Abstract
As a latecomer in the projected capacitive touch panel market, Shenzhen O-film Tech Co., Ltd. managed to attract branded smartphone vendors, such as Lenovo, ZTE, Huawei, Samsung, and Asus, by providing them with low-cost solutions. After gaining a foothold, the company further builds up its R&D strength by focusing on the in-house development of metal mesh touch panels. This research profiles O-film's product strategies and patent portfolio, with a close look at its deployment of related technologies in the touch panel industry.

by Chung-Yu Yang
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1. Overview of O-film's Projected Capacitive Touch Panel Business

O-film (Shenzhen O-film Tech Co., Ltd.) was founded in 2001 and became a listed company in Shenzhen Stock Exchange in 2010, with main business scope covering camera lens, touch panel, LCM (LCD module), and optical fiber coating.

The company started as a resistive touch panel manufacturer. However, with Apple leading the trend to adopt projected capacitive touch panels, O-film joined the fray in 2010 and began shipment of such panels in 2011. Its subsidiaries include Suzhou O-film Tech Co. Ltd, Nanchang O-film Tech Co. Ltd, and Nanchang O-film Nanotechnology Co. Ltd. Among them, Suzhou and Nanchang subsidiaries are in charge of producing strengthened glass, projected capacitive touch panel, and ITO (Indium Tin Oxide) film. In December 2012, O-film signed an agreement with Suzhou NanoGrid Technology Co., Ltd., in which Suzhou NanoGrid Technology transferred 100% of its stake in Suzhou Meng Si Wei Photoelectricity Technology to O-film. After the stock transfer, Meng Si Wei Photoelectricity Technology became O-film's wholly-owned subsidiary and was renamed Nanchang O-film Nanotechnology, focusing on the development of metal mesh touch panels.

1.1 Revenue Growth Driven by Projected Capacitive Touch Technology

O-film's annual revenues grew steadily during 2009 and 2012, with an exponential growth between 2011 and 2012. In the first half of 2013, the company's revenues totaled 3.3 billion RMB (US$545 million; US$1=6.058 RMB), close to the company's year-round revenues of 3.9 billion RMB (US$644 million) in 2012. During 2012 and the first half of 2013, projected capacitive touch panels grasped 90% of O-film's annual revenues and contributed to the company's recent revenue hike.
1.2 Higher Gross Profit Margin Compared to Industry Counterparts
1.3 Highly Concentrated Customer Base Increases Operational Risks

Table 1

<table>
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<tr>
<th>Rank</th>
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<td>Accumulated Revenue Share</td>
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Source: O-film, compiled by MIC, February 2014

1.4 Focus on China's Domestic Market

Figure 4

| O-film's Domestic and Overseas Sales Share, 2009 – 1H 2013 |
1.5 Touch Panel Business Bolstered by Government Subsidies

2. O-film's Product Strategy
2.1 Low Cost Strategy for Small, Medium-sized Products

2.1.1 Dedication to Roll-to-Roll Production Process

2.1.2 Increasing the Share of ITO Film Made In House

2.2 Accelerating New Product Development & Expanding Large-size Applications

2.2.1 Capability to Independently Produce Metal Mesh

2.2.2 Fast Commercialization on Good Customer Relationship

2.2.3 Expansion to LCM for Total Solutions

3. Insight into O-film's Patent Applications

Figure 6     Major Components of a Touch Display
3.1 Consolidating In-house R&D Strength

Source: O-film, compiled by MIC, February 2014

3.2 Enormous Utility Patents Deter Potential Competitors

Source: O-film, compiled by MIC, February 2014
Figure 9  Share of Accumulated Patent Applications by Type, 2009 – 2013

Table 2  Major Events of the Patent Infringement Lawsuits between O-film and TPK

<table>
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<th>Date</th>
<th>Event Details</th>
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Source: O-film, compiled by MIC, February 2014
3.3 Focusing on the Chinese Market Alone

3.4 Recruiting Outstanding Inventors

Table 3

<table>
<thead>
<tr>
<th>Inventor</th>
<th>Share of O-film's Overall Patents</th>
<th>Research Field</th>
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Note: A patent co-authored by several inventors are double counted.
Source: O-film, compiled by MIC, February 2014


Figure 10

O-film's Invention Patents by Technology Field, 2010 – 2013
4.1 Emphasis on Developing Metal Mesh Technology

4.1.1 Patterned Processing based on Imprinting Technology

4.1.2 Filing PCT Applications for Overseas Markets

<table>
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<th>Application Number</th>
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Source: WIPO, compiled by MIC, February 2014

4.2 Cutting into Integrated Touch Panel Business
4.3 Focusing on Slim Design and Reducing Cost
5. MIC Perspective
Low Cost Strategy to Gain a Foothold First

Dedication to R&D and Vertical Integration

Comprehensive Patent Portfolio Based on Self-Developed Technology

Lack of Overseas Patents Puts O-film at a Disadvantage
Appendix
Research Scope

This report covers the latest information of China-based touch panel manufacturer O-film, its product strategy, and patent deployment.

Databases used by this research include SIPO, USPTO, and WIPO. Columns surveyed include title, applicant, and inventor, with key words such as "touch control" and the names of important inventors. A total of 237 patents (both in progress and granted) were analyzed in this research. These patents were filed and revealed to the public by O-film before November 2013.
## Glossary of Terms

<table>
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<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>FPC</td>
<td>Flexible Printed Circuit</td>
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<tr>
<td>G/F</td>
<td>Glass Film</td>
</tr>
<tr>
<td>G/F/F</td>
<td>Glass Film Film</td>
</tr>
<tr>
<td>G/G</td>
<td>Glass Glass</td>
</tr>
<tr>
<td>ITO</td>
<td>Indium Tin Oxide</td>
</tr>
<tr>
<td>LCD</td>
<td>Liquid Crystal Display</td>
</tr>
<tr>
<td>LCM</td>
<td>LCD Module</td>
</tr>
<tr>
<td>OGS</td>
<td>One Glass Solution</td>
</tr>
<tr>
<td>P/F</td>
<td>PET Film</td>
</tr>
<tr>
<td>PCT</td>
<td>Patent Cooperation Treaty</td>
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</table>
List of Companies

3M
Acer
Asus
Atmel
Beijing
Beny Wave Technology Ltd.
Coolpad
CPT
Dell
EagleTech
Communication
E-shine
Evolution
Hong Kong
Fujifilm
GSEO
HP
Huawei
Innolux
JDI Japan Display Inc.
KOLEN
Lenovo
LG Display
Lite-On
Oclaro Inc.
Samsung
Sharp
Shenzhen O-film Tech Co., Ltd.
SIPO State Intellectual Property Office of the P.R.C.
USPTO United States Patent and Trademark Office
WIPO World Intellectual Property Organization
ZTE