玻璃有限公司 HNG

TG HUANAN GLASS CO., LTD.

2003年成立

浮板玻璃 / 加工玻璃 / 低輻射玻璃

Float Glass / Processed Glass / Low-E Glass

## 生產基地 Production Facilities

#### 台玻東海玻璃有限公司 DHG

TG DONGHAI GLASS CO., LTD.

2003年成立

浮板玻璃 / Float Glass

#### 台玻天津玻璃有限公司 TJG

TG TIANJIN GLASS CO., LTD.

2004年成立

浮板玻璃 / 加工玻璃 / 低輻射玻璃

Float Glass / Processed Glass / Low-E Glass

#### 台玻咸陽玻璃有限公司 TXY

TG XIANYANG GLASS CO., LTD.

2010年成立

浮板玻璃 / 加工玻璃 / 低輻射玻璃

Float Glass / Processed Glass / Low-E Glass

#### 台玻安徽玻璃有限公司 TAH

TG ANHUI GLASS CO., LTD.

2010年成立

浮板玻璃 / Float Glass

#### 台玻太倉工程玻璃有限公司 TTAR

TG TAICANG ARCHITECTURAL GLASS CO., LTD.

2010年成立

低輻射玻璃 / Low-E Glass

#### 台玻武漢工程玻璃有限公司 TWAR

TG WUHAN ARCHITECTURAL GLASS CO., LTD.

2010年成立

低輻射玻璃 / Low-E Glass

#### 玻璃纖維增強絲 / 玻璃纖維布

Fiberglass Reinforced / Fiberglass Fabric

#### 台灣桃園廠 TT

TAIWAN TAOYUAN FACTORY

1990年投產

玻璃纖維增強絲 / 玻璃纖維布

Fiberglass Reinforced / Fiberglass Fabric

#### 台灣鹿港廠 TL

TAIWAN LUKANG FACTORY

1998年投產

玻璃纖維布 / Fiberglass Fabric

#### 台嘉玻璃纖維有限公司 TGF

TAICHIA GLASS FIBER CO., LTD.

2001年成立

玻璃纖維布 / Fiberglass Fabric

#### 台嘉成都玻纖有限公司 TCD

TAICHIA CHENGDU GLASS FIBER CO., LTD.

2011年成立

玻璃纖維布 / Fiberglass Fabric

#### 台嘉蚌埠玻璃纖維有限公司 TBF

TAICHIA BENGBU GLASS FIBER CO., LTD.

2012年成立 (EST. 2019-1Q 投產)

玻璃纖維布 / Fiberglass Fabric



TF, 250,068 M<sup>2</sup> (375 畝)



TL / TF-4, 260,343 M<sup>2</sup> (395 畝)



TC / TVTIG, 272,480 M<sup>2</sup> (408 畝)



QFG / QRG, 429,126 M<sup>2</sup> (643 畝)



CFG / TKG, 404,770 M<sup>2</sup> (607 畝)



CDG, 452,027 M<sup>2</sup> (678 畝)



HNG, 364,907 M<sup>2</sup> (547 畝)



DHG, 398,096 M<sup>2</sup> (597 畝)



TJG, 300,448 M<sup>2</sup> (450 畝)



TXY, 452,703 M<sup>2</sup> (679 畝)



TAH, 572,643 M<sup>2</sup> (858 畝)



TTAR, 199,525 M<sup>2</sup> (300 畝)



TWAR, 222,000 M<sup>2</sup> (333 畝)



TT, 181,181 M<sup>2</sup> (271 畝)



TGF, 323,539 M<sup>2</sup> (485 畝)



TCD, 362,668 M<sup>2</sup> (544 畝)



## 生產基地 Production Facilities

### 太陽能玻璃 Photovoltaic Glass

**台玻福建光伏玻璃有限公司 FPG**  
TG FUJIAN PHOTOVOLTAIC GLASS CO., LTD.  
2006年成立  
光伏玻璃 / Photovoltaic Glass

**台玻悅達太陽能鏡板有限公司 TYSM**  
TG YUEDA SOLAR MIRROR CO., LTD.  
2011年成立  
太陽能鏡板 / Solar Mirror

### 容食廚玻璃 Glass Container / Glass Tableware & Glass Kitchenware

**台灣新竹廠 TS**  
TAIWAN HSINCHU FACTORY  
1967年投產  
容器玻璃 / 食器玻璃 / 廚器玻璃  
Glass Container / Glass Tableware / Glass Kitchenware

### 汽車玻璃 Automotive Glass

**台灣汽車玻璃有限公司 TAGC**  
TAIWAN AUTOGLASS IND. CORP.  
1988年成立  
汽車玻璃 / Automotive Glass

**台玻悅達汽車玻璃有限公司 TYAU**  
TG YUEDA AUTOGLASS CO., LTD.  
2010年成立  
汽車玻璃 / Automotive Glass

### 鹽化工 Salt Chemical

**實聯化工江蘇有限公司 SCJ**  
SHIHLIEN CHEMICAL INDUSTRIAL  
JIANGSU CO., LTD.  
2009年成立  
純鹼 / 氯化銨  
Soda Ash / Ammonium Chloride

FPG, 388,822 M<sup>2</sup> (583 畝)TYSM, 266,400 M<sup>2</sup> (400 畝)TS, 129,090 M<sup>2</sup> (173 畝)TYAU, 132,755 M<sup>2</sup> (199 畝)SCJ, 2,000,010 M<sup>2</sup> (3,000 畝)

## 集團一覽 Company List

截至2016.04.15

項目 Item	創立 Est.	資本額 Capital		營業項目 Business Scope	主要股東 Major Shareholder	持股率 Holding %
		千元	US\$000			
台灣玻璃工業股份有限公司 TGI Taiwan Glass Ind. Corp.	1964	25,080,608	-	玻璃製造 Glass Mfg.	THG	61
台灣玻璃美國銷售有限公司 TGUS Taiwan Glass USA Sales Corp.	1973		461	玻璃銷售 Glass Sales	TGI	100
台灣汽車玻璃股份有限公司 TAGC Taiwan Autoglass Ind. Corp.	1988	300,000	-	汽車玻璃製造 Automotive Glass Mfg.	TGI	87
台灣玻璃中國控股有限公司 TGCH Taiwan Glass China Holding Ltd.	1993	-	1,243,386	大陸投資控股公司 China Investment	TGI	93
台玻青島玻璃有限公司 QFG TG Qingdao Glass Co., Ltd.	1993	-	82,800	平板玻璃製造 Flat Glass Mfg.	TGCH	100
青島壓花玻璃有限公司 QRG Qingdao Rolled Glass Co., Ltd.	1993	-	29,293	壓花玻璃製造 Rolled Glass Mfg.	TG-G	100
台玻長江玻璃有限公司 CFG TG Changjiang Glass Co., Ltd.	1994	-	70,000	平板玻璃製造 Flat Glass Mfg.	TGCH	100
台嘉玻璃纖維有限公司 TGF Taichia Glass Fiber Co., Ltd.	2001	-	110,000	玻璃纖維布製造 Fiberglass Fabric Mfg.	TGCH	100
台玻成都玻璃有限公司 CDG TG Chengdu Glass Co., Ltd.	2002	-	70,000	平板玻璃製造 Flat Glass Mfg.	TGCH	100
台玻華南玻璃有限公司 HNG TG Huanan Glass Co., Ltd.	2003	-	106,000	平板玻璃製造 Flat Glass Mfg.	TGCH	100
台玻東海玻璃有限公司 DHG TG Donghai Glass Co., Ltd.	2003	-	80,000	平板玻璃製造 Flat Glass Mfg.	TGCH	100
台玻昆山玻璃有限公司 TKG TG Kunshan Glass Co., Ltd.	2004	-	24,000	平板玻璃製造 Flat Glass Mfg.	TGCH	100
台玻天津玻璃有限公司 TJG TG Tianjin Glass Co., Ltd.	2004	-	71,000	平板玻璃製造 Flat Glass Mfg.	TGCH	100
台玻福建光伏玻璃有限公司 FPG TG Fujian Photovoltaic Glass Co., Ltd.	2006	-	82,928	光伏玻璃製造 Photovoltaic Glass Mfg.	TGCH	100
台玻咸陽玻璃有限公司 TXY TG Xianyang Glass Co., Ltd.	2010	-	100,000	平板玻璃製造 Flat Glass Mfg.	TGCH	100
台玻太倉工程玻璃有限公司 TTAR TG Taicang Architectural Glass Co., Ltd.	2010	-	35,000	Low-E 玻璃製造 Low-E Glass Mfg.	TGCH	100
台玻悅達汽車玻璃有限公司 TYAU TG Yueda Autoglass Co., Ltd.	2010	-	40,000	汽車玻璃製造 Automotive Glass Mfg.	TG-G	60
台玻安徽玻璃有限公司 TAH TG Anhui Glass Co., Ltd.	2010	-	85,000	平板玻璃製造 Flat Glass Mfg.	TGCH	100
台玻武漢工程玻璃有限公司 TWAR TG Wuhan Architectural Glass Co., Ltd.	2010	-	35,000	Low-E 玻璃製造 Low-E Glass Mfg.	TGCH	100
台玻悅達太陽能鏡板有限公司 TYSM TG Yueda Solar Mirror Co., Ltd.	2011	-	40,000	太陽能鏡板玻璃製造 Solar Mirror Glass Mfg.	TGCH	75
台嘉成都玻纖有限公司 TCD Taichia Chengdu Glass Fiber Co., Ltd.	2011	-	67,000	玻璃纖維布製造 Fiberglass Fabric Mfg.	TGCH	100
台玻東元真空節能玻璃 股份有限公司 TVIG TG TECO Vacuum Insulated Glass Corp.	2011	240,000	-	Low-E 真空玻璃製造 Low-E Vacuum Glass Mfg.	TGI	68
台玻哈利歐玻璃股份有限公司 HTG Hario TG Glass Corp.	2012	20,000		食廚器具銷售 Selling of tableware and kitchenware	TGI	50
台嘉蚌埠玻璃纖維有限公司 TBF Taichia Bengbu Glass Fiber Co., Ltd.	2012	-	60,000	玻璃纖維布製造 Fiberglass Fabric Mfg.	TGCH	100
台玻文教基金會 TG-F TG Cultural & Educational Foundation.	1989	170,000	-	文教事業 Cultural & Educational Fdn.	TGI	100
總資本額 Total		25,810,608	2,431,868			

## 台玻集團 Taiwan Glass Group



創辦人  
Founder

林玉嘉 Lin, Y C



董事長  
Chairman

林伯豐 Lin, P F



總經理 總裁  
President & CEO

林伯實 Lin, P S



駐會董事  
Executive Director

林伯淳 Lin, P C

## 2015 年度營運報告

### 2015 年度 營運合併報表

銷售量	3,667千公噸	(-1.2%)	
營業收入	41,286百萬元	(-0.7%)	=US\$ 1,303 mil
營業損失	(3,018)百萬元	(+20.9%)	=US\$ (95) mil
營業外利益	(1,890)百萬元	(-181.1%)	=US\$ (60) mil
稅前淨損	(4,908)百萬元	(+2,849.8%)	=US\$ (155) mil
稅後淨損	(5,225)百萬元	(+1,513.8%)	=US\$ (165) mil
稅後淨(損)利歸屬於母公司業主	(4,688)百萬元	(-3,158.6%)	=US\$ (148) mil
母公司業主權益	43,856百萬元	(-9.6%)	=US\$ 1,338 mil
股票市值	32,229百萬元	(-45.1%)	=US\$ 983 mil

每股純益(1.97)元，股東權益每股17.49元=US\$0.53，  
考量次年度資本預算規劃，2015年度擬不配發股東股息。

### 2015 年生產

平板玻璃	台灣 大陸	台中廠平板玻璃1座、鹿港廠平板玻璃1座、台中電子級超薄玻璃1座，計3座生產線，年產 347千公噸 (+2.4%) 昆山、成都、天津、東莞、青島、東海、咸陽及鳳陽廠平板玻璃11座，福建光伏玻璃1座，計12座生產線，年產2,893千公噸 (-1.7%)
玻布 / 玻纖	台灣 大陸	桃園廠及鹿港廠玻纖1座、玻布1座，計2座生產線，年產 72千公噸 (+15.9%) 昆山廠玻布3座、成都廠玻布1座，計4座生產線，年產 55千公噸 (+84.1%)
容食廚玻璃	台灣	新竹廠容食廚器玻璃8座生產線，年產 134千公噸 (-11.1%)
汽車玻璃	台灣 大陸	台中廠汽車玻璃生產線，年產 14千公噸 (+10.3%) 鹽城廠汽車玻璃生產線，年產 10千公噸 (+82.3%)
合計		3,525千公噸 (-0.5%)

### 2015 年銷售

平板玻璃	台灣 大陸 計	銷售量 344千公噸 (-4.6%)，銷售額 4,996百萬元 (-3.4%) 銷售量 3,037千公噸 (-0.9%)，銷售額 24,656百萬元 (-1.4%) 計3,381千公噸，新台幣29,652百萬元 = US\$ 936mil (-1.7%)，佔集團營業額68.4%
玻布 / 玻纖	台灣 大陸 計	銷售量 69千公噸 (-18.1%)，銷售額 4,633百萬元 (-16.5%) 銷售量 53千公噸 (+33.8%)，銷售額 4,291百萬元 (+22.5%) 計122千公噸，新台幣 8,924百萬元 = US\$282mil (-1.4%)，佔集團營業額 20.6%
容食廚玻璃	台灣	銷售量 141千公噸(-4.5%)，銷售額 3,306百萬元 = US\$104mil (-1.8%)， 佔集團營業額 7.6%
汽車玻璃	台灣 大陸 計	銷售量 14千公噸(+9.3%)，銷售額 977百萬元 (+4.2%) 銷售量 9千公噸(+103.4%)，銷售額 493百萬元 (+115.2%) 計23千公噸，新台幣 1,470百萬元 = US\$ 46mil (+26.1%)，佔集團營業額 3.4%
合計		3,667千公噸，銷售額新台幣 43,352百萬元 = US\$ 1,368mil (-0.9%) 減合併沖銷後，銷售額新台幣 41,286百萬元 = US\$ 1,303mil (-0.7%) 內銷佔83%，外銷佔 17%

## 2015 Operation Report

2015 Consolidated Performance			
Sales Volume	3,666,640 MT		(-1.2%)
Operating Revenue	U\$ 1,303mil		(-0.7%)
Operating Loss	U\$ (95)mil		(+20.9%)
Non-operating Income	U\$ (60)mil		(-181.1%)
Loss Before Tax	U\$ (155)mil		(+2,849.8%)
Net Loss After Tax	U\$ (165)mil		(+1,513.8%)
Income (Loss) After Tax Attributable to Stockholders of the Parent	U\$ (148)mil		(-3,158.6%)
Total Equity Attributable to Stockholders of the Parent	U\$ 1,338mil		(-9.6%)
Stock Market Value	U\$ 983mil		(-45.1%)
Earnings per share : (U\$0.06), Equity per share: U\$0.53			
In consideration of planning capital budget for next year, it is proposed not to distribute dividend to stockholders for FY 2015.			

### 2015 Production

Flat Glass	Taiwan	3 Flat plants, annual production 347,000MT (+ 2.4%)
	China	11 flat plants & 1 Photovoltaic Cover Glass plant, annual production 2,893,000MT (- 1.7%)
Fiberglass / Fiberglass Fabric	Taiwan	1 glass fabric plants & 1 glass fiber plant, annual production 72,000MT (+15.9%)
	China	4 glass fabric plants, annual production 55,000MT (+ 84.1%)
Glass Container & Glassware	Taiwan	8 plants, annual production 134,000MT (-11.1%)
Auto Glass	Taiwan	TAGC plant, annual production 14,000MT (+10.3%)
	China	TYAU plant, annual production 10,000MT (+82.3%)
Group Total		3,525,000MT (-0.5%)

### 2015 Sales

Flat Glass	Taiwan	Volume 344,000MT (- 4.6%), sales revenue U\$158mil (- 3.4%)
	China	Volume 3,037,000MT (- 0.9%), sales revenue U\$778mil (- 1.4%)
	Total	3,381,000MT, U\$936 mil (- 1.7%), 68.4% of group sales
Glass Fabric / Fiber	Taiwan	Volume 69,000 MT (-18.1%), sales revenue U\$146mil (- 16.5%)
	China	Volume 53,000 MT (+ 33.8%), sales revenue U\$136mil (+22.5%)
	Total	122,000MT, U\$282 mil (- 1.4%), 20.6% of group sales
Glass Container & Glassware	Taiwan	Volume 141,000MT(- 4.5%), sales revenue U\$104mil (- 1.8%), 7.6% of
Automotive Glass	Taiwan	Volume 14,000MT(+9.3%), sales revenue U\$31mil (+4.2%)
	China	Volume 9,000MT(+103.4%), sales revenue U\$15mil (+115.2%)
	Total	23,000MT, U\$46 mil (+26.1%), 3.4% of group sales
Group Total		3,667,000MT, revenue U\$1,368mil (-0.9%) : Net Sales revenue U\$1,303mil (-0.7%) domestic market 83% and export 17%

## 合併財務一覽 Consolidated Financial Scan

項目 Item	單位 Unit	2014	2015	+	-
銷售量 Sales Volume	公噸 MT	3,712,820	3,666,640		1.2
營業收入 Operating Revenue	千元 US\$000	41,570,020 1,373,943	41,286,161 1,302,855		0.7
營業損失 Operating Loss	千元 US\$000	(2,497,115) (82,533)	(3,017,817) (95,232)	20.9	
營業外收入及支出 Non-operating Income and Expenses	千元 US\$000	2,330,734 77,034	(1,890,092) (59,645)		181.1
稅前淨損 Loss Before Tax	千元 US\$000	(166,381) (5,499)	(4,907,909) (154,877)	2,849.8	
稅後淨損 Net Loss After Tax	千元 US\$000	(323,792) (10,702)	(5,225,450) (164,898)	1,513.8	
稅後淨(損)利歸屬於母公司業主 Income (Loss) After Tax Attributable to Stockholders of the Parent	千元 US\$000	153,261 5,065	(4,687,597) (147,925)		3,158.6
每股純益 Earnings Per Share	元 US\$	0.06 0.00	(1.97) (0.06)		3,383.3
純益率 Earning Ratio	%	0.37%	(11.35)%		3,167.6
每股股利 (現金+股票) Dividend Per Share (Cash+Stock)	元 US\$	0 0.0000	0 0.0000		
資產總額 Total Assets	千元 US\$000	105,970,541 3,353,498	96,029,723 2,929,969		9.4
實收資本 Capital	千元 US\$000	23,780,608 752,551	25,080,608 765,236	5.5	
母公司業主權益 Total Equity Attributable to Stockholders of the Parent	千元 US\$000	48,500,064 1,534,812	43,856,441 1,338,107		9.6
每股淨值 Equity Per Share	元 US\$	20.39 0.65	17.49 0.53		14.2
自有資本率 Shareholders' Equity to Total Assets Ratio	%	45.8%	45.7%		0.2
合併權益報酬率 Return on Total Equity	%	(0.6)	(10.5)	1,650.0	
股票市值 Stock Market Value	千元 US\$000	58,738,102 1,858,801	32,228,581 983,328		45.1
新投資金額 New Capital Expenditure	千元 US\$000	7,224,894 238,792	2,665,469 84,113		63.1

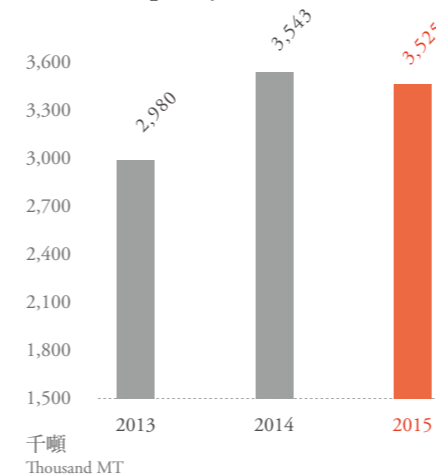


## 合併資產負債表 Consolidated Balance Sheet

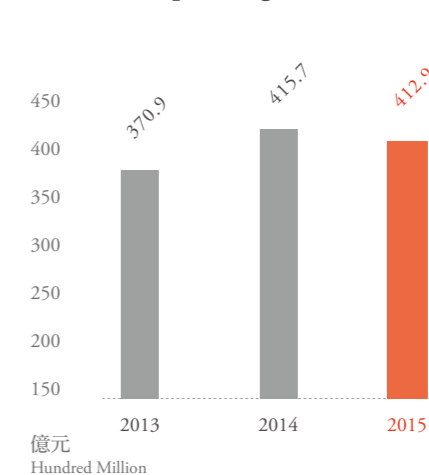
	2014			2015		
	千元	US\$000	%	千元	US\$000	%
<b>資產</b>						
流動資產	29,410,927	930,726	27.8	25,243,735	770,213	26.3
Assets						
採用權益法之投資	3,647,110	115,415	3.4	2,869,224	87,543	3.0
Investments Accounted for Using the Equity Method						
不動產、廠房及設備	67,767,191	2,144,531	63.9	63,797,975	1,946,544	66.4
Property, Plant and Equipment						
其他非流動資產	5,145,313	162,826	4.9	4,118,789	125,669	4.3
Other Noncurrent Assets						
<b>資產合計</b>	<b>105,970,541</b>	<b>3,353,498</b>	<b>100.0</b>	<b>96,029,723</b>	<b>2,929,969</b>	<b>100.0</b>
Total Assets						
<b>負債</b>						
流動負債	32,420,418	1,025,963	30.6	32,807,140	1,000,981	34.2
Liabilities						
長期負債	18,377,162	581,556	17.3	13,251,338	404,312	13.8
Long-term Loan						
其他非流動負債	2,656,154	84,055	2.5	2,685,708	81,944	2.8
Other Noncurrent Liabilities						
<b>負債合計</b>	<b>53,453,734</b>	<b>1,691,574</b>	<b>50.4</b>	<b>48,744,186</b>	<b>1,487,237</b>	<b>50.8</b>
Total Liabilities						
<b>權益</b>						
母公司業主權益計	48,500,064	1,534,812	45.8	43,856,441	1,338,107	45.7
Total Equity Attributable to Stockholders of the Parent						
實收資本	23,780,608	752,551		25,080,608	765,236	
Capital						
非控制權益	4,016,743	127,112	3.8	3,429,096	104,625	3.5
Non-controlling Interests						
<b>權益合計</b>	<b>52,516,807</b>	<b>1,661,924</b>	<b>49.6</b>	<b>47,285,537</b>	<b>1,442,732</b>	<b>49.2</b>
Total Equity						
<b>負債及權益</b>	<b>105,970,541</b>	<b>3,353,498</b>	<b>100.0</b>	<b>96,029,723</b>	<b>2,929,969</b>	<b>100.0</b>
Liabilities & Equity						

## 合併資產負債表 Consolidated Balance Sheet

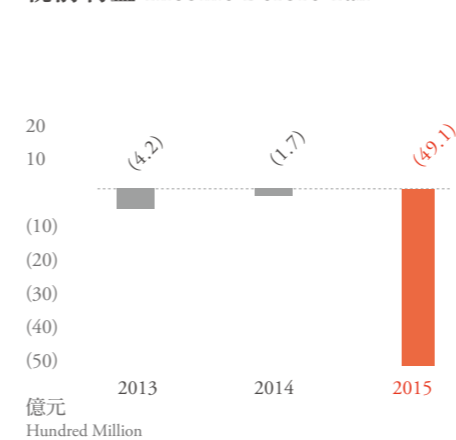
### 生產量 Capacity



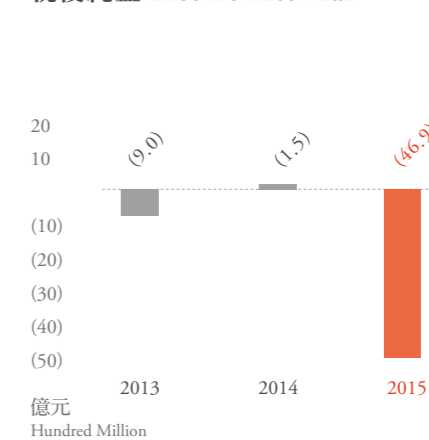
### 營業收入 Operating Revenue



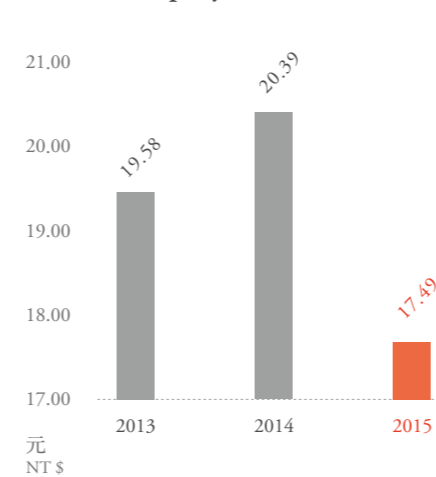
### 稅前利益 Income Before Tax



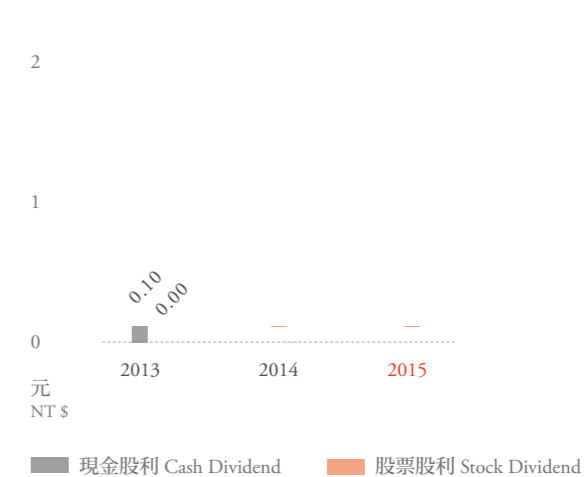
### 稅後純益 Income After Tax



### 每股淨值 Equity Per Share



### 每股股利 Dividend Per Share



## 董事長致詞

### 2016 年 展望

各位董事、各位股東，對於2016年展望，敬請指教。

延續2015年全球經濟成長遲緩現象，2016年上半年經濟情勢依舊維持疲弱情況，尤其是大陸製造業成本優勢明顯下降，企業成本指數持續上升，同時台灣與全球多數國家進出口都呈現衰退，透露出全球經濟在2016年仍將很難有成長的表現。

綜觀台玻2015年業績，整體主要受惠下半年開始的能源價格下跌，惟因大陸經濟情勢複雜，所屬各公司所在地區亦有不同情況，未能一概而論，以下分別從產品面來報告。

在平板玻璃方面，台灣台中廠TF-2及TF-4平板玻璃線，產銷順利；新開發TF-5超薄玻璃線，生產消費性電子產品所需求的0.33mm及0.7mm超薄觸控玻璃已量產，惟品質及良率有待提升，並努力降低成本爭取訂單。大陸平板玻璃行業在產能過剩、供需失衡及下游房地產需求兩極化的大環境下，市場整體增長空間有限，雖有淘汰落後產線、優化平板玻璃及節能玻璃產業結構之政策，但實施力度並未如預期，短期看來仍難以改善，加上同業仍有使用燃煤生產，對銷售與獲利形成壓力。台玻天津及青島廠為提升營運績效，已將部分產能轉向供應汽車玻璃原板，期望以高品質的產品及完善的服務為首重。台玻大陸平板玻璃將持續以高附加價值節能玻璃及多樣化產品，穩定供應現有客源，並開發潛在客戶。此外，鑒於光伏玻璃市場策略導向，台玻決定邀請中國建材集團所屬之凱盛集團入資台玻福建光伏玻璃公司，合作發展光伏玻璃產業。

在玻璃纖維方面，台灣鹿港廠持續進行超薄玻纖布產品開發，以確保掌握下一代更高階行動裝置商機；桃園廠則投入研發提升具有更高強度、高耐磨損性、高密度技術水準的項目，期以開發高科技產品的市場。大陸成都玻纖布廠已順利投產。整體而言，台玻高品質的玻璃纖維布及玻璃纖維增強絲，已獲國際知名大廠指定使用在最高端的數位行動裝置產品中。

在容食廚器方面，持續朝向開發高附加價值產品，以增加獲利。容器產品品質，長期受到美國客戶信賴，訂單穩定成長；耐熱奶瓶深獲日本、美國、大陸及台灣各大嬰幼兒品牌青睞，產品已走向國際市場；生產 $\alpha$ -33耐熱玻璃加工製成多樣化接柄及雙層杯型，兼具美觀、實用及高附加價值，普受國內外各大品牌持續訂貨，同時也為台玻發展自有品牌奠定先期基礎。

台玻轉投資的實聯化工江蘇公司聯碱項目，自2014年11月全面投產以來，2015年已達到全產全銷的目標，預期今年將可盈餘獲利。第二期的生技鹽及鹼性飲用水項目，已按規劃開展，預計2017年起各項目陸續投入營運後，將可有效提升實聯化工整體獲利。

為充實營運資金，降低銀行負債，台玻計畫將再進行增資，以健全財務結構。

展望未來，台玻集團仍將堅持本業，降低營運成本，精進研發，優化改善產線製程結構，在既有的基礎上，以穩健的腳步創新價值提升獲利，並持續落實企業社會責任，迎接未來的挑戰。

林伯豐

2016.06.17

## Chairman's Message

### 2016 Operation Perspectives

Directors and shareholders, thank you and look forward to having your opinion on 2016 operation perspectives.

Continuing with the sluggish situation of global economic growth in 2015, the economic situation of the first half of 2016 is still weak. Particularly, the advantage of manufacturing cost in China has lessened because of rising costs, and at the meantime, import and export of Taiwan and most global countries have decreased, showing that it is still difficult for the global economy to grow significantly in 2016.

In regard to TGI's performance in 2015, it has mainly benefited from the decline of energy price in the second half of the year. Nevertheless, due to the complicated economic circumstance of China, the subsidiaries in different regions have various situations and cannot be generalized. We make a brief report by product lines as follows.

In flat glass, both production and marketing of the TF-2 and TF-4 flat glass production lines in TGI's Taichung Factory are running smoothly. The new TF-5 ultra-thin production line for 0.33mm and 0.7mm ultra-thin touch screens has reached mass production scale, however improvements can still be made to the yield and cost reduction to win over orders. Under the environment of excess capacity, and imbalanced demand for uneven real estate, the growth of market for flat glass industry in China is limited. Even though we have strategies to eliminate outdated production lines and optimize industrial structure, this problem cannot be improved in short term. There are still other manufacturers that use coal or other polluted fuels to make flat glass, causing pressure to our sales and profits. The capacities at TJG and QFG have been partially converted to supply automotive glass to boosting operation performance. TGI hopes to make high-quality products and perfect service to provide high value added energy-saving glass and diversity productions for clients. Furthermore, TGI has decided to invite CNBM/Triumph Group to invest in FPG and form an alliance to capitalize on the positive business opportunities in Photovoltaic glass.

In fiberglass, TGI's Lukang Factory continues to develop ultra-thin fiberglass fabric to stay in step with the development of higher level mobile devices for the next generation. TGI's Taoyuan Factory invests in new R&D items of higher strength, higher abrasion resistance and higher density technical standards to develop the market of high-tech products. Furthermore, TGI's TCD Factory has started production successfully. In general, TGI's high-quality fiberglass fabric and fiberglass yarn are well received by internationally renowned manufactures to use on high-end digital mobile products.

In container glass, TGI continues to develop high value added products to increase profits. The high quality of container products has been well received by American clients, and the orders have been expanding stably. The heat-resistant baby feeding bottles are well received by Japanese, American, Chinese and Taiwanese manufacturers of brand name of infant products, and our products have entered the international market already. The containers with various handles and doublewall glass which are made of  $\alpha$ -33 heat-resistant glass are artistic, practical, and high value added. They continue to win orders from famous domestic and international brands. Meanwhile, the products lay a foundation for TGI's private brand development.

The soda ash product of Shihlien Chemical Industrial Jiangsu Co., Ltd. (SCJ), which started production in November of 2014, has reached the goal of full production capacity in 2015. There will be profits generated starting this year. The second phase biotech salt products and alkaline drinking water has started to be developed according to the planning. The profits of SCJ are expected to be enhanced from 2017 after operation of all products have been implemented successfully.

To meet working capital needs and reduce debt, TGI is planning to increase capital to strengthen its financial structure.

Looking to the future, TGI will keep focusing on the core business of glass production, curtail operation cost, refine research and development, and improve manufacturing processes. Building on the existing foundation, TGI will continue to innovate, increase profits, keep carrying out corporate social responsibility, and welcome challenges of the future.

Lin, Por Fong

2016.06.17



## 台灣玻璃工業有限公司董事及經理人團隊 TGI Directors & Managers



董事團隊（數字由左至右）

林伯豐 Lin, P F	前排5	林伯實 Lin, P S	前排4	林伯淳 Lin, P C	前排3		
林豐正 Lin, F C	前排6	陳清治 Chen, C C	前排7	黃清苑 Hwang, T Y	前排8		
張伯欣 Chang, P S	前排2	林瀚東 Lim, H T	前排9	徐莉玲 Hsu, L L	前排1	蘇育德 Su, Y T	後排3
林嘉宏 Lin, C H	後排4	林嘉佑 Lin, C Y	後排5	林嘉明 Lin, C M	後排6	林保村 Lin, B T	後排2
						陳正章 Chen, C C	後排1



經理人團隊（數字由左至右）

董事長 Chairman	林伯豐 Lin, P F	前排5	總經理 總裁 President & CEO	林伯實 Lin, P S	前排4	駐會董事 Executive Director	林伯淳 Lin, P C	前排6
纖維事業部營運長 COO, Fiber	蘇育德 Su, Y T	前排3	大陸事業部營運長 COO, China Prod.	林嘉宏 Lin, C H	前排7	纖維事業部 總經理	林嘉佑 Lin, C Y	前排8
財務本部總經理 GM, Finance	林嘉明 Lin, C M	前排9	玻璃新材料部 總經理 GM, New Glass	林保村 Lin, B T	前排2	GM, Fiber 台嘉坡纖 總經理 TGF GM	陳正章 Chen, C C	前排1

## 台灣玻璃工業有限公司第 18 屆董事 / 第 1 屆審計委員 (2015-2018)

### TGI 18<sup>th</sup> Directors / 1<sup>st</sup> Audit Committee

董事長  
Chairman  
林伯豐  
Lin, P F  
Since 1967

總經理 總裁  
President & CEO  
林伯實  
Lin, P S  
Since 1967

獨立董事/審計委員  
Independent Directors/  
Audit Committee  
林豐正  
Lin, F C  
Since 2012

陳清治  
Chen, C C  
Since 2012

黃清苑  
Hwang, T Y  
Since 2012

董事  
Directors

林伯淳  
Lin, P C  
Since 1976

張伯欣  
Chang, P S  
Since 2009

林瀚東  
Lim, H T  
Since 2009

徐莉玲  
Hsu, L L  
Since 2015

蘇育德  
Su, Y T  
Since 1996

林嘉宏  
Lin, C H  
Since 2000

林嘉佑  
Lin, C Y  
Since 2004

林嘉明  
Lin, C M  
Since 2006

陳正章  
Chen, C C  
Since 2009

林保村  
Lin, B T  
Since 2009

## 台灣經營團隊 Taiwan Management Team

董事長 Chairman	林伯豐 Lin, P F	平板事業部總經理 GM, Flat	許吉清 Hsu, C C
總經理 總裁 President & CEO	林伯實 Lin, P S	玻璃新材料部總經理 GM, New Glass Materials	林保村 Lin, B T
纖維事業部營運長 COO, Fiber	蘇育德 Su, Y T	玻璃新材料部協理 AGM, New Glass Materials	林峻毅 Lin, J I
纖維事業部總經理 GM, Fiber	林嘉佑 Lin, C Y	平板研發部總經理 GM, Flat Glass R&D	藍政彥 Lan, C Y
纖維事業部專案副總 VGM, Project Fiber	陳正章 Chen, C C	台中廠 / 鹿港平板廠 / 彰濱廠副總 Plant VGM., TF / TF4 / T C	趙宏榮 Chao, H J
纖維事業部協理 AGM, Fiber	蔡維新 Tsai, W S	平板玻璃技服協理 AGM Flat / Techn. Service	張雅聰 Chang, Y T
鹿港廠廠長 Plant Dir., TL	黃建忠 Huang, C C	鹿港平板廠廠長 Plant Dir., TF4	王澤南 Wang, C N
鹿港廠研發協理 AGM, R&D, TL	劉敏雄 Liu, M H	彰濱廠協理 AGM, TC	范增凱 Fan, T K
桃園廠廠長 Plant Dir., TT	陳慶良 Chen, C L	容食事業部副總 VGM, Container & Glassware	謝進興 Hsieh, C H
大陸事業部營運長 COO, China Prod.	林嘉宏 Lin, C H	品牌部協理 AGM, Brands	李妣瑩 Lee, C Y
財務本部總經理 GM, Finance	林嘉明 Lin, C M	新竹廠廠長 Plant Dir., TS	吳青杰 Wu, C C
管理本部副總 VGM, Admin.	洪有欽 Hung, Y C	新竹廠生產協理 AGM, Prod., TS	王再興 Wang, T H
採購本部副總 VGM, Purchasing	蔡增銘 Tsai, T M	新竹廠設備協理 AGM, Equip., TS	吳蔚騰 Wu, W T
		車板本部總經理 GM, Autoglass	吳志郎 Wu, T L
		車板本部副總 VGM, Autoglass	陳冠宇 Chen, K Y

## 大陸經營團隊 China Management Team

台灣玻璃中國控股有限公司 TGCH	董事長 Chairman	林伯豐 Lin, P F		
	副董事長 Deputy Chairman	林伯實 Lin, P S		
	董事 Directors	林伯淳 Lin, P C	林嘉宏 Lin, C H	
		林嘉佑 Lin, C Y	林嘉明 Lin, C M	
台玻長江玻璃有限公司 CFG 台玻昆山玻璃有限公司 TKG	董事長 Chairman	林伯豐 Lin, P F		
	大陸事業部營運長 COO, China Prod.	林嘉宏 Lin, C H		
	副總 VGM	李 虎 Lee, H		
	專案協理 AGM, Project,	高武德 Kao, W T	李建誼 Lee, J Y	LE玻璃總經理 GM, LE glass
	營業部/加工部副總 VGM, Sales/ Processing	時 忠 Shih, C		加工部協理 AGM, Processing
台玻成都玻璃有限公司 CDG	董事長 Chairman	林伯豐 Lin, P F		
	大陸事業部營運長 COO, China Prod.	林嘉宏 Lin, C H		
	總經理 GM	陳國明 Chen, K M		LE玻璃總經理 GM, LE glass
	副總 VGM	姬文剛 Chi, W G		張政峰 Chang, C F
台玻咸陽玻璃有限公司 TXY	董事長 Chairman	林伯豐 Lin, P F		
	大陸事業部營運長 COO, China Prod.	林嘉宏 Lin, C H		
	總經理 GM	劉金璋 Liu, C C		
	LE玻璃總經理 GM, LE glass	張政峰 Chang, C F		
台玻安徽玻璃有限公司 TAH	董事長 Chairman	林伯豐 Lin, P F		
	大陸事業部營運長 COO, China Prod.	林嘉宏 Lin, C H		
	代理總經理 Deputy GM	陳祺灝 Chen, C H		
	管理部/成品部協理 AGM, Admin./W&D	王鳳寶 Wang, F P		
台玻太倉工程玻璃有限公司 TTAR	董事長 Chairman	林嘉宏 Lin, C H		
	總經理 GM	張政峰 Chang, C F	副總 VGM	時 忠 Shih, C
	協理 AGM	李建誼 Lee, J Y		
台玻武漢工程玻璃有限公司 TWAR	董事長 Chairman	林嘉宏 Lin, C H		
	總經理 GM	張政峰 Chang, C F	副總 VGM	姚永峰 Yao, Y F
台玻悅達汽車玻璃有限公司 TYAU	董事長 Chairman	林嘉宏 Lin, C H		
	總經理 GM	吳英華 Wu, Y H	副董事長 Vice Chairman	符貴興 Fu, K H
			協理 AGM	呂宗祥 Lu, T H

## 大陸經營團隊 China Management Team

台玻悅達太陽能鏡板有限公司 TYSM	董事長 Chairman 總經理 GM	林嘉宏 Lin, C H 趙明 Chao, M	副董事長 Vice Chairman	符貴興 Fu, K H
台嘉玻璃纖維有限公司 TGF	董事長 Chairman 纖維事業部營運長 COO, Fiber 纖維事業部總經理 GM, Fiber 廠長 Plant Dir.	林伯豐 Lin, P F 蘇育德 Su, Y T 林嘉佑 Lin, C Y 王明慶 Wang, M C	協理 AGM 採購部協理 AGM, Purchasing	蕭世欽 Hsiao, S C 張森河 Chang, S H
台嘉成都玻纖有限公司 TCD	董事長 Chairman 纖維事業部營運長 COO, Fiber 纖維事業部總經理 GM, Fiber 營業部協理 AGM, Sales	林伯豐 Lin, P F 蘇育德 Su, Y T 林嘉佑 Lin, C Y 蔡維新 Tsai, W S	總經理 GM 採購部協理 AGM, Purchasing	胡文亮 Hu, W L 張森河 Chang, S H
台玻青島玻璃有限公司 QFG 青島壓花玻璃有限公司 QRG	董事長 Chairman 總經理 GM	林伯實 Lin, P S 宋成紅 Sung, C H		
台玻華南玻璃有限公司 HNG	董事長 Chairman 總經理 GM 鏡板部副總 VGM, Mirror glass	林伯淳 Lin, P C 李天明 Lee, T M 趙成家 Chao, C C	節能玻璃部協理 AGM, LE glass	趙新臣 Chao, H C
台玻東海玻璃有限公司 DHG	董事長 Chairman 總經理 GM	林伯實 Lin, P S 陳月進 Chen, Y C	副總 VGM	顏和平 Yan, H P
台玻福建光伏玻璃有限公司 FPG	董事長 Chairman 副總 VGM	林伯實 Lin, P S 楊萬鈺 Yang, W Y		
台玻天津玻璃有限公司 TJG	董事長 Chairman 總經理 GM 工程玻璃部協理 AGM, Engineering glass 浮法玻璃部生產協理 AGM, Flat glass	林伯淳 Lin, P C 楊溪鎮 Yang, S J 侯琨玉 Hou, K Y 侯俊山 Hou, C S	LE玻璃部協理 AGM, LE glass	趙新臣 Chao, H C
台嘉蚌埠玻璃纖維有限公司 TBF (建廠中 Under Construction)	董事長 Chairman 纖維事業部營運長 COO, Fiber 總經理 GM 採購部協理 AGM, Purchasing	林伯豐 Lin, P F 蘇育德 Su, Y T 陳正章 Chen, C C 張森河 Chang, S H		

## 產品介紹 Products

項目 Item	地區 Area	窯爐座 Furnaces	現有產能 Existing Capacity(MT)
<b>台玻集團各產品總產能 Total Production Capacity of Each Product</b>			
浮式平板玻璃 Float Glass	台灣 Taiwan 大陸 China 小計 Total	2 11 13	340,000 2,924,000 3,264,000
電子級超薄玻璃 Electronic Grade Ultra-thin Glass	台灣 Taiwan 大陸 China 小計 Total	1 - 1	15,000 - 15,000
光伏玻璃 Photovoltaic Glass	台灣 Taiwan 大陸 China 小計 Total	- 1 1	- 219,000 219,000
太陽能鏡板 Solar Mirror	台灣 Taiwan 大陸 China 小計 Total	- 1 1	- 72,000 72,000
壓花玻璃 Rolled Glass	台灣 Taiwan 大陸 China 小計 Total	- 1 1	- 39,600 39,600
玻璃纖維布 Fiberglass Fabric	台灣 Taiwan 大陸 China 小計 Total	1 4 5	20,000 72,000 92,000
玻璃纖維增強絲 Fiberglass Reinforced	台灣 Taiwan 大陸 China 小計 Total	1 - 1	60,000 - 60,000
容器玻璃 Glass Container	台灣 Taiwan 大陸 China 小計 Total	6 - 6	166,600 - 166,600
食廚玻璃 Glassware	台灣 Taiwan 大陸 China 小計 Total	2 - 2	11,000 - 11,000
合計 Total		13 18 31	612,600 3,326,600 3,939,200

### 台玻集團Low-E線加工產能 Capacity of Low-E Processing Production Lines

產品 Products	地區 Area	生產線 Lines	千M <sup>2</sup> Thousand M <sup>2</sup>
低輻射Low-E玻璃 Low-E Glass	台灣 Taiwan 大陸 China	1 8	4,000 32,000
低輻射真空玻璃 Low-E Vacuum Glass	台灣 Taiwan	1	300
合計 Total		10	36,300

### 台玻集團汽車玻璃加工線產能 Capacity of Automotive Glass Processing Production Lines

產品 Products	地區 Area	生產線 Lines	千台 Thousand Cars
汽車玻璃 Automotive Glass	台灣 Taiwan 大陸 China	1 2	250 450
合計 Total		3	700



## 產品介紹 Products

### 平板玻璃

平板玻璃是台玻發展的核心產品，台灣及中國大陸是台玻生產製造的兩大區域。產品主要行銷台灣、中國、日本、韓國、東南亞、北美、中東、澳洲、歐洲、南非及俄羅斯等地區。

### 建築用

#### 浮式明板玻璃 / 浮式色板玻璃

浮式明板玻璃表面平滑，波紋少，透視性佳，透過調伴適量色料，成為色板玻璃，可減少輻射熱的穿透，節省能源，增加建築物外觀色彩變化，創造更高價值感。

### 壓花玻璃

具有透光不透視之功能，亦可創造各種不同的模糊光移及陰影。

### 低輻射玻璃

隔熱效果最佳，具高透光率，可達環保節能及綠建材、綠建築的要求。世界先進國家生產之低輻射玻璃皆以雙層玻璃(隔熱及隔音效果佳，中間層為乾燥氣層有防霧效果)成品銷售。台玻各種低輻射玻璃產品輻射率可達最高級的0.02-0.12。

### 低輻射真空玻璃

真空玻璃是由一片浮式玻璃與一片低輻射玻璃組合密封，並將中間0.2mm的間隙抽成真空，為新一代的節能玻璃產品。結合低輻射鍍膜與真空的優點，具有良好的隔熱、隔音及防結霧功效，尤其保溫性能是中空玻璃的2-3倍，是單片普通玻璃的4-6倍，能為居家創造更舒適的生活環境。

### 反射玻璃

可防止陽光直射，隔熱性能高，提供室內居住者舒適感，亦能節省能源，並呈現多彩和諧的建築物外觀。

### 強化玻璃

強度約為普通玻璃的3-5倍，可增加玻璃使用的安全性，當玻璃遭受外力破壞時成為豆粒大的顆粒，減少對人體的傷害；可耐溫度之急速變化，因有瞬間破裂的風險，應再作熱浸處理Heat Soak test，確保使用上更安全。

### 熱處理增強玻璃

強度為普通玻璃的2倍，波紋較平整，且不易瞬間破裂。

### 膠合玻璃 / 高性能隔音膠合玻璃

具有安全性、防犯性、隔離紫外線、控制可視光線透過率、防止玻璃碎片飛散等特性，如使用有色膠合膜，亦可提昇建築物外觀的美感，且可減輕熱能進入室內，節省冷氣能源，增加生活環境舒適度。台玻開發製成之高性能隔音膠合玻璃，除上述特點，更具備了極佳的中高頻的隔音效果。

### 網印漆板玻璃

色澤多樣化，穩定不褪色，可減少太陽熱能進入室內，降低空調費用，且經強化處理，安全性高，可替代石材、磁磚，減輕建築物外牆結構負荷，亦可有效降低眩光作用。顏色及圖案也能提供客製化服務，創造設計獨特性及美感。

### 彎曲玻璃 / 彎曲強化玻璃

增添建築物景觀的雄偉性與優美性，使室內隔間更具多采多姿的變化；經過強化加工後，強度為一般彎曲玻璃的3-5倍，可因應對彎曲造型更大尺寸的要求，視覺品質佳。

### 銀鏡玻璃

反射影像清晰、精準，背漆可耐酸、耐濕，環保銀鏡運用無銅、鉛製程，避免重金屬污染，符合地球環保潮流。

### 光電用

#### 優白玻璃

具有比一般透明玻璃更優越的光學性能，更高的可見光及紅外線透過率，大量提升太陽熱能使用率，可使用在任何需要低鐵高透光及高透視場合或產品，例如太陽能電池BIPV及高級建材需求使用，以因應未來因石油資源枯竭，人類對節能環保及再生能源的需求。

### 超白光伏玻璃

主要用於晶體矽太陽電池板的蓋板玻璃，具有低含鐵量、高透光率、低光反射率、高平整度、高機械強度、低自爆率、抗風化、抗沖擊等優異特點。

## 產品介紹 Products

### 電子級超薄玻璃

台中廠TF5為全新電子級超薄觸控玻璃生產線，全面導入電腦化自動生產管理系統、無塵室及機械手臂收片等設備。2014年11月正式投產，厚度1.1mm、0.7mm至0.55mm皆已量產，0.33mm也已產出，產品經過多重檢驗嚴格把關，媲美日系供應廠商，達到高品質的國際水準，可供應國內外電子大廠生產高品質之消費性電子產品。

### 汽車玻璃

台灣汽車玻璃股份有限公司，生產製造各式汽車用前擋風膠合玻璃、天窗、車門窗及後擋風強化玻璃。為台灣主要汽車玻璃供應商，市場佔有率40%；產品通過世界各國汽車零件品質安全認證：台灣車輛安全審驗中心、歐盟ECE、日本JIS、美國AS及中國CCC，並供應 TOYOTA、FORD、MAZDA、HONDA、NISSAN、HYUNDAI、SUZUKI等國內、外各大汽車製造廠生產線組裝及售後服務零件使用。

### 玻璃纖維增強絲

玻璃纖維的製造係將熔融狀的玻璃絲急冷固化而得之纖維狀材料。

用途: F.R.P(Fiber Reinforced Plastic)產業，利用玻璃纖維來強化塑膠材料，應用層面包括：船體類、管建類、耐腐蝕工程類、工程塑膠類、運動器材類、電子電器類、運輸工具類、航太軍事類等。台玻目前玻璃纖維增強絲產品有切股氈(CSM)、併股紗束(CR)、直捲紗束(DR)、編紗束(WR)、切股(CS/O-CS)。玻璃纖維的優異性為耐衝擊強度高、電氣絕緣性佳，是FRP產業中最廣泛使用之材料。

### 玻璃纖維紗、布

#### 玻璃纖維紗

係由慎選合格的原料精密混合，嚴格的生產條件控制，經由高溫溶解抽取而成；台玻生產單纖直徑G(9  $\mu$ m)、E(7  $\mu$ m)、D(5  $\mu$ m)及BC(4  $\mu$ m)等系列玻璃纖維紗，品質精良，除大量用於織造電子級玻璃纖維布供作印刷電路板(PCB)原材料外，亦被廣泛使用作為補強材及其他用途。

### 玻璃纖維布

台玻以自製優質玻璃纖維紗織造#7628、#2116、#1080、#106、#1027等完整系列之電子級玻璃纖維布，生產規模位居全球前二大廠之列。主要供應國內外銅箔基板大廠生產黏結片及高壓成型板材用於印刷電路板，品質符合嚴格標準，並廣為國內外知名大廠指定使用。

### 玻璃器皿

#### 容器

玻璃容器具有絕佳之透明度，且易封蓋及長時間保存內容物風味等優點。此外，玻璃容器亦能漸進加熱至高溫而不變形。且可百分之百的回收再使用之特性，不會破壞地球環境生態，勢必是未來政府環保政策與社會環保意識最為支持的一種包裝材料。為因應市場需求與考量環保因素，台玻致力於輕量瓶(NNPB)吹製技術，製造厚度輕薄均勻、外型美觀的瓶形，年產量超過2億支以上，不僅可減輕客戶的採購成本，並可節省原料與能源，進而促進對環境的保護。容器種類可分為：狹口瓶、廣口瓶、輕量瓶(NNPB)，色澤可分為透明、茶色、綠色(翡翠綠、古典綠、香檳綠)、寶藍色等色。為提供嬰兒奶瓶市場多樣性的選擇，台玻新開發生產耐熱玻璃奶瓶，瞬間耐熱溫差可達150℃，符合國家CNS標準，提供消費者更具安全保障的高品質奶瓶。

#### 食器

產品分為杯身較薄的吹製杯及杯身較厚、有手把的壓製杯，色澤及白度優並可提供客戶不同顏色的選擇(如：黑色、鐵灰色、藍色、綠色、紫色等)，品質符合CNS、美國FDA、歐盟REACH及SVHC等多項國際標準。產品種類有水杯、啤酒杯、威士忌杯、馬克杯、密封罐、碗盤等，可搭配印刷、貼花、咬霧、噴砂、噴色等加工處理，讓產品更豐富。

#### 廚器

為膨脹係數 $\alpha$ -33之硼矽酸耐熱玻璃，瞬間溫差可達150℃，且耐酸鹼性與強度均較鈉鈣玻璃佳，大幅提升使用安全性及用途多樣化。產品主要為咖啡壺、沖茶器、泡茶壺、儲物罐等，並陸續開發接柄杯及雙層杯等加工產品，提高附加價值。

## 產品介紹 Products

### 食廚器玻璃加工

與日本耐熱玻璃廠HARIO合作，導入技術並設立食廚加工場，對於自行生產的耐熱玻璃產品進行加工及組裝作業，強化台玻食廚器產品的多元性。

### 容食廚器產品設計與自有品牌開發

由日本工業設計大師深澤直人操刀，設計簡單又具質感的生活器皿以作為市場區隔並發展自有品牌。

## 實聯化工江蘇股份有限公司

### 純鹼

純鹼 ( $\text{Na}_2\text{CO}_3$ ) 是重要的化工基本原料之一，廣泛應用於化工、玻璃、冶金、造紙、印染、合成洗滌劑、石油化工、食品、醫藥衛生等工業，使用量大，在國民經濟中佔有重要的地位。

### 氯化銨

氯化銨 ( $\text{NH}_4\text{Cl}$ ) 是一種優良的氮肥，廣泛應用於複合肥行業。特別適用於水稻、小麥、棉花、麻類、蔬菜等作物，肥效快、持續時間長、能加速作物光合作用，促進新陳代謝，增根壯莖茂葉，提高作物的抗病蟲害和抗倒狀能力，增加產量。



實聯化工江蘇有限公司 聯碱廠  
SHIH LIEN CHEMICAL INDUSTRIAL JIANGSU CO., LTD. Soda Ash Plant

## 產品介紹 Products

### Flat Glass

Flat glass is one of the core products of TG. With production plants based in Taiwan and China, TG's major markets reach Taiwan, China, Japan, Korea, South-East Asia, North America, Middle East, Australia, Europe, South Africa, Russia, and so forth.

### for ARCHITECTURE

#### Clear Float Glass / Tinted Float Glass

Clear float glass features smooth and flat surfaces, low distortion, and high transparency. With a prescribed quantity of tint agent, it can be turned into tinted float glass, which reduces solar heat transmission to save energy and offers diverse exterior colors for buildings to create higher added-value.

#### Rolled Glass

Rolled Glass not only provides the function of visual screen but also enables shifts between light and shade.

#### Low-E Glass

Low-E glass has the best performance of thermal insulation and offers high transparency and energy-saving properties that is required for green buildings and construction materials. The Low-E Glass supplied in developed countries is all made into insulating glass (which offers better insulation and soundproof performance and prevents misting by using dry air in the unit). All TG's Low-E glass can achieve an emissivity coefficient between 0.02 and 0.12.

#### Low-E Vacuum Glass

Consists of one pane of float glass and one pane of Low-E glass, with a 0.2mm vacuum in between. This is a new-generation energy saving glass with advantages of Low-E coating and vacuum spacing. It presents excellent thermal, acoustic and anti-mist performance, its insulative ability is 2 to 3 times better than normal insulating glass and 4 to 6 times than single glass, creating wonderful living environment.

#### Reflective Glass

Reflective glass can deflect incident sunlight and provide high thermal performance for indoor comfort. It can save the energy, and meanwhile improve the aesthetic appeal of the building.

### Tempered Glass

Tempered glass is 3-5 times stronger than annealed glass and improves the safety of glass application. Once broken, the glass crumbles into small granular chunks, which are less likely to cause injury. It can also withstand sudden changes in temperature. To avoid the spontaneous breakage, tempered glass should undergo heat soak test to improve safety in use.

### Heat Strengthened Glass

Heat strengthened glass is 2 times stronger than annealed glass with less distortion, and less likely to occur spontaneous breakage.

### Laminated Glass /

#### Sound Control Laminated Glass

Laminated glass has features of enhanced safety, security, protection from ultraviolet rays, control over transparency levels and shatter-prevention. The color laminated glass can raise the aesthetic appeal of the building, reduce the solar heat transmission to save energy and improve the comfort of living areas. In addition to the features above, sound control laminated glass, developed by TG, also provides an excellent sound insulation properties, ranging from medium to high frequency.

### Ceramic Spandrel Glass /

#### Ceramic Silkscreen Glass

Ceramic spandrel and ceramic silkscreen glass provide a variety of stable and durable colors. They can also reduce air-conditioning cost by insulating solar heat. After being tempered to improve safety, spandrel and silkscreen glass can be a substitute for stone and tile to reduce the structural load on the external wall. The printing of the glass can also reduce glare. Various colors and graphics can be custom-made to meet designing needs as well as create particularity of space design.

### Bent Glass / Bent Tempered Glass

Buildings glazed with bent glass can improve spectacular and aesthetic appeal and have the advantages of diversified facade and interior partition. After tempering process, bent tempered glass, which is 3-5 times stronger than ordinary bent glass, can meet the requirements for larger sizes and exceptional optical quality.



## 產品介紹 Products

### Silver Mirror

Mirror glass provides clear and exact reflections. Its back paint resists acid and humidity. Environmentally-friendly silver mirror is produced by copper/lead free process to prevent metal contamination, meeting environmental requirements around the world.

### for SOLAR PANEL

#### Super Clear Glass

Super clear glass has better optical performance with higher visible light and infrared transmittance than ordinary clear glass and greatly enhances solar heat transmittance. Super clear glass can be used for any applications and products that require high transmittance and transparency, i.e. the application of BIPV solar module and advanced construction materials, to respond to the issues of oil resource depletion and the requirements of clean and renewable energy.

### Low Iron Photovoltaic Cover Glass

Mainly used as the cover of crystalline silicon solar modules with the advantageous features of low iron content, high transmission, low reflecting rate, high flatness, high mechanical strength, low probability of spontaneous breakage, anti-weathering, high impact resistance and so forth.

### Electronic Grade Ultra-Thin Glass

The TF5 furnace in Taichung Factory is a newly established production line for electronic grade ultra-thin glass. Introducing the installations of Computerized Automated Production Management System, cleanroom and mechanical arms for collecting glass panes, this line started production in November 2014 with mass production for 1.1mm and 0.7mm glass and production of 0.33mm glass. All of the products undergo strict inspections before shipment. The high quality product is able to compete with Japanese manufacturers and provide for major electronic manufacturers at home and abroad to produce consumer electronic goods.

### Automotive Glass

Taiwan Autoglass Ind. Corp., the main supplier of automotive glass in Taiwan with 40% market share, produces various laminated windshield glass, sunroof glass, side windows, and tempered rear windows. Its glass products not only are awarded the quality and safety certifications around the world, including VSCC in Taiwan, ECE in European Union, JIS in Japan, AS in the U.S., and CCC in China, but also are

supplied as Original Equipment and Automotive Glass Replacement for several international car makers, such as TOYOTA, FORD, MAZDA, HONDA, NISSAN, HYUNDAI, and SUZUKI.

### Fiberglass Reinforced

Fiberglass reinforced is a fiber-like material manufactured by rapidly cooling melted glass filaments. FRP (fiber reinforced plastic) industry uses fiber glass to reinforce plastic composites, widely applied to the fields including: shipbuilding, construction, corrosion-resistant engineering, engineering plastics, sports/recreation, electronics, transportation, military and aerospace, etc. The products of TG fiberglass reinforced include Chopped Strand Mat (CSM), Conventional Roving (CR), Direct Roving (DR), Woven Roving (WR), and Chopped Strand (CS/O-CS). With outstanding characteristics of high impact strength and excellent electrical insulation properties, fiberglass reinforced is widely used in FRP industry.

### Fiberglass Yarn & Fabric

#### Fiberglass Yarn

Fiberglass Yarn is the product of select materials mixed in a specific proportion, melted in high temperature furnaces and drawn into filament under strict control. TG is capable of producing a variety of fiberglass yarn with single filament diameters in G (9  $\mu$  m), E (7  $\mu$  m), D (5  $\mu$  m) and BC (4  $\mu$  m). TG fiberglass yarn is not only woven in large volume into E-glass fiberglass fabric for the production of printed circuit boards (PCB), but also in an extensive range of applications requiring strengthening, reinforcement, and other related uses.

#### Fiberglass Fabric

By making fiberglass yarn in house, TG weaves a complete series of E-glass fiberglass fabric such as #7628, #2116, #1080, #106, #1027 and etc, ranking it among the world's top two manufacturers by production scale. TG supplies fiberglass fabric to domestic and overseas Copper Clad Laminate (CCL) manufacturers to be reworked as prepreg and laminate, the preparatory status of PCBs. By adhering to the highest quality standards, TG has become an internationally renowned and trusted manufacturer.

## 產品介紹 Products

### Container, Tableware & Kitchenware

#### Container

Glass containers possess the special advantages of excellent transparency, easy sealing and flavor preservation. Furthermore, glass containers can be heated up gradually without deforming. It is also 100% recyclable and, therefore, environmentally friendly, fully aligned with government's environment protection policy and supported by social environmental consciousness groups.

In light of market demand and environmental concerns, TGI has put emphasis on NNPB technique to produce lightweight glass bottles, consistent wall thickness and good appearance, with production capacity more than 200 million pieces each year. Besides saving cost for customers, lightweight bottles require less raw materials and energy, therefore are more environmentally friendly.

Glass containers are classified by shape: narrow neck bottles, wide mouth jars, lightweight bottles (NNPB) and by color: flint, amber, green (emerald, antique, champagne green), cobalt blue, etc..

To provide more choices to the markets, TGI has developed and produced heat-resistant baby feeding bottles, capable of withstanding thermal shock up to 150°C, which meets the requirements of CNS and safety standards of high quality.

#### Tableware

Tableware glass includes blown-wares with thin walls and press-wares for thicker walls or glasses with handles. With its high transparency and clarity, various colors (ex. black, charcoal, blue, green, purple) are available for clients to choose from. The fine quality of our tableware products have been approved to meet CNS, FDA, ROHS, REACH and SVHC standards. A variety of products including tumblers, beer glasses, whisky glasses, mugs, canisters, bowls/plates with diverse value-added process such as screen-printing, frosting, sand-blasting and color spraying meet market needs.

#### Kitchenware

Kitchenware glass is made of  $\alpha$ -33 borosilicate material with thermal resistant to 150°C temperature difference with better alkali and acid-resistance than sodalime glass, enhancing the safety and diversity of products. Product range includes coffee / tea pots, pitchers,

jars, etc, and we continue to add value by developing handle-attaching and double-wall glassware.

#### Tableware & Kitchenware Processing

TG cooperated with HARIO, a Japanese borosilicate glass manufacturer, to increase know-how and build a plant for glass processing as well as parts-assembling which will enhance the diversity of the product range.

#### Design and Brand Name

TG has invited renowned Japanese industrial designer Fukasawa Naoto to manage product designs that are simple yet high quality to build a lifestyle brand separate from the current market segment.

### Soda Ash & Ammonium Chloride

#### SHIHLIEN CHEMICAL INDUSTRIAL JIANGSU CO., LTD.

##### Soda Ash

Soda ash ( $\text{Na}^2\text{CO}^3$ ) is one of the most important industrial chemicals with widespread applications. It is one of the basic raw materials for glass, for papermaking, dyeing and detergents, and can also be used as flux for metallurgy and softener for water purification.

##### Ammonium Chloride

Ammonium Chloride ( $\text{NH}^4\text{C}^1$ ) is mainly used as nitrogenous fertilizer for the complex fertilizer industry. It accelerates photosynthesis and crop metabolism, contributing to plant health and thereby increases crop yield. It is highly suitable for rice, wheat, cotton, hemp and vegetables, with a quick and long-lasting fertilizing effect.



## 產品介紹 Products

### Low-E 玻璃

#### 單銀低輻射玻璃

1. 紅外線反射率高，可直接反射遠紅外熱輻射；
2. 表面輻射率(ε)低，吸收外來能量的能力小，從而再輻射出的熱能少；
3. 遮陽係數(SC)可選擇範圍廣，可根據需要調節太陽直接輻射能透過量，以適應不同的設計需要。

#### 雙銀低輻射玻璃

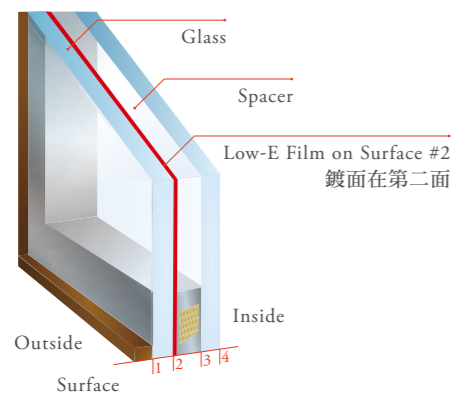
1. 較高的可見光透光率，室內可充分利用自然光采光。
2. 極低的太陽能透過率，有效限制太陽熱輻射的透過，尤其是近紅外熱輻射透過；遮陽係數(SC)較單銀Low-E玻璃更低。
3. 有效地限制夏季室外的熱輻射進入室內。和單銀Low-E玻璃比較，冬季保溫性能更好，傳熱係數(U值)更低。

#### 三銀低輻射玻璃

高透光率、低反射率、低SC值並存，極低的輻射率與雙銀低輻射玻璃或單銀低輻射玻璃對比，具有同樣可見光透過率的三種玻璃：  
 SC三銀玻璃 < SC雙銀玻璃 < SC單銀玻璃  
 具有同樣SC值的三種玻璃，室外反射率下限RO：  
 RO三銀玻璃 < RO雙銀玻璃 < RO單銀玻璃

### 低輻射中空玻璃構造圖

#### Construction of Low-E Insulating Glass



### Low-E Glass

#### Single Low-E Glass

1. Because of the high infrared reflectance, the Low-E glass can reflect far infrared heat radiation directly.
2. Due to the low emissivity, the glass surface is less able to absorb external energy, and thus lower the reradiated thermal (heat) energy.
3. With wide range of shading coefficient (SC) options, customers can choose different levels of direct solar heat transmission based on needs and designs.

#### Double Low-E Glass

1. With higher visible light transmittance, it allows to make the most of indoor natural lighting.
2. The solar heat transmission through windows is extremely low. It effectively limits solar thermal radiation, especially the near-infrared. Its shading coefficient is also lower than Single Low-E Glass.
3. It effectively limits outdoor thermal radiation in summer. Compare with Single LOW-E Glass, it also has better insulation and lower U value in winter.

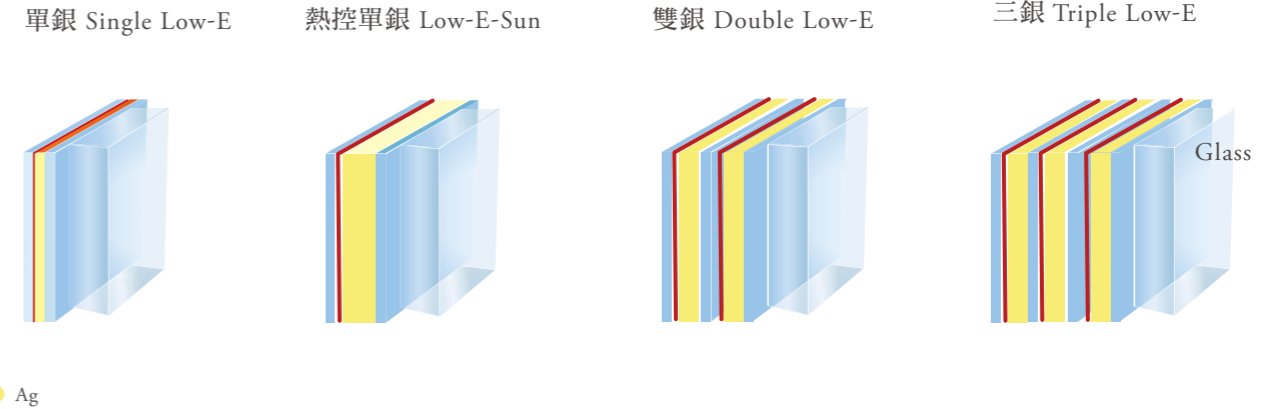
#### Triple Low-E Glass

With all the features of high transparency, low reflectivity, low SC values, and low emissivity. Compare Double Low-E glass or Single Low-E glass with the same visible light transparency:  
 SC Triple Low-E glass < SC Double Low-E glass < SC Single Low-E glass  
 With the same SC value, the outdoor reflective rate lower limit RO:  
 RO Triple Low-E glass < RO Double Low-E glass < RO Single Low-E glass

## 產品介紹 Products

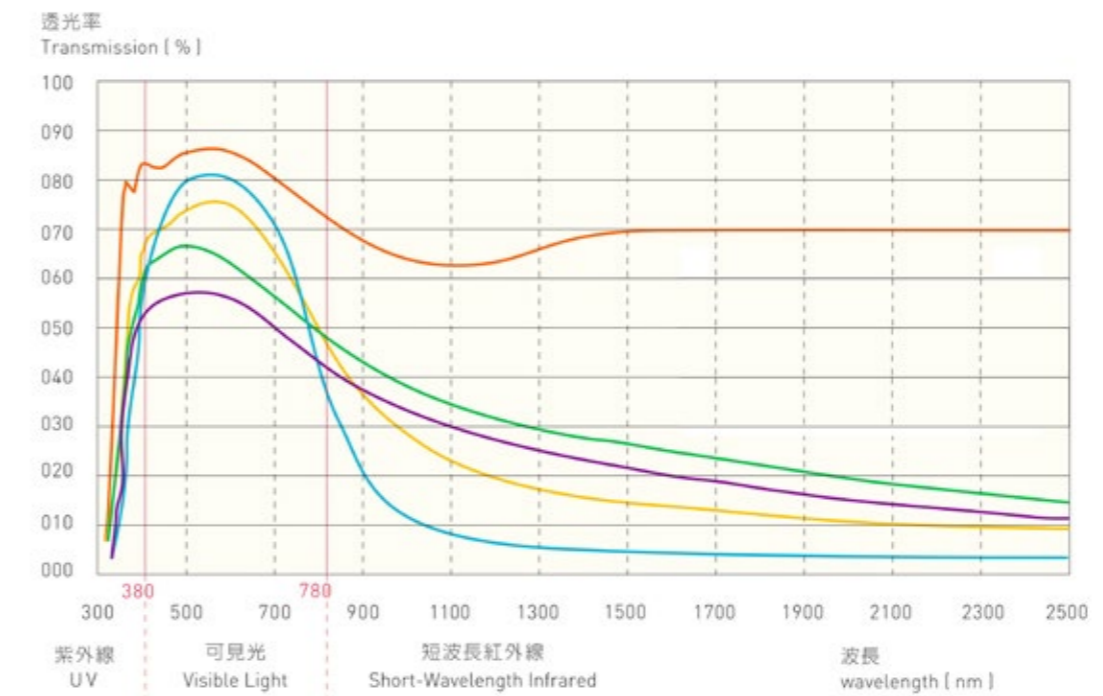
### 鍍膜層構造

#### Low-E Coating Structures



### 不同鍍膜在太陽光譜中透射率的比較

#### Spectrum for Different Coating Glass Transmission



### 空調耗電比率

透明玻璃	用電比率：1.00
三銀Low-E玻璃	用電比率：0.57
雙銀Low-E玻璃	用電比率：0.62
單銀Low-E玻璃	用電比率：0.66
熱控單銀Low-E玻璃	用電比率：0.64

## 產品介紹 Products

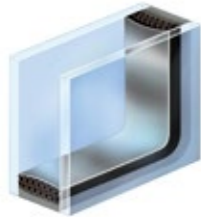
### TPS玻璃

#### 新一代中空系統

TPS是一種新型的中空玻璃暖邊系統，它是以特殊丁基膠為輔材，填入分子篩的熱塑性隔條。

#### 特性

1. TPS: Thermo Plastic Spacer / 熱塑性隔條
2. TPS熱塑性隔條不含金屬嵌入物
3. 提高玻璃邊緣的熱阻隔性
4. 溫度均勻分布在整個玻璃表面
5. 有效降低凝露的產生
6. 彈性邊緣密封
7. 使玻璃設計變得更為靈活和方便
8. 完美的匹配玻璃裝配行業
9. 高的質量控制=更長的使用壽命



普通型 Conventional IGU  
分三部分：剛性間隔填充分子篩塗布丁基膠  
Three parts: fixed spacer filled with desiccant and a special butyl.



TPS  
一個整體：熱塑性隔條填充分子篩  
One single unit: Thermo Plastic Spacer filled with desiccant.

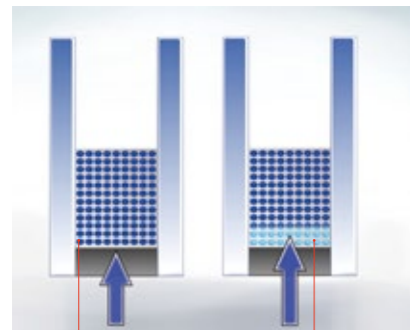


良好的力學性能  
Better mechanical performance

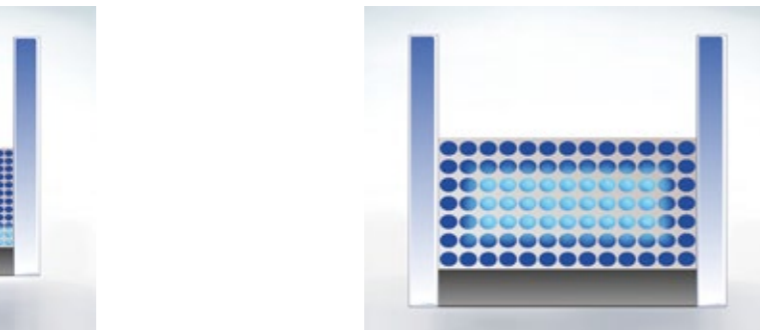
### TPS濕氣屏障的原理 The Principles of TPS Moisture Barrier

長久的使用壽命源自最終的水氣屏障

The durability is ultimately determined by the barrier of moisture.



初期水分滲入  
Humidity penetration in early stage.



水分滲入後期形成自然屏障  
After the penetration, the moist develops a natural barrier.

- 乾燥的分子篩 Dry desiccant
- 半飽和分子篩 Half-saturated desiccant
- 飽和分子篩 Saturated desiccant

## 產品介紹 Products

### 應用領域

1. 住宅建築
2. 商用建築
3. 結構幕牆
4. 高速鐵路
5. 汽車、大型巴士

### Applications

1. Residential building
2. Commercial buildings
3. Structural curtain wall
4. High speed rail
5. Vehicles and buses

### 設計師擁有選擇權

#### Designers have the options



1. 生產形狀靈活多樣  
Dynamic and various shapes



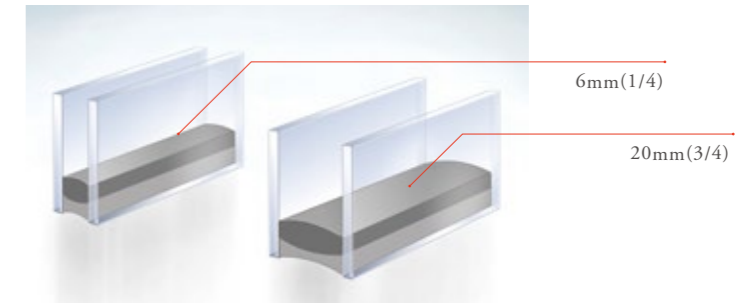
2. 鏤空的中空玻璃系統  
Hollow-out insulating glass system



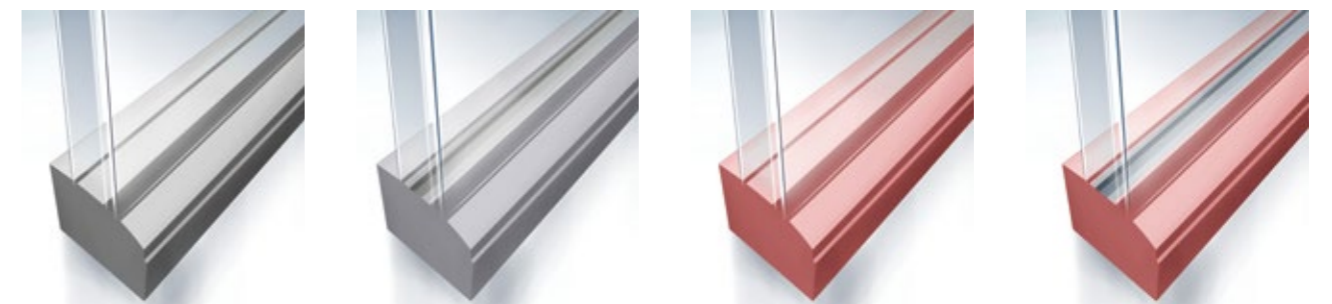
3. 內飾條協調地裝在熱塑性隔條上  
Moulding / decoration strip works perfectly with Thermo Plastic Spacer



4. 有邊或無邊的中空玻璃  
Insulating glass with or without edge



5. 隔條寬度通常可以在6到20mm的範圍內任意調節  
The width of spacer normally can be freely adjusted between 6 and 20mm



6. 在窗框和玻璃之間獲得更好的視覺感官  
Better visual effects for the frame and glass



## 產品介紹 Products

### Low-E 真空玻璃

將一片平板玻璃及一片Low-E玻璃，以真空用封裝材料封合，形成一封閉空間，中間以不影響透光性的極小支撐點隔開，利用側邊處的抽氣管，將內部空氣抽出後封口，即形成Low-E真空玻璃。

#### 產品規格

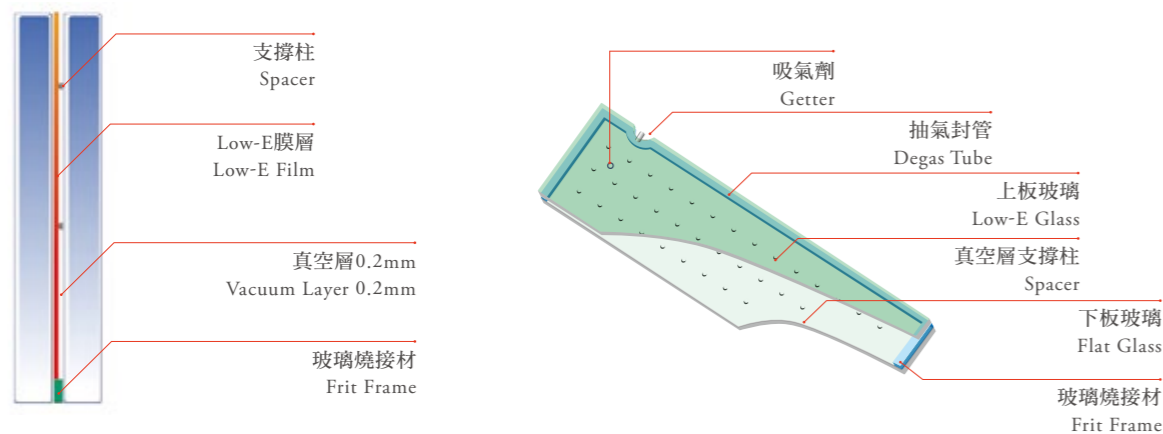
玻璃厚度: 3.2+3.2-8+8 mm  
 最大尺寸: 3600\*1800 mm  
 最小尺寸: 500\*500 mm

#### 優點

1. 傳熱係數U值低: 可大幅降低空調耗電量，降低污染和溫室氣體排放，減少環境污染，達到節能減碳。
2. 隔熱保溫: 炎熱的夏季，能有效阻隔太陽光熱源，保持室內涼爽；寒冷的冬季，能有高效能隔絕熱耗，維持室內保暖舒適。
3. 隔音減噪: 真空層能有效阻隔聲音傳遞，隔音量可達39dB。
4. 防止結露: 最低結露溫度可達-40℃，不會產生窗戶霧化及內結露現象。
5. 使用壽命長: 放置吸氣劑材料可維持真空度穩定及保護Low-E鍍膜，延長節能壽命。

台玻東元所開發的真空玻璃，經「CTC中國建築材料檢驗認證中心」驗證，達到國家標準中建築門窗保溫性能分級的最高等級。

#### 真空玻璃結構圖 VIG Structure



### Low-E VIG

Consists of one piece of float glass and one piece of Low-E Glass, there are tiny spacers to form a gap between two glass plates with a vacuum layer 0.2mm. Using the frit on glass edges to enclose the space. Insert a tube connected to this space for degassing. Seal the tube after degassed, and this panel is formed as a VIG.

#### Specification

Glass Thickness: 3.2+3.2-8+8 mm  
 Max. size: 3600\*1800 mm  
 Min. size: 500\*500 mm

#### Advantages

1. Low thermal transmittance U value: can significantly reduce the air conditioning electricity consumption, decrease pollutants and greenhouse gas emissions, reduce environmental pollution, to meet the energy saving and carbon reduction requirements.
2. Heat Insulation: in hot summers, it can effectively block sunlight heat, keeping interiors cool; in cold winters, it has high performance of heat loss insulation, keeping interiors warm and comfortable.
3. Soundproofing: vacuum layer can effectively block noise transmission and reduce sound transmission class by 39dB.
4. Anti-dew-forming: minimum condensation temperature about -40 °C without windows fogging and inner condensation.
5. Long usage life: place getter material inside to maintain vacuum level stable and protect Low-E coating to prolong the usage life.

Vacuum glass developed by TG TECO which was tested by "CTC China Building Material Test and Certification Center" has reached the highest level of national standards in insulation grade for building windows.

## Low-E 玻璃應用 Applications

### 適用(亞)熱帶型氣候組合

#### Assembly Sequence Suitable for (Sub) Tropical Zone



室外 Outside  
 Low-E glass  
 (coating on surface #2)      1 2      3 4      室內 Inside  
 Clear or tinted glass

鍍面在#2面: 阻斷大量輻射熱能的穿透，僅少數熱能進入使室內保持涼爽。

coating on surface #2: The heat is reradiated back outdoors, reducing the heat gain potential into the building interior.



中國信託新總行大樓  
 CTBC Bank  
 Low-E (TDE72) IGU

### 適用(寒)溫帶型氣候組合

#### Assembly Sequence Suitable for (Frigid) Temperate Zone



室外 Outside      1 2      3 4      室內 Inside  
 Clear or tinted glass      Low-E glass  
 (coating on surface #3)

鍍面在#3面: 室內的熱能因Low-E雙層玻璃的阻斷而不易輻射至室外而能保暖。

coating on surface #3: Low-E insulating glass will reflect IR heat from inside the room to help reduce the energy loss.



台中國家歌劇院  
 National Taichung Theater  
 Low-E (TDE78) IGU



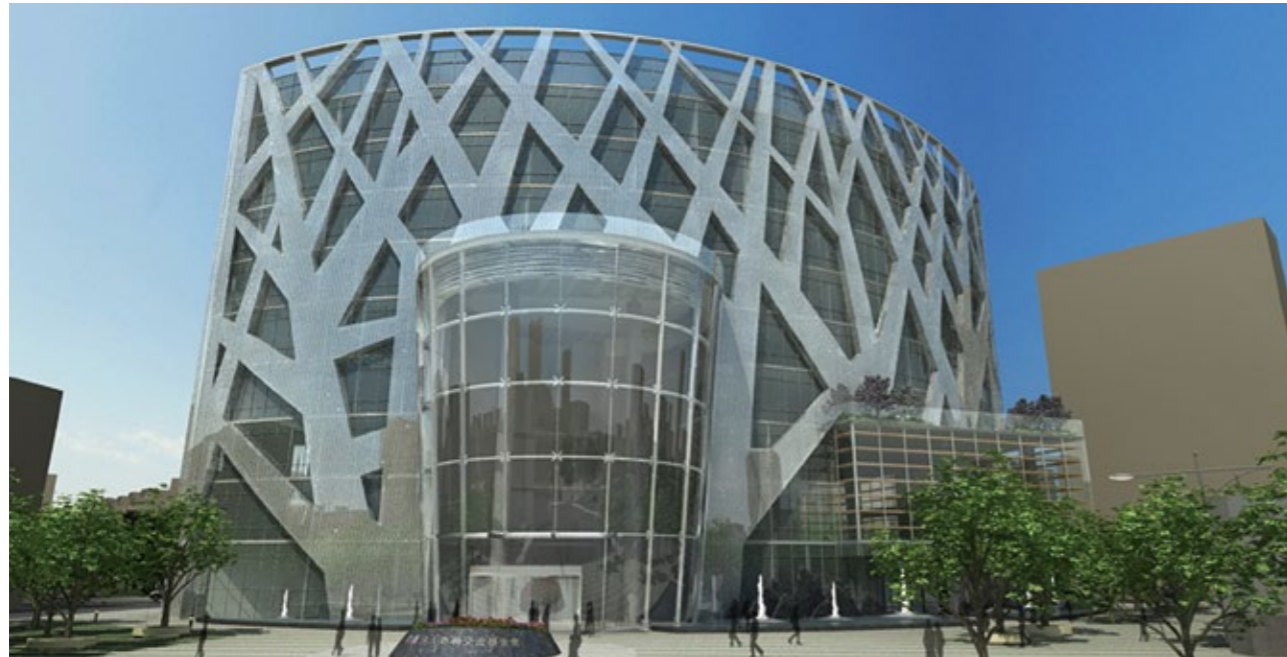
奇美醫院 第四醫療大樓  
 Chi Mei Hospital-Fourth Medical Building  
 Low-E Vacuum Glass



國泰置地廣場  
 Cathay Landmark  
 Low-E (TDE44) IGU



## 節能實例 Energy Saving Project Case Study



海峽交流基金會 The Straits Exchange Foundation 採用TG 灰色雙銀低輻射中空玻璃 Glass Type: TG Gray Double Low-E CLR (GY-TDE)

「海峽交流基金會」位於台北市大直北安路的新大樓，建築物帷幕外牆是台玻與閻辰昌建築師共同研發設計，獲得「建物外玻璃熱透過率(THT)值在0.18以下的綠建築節能(銀級)標章」。建物外牆90%都是玻璃結構，採用台玻Low-E節能雙層玻璃，相較採用一般玻璃，預估可減少50%的冷氣耗電費。主要區分三大部分：

1. 大廳「天燈」玻璃結構體總高20公尺，入口用結構玻璃方式支撐5片大玻璃，組成倒錐型立體天燈，每片約一層樓高，尺寸完全不同尤其以異形切割加工為Low-E節能雙層玻璃，中間為12mm惰性氣體Argon的空氣層。
2. 藏在鋁板樟樹後面的門窗玻璃，是外牆面積最大的玻璃結構，採用Low-E節能雙層玻璃，中間為6mm惰性氣體的空氣層，能有效克服西曬，增強阻隔熱能。
3. 建物右側「大會議廳」，考慮到使用的頻率與功能性，控制阻隔熱能，並減少太陽光所造成的眩光，同時防紅外線與紫外線，採用Low-E節能雙層玻璃，中間為8mm惰性氣體的空氣層，讓會議室光源柔和。

The Straits Exchange Foundation has its office in a new building at Bei-an Road, Dazhi, Taipei. The building was awarded as a green building on the merit of external glazing with a coefficient of thermal transmittance (THT) smaller than 0.18 (Silver Level) for its curtain wall, designed cooperatively by TGI and architect Charles C. Yen. 90% of the building's external wall is made of glass structure, glazed with TGI's Low-E energy-saving insulating glass units, saving about 50% of electricity cost for air conditioning compared with common glass. The building consists of three major sections:

1. The lobby "Sky Lantern", built with glass structures 20 meters high, has adopted structural glass for its entrance, supporting five large-sized glass panels and forming a reversed conical shape. Each glass panel, measuring one storey in height, has different dimensions and is processed into Low-E energy-saving insulating glass units with a 12mm Argon-filled space.
2. The glazing of doors and windows behind the aluminum camphor tree is the largest exterior glass structure, installed with Low-E energy-saving insulating glass units with a 6mm Argon-filled space, effectively overcoming the direct exposure to afternoon sun and enhancing the insulation of heat.
3. Considering the frequency of use and functions of the Convention Hall on the right side of the building, Low-E energy-saving insulating glass units with an 8mm Argon-filled space was used for the glazing. Hence, the heat, sunlight glare, infrared light and ultraviolet light were effectively controlled or reduced, illuminating the hall with soft and glare-free light.

## 股務記錄 Stock

年 Year	加權指數 Taiaex		股價 Stock Price		股利 Dividend	
	High	Low	High	Low	Cash	Stock
1973	514	225	38.60	25.20	1.00	2.00
1974	498	188	35.20	11.30	0.70	1.80
1975	429	190	28.30	13.60	0.70	1.80
1976	417	257	26.95	17.00	2.00	0.84
1977	450	313	27.65	17.30	0.80	1.70
1978	688	447	36.00	24.80	1.24	1.96
1979	659	502	35.40	24.40	2.072	1.428
1980	599	480	32.20	23.30	1.889	1.111
1981	600	502	27.70	20.50	0.50	1.50
1982	546	421	23.00	15.40	0.20	1.10
1983	765	434	38.20	17.10	0.72	1.48
1984	969	764	37.00	30.20	0.60	1.60
1985	840	636	33.10	20.30	-	1.40
1986	1039	839	40.10	31.70	-	1.60
1987	4673	1063	95.00	38.70	-	1.80
1988	8789	2341	125.00	58.50	-	1.80
1989	10773	4873	188.00	78.00	-	2.00
1990	12495	2560	144.00	36.90	-	1.80
1991	6305	3316	71.00	39.70	0.458	1.042
1992	5391	3327	47.50	28.00	0.35	1.00
1993	6070	3135	53.00	29.70	0.35	1.00
1994	7183	5194	65.00	41.70	0.35	1.50
1995	7051	4503	63.50	46.00	0.35	1.50
1996	6982	4690	67.50	47.50	-	1.903
1997	10116	6802	66.50	36.30	0.76	1.09
1998	9277	6251	44.90	30.30	1.35	-
1999	8608	5474	34.80	20.10	1.25	-
2000	10393	4555	39.80	22.00	0.80	0.81
2001	6104	3411	33.20	17.80	1.00	-
2002	6484	3846	29.10	17.60	0.30	0.70
2003	6182	4044	28.60	20.30	0.40	0.80
2004	7135	5255	33.00	24.30	0.50	1.00
2005	6600	5565	31.50	23.70	0.40	0.80
2006	7823	6232	30.40	21.60	0.24	0.96
2007	9859	7306	46.30	25.55	0.40	0.80
2008	9309	3955	41.55	13.30	0.20	0.30
2009	8188	4165	27.70	15.40	0.20	0.30
2010	8990	7072	38.50	24.60	0.60	1.00
2011	9220	6609	53.70	27.10	0.45	0.45
2012	8144	6895	37.30	23.75	0.10	-
2013	8647	7603	35.20	25.70	0.10	-
2014	9569	8264	33.50	21.00	-	-
2015	9973	7410	24.60	10.65	-	-
Total	-	-	-	-	23.33	45.67

主要股東(2016-04) Major Shareholders	(%)
台豐投資股份有限公司 Tai Hong Investment Corp.	14.86
合和投資股份有限公司 Ho Ho Investment Corp.	12.96
台建投資股份有限公司 Tai Chien Investment Corp.	8.80
台成投資股份有限公司 Tai Cheng Investment Corp.	8.05
台玉投資股份有限公司 Tai Yu Investment Corp.	6.24
台嘉投資股份有限公司 Tai Chia Investment Corp.	5.58
林建成嘉記股份有限公司 Lim Ken Seng Kah Kih Corp.	4.66
富邦人壽保險股份有限公司 Fubon Life Insurance Corp.	3.12
全球人壽保險股份有限公司 TransGolbe Life Insurance Corp.	2.35
南山人壽保險股份有限公司 Nan Shan Life Insurance Corp.	2.22
台玻職工退休基金管委會 TGI Retirement Fund.	1.48
東南亞玻璃工業股份有限公司 S.E.A. Glass PTE. Ltd.	0.99
Total	71.31

股東總人數(2016-04) Total Shareholders	44,141 人
2015 總成交量數 Transaction Volume	528,971,340 股
員工總人數(2016-04) Employees	台灣 4,677 人 大陸 10,713 人 合計 15,390 人

決算日期: 2015年12月31日  
Fiscal Year Ends on December 31, 2015  
股東常會: 2016年06月17日  
General Shareholders' Meeting: June 17, 2016  
公告: 公開資訊觀測站  
Public Notice: mops.twse.com.tw/index.htm  
辦理過戶: 台灣玻璃工業公司 股務課  
Stock Transfer Registration: TGI Stock Affairs Div.  
會計師: 安永聯合會計師事務所  
C.P.A.: Ernst & Young



# 集團沿革 Taiwan Glass Group History

## 1964

1964 公司創立，資本額一億五千萬元  
Company established, capital NT\$150 million



1965 日本旭硝子株式會社平板玻璃技術合作  
Asahi, Japan for Sheet Glass TAA.



新竹廠破土典禮  
Hsinchu Factory Groundbreaking



1967 新竹平板廠投產  
TS Factory Sheet Glass Plant Production



## 1970

1970 美國WHEATON GLASS 容器玻璃技術合作  
Wheaton Glass PLC. USA for Container Glass TAA.



1972 台玻大樓落成  
TGI Building inaugurated



1973 台玻股票上市  
TGI Stock listed on Taiwan Stock Exchange

1974 英國PILKINGTON PLC. 色板玻璃技術合作  
Pilkington PLC. UK for Tinted Glass TAA.



1977 德國VEBA GLASS AG. 食器玻璃技術合作  
Veba Glass Ag. Germany for Tableware Glass TAA.

## 1980

1980 英國PILKINGTON PLC. 平板浮法玻璃技術合作  
Pilkington PLC. UK for Float Glass TAA.

1983 台中平板浮法廠投產  
TF Factory Float Glass Plant Production

1987 美國OWENS CORNING FIBERGLASS CORP. 玻璃纖維技術合作  
Owens Corning Fiberglass Corp. USA for Fiberglass Reinforced TAA.



日本柴田株式會社耐熱玻璃技術合作  
Sibata Hario, Ltd. Japan for Heat-Resistant Glass TAA.



1988 日本鐘紡株式會社玻璃纖維布技術合作  
Kanebo, Ltd. Japan for Fiberglass Fabric Glass TAA.



1989 二十五週年慶 25<sup>th</sup> Anniversary



## 1990

1990 桃園玻璃纖維布及玻璃纖維廠投產  
TT Factory Fiberglass Fabric & Fiberglass Reinforced Plant Production

1992 創辦人大陸考察  
Founder Lin, business visit to China

1993 台灣玻璃中國控股公司創立  
Taiwan Glass China Holding Ltd. Established

1994 德國HERMANN HEYE 容器玻璃技術合作  
Hermann Heye, Germany for Container Glass TAA.

三十週年慶 30<sup>th</sup> Anniversary



青島廠建廠 QFG Construction



# 集團沿革 Taiwan Glass Group History

## 1995

1995 日本石塚硝子株式會社食器玻璃技術合作  
Ishizuka Glass Co., Ltd. Japan for Tableware TAA.

台中、桃園、新竹三廠ISO-9002認證通過  
TF, TT, TS, Factory ISO-9002 Certification

青島浮法玻璃有限公司投產  
Qingdao Float Glass Co., Ltd. Plant Production



創辦人訪問北京 Founder Lin, Beijing visit



1997 台玻長江玻璃有限公司投產  
TG Changjiang Glass Co., Ltd. Plant Production

1998 鹿港玻璃纖維布廠投產  
TL Factory Fiberglass Fabric Plant Production

2000 台中廠引進雙銀輻射玻璃技術  
Taichung Factory Double Low - E Glass Coating Technology

## 2001

2001 桃園、新竹、台中、鹿港四廠ISO-14001認證通過  
TT, TS, TF, TL, Factory ISO-14001 Certification

2002 創辦人榮獲第32屆全球玻璃工業鳳凰獎(美國)  
Founder Lin, Awarded with the Phoenix Award (USA)



台玻長江玻璃有限公司CFG-2投產  
TG Changjiang Glass Co., Ltd. CFG-2 Plant Production

2004 台嘉玻璃纖維有限公司投產  
Taichia Glass Fiber Co., Ltd. Plant Production

台玻東海玻璃有限公司投產  
TG Donghai Glass Co., Ltd. Plant Production

台玻成都玻璃有限公司投產  
TG Chengdu Glass Co., Ltd. Plant Production

四十週年慶 40<sup>th</sup> Anniversary



## 2005

2005 台玻華南玻璃有限公司投產  
TG Huanan Glass Co., Ltd. Plant Production



台嘉玻璃纖維有限公司TGF-2投產  
Taichia Glass Fiber Co., Ltd. TGF-2 Plant Production

2006 台玻昆山玻璃有限公司CFG-3投產  
TG Kunshan Glass Co., Ltd. CFG-3 Plant Production

台玻天津玻璃有限公司投產  
TG Tianjin Glass Co., Ltd. Plant Production

鹿港平板廠TF-4投產  
TL Factory TF-4 Flat Glass Plant Production

2007 台嘉玻璃纖維有限公司TGF-3投產  
Taichia Glass Fiber Co., Ltd. TGF-3 Plant Production

## 2008

2008 台玻成都玻璃有限公司CDG-2投產  
TG Chengdu Glass Co., Ltd. CDG-2 Plant Production

台玻華南玻璃有限公司HNG-2投產  
TG Huanan Glass Co., Ltd. HNG-2 Plant Production



台嘉玻璃纖維有限公司TGF-4投產  
Taichia Glass Fiber Co., Ltd. TGF-4 Plant Production



新竹廠TS-7壓花窯改建容器窯  
Hsinchu Factory TS-7 Rolled Glass Furnace Rebuilding to Container Glass Furnace

2009 桃園廠TT-1擴建FRP  
Taoyuan Factory TT-1 Fiberglass Reinforced Furnace Rebuilding & Expansion

彰濱廠引進最新低輻射玻璃鍍膜技術  
Changpin Factory New Low-E Glass Coating Technology

台玻福建光伏玻璃有限公司動土  
TG Fujian Photovoltaic Glass Co., Ltd. Established & Groundbreaking



# 集團沿革 Taiwan Glass Group History

## 2010

2010

台玻悅達汽車玻璃有限公司創立  
TG Yueda Autoglass Co., Ltd. Established



台玻太倉工程玻璃有限公司創立及動土  
TG Taicang Architectural Glass Co., Ltd. Established & Groundbreaking

台玻咸陽玻璃有限公司創立  
TG Xianyang Glass Co., Ltd. Established

台玻安徽玻璃有限公司創立  
TG Anhui Glass Co., Ltd. Established

台玻武漢工程玻璃有限公司創立  
TG Wuhan Architectural Glass Co., Ltd. Established

台玻福建光伏玻璃有限公司投產  
TG Fujian Photovoltaic Glass Co., Ltd. Plant Production



## 2011

2011

彰濱廠投產  
Changpin Factory Plant Production

新竹廠ISO-22000認證通過  
TS Factory ISO-22000 Certification

台玻悅達太陽能鏡板有限公司創立  
TG Yueda Solar Mirror Co., Ltd. Established

台嘉成都玻纖有限公司動土  
Taichia Chengdu Glass Fiber Co., Ltd. Groundbreaking



台玻安徽玻璃有限公司動土  
TG Anhui Glass Co., Ltd. Groundbreaking

台玻武漢工程玻璃有限公司動土  
TG Wuhan Architectural Glass Co., Ltd. Groundbreaking

台玻東元真空節能玻璃股份有限公司創立  
TG Teco Vacuum Insulated Glass Corp. Established



## 2013

2013

台玻咸陽玻璃有限公司烘窯投產  
TG Xianyang Glass Co., Ltd. Plant Production



台玻安徽玻璃有限公司烘窯投產  
TG Anhui Glass Co., Ltd. Plant Production



新竹廠TS-10耐熱容器窯 / TS-11耐熱食器窯投產  
Hsinchu Factory TS-10 / TS-11 Production

台玻東海玻璃有限公司DHG-2投產  
TG Donghai Glass Co., Ltd. DHG-2 Plant Production

實聯化工江蘇有限公司投產  
Shihlien Chemical Industrial Jiangsu Co., Ltd. Plant Production



2012

台玻悅達汽車玻璃有限公司投產  
TG Yueda Autoglass Co., Ltd. Plant Production



台玻華南玻璃有限公司  
低輻射鍍膜玻璃生產線投產  
TG Huanan Glass Co., Ltd. Low-E Glass Production

台玻太倉工程玻璃有限公司  
低輻射鍍膜玻璃生產線投產  
TG Taicang Architectural Glass Co., Ltd. Low-E Glass Production

台玻武漢工程玻璃有限公司  
低輻射鍍膜玻璃生產線投產  
TG Wuhan Architectural Glass Co., Ltd. Low-E Glass Production

台玻哈利歐股份有限公司創立  
Hario TG Glass Corp. Established



## 集團沿革 Taiwan Glass Group History

2014

2014

台玻東海玻璃有限公司DHG-3投產  
TG Donghai Glass Co., Ltd. DHG-3  
Plant Production



台玻集團創業五十週年  
50<sup>th</sup> Anniversary of TG



台玻東元真空節能玻璃股份有限公司投產  
TG Teco Vacuum Insulated Glass Corp.  
Plant Production

台中廠TF-5電子級超薄玻璃投產  
Taichung Factory TF-5 Electronic Grade Ultra-  
thin Glass Production

2015

2015

新竹廠TS-3容器窯投產  
Hsinchu Factory TS-3 Production

台玻悅達太陽能鏡板有限公司投產  
TG Yueda Solar Mirror Co., Ltd Established.  
Plant Production

台嘉成都玻纖有限公司投產  
Taichia Chengdu Glass Fiber Co., Ltd.  
Production



TAIWAN GLASS GROUP

台玻集團

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

[www.taiwanglassgroup.cn](http://www.taiwanglassgroup.cn)

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