Display Materials & Components

Will polarizer supply fully meet rising demand?

September 2014

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Executive summary

The polarizer market is estimated to increase by 5.3% in 2014 compared to a year ago to $10.3 billion. It is also forecast to rise 5.4% in 2015. In terms of area, in particular, the market is forecast to grow at a compound annual growth rate of 7.5% from 397 million square meters in 2014, to exceed 500 million square meters in 2018. Panel demand is forecast to be particularly strong in 2014 and 2015. This is largely due to the spiked demand during the World Cup; the Brazilian government’s subsidy policy; diversification of product line-ups including ultra-high definition (UHD), 3D, and curved TVs; and the scaling up of smart devices. Prices of polarizers are falling steadily, but the average price per unit area is unlikely to drop by large on diversification of premium-class large TV line-ups, including UHD, 3D and curved TVs, and their production increase. As a result, they are expected to maintain a CAGR of 4.0%, in terms of value.

There are two issues stemming from such a robust panel demand.

First, there are concerns on the shortage of polarizer supply. IHS expects polarizer supply to become tight from the second half of 2014 and go through a shortage beginning 2015. The biggest reason is demand for polarizer, in terms of area, is forecast to grow at a CAGR of 7%, but the supply is expected to grow only at a CAGR of 2% due to a lack of new operating lines. (Please refer to page 56.)

Another issue is tariffs from China. China has hiked tariffs on polarizers to 8% this year and it may hike them again to 11% next year. Such a tariff increase means polarizers will lose price competitiveness. China-based panel makers will also likely depend more on polarizer supplies in China rather than importing them. But supplies in China absurdly fall short of meeting the panel demand in China. LG Chem Ltd., which already built a new line in China, and Chi Mei Materials Technology Corp. (CMMT) are expected to greatly benefit from the rise in panel demand in China. (See p.60.) In this context, Nitto Denko Corp. and China’s Shenzhen SAPO Photoelectric Co. (SAPO) are believed to have reached a business pact.
In terms of sub-films, adoption of acryl film, which has strong durability, and COP film is rising on an increase in open-cell business. PET-used polarizers produced by Samsung SDI Co. are also steadily being adopted, albeit at a small quantity. An increase in adoption of IPS mode and the start of adoption of Nitto’s resin-type PVA polarizers, the ultimate thin polarizer, will bring a big change in the polarizer sub-film market in the future.

IHS analyzed the polarizer market forecasts from 2013 to 2018, production line status by manufacturer, supply chain, and price trends. It also tried to enhance understanding of the polarizer market in which competition of high value-added film production has begun in full scale, through an analysis of optical sub-films, such as TAC, PVA, PET protection, release, anti-reflection, and compensation films.
Chapter 1. Polarizer market and industry
1. Overview

1.1. Research methodology

- Data collection

The data used in this report has been collected and analyzed through various methods. The most important, basic data regarding supply was collected through Q&A sessions with major suppliers and research. Also, IHS has been collecting information continuously including materials from industrial and academic conferences, various display industry-related exhibitions, companies' earnings and analysis reports, press releases, and Internet search.

- Data analysis

The collected data has been analyzed under the methods of cross fact-checking and correlating the information as well as through diachronic/synchrnical studies by using existing analysis data. In particular, past demand/supply conditions and technology comparisons have been using the industry forecasts and regular/irregular reports released by IHS Technology as the fundamental basis of analysis.

- Demand for polarizers and sub-films

This is based on panel makers' shipment results and their plans to raise production capacities, collected through various methods and routes from panel makers and polarizer companies.

- Polarizer and sub-film supplies

This is based on polarizer makers' shipment results and their plans to raise production capacities, collected through polarizer-use sub-film companies' shipment results and supply chains.

- Polarizer and sub-film markets and prices

IHS has researched global prices of polarizers and sub-films every quarter. The entire amount market is calculated by collecting and calculating average prices of quarterly polarizer shipments and supply prices by product.
1.2. Research scope and definitions

- Research scope: Market sizes are calculated based on area as polarizers are provided in the form of films.
- Research item: Polarizer
- Researched companies: Manufacturers of the above item and its raw materials.
- Research period: Third quarter of 2014
- Long-term forecast: Markets from 2013 to 2018
- Supply chain: Calculated based on the second quarter of 2014

- Units and Abbreviations
  - Y/Y Growth: Year-on-year growth
  - Q/Q Growth: Quarter-on-quarter growth
  - CAGR: Compound annual growth rate
  - L.TFT: Large TFT (9-inch or larger, including tablet PCs)
  - S/M TFT: Small/Medium TFT
  - Dongwoo: Dongwoo Fine Chem.
  - LGD: LG Display
  - SDC: Samsung Display
  - CMMT: Chi Mei Materials Technology
  - BQM: BenQ Materials (Formerly Daxon)
  - CSOT: Shenzhen China Star Optoelectronics Technology
  - CEC: Nanjing CEC-Panda LCD Technology
  - PLD: Panasonic Liquid Crystal Display
  - INX: Innolux Display
  - TAC: Tri-acetyl cellulose
  - PVA: Poly-vinyl alcohol
  - PET: Polyethylene terephthalate
  - COP: Cycloolefin polymer
  - AG: Anti-glare
  - LR: Low reflection
  - HC: Hard coating
  - TN mode: Twisted nematic
  - VA mode: Vertical alignment
  - IPS mode: In-plain switch
1.3. Revisions made in the H2 2014 report

- Changes in classification of small- and medium-sized panel applications
  Divided the mobile phone into two: Smartphone and mobile phone (feature phone).
  Integrated the DSC and the camcorder into the camera.
  Integrated PND, DPF, PMP, and portable DVD into the portable.

- Revised down the polarizer price per unit area.

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- Revised up effective area, cutting rates, and yields that are applied when calculating polarizer demand.
  Previous: Effective area (95%) x cutting rates (85~88%) x yields (93~95%) = 75~79%
  Revision: Effective area (95%) x cutting rates (90~95%) x yields (93~95%) = 80~86%
  → Please note that the polarizer value market in the H2 2014 report fell from that in the H1 2014 report due to the revisions in demand area and prices.
2. Polarizer market forecast

2.1. Overall polarizer market forecast, 2013–2018

- The polarizer market is estimated to grow 5.3% in 2014 compared to a year ago to $10.3 billion. It is forecast to rise 5.4% in 2015 as well.
- Polarizer prices have been falling despite the brisk panel market, but the average price is unlikely to fall sharply on the diversification of premium-class TV line-ups like 3D and UHD, maintaining a CAGR of 4.0% from 2013 to 2018.
3.5. Polarizer demand forecast by display mode

- Demand area of TFT-LCD-use polarizers including both s/m and large-sized will reach 394.7 million square meters in 2014. By LCD display mode, twisted nematic (TN) mode will account for 47 million square meters, or 12%, while wide view panel-use VA and IPS are likely to account for a combined 348 million square meters, or 88%.

- IPS mode is increasingly used in applications like monitors, notebook PCs, tablet PCs, and smartphones. Market share of IPS-use mode will increase to 41% in 2018, while VA mode is likely to take about 50%, and TN mode 9% of the total market in 2018.
## 5. Analysis of polarizer production capacity

### 5.1. Polarizer production line and capacity

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6. Status of major polarizer companies

6.1. Nitto

- Nitto posted $xxx million in polarizer revenue in the second quarter of 2014.
- It owns xx production lines, including one in Pyeongtaek, South Korea. The Japanese company is the world’s largest polarizer maker with an annual production capacity of more than xxx million square meters.
- It has brought in resin PVA production facilities and already has two film manufacturing lines. Currently, this type of polarizers are supplied for Apple products. At the same time, it is providing roll-to-panel (RTP) equipment to Samsung Display Co., AU Optronics Corp. (AUO), and CSOT, securing more than a certain level of orders.
- It is leading innovations in polarizer technologies by applying resin PVA and acryl films, and by developing compensation films like the Amond.
- Each quarter, Nitto is supplying more than xx% of the global demand.

* RTP equipment: Roll-to-panel equipment. Polarizer makers provide polarizers in roll to panel makers, and panel makers use the equipment to cut the roll-type polarizer after laminating it.
7.3. Monitor-use polarizer

- In the first half of 2014, LG Chem’s share in the monitor-use polarizer market was the largest with xx%, followed by CMMT with xx%, and BQM and SDI with xx% each.
8. Polarizer demand/supply and price trends

8.1. Polarizer supply and demand

- By area, polarizer demand is expected to amount to xxx million square meters in 2014. It is likely to grow at a CAGR of x% to exceed xxx million square meters by 2018. However, the supply will merely grow at a CAGR of xx% due to an absence of new operating lines.
- The supply will be tight across the board in 2014 and genuinely fall short of demand from 2015.
8.3. Polarizer price trends

- In 2014, the price per unit area of large TFT-LCD polarizers stood at $xxxx/sqm, s/m TFT-LCD ones at $xxxx/sqm and AMOLED-use at $xxxx/sqm.
Chapter 2. Polarizer sub-film market and industry
3.3. PVA protection film market forecast by base film

- TAC film is the most popular base film for a compensation film, such as WV, N-TAC, Z-TAC, and B-TAC. In 2014, the PVA protection film market is estimated at ¥xxxx billion, and likely to diminish to ¥xxx billion in 2018 due to the contraction in the WV film market and the price competition with other compensation films.

- The market for COP film, which is applied to VA mode and AMOLED-use compensation film, and some IPS-use film, is estimated to amount to ¥xx billion in 2014 and develop to ¥xx billion in 2018.
3.4. PVA protection film production capacity

- Major clients of Hoesung Corporation include SDI, LG Chem, and Dongwoo Fine-Chem. Hoesung recently began operating its second line, but due to the implementation of 3D film-patterned retarder (FPR)-integrated polarizer in the second half of 2013, its TAC supply dropped sharply.

- Shinkong Synthetic Fiber Corp. also supplies TAC films to BQM, Optimax, and Sumitomo, and started operating its second line in 2014.

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**TAC film production capacity by manufacturer**

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<tr>
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**TAC film production capacity share by manufacturer**

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Source: IHS © 2014 IHS
4.4. Compensation film market share by film type

- By film type, N-TAC for VA mode will take xx% of the demand for large-sized TFT-LCD-use compensation film in 2014, Zeonor xx%, B-TAC xx%, Z-TAC for IPS mode xx%, acryl xx%, and WV film for TN mode xx%. Due to a rise in open cell business, polarizer makers wish to increase COP application in VA mode, but because Zeon Corporation’s COP film production capacity is limited, its application increase looks to be difficult this year.

- In s/m TFT-LCD protection film, Z-TAC share will be xx% due to an increase in IPS mode, WV for TN mode xx%, and Zeonor Film for mobile VA xx%.

- The AMOLED-use compensation film market is competed between Teijin Ltd.’s WRF film, COP film, and Nitto’s Amond, but since the Galaxy S5 implemented COP this year, major portion is taken by COP.