

Ceremony Held to Commemorate the Opening of the Liquid Crystal (LC) Film Plant in Suzhou, China

For immediate release

Nippon Oil LC Film (Suzhou) Corporation, a wholly owned subsidiary of Nippon Oil Corporation (NOC; Fumiaki Watari, President), has completed the construction of the plant of Liquid crystal (LC) film in Suzhou, China, and have announced the opening of the plant in a ceremony held on September 7th. Approximately 100 guests, including Mr. Min Wang, the Communist Party Leader of Suzhou City, customers, and other related parties were invited to the ceremony to mark the opening of the plant. The preparation of the plant was started in May 2003. The annual production capacity is approximately 1.2 million square meters. The trial fabrication has just begun in August.

A new plant was viewed as necessary because the Tatsuno Plant of Nippon Oil LC Film Co., Ltd. (Takao Kurita, President)—a wholly owned subsidiary of NOC, which is located in Japan's Nagano Prefecture—has almost been running with its full annual capacity (about 1.2 million square meters) in these years. Recently, the LC film series from NOC group have widely been applied to color liquid crystal displays (LCDs). The demand of the films is growing rapid than expected not only because of the massive growth in demand in the cellular phone market but also because of the ongoing worldwide shift of their displays to be color LCDs instead of monochrome displays.

China has become the largest production center for cellular phones in the world. The leading global cellular phone manufacturers have constructed their plants in China. The growth of the Chinese companies in this field is outstanding. Thus the location of the new plant in Suzhou was decided based on the need to provide just-in-time deliveries to customers in the Suzhou and Shanghai districts as well as to enhance the cost-competitiveness.

The completion of the Suzhou Plant brings the annual LC film production capacity of the NOC Group to be 2.4 million square meters. The commercial production of the new plant is scheduled to start from February 2005. In addition, Nippon Oil LC Film (Suzhou) is also positioned as the regional sales center and is expected to continue to expand the scope of its activities.

1. Details of the Plant Opening Ceremony

(1) Date and time: September 7, 2004, 10am to 11am

(2) Place: Nippon Oil LC Film (Suzhou) Corporation

(555 Jinfeng Road, Suzhou, Jiangsu, China)

(3) Principal participants:

Invited guests: Mr. Min Wang (Communist Party Leader of Suzhou City), Mr. Nobuyuki Sugimoto (Consul General of the Japanese Consulate in Shanghai)

Participants from Nippon Oil: Fumiaki Watari (President), Tatsunosuke Okabe (Managing Director), Makoto Satani (Managing Director)

2. Outline of the Company

(1) Company name: Nippon Oil LC Film (Suzhou) Corporation (Jun Mukai, President)

(2) Location: Suzhou New District, Suzhou, Jiangsu, China

(3) Date of establishment: May 22, 2003

(4) Paid-in capital: US\$25 million (Approx. ¥3.0 billion)

(5) Lines of business: Production of LC film and sales in China and other markets

(6) Production capacity: Approx. 1.2 million square meters annually

(7) Number of employees: Approx. 150 (when operating in three shifts on first production line)

Supplementary Information: Further information on the background for the establishment of the subsidiary in China and the LC film series may be found on the following pages.

● Background for the Establishment of the Subsidiary in China

China has already become the world's largest manufacturing center for cellular phones, as the top five global makers—Nokia,

Motorola, Samsung Electronics, and Sony Ericsson (which dominate about 70% of worldwide production) —have constructed their fabrication lines in China, and local manufacturers, including TCL Mobile Communications, have experienced rapid growth. These mobile phone manufacturers had originally positioned their operations in China as production centers for exporting to the rest of the world, but today the additional role of these operations is sales function in the Chinese domestic market, which is expected to show massive growth going forward.

At the same time, along with the entry of mobile phone manufacturers, suppliers of LCDs and polarizers have also set up their operations in China. This is making it possible to create a just-in-time supply system for parts and materials in the LCD industry in the greater Shanghai region. The principal focus of Nippon Oil LC Film's business plans is marketing LC film to those LCD suppliers for cellular phones. The decision to build a new plant in China was taken with the objective of creating a stronger production and marketing system to enable Nippon Oil LC Film to build closer cooperative relationships with those cellular-phone-related manufacturers that have already established bases in this region.

● The LC Film Series

Films with optical functionality are essential for improving the visual performance of LCDs. The lineup of Nippon Oil LC Film products includes LC films for super twisted nematic (STN) LCDs as color compensators and NH films for thin film transistor (TFT) LCDs as viewing angle compensators; both of these are laminated to LCDs together with polarizer using adhesive compounds. Interest among leading LCD producers is strong, as evidenced by the high level of inquiries.

Compared with previous polycarbonate films, LC films feature high-performance optical functions since they possess twisted internal structure, which is precisely and freely controlled by the sophisticated fabrication process. Customizing the internal structure of the film to the LCDs, it is possible to achieve higher performance (greater contrast and better color purity) without changing the design of the customers' LCDs.

NH films are viewing compensators for TFT-LCDs. The film possesses a special internal structure of liquid crystalline polymers in which the tilt angles of the polymers vary gradually relative to the normal orientation of the film. The film greatly improves the viewing-angle performance, which is a problem with the transmissive modes of transreflective TFT-LCDs. The film maintains the contrast and suppresses the color changing and the gray-scale inversion, so it keeps the images natural and recognizable even when viewed from oblique angles. Moreover, the film functions as both a viewing angle compensator and a nematic retarder sheet, so it boosts the panel performance without increasing the number of optical sheets. Panels made with NH film are therefore widely used in portable applications, where thickness is one of the important issues.