

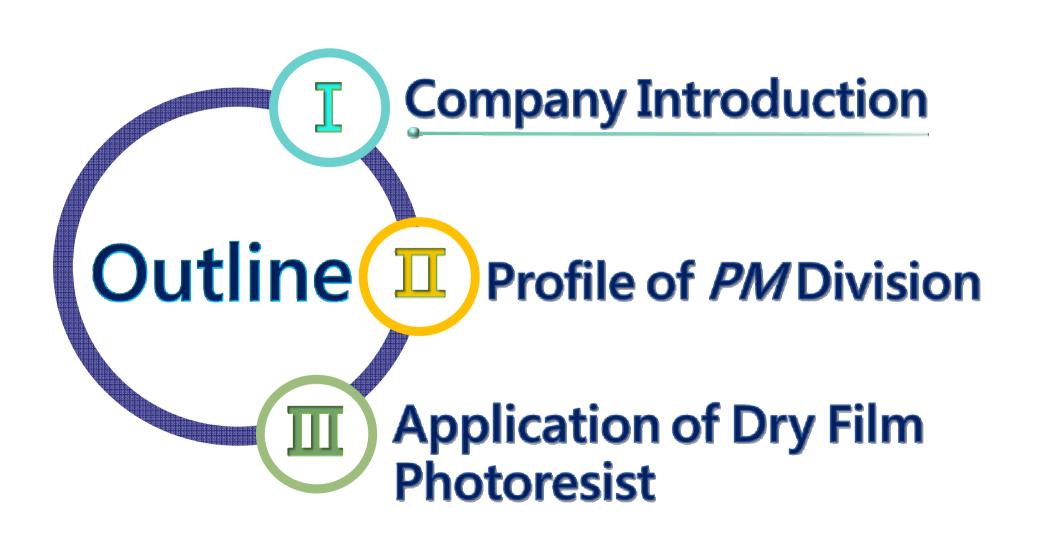


ETERNAL MATERIALS CO., LTD.

Industrial Application and Globalization of Dry Film Photoresist

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ETERNAL MATERIALS CO., LTD.



Profile of Eternal



- Core Business: Manufacturing, processing and sales
- •Founding: in 1964, Headquarters in Kaohsiung, Taiwan
- Year of Listed on Taiwan Stock Exchange: 1994
- Chairman: Allen K. L. Kao
- •Number of Employees: 4,706 ¹
- •Number of Production Sites: 25

(3 in Taiwan, 15 in Mainland China, 1 in United States, 1 in Thailand, 3 in Japan, 1 in Malaysia and 1 in Italy)

- •Overall Sales Revenue in 2017: USD 1,365 million ²
- •Headcounts of Researchers: 541

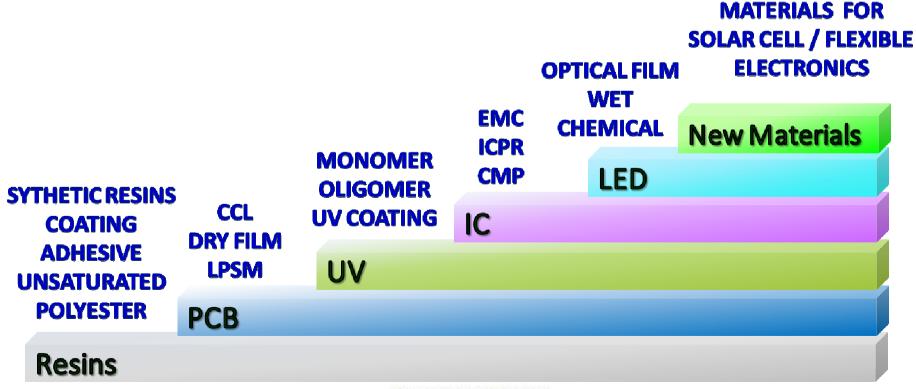
(R&D expenditures accounted for 3% of sales revenue)

- One of the leading suppliers of Dry film photoresist in the world.
- One of three largest UV curable Monomers & Oligomers material suppliers.
- One of the leading suppliers of synthetic resin in Asian.

Development Milestones

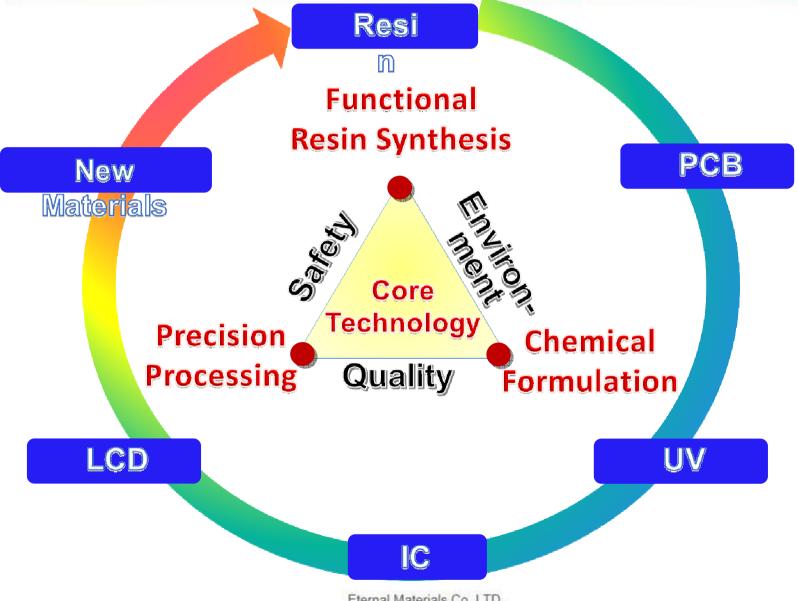


1964 1985 1989 2000 2004 2008 **2016+**



Core Technology





Business Group



2017

Resins Materials



- Synthetic Resins Business Division
- Unsaturated Polyester Resins Division

Consolidated Revenue USD 1365 million

54%

29%

Other 1 %

16%

Electronic Materials





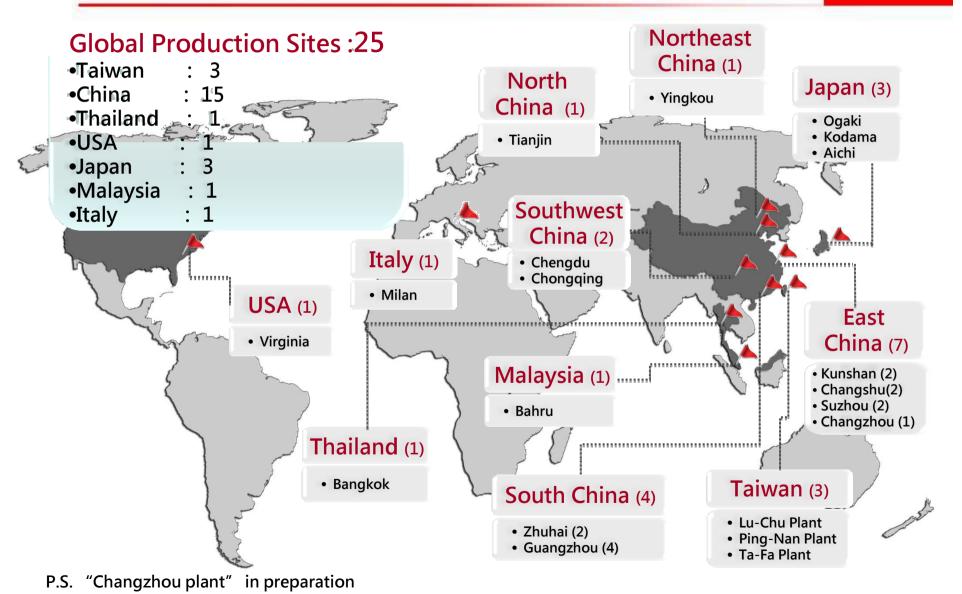
- Copper Clad Laminates Division
- Photoresist Material Business Division

High Performance Materials

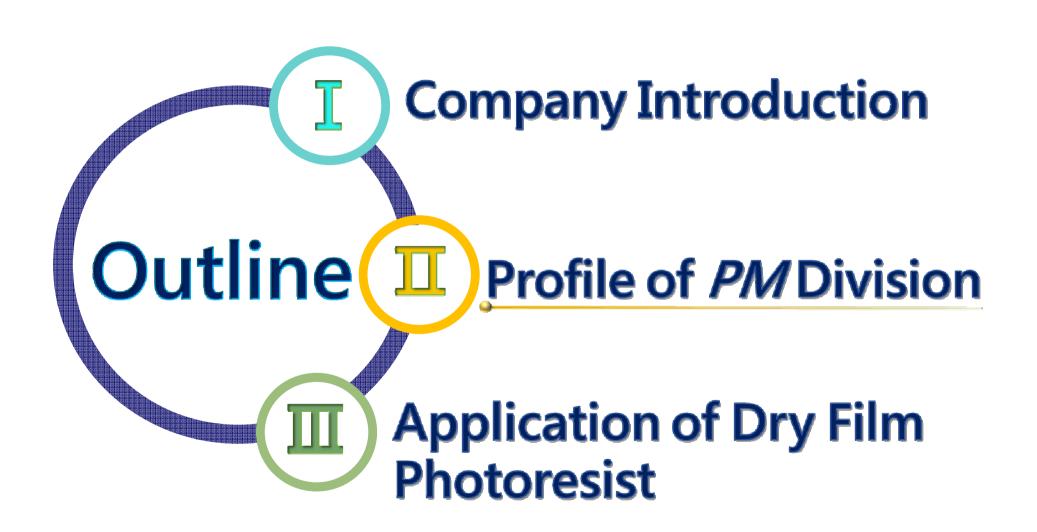


Global Production Sites



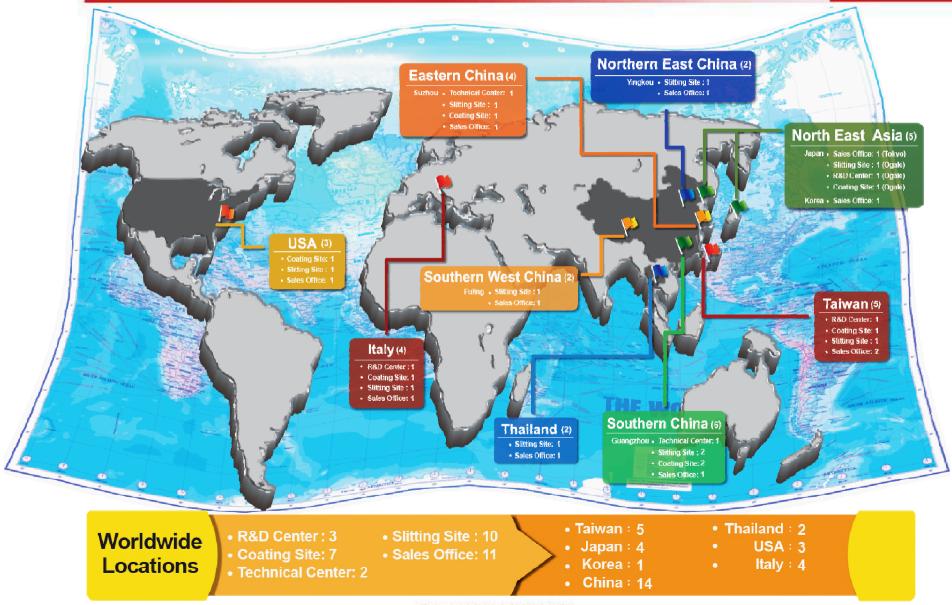


ETERNAL MATERIALS CO., LTD.



PM Division-Global Layout **Example**





PM Division-Coating Sites









Taiwan – Kaohsiung Coating Research Center (1) Coating Plants





PM Division-Coating Sites



2 Coating Lines for Metal Foils

South China Guangzhou



China: 1 Coating Line



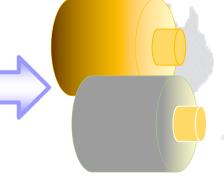


Taiwan: 1 Coating Line









Copper Foil

Aluminum Foil

PM Division-Slitting Site/Office



Northern East China



Yingkou (2)



China: 9





Southern China



Southern West China



Fuling (2)

PM Division-Slitting Site/Office



USA:2

Japan: 2

Italy: 2

Korea:1

Thailand : 2

Taiwan: 3

Japan Ogaki Tokyo











PM Division-Product Category 5







Photosensitive Dry Film Solder Mask Photo-Imageable Coverlay (PIC)



Dry Film Photosensitive Polyimide



Anisotropic Conductive Film

Liquid UV Curable Marking Ink



Toll Coating Service

PM Division-One-Stop Service





For Better Quality and Higher Efficiency

Varnishing



Coating



Slitting



Logistics



- 1 22±2°C, <60%RH
- ② 5±3℃
- ③ -20±2°C

Raw **Materials** Receiving

Raw **Materials Storage**

Varnishing

Coating

Slitting & **Packaging**

Product Storage

PM Division-Related Certificates Company PM Division-Related Certificates















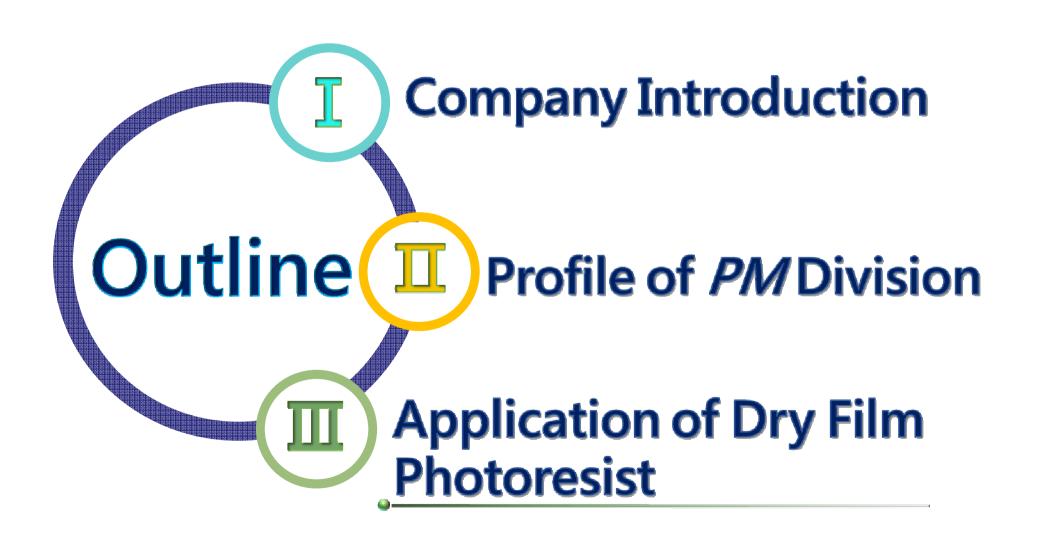




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ETERNAL MATERIALS CO., LTD.



Dry Film - Introduction



Dry film photoresist (DF) is mainly used in one of the raw materials for image transfer process in printed circuit board (PCB) and various electronic products.

Dry Film

Photoresist

- ◆ Printed Circuit Board (Single Sided Board, Double Sided Board, Multilayer Board, Rigid Board, Flexible Print Circuit Board, Rigid Flex Board)
- ◆ HDI Board (High Density Interconnect)
- ◆ Special Board Heavy Copper Board, High Frequency Board, ALPCB(MCPCB) · IC Substrate (MCM.CSP.BGA.Flip Chip)
- Nickel Electroplating / Gold Electroplating/ ENIG(Electroless Nickel Immersion Gold)
- **◆** Wafer
- **◆ LDI** (Laser Direct Imaging)
- Sand Blasting
- **☞ ITO Etching**
- **◆** Lead-Frame Base

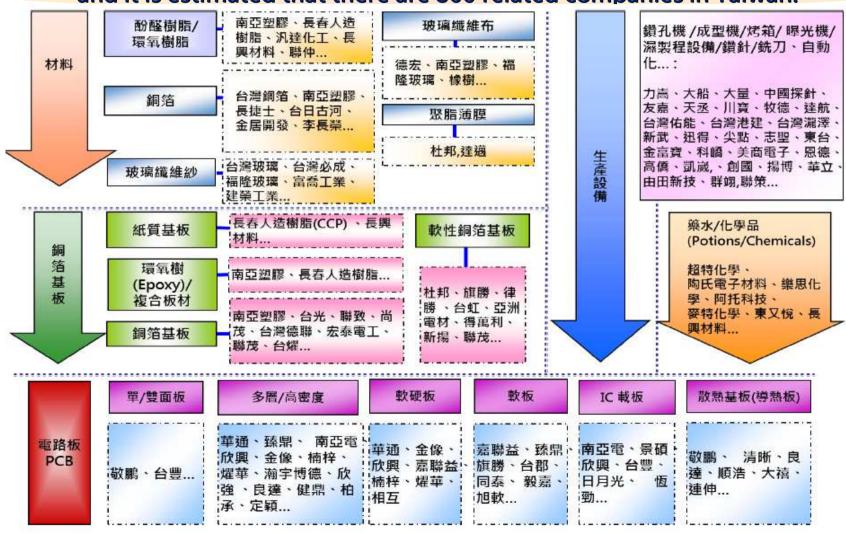
.....etc

Printed circuit board (PCB) materials are used in the field of electronic products such as information, communication, automotive, semiconductor, consumer...etc.

Dry Film - PCB Supply Chain



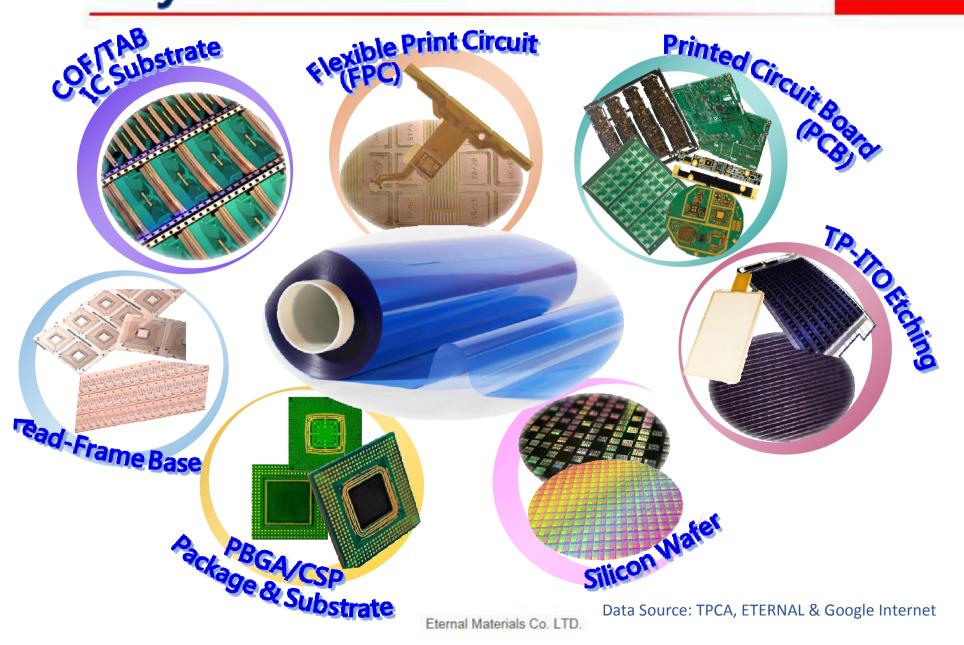
Taiwan has the most complete PCB industry supply chain in the world, and it is estimated that there are 800 related companies in Taiwan.



Source: IEK of ITRI, TPCA (2017/06)

Dry Film - Material Relevance







Automotive Electronics

Medical **Electronics**



Data Source: IEK, EEWORLD, eeToday-E headlines, Ctimes Google Internet



Consumer **Electronics**

Mobile **Communications Smart Phone Smart Watch Drone** Wearable Devices AR/VR **Display**





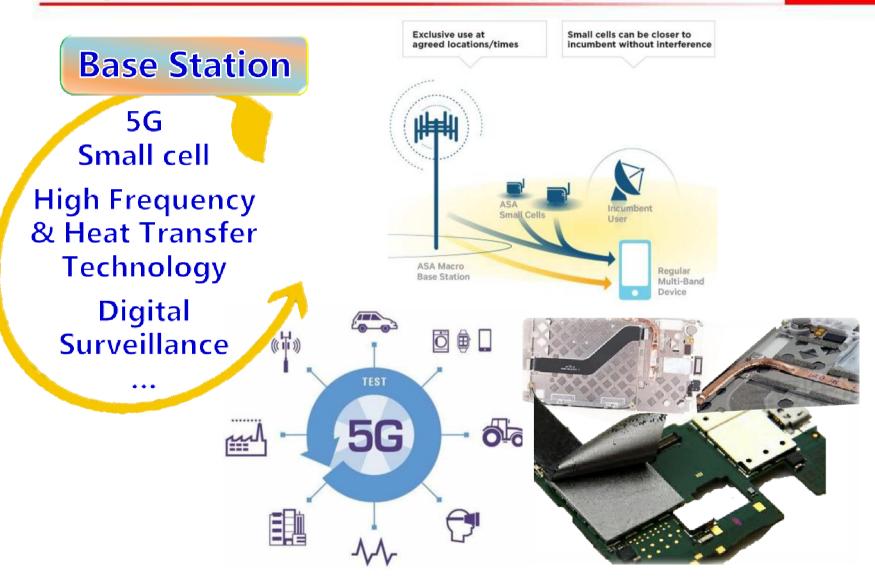












Data Source: IEK, investanchors, Qualcomm, 3elife.net Google Internet Eternal Materials Co. LTD.



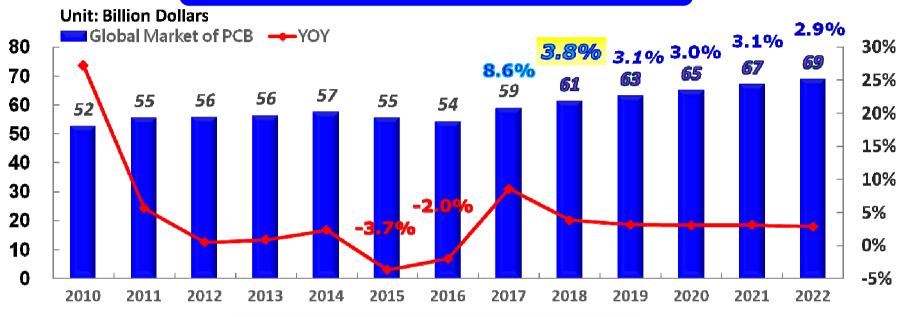


Data Source: IEK, mengkeji, TechNews Google Internet Eternal Materials Co. LTD.

Dry Film-Marketing Information



Global PCB Forecast Update (2017~2022)

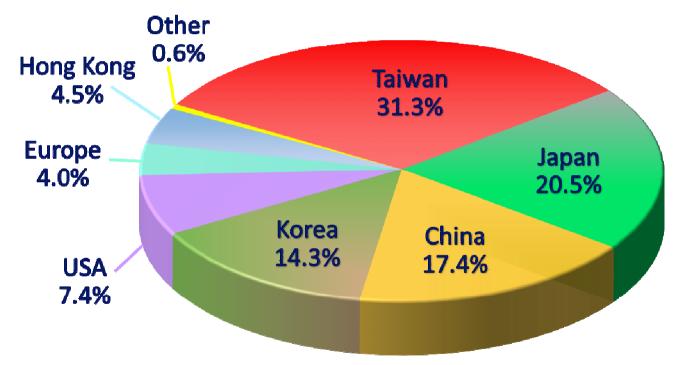


2015:-3.7 % 2016: -2.0 % 2017: + 8.6 % 2018: + 3.8 % (F) 2017 ~ 2022 CAAGR 3.2%

Source: 2017 Prismark Report and Eternal Market Summary



2017 Global PCB Distribution by Country of Production



2017Y China (Include Chinese and Hong Kong investors) China Global Market Share Reached 21.9% > Japanese Manufacturer 20.5%

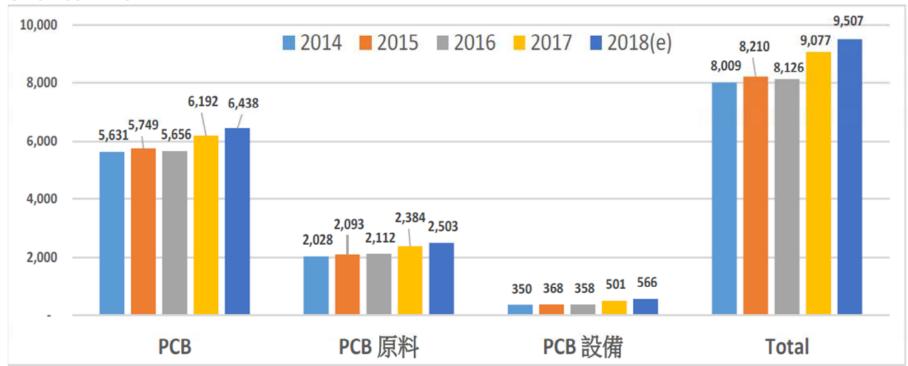
Source: TPCA, IEK of ITRI (2018/06)

Dry Film-Marketing Information



Taiwan PCB Industry Chain Production Value Trend

Unit: 100 million NTD



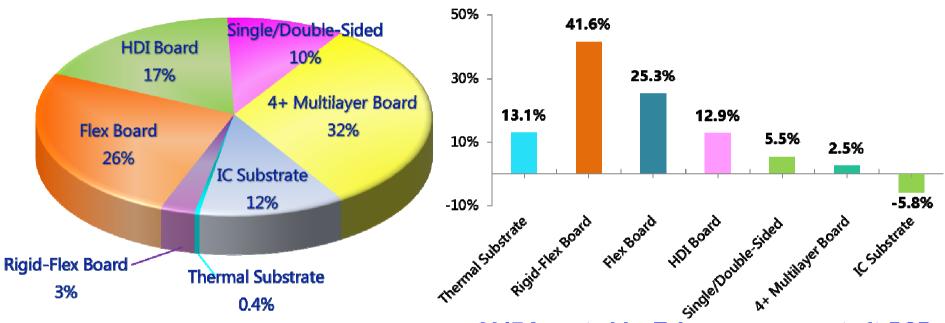
2017 Taiwan PCB industry chain production value of Cross-Strait Breaking through 900 Billion(NTD)

Source: TPCA & IEK of ITRI (2018/02)

Dry Film-Marketing Information



2017 Invested by Taiwanese cross-strait PCB the Proportion of Products Trend



There has been an increase in all products, except for the IC Substrate.

2017 Invested by Taiwanese cross-strait PCB **Products of YOY growth rate**

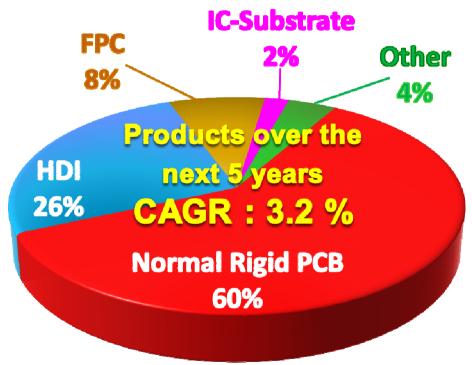
Note: The total production value of PCB by all manufacturers in Taiwan

Source: TPCA & IEK of ITRI (2018/02)

Dry Film Market Share



2018 Global DF Market Size Forecast ~ 11.4 Million KSF



2018 DF Market Size by Product Analysis Unit: Ten thousand KSF/Y

FPC > HDI > R-PCB, IC-Substrate
The greatest push for growth is FPC, HDI

Source: 2017 Prismark Report and Analysis and Update by Eternal Market Report

Eternal Materials Co. LTD.

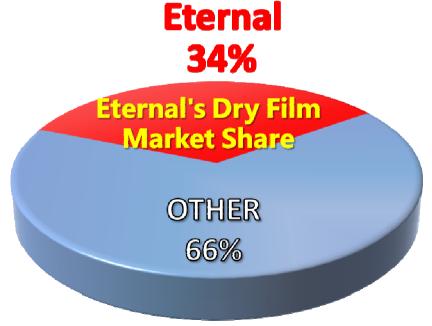
Dry Film Market Share





Global Dry Film Market Size Update (2014~2018)

Ten Thousand KSF	2014	2015	2016	2017	2018(F)
Dry Film Market Size	1,001	995	1,020	1,100	1,140



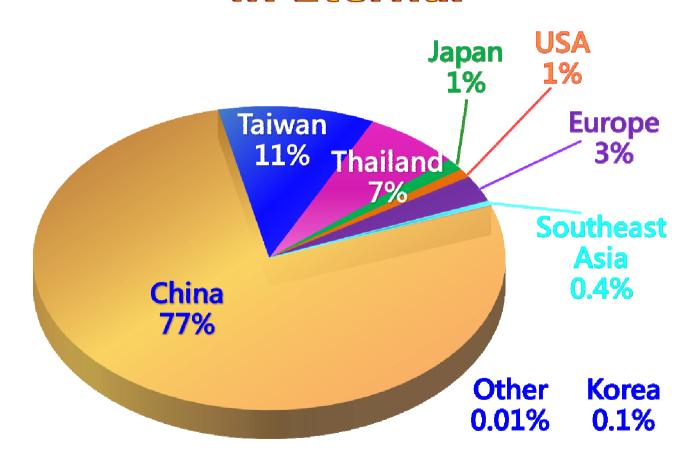
Global Dry Film Market Share Comparison (2017Y)

Source: 2017 Prismark Report and Analysis and Update by Eternal Market Report

Dry Film Market Share



Global Dry Film Market Distribution in Eternal



Global Coating Capacity





Coating Process Capability Thickness
50nm ~ 300um

Future Perspectives



1

Develop in the US, Japan and Korea markets by PCB well-known enterprises strategic alliance to stay ahead in the world.

- 2
- Continuingly expanding the market of Vacuum Laminator in IC/package substrate, passive components, FPC boards and semiconductor...etc.
- 3

Maintain existing customers and to develop potential customers of toll coating.



Continuous improvements in the precision coating capability to meet customer needs.







THANK YOU

ETERNAL MATERIALS