

# 奇美實業公司暨產品簡介

業務處

2007/04/10

# 大綱



- 奇美集團介紹
- 公司概況及發展大事紀
- 主要產品產能及擴產計劃
- LCD相關材料簡介
  - 電子化學品、導光板、擴散板、ABS、PC

# CHI MEI GROUP



## Petro-Chemical

- Chi Mei Corporation
- Chi Mei Asahi Corporation
- Zhenjiang Chi Mei Resin
- Zhenjiang Chi Mei Chemical
- Zhenjiang Chi Mei Plastic



## IT Industry

- Chi Mei Optoelectronics
- Himax Optoelectronics
- Chi Mei Electroluminescence
- ID Tech
- Nexgen Mediatech Inc.
- Chi Lin Optronics Corp.
- Chi Lin Technology



## Trading & Logistic

- Chi Mei Storage
- Zhenjiang Chi Mei Storage
- Chi Mei Trading Co.,Ltd.



## Construction

- Poly Chemical Engineering



## Food Industry

- Chi Mei Frozen Food
- Chi Mei Cafe



## Non-Profit

- Chi Mei Culture Foundation
- Chi Mei Museum
- Chi Mei Medical Center

# 公司概況

- 公司成立：**1959**
- 董事長：**廖錦祥先生**
- 資本額[2006]：**美金 529 Million**
- 從業員 [2006]：**1,700人**
- 營業額 [2006]：**美金 2.3 Billion**

# 公司發展大事紀



1959 公司成立，開始生產壓克力板(Acrylic Sheet)

1968 PS量產(一般級、耐衝擊、發泡級)

1976 ABS量產

1981 壓克力粒,板(PMMA Resin & Sheet)量產

1993 ISO9002認證

1995 聚丁二烯(BR) 、TPE量產



# 公司發展大事紀



- 1998 鎮江奇美ABS、PS量產
- 1999 ISO 14001認證
- 2000 電子化學品量產
- 2001 ISO9001認證(Y2K版本)
- 2002 PC及光學級壓克力板(LGP)量產
- 2003 光學級擴散板(DP) & MS(PMMA+PS)量產
- 2006 壓克力粒台灣及鎮江新廠開車



# 主要產品



## \* 塑膠 & 橡膠

Item	Capacity (10K.ton/Y)	Ranking	
		Taiwan	Worldwide
ABS/AS resin	125	1 <sup>st</sup>	1 <sup>st</sup>
PS resin	40	1 <sup>st</sup>	7 <sup>th</sup>
PMMA resin	19	1 <sup>st</sup>	3 <sup>rd</sup>
LBR	5	1 <sup>st</sup>	
TPE	9	1 <sup>st</sup>	4 <sup>th</sup>
PC resin	14	1 <sup>st</sup>	10 <sup>th</sup>
MS resin	2	-	-

## \* 電子材料

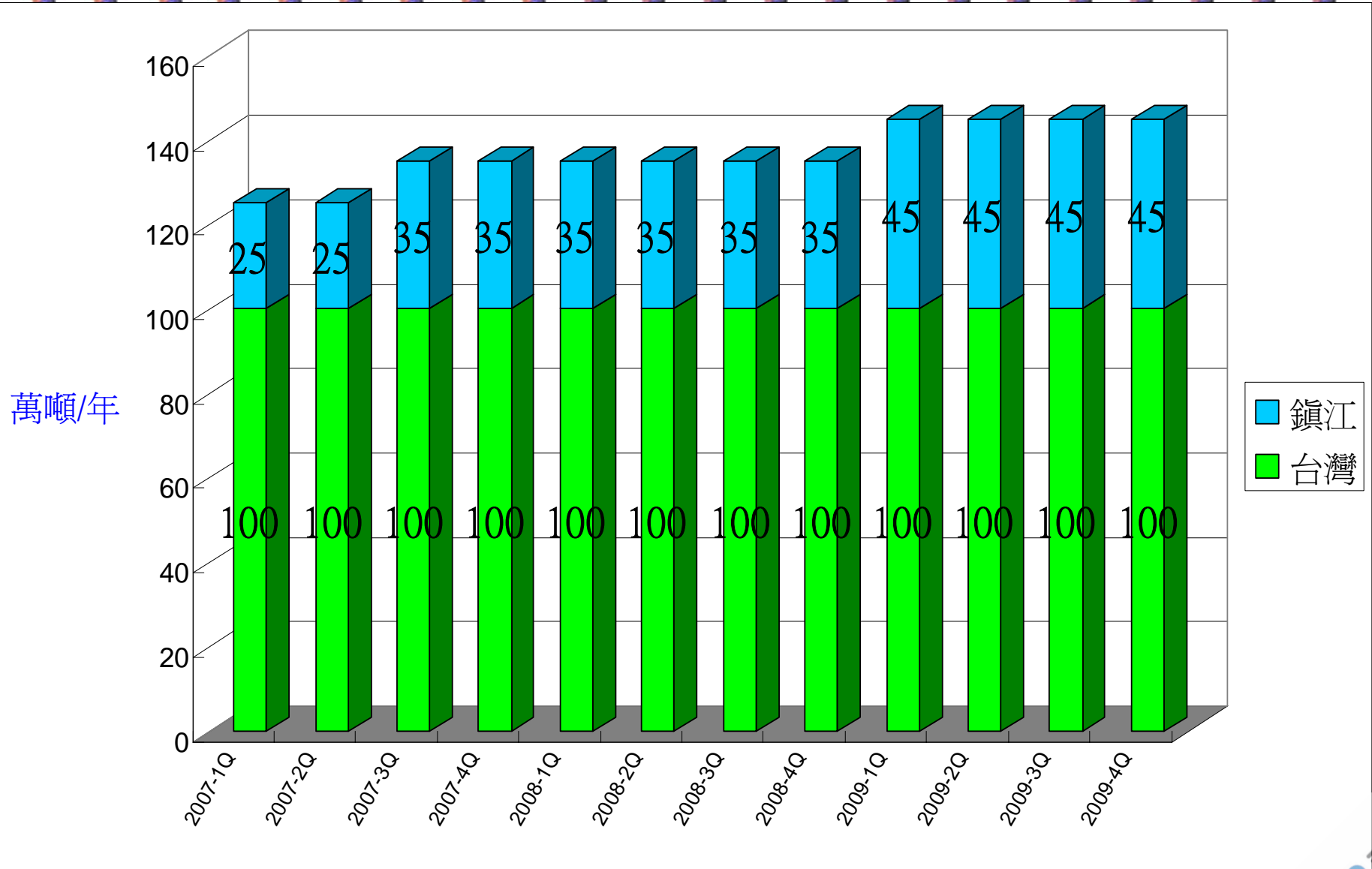
(a).Color resist、Photo resist、Developer、EBR、Etchant、Stripper

**(b).Optical PMMA Sheet (LGP)、Optical PMMA pellet**

**(c).Optical Diffuser Plate**

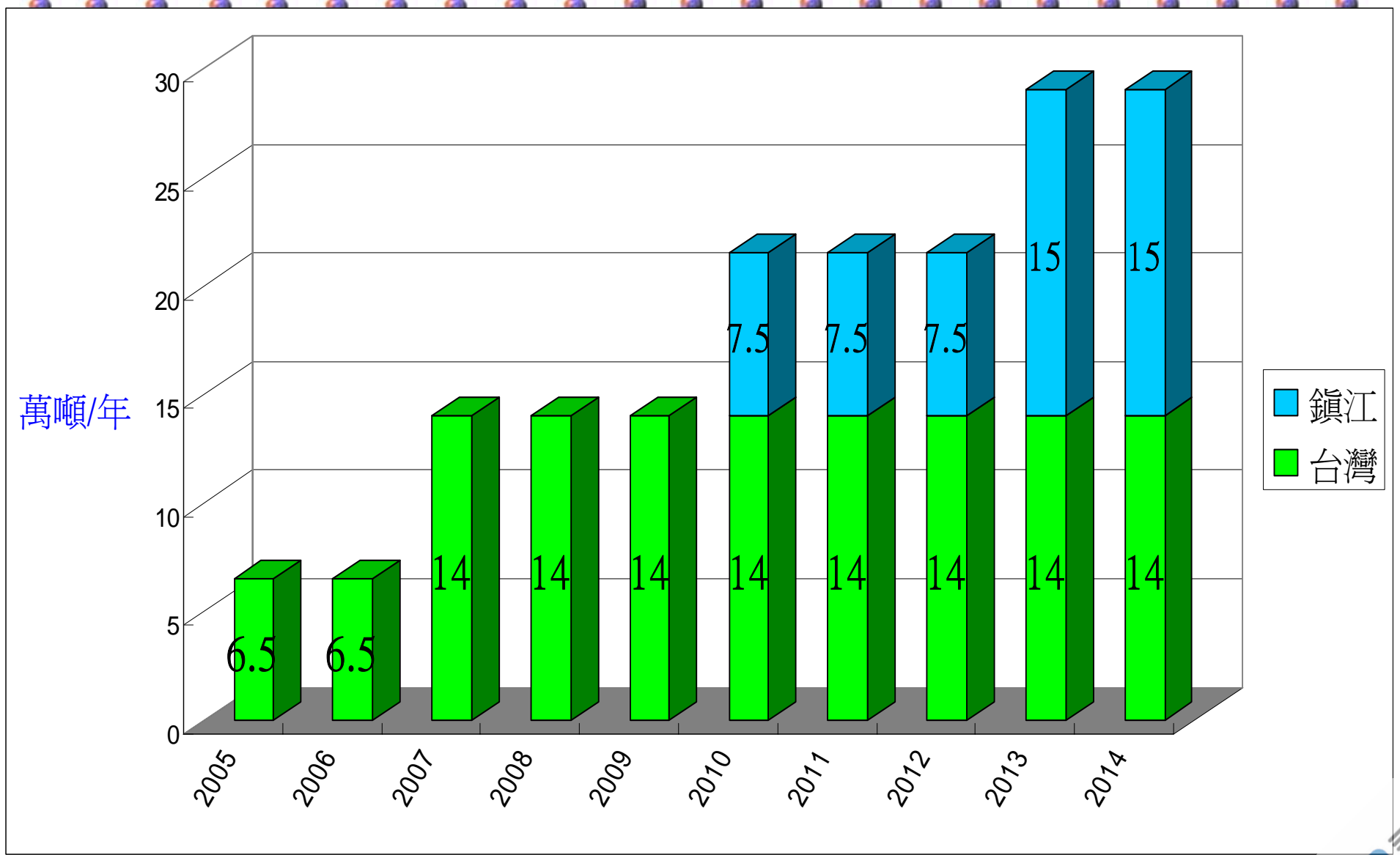


# 奇美ABS產能及擴產計劃

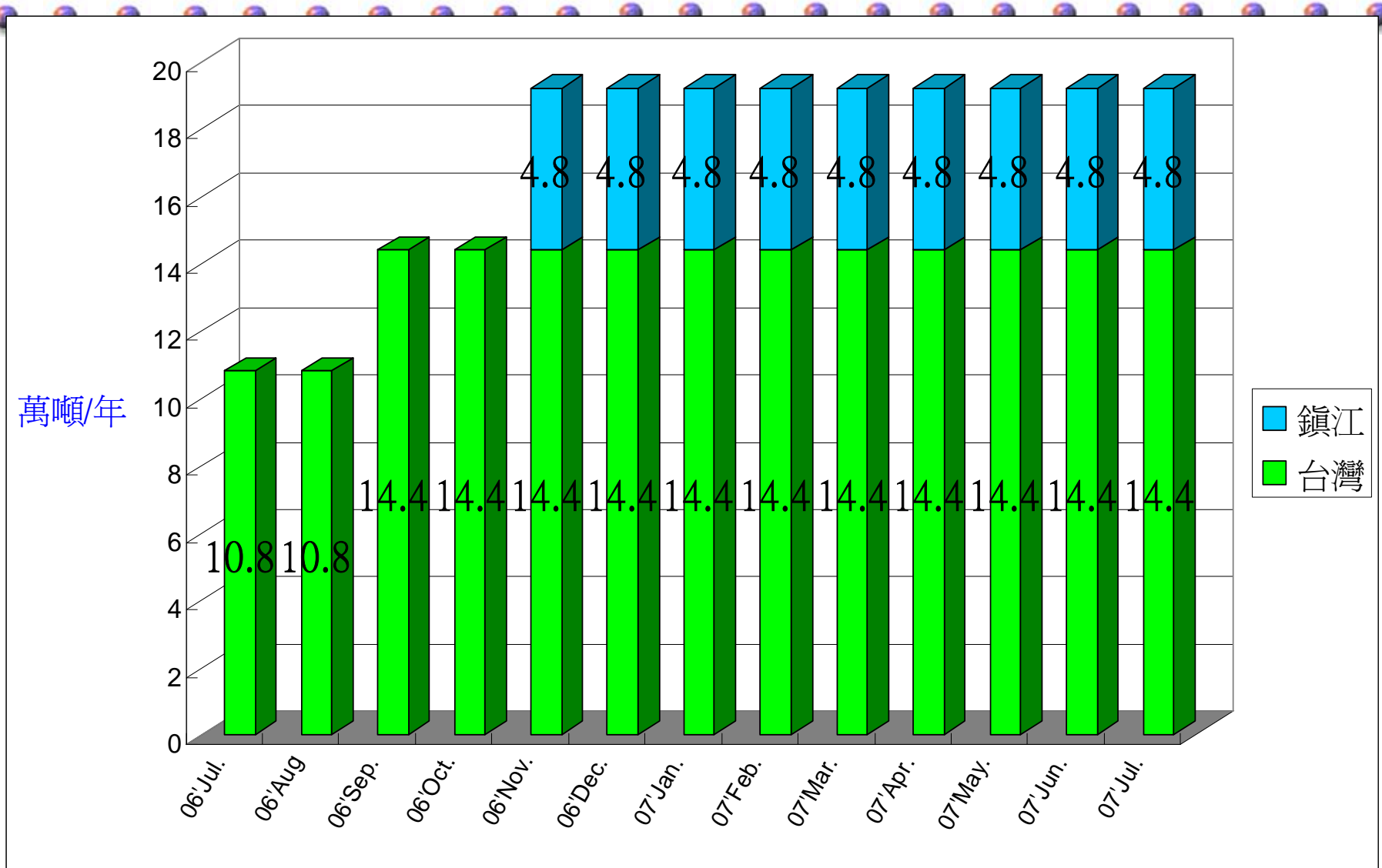




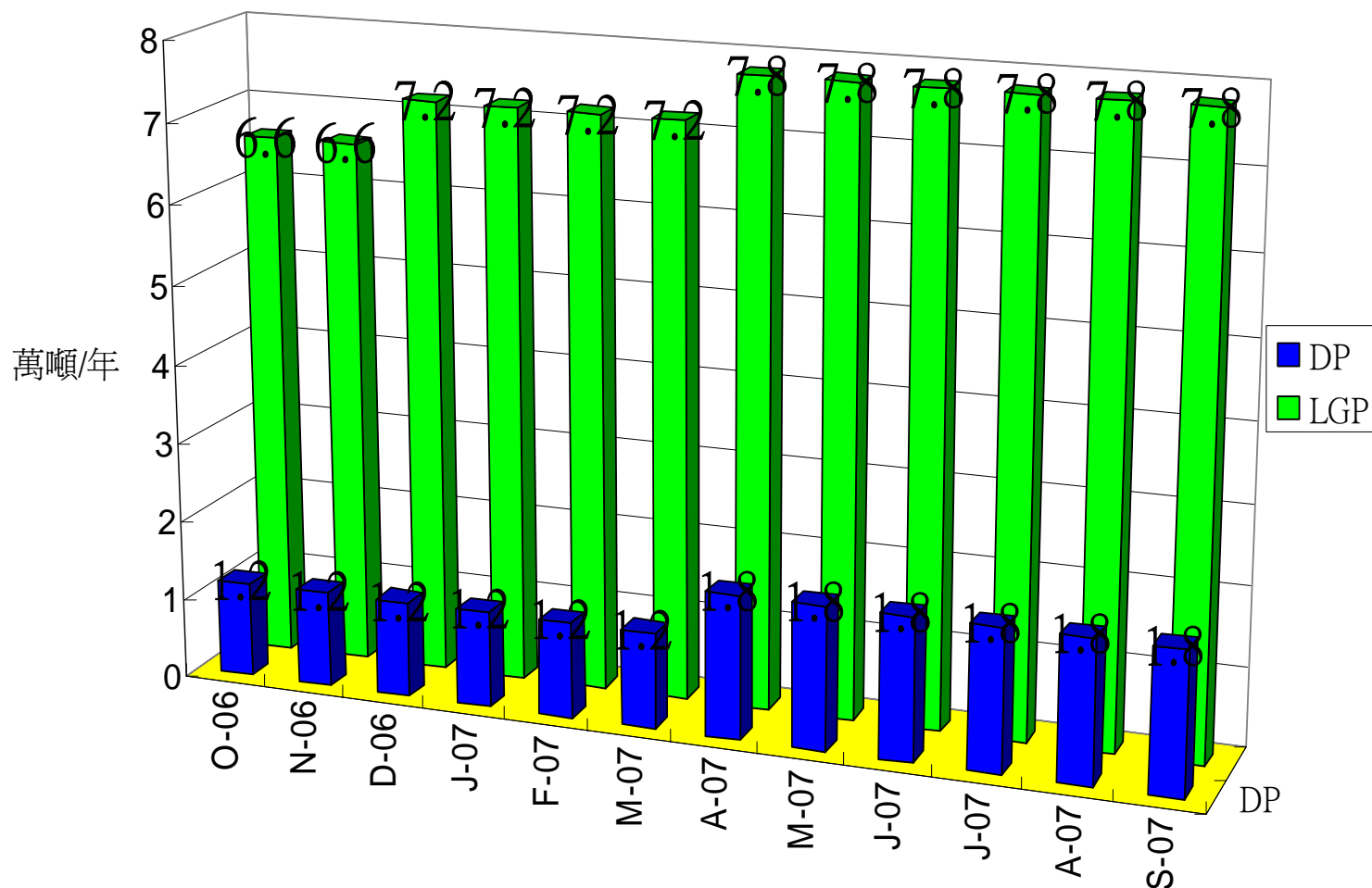
# 奇美PC產能及擴產計劃



# 奇美PMMA粒產能及擴產計劃



# 奇美LGP&DP產能及擴產計劃



# 奇美電子化學品產能及擴產計劃



產品別	產能(M <sup>3</sup> /年)		
	2006	2007	2008
彩色光阻劑	500	690	1,730
樹脂BM	190	290	800
Photo Spacer	240	670	740
正行光阻劑	460	460	1,230
PI配向膜	0	36	36
顯影液	33,000	33,000	33,000
清洗液	21,200	21,200	21,200
蝕刻液	10,800	10,800	10,800
剝離液	9,700	9,700	9,700
光阻類	1,390	2,146	4,536
非光阻類	74,700	74,700	74,700
合計	76,090	76,846	79,236



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# LCD 相關塑膠材料



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# 電子化學品

應用：*Color filter & TFT Array*

# CMC電子化學品產品一覽



產品		應用	存放
彩色 光阻	R	CRR17S(HC)	TV、大型monitor
	G	CR106G	15" monitor
		CRG08F	Notebook
		CRG28S	TV、大型monitor
		CRG7WS(HC)	
	B	CR101B	15" monitor
		CRB16C	Notebook
		CRB07C	小尺寸顯示器
		CRB079	大型monitor
		CRB07S	
		CRB17S	
			5°C

# CMC電子化學品產品一覽



產品		用途	存放
正型光阻	TR310D	Cr BM	5°C 冷藏
	TR313A	MVA	
	TR303D	TFT	
黑色光阻	CRK01H(NOD)	Resin BM	
	CRK05B(HOD)	Resin BM	
光阻間隔體	SR529A	Photo spacer	- 15°C 冷藏
	SR539A/B	Photo spacer	



# CMC電子化學品產品一覽



產品		用途	存放
晶邊清洗液	EB673	正光阻洗邊	25°C
	EB630	正光阻洗邊	
顯影液	DP205	負光阻顯影	
	DP213	正光阻顯影	
蝕刻液	EA703	ITO 蝕刻	
	EA714	Cr 蝕刻	
剝離液	ST823	CF rework	
	ST841	ITO rework	
玻璃洗劑	GD868A	玻璃基板清洗	

## 包裝方式(光阻類)

包裝型式	容 量	產 品	附 註
玻璃瓶	1 Gal	CR,PR,RBM,PS	
Now Pak	19 L	CR,PR,RBM,PS	內袋
Drum(EP)	200 L	EBR	有機溶劑
Drum(PE)	200 L	EA	酸,鹼
Lorry	12M <sup>3</sup>	DP,EB,EA,ST	6M <sup>3</sup> X2
Lorry	20M <sup>3</sup>	DP	20M <sup>3</sup> X1
Tote	1M <sup>3</sup>	ST	
PE桶	20L	GD	

# 包裝方式(光阻類)



外套黑色遮光袋



4瓶一箱，以保力龍座固定，中間放置保冷劑

## 3.5 L Gallon瓶包裝方式



## 19 L Nowpak 瓶包裝方式

# 包裝方式(chemical)



200 L Drum



1M<sup>3</sup> Drum



6 or 20 M<sup>3</sup> Lorry



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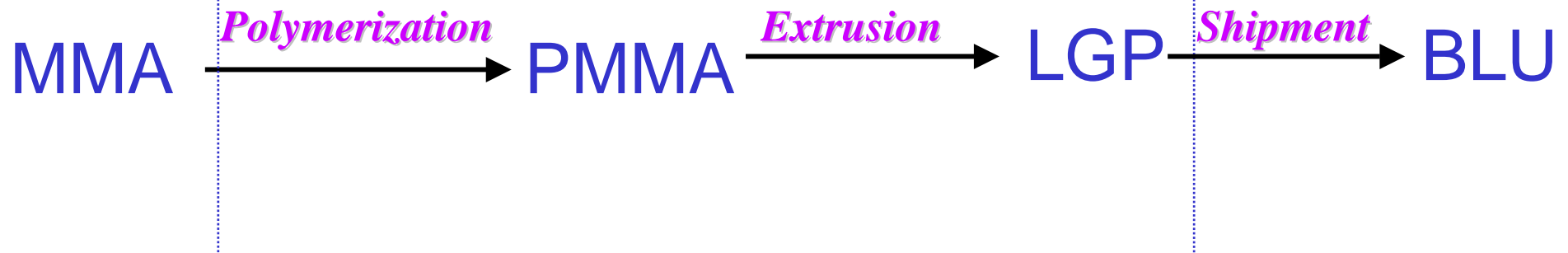
# 光學級壓克力板(導光板)

應用：側光式背光模組

# Optical PMMA Sheet



## Chi Mei Corporation



# What is PMMA ?



- PMMA= (Poly Methyl Meth Acrylate 聚 甲基丙烯酸甲酯)

general name : 壓克力(Acrylic)

- Characteristics :

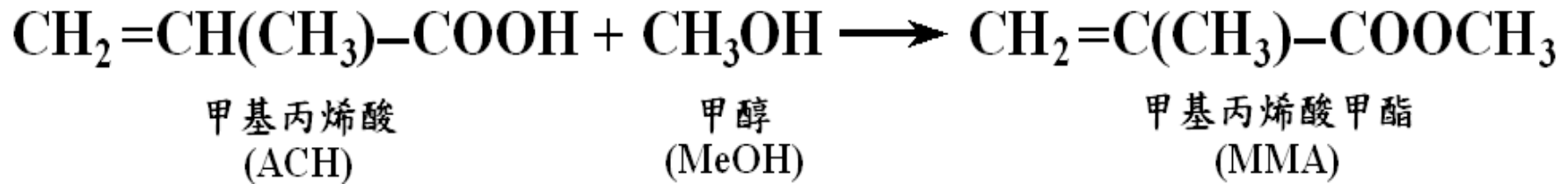
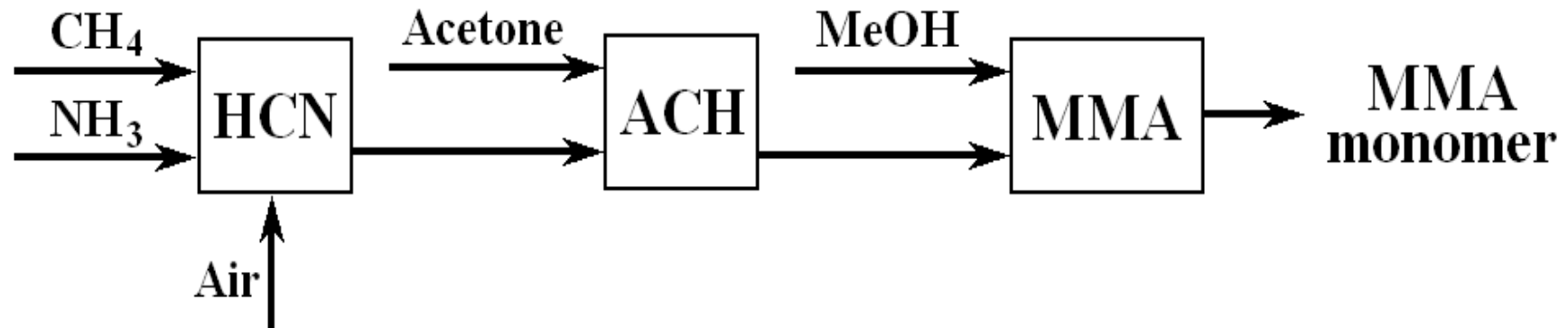
excellent weathering property, transparency, glossy surface,  
superior physical, chemical and electric properties.

- Application :

Sunglasses, Automobile parts, housewares, LGP...etc.

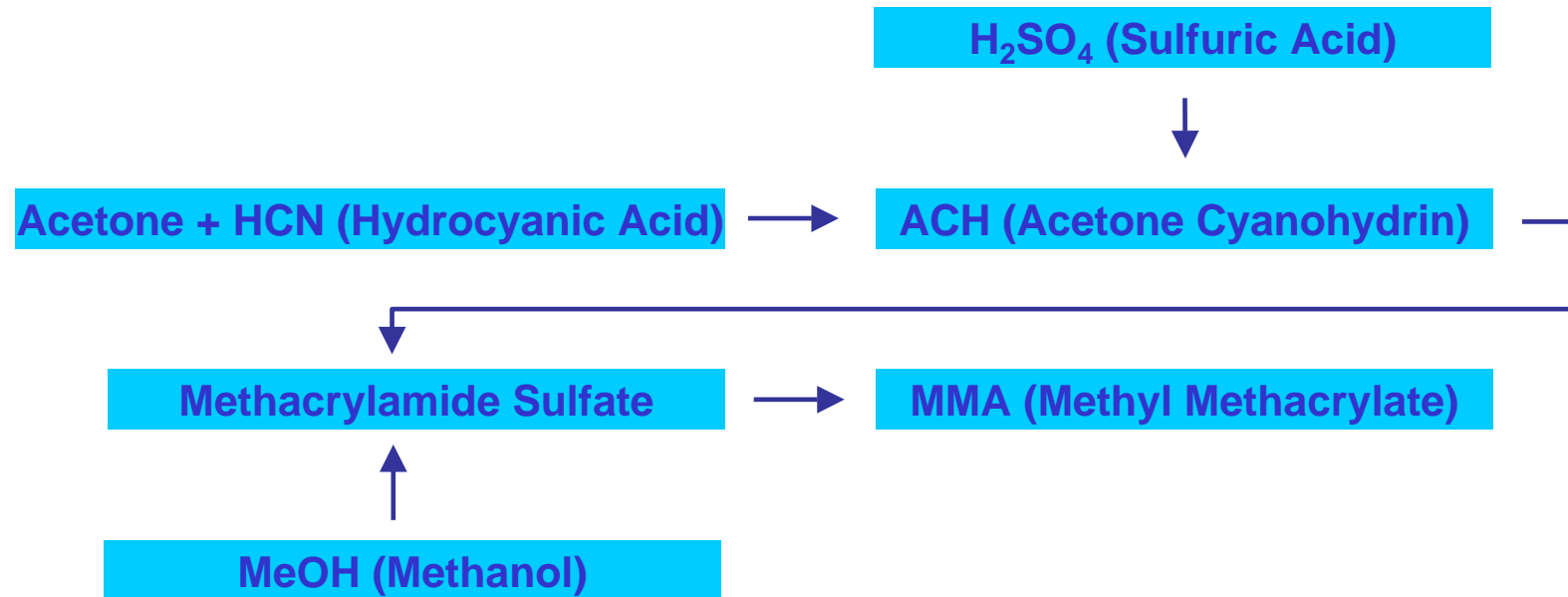


# MMA monomer process



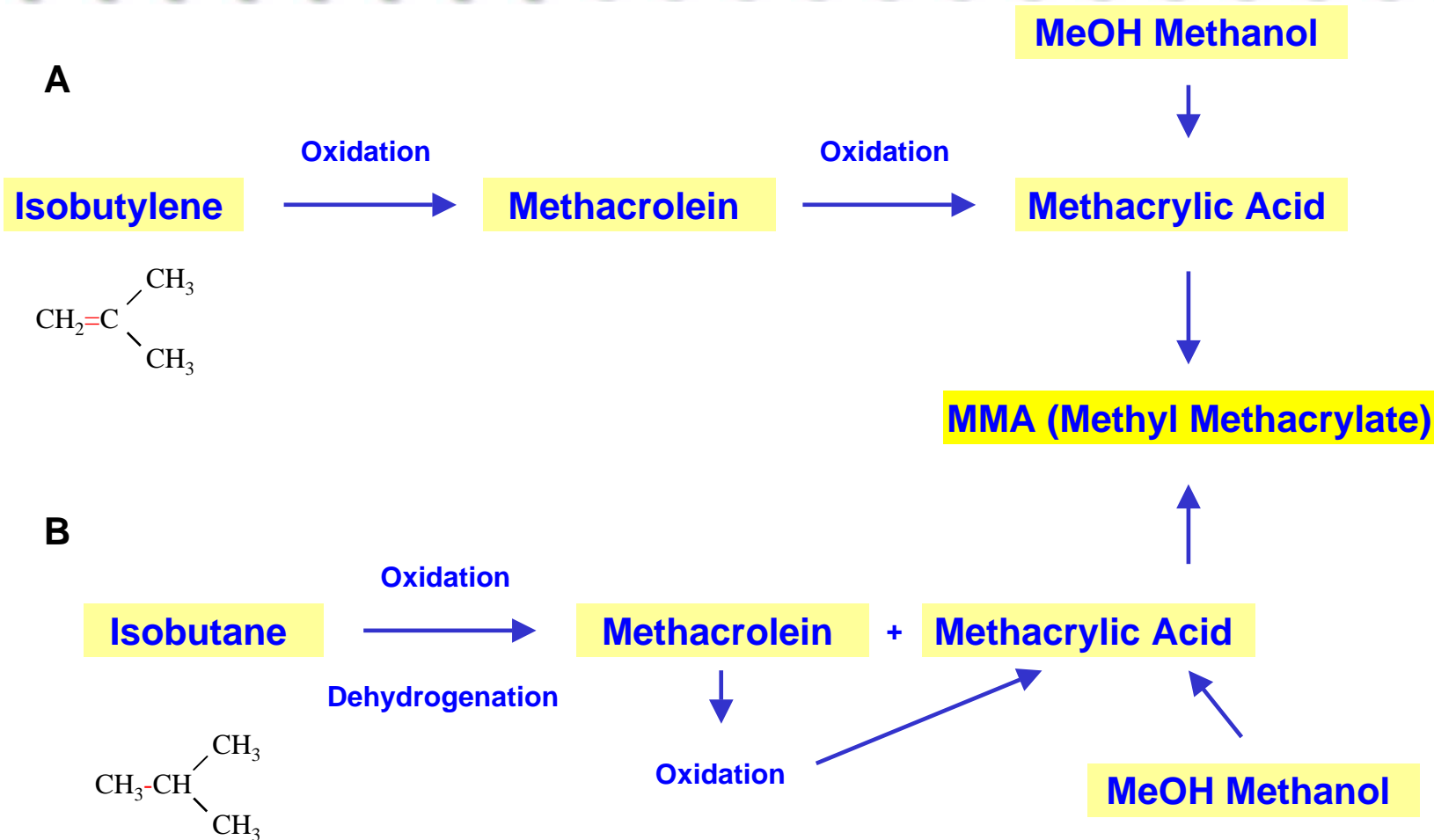


# MMA Process - ACH



- Acetone + HCN (Hydrocyanic Acid) → ACH (Acetone Cyanohydrin)
- ACH + H<sub>2</sub>SO<sub>4</sub> (Sulfuric Acid) → Methacrylamide Sulfate
- Methacrylamide Sulfate + MeOH (Methanol) → MMA (Methyl Methacrylate)

# MMA Process – C4



# Manufacturing Process



(1).MMA(liquid)====polymerization====>PMMA(pellet)

PMMA(pellet)====extrusion====>PMMA(sheet)

ex.Sumitomo, Asahi, CMC

(2).MMA(liquid)=====pre-polymerization====> 30%PMMA (liquid)

=====casting====>PMMA(sheet)

ex.Mitsubishi.

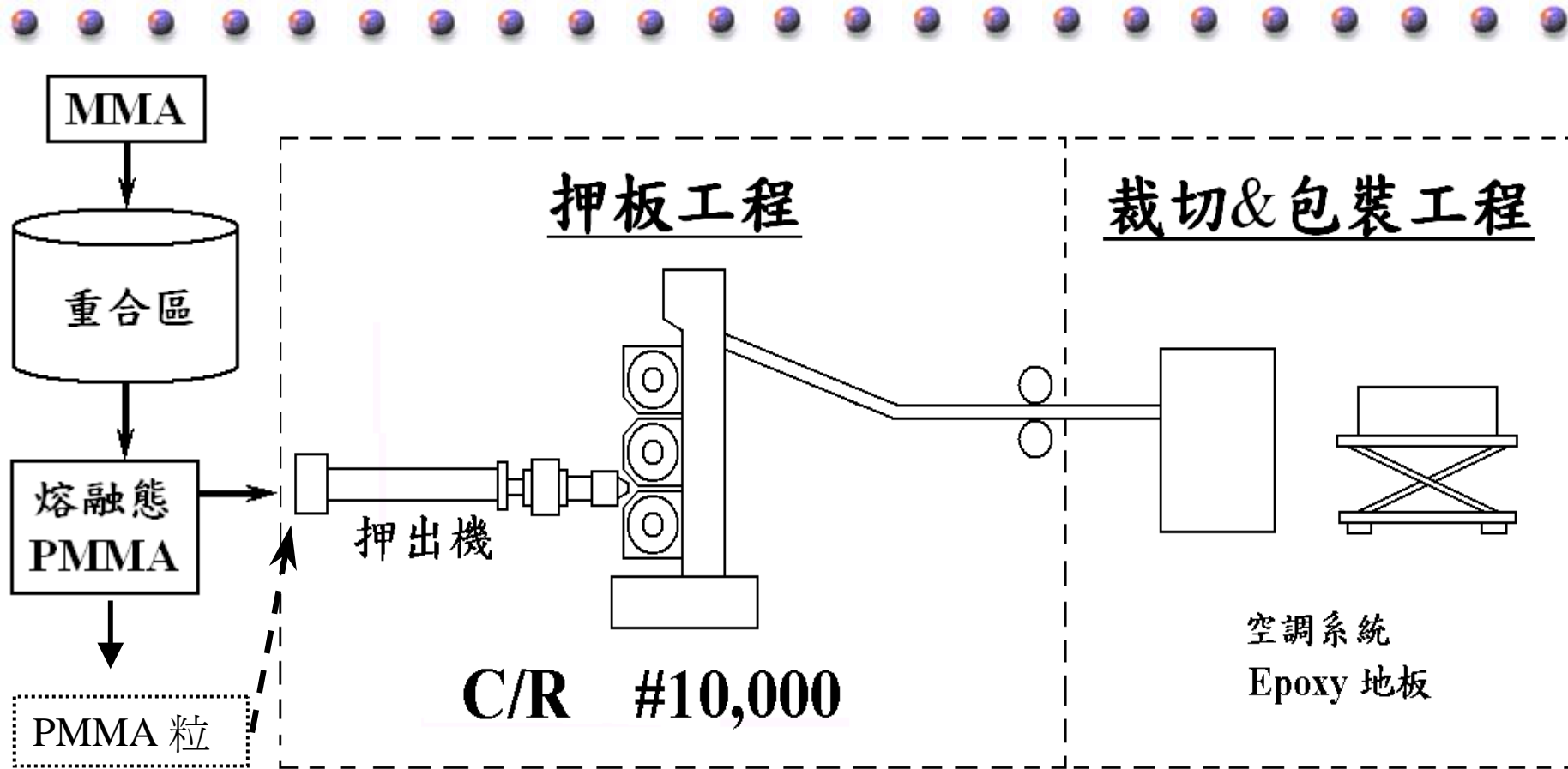
(3).MMA(liquid)=====polymerization====>PMMA(melt)

=====DSP(direct sheeting process)====>PMMA (sheet)

ex.CMC only



# Process Illustration



QC items : dimension 、 bending & optical properties...

# CMC Optical PMMA Sheet - Status



**Mass Production : Mar, 2002**

**Dimension : 2mm, 3mm, 4mm, 6mm, 8mm, 10mm, 12mm**

- 1100x1380 mm ( 3mm, 6mm ) for 15"
- 1100x 990 mm ( 4mm ) for 15"
- 1090x1170 mm ( 6mm, 8mm ) for 17"
- 1140x1430 mm ( 6mm, 8mm ) for 17"
- 1200x1285 mm ( 6mm, 8mm ) for 19"
- 1100x1300 mm ( 6mm, 8mm ) for 19"wide
- 1210x1380 mm ( 10mm ) for 20"
- 1210x1285 mm ( 10mm ) for 20"
- 1000x1240 mm (6mm, 10mm ) for 22"wide

**Capacity : 6,000MT / month (Now)**

**Expansion : 6,500MT / month (07'Apr.~)**



# Dimension List



Dimension (m/m)	Kg/Sheet	Sheet/ Pallet	Net Weight (Kg/Pallet)	Gross Weight (Kg/Pallet)	Application		Pallets/ Container	Sheets/ Container
2*1100*1170	3.09	200	618	671	---	---	---	---
3*1100*1380	5.46	160	874	935	15"	17 pcs	21P/20'	3360
4*1100*990	5.23	120	628	672	15"	13 pcs	30P/20'	3600
4*1090*1285	6.72	120	806	863	19"wide	12pcs	23P/20'	2760
4*1090*1170	6.12	120	734	787	17"	12pcs	24P/20'	2880
4*1165*1210	6.77	120	812	874	17"wide	15pcs	24P/40'	2880
4*1190*1125	6.43	120	772	834	17"wide	15pcs	24P/40'	2880
6*1080*1285	9.99	80	799	856	19"wide	12pcs	23P/20'	1840
6*1090*1285	10.08	80	806	863	19"wide	12pcs	23P/20'	1840
6*1000*1240	8.93	80	714	764	22"wide	8pcs	24P/20'	1920
6*1010*1250	9.09	80	727	777	22"wide	8pcs	24P/20'	1920
6*1100*1380	10.93	80	874	935	15"	17 pcs	21P/20'	1680
6*1080*1150	8.94	80	715	768	17"	12 pcs	24P/20'	1920
6*1090*1170	9.18	80	734	787	17"	12 pcs	24P/20'	1920
6*1190*1260	10.80	80	864	926	19"	12 pcs	24P/40'	1920
6*1200*1285	11.10	80	888	950	19"	12 pcs	23P/40'	1840
6*1140*1430	11.74	80	939	1004	17"	16 pcs	22P/40'	1760
8*1080*1285	13.32	60	799	856	19"wide	12 pcs	23P/20'	1380
8*1090*1285	13.45	60	807	864	19"wide	12 pcs	23P/20'	1380
8*1080*1150	11.92	60	715	768	17"	12 pcs	24P/20'	1440
8*1090*1170	12.24	60	734	787	17"	12 pcs	24P/20'	1440
8*1190*1260	14.39	60	863	925	19"	12 pcs	24P/40'	1440
8*1200*1285	14.80	60	888	950	19"	12 pcs	23P/40'	1380
8*1140*1430	15.65	60	939	1004	17"	16 pcs	22P/40'	1320
10*1210*1285	18.66	45	840	902	20"wide	12pcs	24P/40'	1080
10*1210*1320	19.17	45	863	930	20" / 20.1"	11 pcs	24P/40'	1080
10*1210*1380	20.04	45	902	969	20" / 20.1"	11 pcs	23P/40'	1035



# 光學級擴散板(DP)

應用：直下式背光模組



✦ **History :**

**DC-551 by OEM => 02'Oct.~**

**DC-551D by CMC=> 03'Aug.~**

**DC-551F, DC-701F by CMC => 04'Jan.~**

***DC-553F, DC-703F by CMC => 05'May.~***

***DS-series, DM-series by CMC =>05'Dec.~***



*Development  
of multilayer*

✦ **Dimension : 2\*1140\*1400 mm...total 7 sizes.**

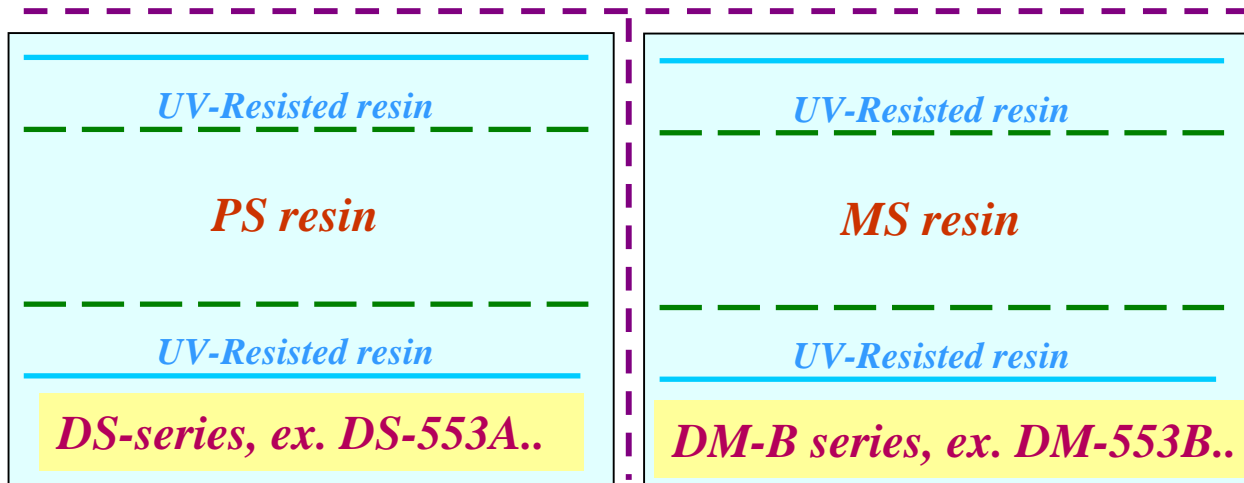
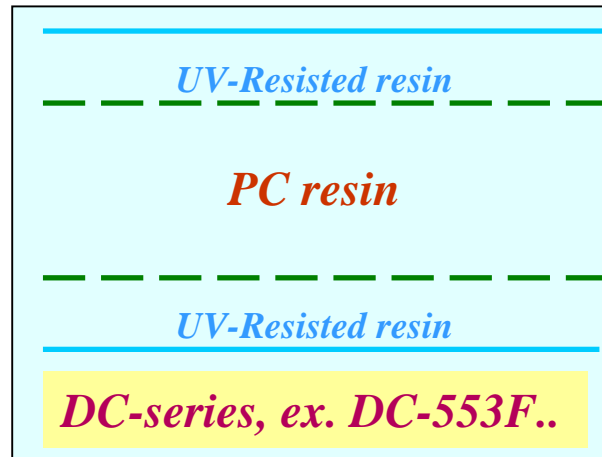
✦ **Application: Direct-lighting LCD MNTs & LCD TVs**

✦ **Current Capacity : 1000 MT/month**

✦ **Expansion : 1500 MT/month (07' Q2~)**



# *Multilayer structure*



# Physical properties

特性 Properties	測試方法 Test Method	測試條件 Test Condition	單位 Unit	DC-series	DS-A series	DM-B series	PC-品	R-品	EM-品
Core Material				PC	PS	MS	PC	PS	MS
引張強度 Tensile Strength	ASTM D-638	2mm, 6 mm/min	Kg/cm <sup>2</sup>	660	400	430	640	440	379
延伸率 Tensile Elongation	ASTM D-638	2mm, 6 mm/min	%	27	5	4	125	3	3
彎曲彈性率 Modulus of Elasticity	ASTM D-638	2mm, 2.8 mm/min	Kg/cm <sup>2</sup>	26,000	27,000	30,000	24,000	30,000	32,000
彎曲強度 Flexural Strength	ASTM D-790	2mm, 2.8 mm/min	Kg/cm <sup>2</sup>	388	500	550	500	600	680
硬度 Hardness	ASTM D-785	2mm	M Scale	39	20	20	34	35	40
IZOD 衝擊強度 Izod Impact Strength	ASTM D-256	2mm, 23°C	Kg-cm/cm	3.4	1.4	1	90	1.2	0.4
比重 Specific Gravity	ASTM D-792	23°C	g/cm <sup>3</sup>	1.20	1.05	1.07	1.20	1.05	1.08
吸水率 Water Absorption	ASTM D-570	-	%	0.18	0.15	0.15	0.3	0.2	0.27
熱變形溫度 Heat Distortion Temp.	ASTM D-648	unannealed	°C	132	90	90	135	90	88
軟化點 Vicat Softening Temp.	ASTM D-1525	1Kg, 50°C/hr	°C	150	105	105	118	106	103
表面硬度 surface Hardness	Pencil month	2mm, 23°C	-	4H	3H	3H	2H	3H	3H
燃燒率 Flammability	UL 94	V2	-	V2	HB	HB	V2	HB	HB



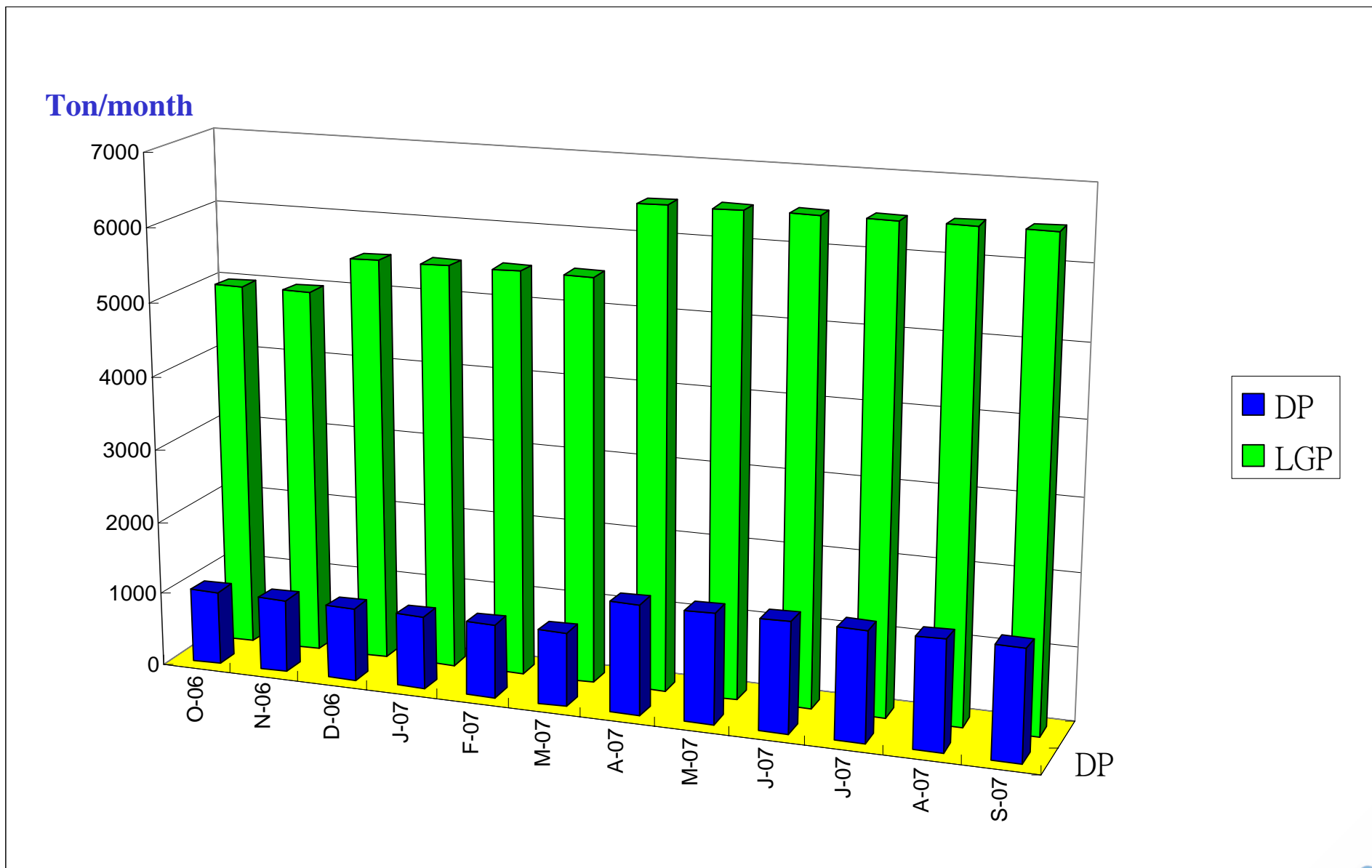
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# 市場狀況



# CMC Capacity Expansion for LGP & DP



# Worldwide LGP demand in 2006

unit : ton

quarter	2006Q1	2006Q2	2006Q3	2006Q4	total
W/W demand	28,300	30,500	36,200	41,500	136,500

\*Worldwide LGP supply = 150 KTon/year

\*\*07' Worldwide demand= 170 KTon/year

# CMC LGP Market Share



unit : ton

quarter	2006Q1	2006Q2	2006Q3	2006Q4	total
W/W demand	28,300	30,500	36,200	41,500	136,500
CMC sales	11,000	10,000	13000(f)	15000(f)	49000(f)
market share	39%	33%	36%	36%	36%

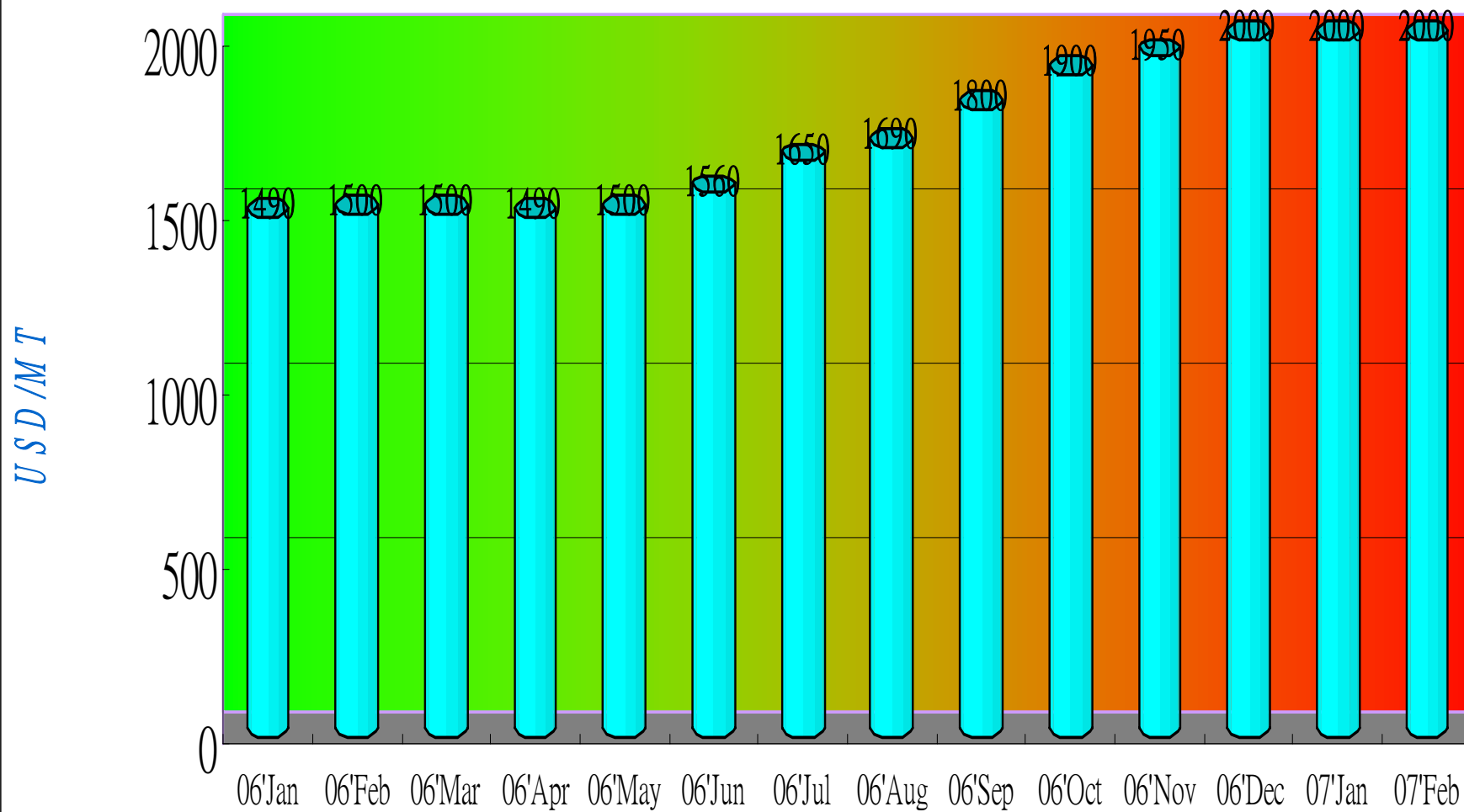
# 2007富士康協議供應量



單位: Ton

時間	1月	2月	3月	4月	5月	6月	7月	8月	9月	10月	11月	12月
保證供應量	700	700	700	850	850	850	1050	1050	1050	1100	1100	1100
最大供應量	840	840	840	1020	1020	1020	1260	1260	1260	1320	1320	1320

## MMA Price Trend



CORPORATION



# *New Products under Development*



• *High Luminance LGP*-CM205B :

=>Gain 5% for 6t // 7% for 8t

• *High Heat-resistance PS DP*-DH series

=>HDT + 10°C // from 90 °C to 102 °C

• *Multi-functional DP*

=>increase Haze // CCFL 16=>12 for 32”

# CMC 競爭力



- LGP

1. 經濟尺寸(裁切利用率**93%~97%**)

2. 高輝度的**LGP**(可提高輝度**3%~7%**)

- DP

1. 多樣化的材質組合**PC,MS,PS**

2. 高耐熱**PS**可適用**40"TV**

# LCD相關塑料

應用：Monitor膠框、前框、後框、底座



**鋼琴烤漆LCD前框**

使用材料：**ABS/PMMA合金**

奇美材料：**PA-718**

**LCD底座**

使用材料：**ABS or HIPS**

奇美材料：**ABS PA-757**

**HIPS PH-88**



### Monitor膠框

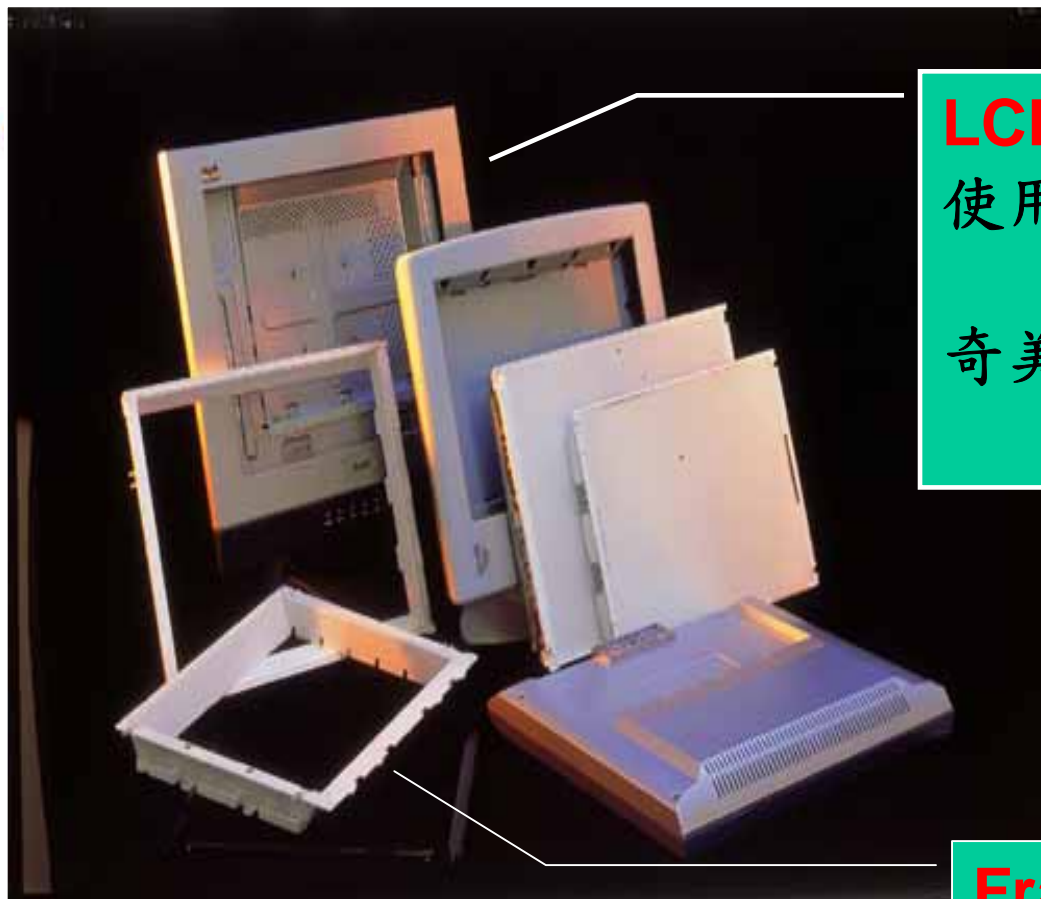
使用材料：ABS,PC/ABS

奇美材料：PA-757,PA-756  
PC-345

### Monitor底座

使用材料：ABS

奇美材料：ABS PA-757  
or PA-756



## LCD後框

使用材料：防火ABS

防火PC/ABS

奇美材料：PA-765/764/763系列  
or PC-510/540

## Frame

使用材料：ABS,PC

奇美材料：PA-757

PC-110V/110N



Thank you!