

Investors' Meeting for Business Strategy
for the IT-related Chemicals Sector
Q&A Summary

Date and time: Thursday, September 1, 1:30 to 2:45 p.m.
Presenter: Toshihisa Deguchi, Representative Director &
Senior Managing Executive Officer

Polarizing film for LCDs

Q. Your company intends to change its business strategy for the business of polarizing film used in large LCD televisions, as profitability is drastically deteriorating amid intensified competition, mainly caused by the rise of Chinese polarizing film manufacturers. Please tell us the details of your business strategy, including your stance on new investments.

A. It seems inevitable that China will become the main market for polarizing film, as it has become increasingly clear that South Korea and Taiwan are gradually reducing production of large LCD panels. Consequently, the rise of competitors and lower prices are expected due to commoditization of the technology. Under these circumstances, our first task is to produce low-cost products while making the best use of existing facilities.

We think we should compete in terms of function in the market of polarizing film for large LCD televisions. Since it will take time for China to begin production of LCD panels for 4K and 8K televisions, we will manufacture polarizing film for 4K and 8K LCD televisions, as a competitive functional product, in South Korea, Taiwan and Japan.

About investments in polarizing film for large-screen TVs, we do not intend to make large investments.

Q. Could you elaborate on your measures on a long-term basis to improve the profitability of polarizing film for TVs? What are your concrete cost-cutting measures? For example, do you plan to use your company's acrylic materials? What do you think of the timing for making investments to compete in the Chinese market? Do you want to make investments by your company alone or through a joint venture?

A. The sales volume of polarizing film for TVs dropped sharply at one time due to the effect of inventory adjustments, but now the sales volume is recovering. Compared with the sales recovery, the improvement in profitability is limited because of the strong yen. As the sales volume has recovered to a certain extent, we want to further promote rationalization. We are making rationalization efforts, such as using our own adhesive as well as our own acrylic film, as you pointed out.

We plan to produce raw film for polarizing film in China through a joint venture. Since our investment in the joint venture is smaller than that of our partner, we would like to withhold comment on our business plans in China. By licensing our technology, we can provide raw materials and supply raw film to the Sumitomo Chemical Group. We want to increase our presence in China.

Q. In the development of coating-type polarizing film and other products for mobile applications, you seem to be playing catch-up with other major Japanese manufacturers. How would you say you are doing compared to your Japanese rivals?

A. We are developing both PVA coating-type and PVA rolled thin film polarizing films. PVA coating is a highly interesting technology. We have received certification for it, but expanding our production volume would require a large investment. The thin film type, on the other hand, with practically the same thinness as PVA coating-type films, can be produced using conventional rolling processes, so our emphasis is on making maximum use of existing production facilities.

OLED display materials

Q. Two polarizing films are used in an LCD while one polarizing film is used in an OLED display. There are various grades of polarizing film for LCDs, so you cannot generalize, but is it correct to think that sales of polarizing film will be reduced almost by half when LCDs are replaced by OLED displays?

A. As far as conventional polarizing film that uses polyvinyl acetate is concerned, one polarizing film is used in an OLED display. Polarizing film for OLED displays contains a quarter-wave plate, a layer that is not used for polarizing film for LCDs. Therefore, each polarizing film for OLED displays has higher value added, and we do not think sales of polarizing film will decrease by half. We would like our customers to recognize this added value.

Flexible display materials

Q. Slide 38 in the presentation shows your roadmap for the development of flexible display materials. It indicates that foldable OLED displays will be developed in 2017 and beyond. When do you think the world's first foldable product will go on sale?

A. We cannot say anything definite, as our information comes from our customers. We have analyzed the situation and feel that a concept of flexible products is not yet clear. As I have already mentioned, we conduct bending tests on flexible touchscreen panels with a bending radius of three millimeters. Most film-based materials can be used without any problem for a bending radius of five or 10 millimeters, which means touchscreen panels that bend slightly. Meanwhile, for a bending radius of two or three millimeters, which means foldable products, different materials are needed.

We are facing increasing demands from display manufacturers for materials we are developing. The display manufacturers are raising the specs of such materials, and it is still unknown when the specs will be finalized.

Q. You seem to think that your company's window film is competitive and this business has potential. I hear that South Korean companies and Japanese chemical manufacturers are also developing transparent polyimide. What do you think about the level of competition in the window film market?

A. I think that our products have had an advantage over competitors' products so far in terms of transparency, color tone, and water absorption. Consequently, if the current product specs do not change, it would be advantageous to our company. However, no final specs have been set, such as a bending radius for bending tests, as well as a limit to the quantity of bending, and a recovery rate.

Q. Is window film made of transparent polyimide?

A. It is made of transparent polyimide, but substances contained in it differ at each company.

Q. It is difficult to imagine the final form of multi-functional materials and components. Are they composed of four films pasted together? Or, does one film perform functions similar to those of four films?

A. It is like a single material under development that will incorporate functions of other materials. By offering multi-functional materials and components, we will help our customers rationalize their operations and improve the performance of their products.

Q. Compared with existing polarizing film, how much added value will multi-functional materials and components have?

A. At present, our customers purchase four materials separately and assemble displays. We will be able to offer our customers cost benefits by providing a set of materials.

Q. On Slide 39, your barrier films are not included among multi-functional materials and components. Are you aiming to provide a standard solution, so that your multi-functional materials and components can be adopted by a wide range of panel manufacturers, layering them on the OLED cells they produce?

A. Barrier films are materials for protecting OLEDs, and are used in customer processes. For this reason, if materials with other functions were integrated into our barrier films, it is not clear whether there would be benefits to introducing these other materials into customer processes. This is why we do not currently include barrier films among multi-functional materials and components.

Q. From a materials standpoint, what are the bottlenecks to practical implementation of rollable and foldable displays? Are there materials even at a bend radius of 5R that are not yet at the practical stage?

A. The currently required specs are within reach, and the fact is, most film-based materials can be used without problem if they are somewhat bendable, such as 5R or 10R. The product concept, however, is not completely fixed, and the specs required of materials being developed are changing and becoming more sophisticated. We intend to continue our development to meet changing customer requirements.

Q. Strictly from the standpoint of material productivity and mass production potential, do you feel you have mostly achieved success?

A. Yes, as long as the assessment standards we have adopted are in line with those of customers.

Others

Q. In describing your investment in the polarizing film business, you noted that investment in China consists of minority investments, and that for large TV applications you are not going to be making large-scale investments but, rather, are seeking cost-efficiency. However, in the stepped chart on Slide 28, the change in fixed costs (comparing FY2015 and FY2018) is more than minus 10 billion yen. How do you explain the rise in fixed costs?

Also, in the measures for cost-efficiency, how much of the effectiveness will come from increasing use of in-house materials and how much from raising throughput for more efficient use of existing facilities?

A. The rise in fixed costs in the stepped chart is not only for polarizing films. It is for the IT-related Chemicals Sector as a whole. Since we expect to boost products like touch sensors, as well, an increase in depreciation and other costs is foreseen.

As for the breakdown in cost-efficiency benefits, we are assuming cooperation from our suppliers, and those efforts are included here along with our own efforts. For our part, we intend to take measures for raising line speeds and utilization rates.

Q. I would like to ask about the development status of high-polymer organic electroluminescent materials, and the potential and timing for future adoption.

A. Manufacturers in South Korea have taken the lead in marketing OLED TVs using vapor deposition low-polymer organic electroluminescent technology. In place of that, we have developed a high-polymer organic electroluminescent material, and are having it assessed by customers, not only in South Korea but also in China and Japan. We have learned that a Japanese customer is planning to market OLEDs for medium-size panel use, and our material is expected to be adopted. Evaluation of our material for large panel use is proceeding mainly in South Korea. We expect the direction to be decided early next fiscal year.

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