Product Roadmap

Prepared by : Henghao
Date : 2015 Q3
Version : V1
Contents

1. Company Profile Overview
2. Touch Technology
3. LCM
4. Lamination
### Background

**COMPAL GROUP**

- **COMPAL**
  - NB, Tablet, Smart Phone ODM
- **Henghao Technology**
  - Touch Solution & System Integration

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Founded</strong></td>
<td>• Dec. 2010</td>
</tr>
<tr>
<td><strong>Capital</strong></td>
<td>• USD183 million / NTD 5.5 billion</td>
</tr>
<tr>
<td><strong>Employee</strong></td>
<td>• 3,000</td>
</tr>
<tr>
<td><strong>Solution</strong></td>
<td>• OGS / Film / Direct Bonding / BLM and LCM Assembly</td>
</tr>
<tr>
<td><strong>Background</strong></td>
<td>• 100% Compal Subsidiary</td>
</tr>
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</table>
**Global Offices and Factories**

**Kunshan (China)**
- Backend Assembly Fab
  - Glass cutting
  - CNC
  - Strengthening
  - FPC bonding
  - Direct bonding (LCM/open-cell)
  - Touch module assembly
  - LCM backend process
- CFOC China Factory - CG provided

**Hsinchu (Taiwan)**
- Henghao HQ
- G4.5 glass sensor fab
  - Capacity: 80K sheets/month
  - Sheet Size: 730 x 920mm
- Film sensor fab
  - RTR process
  - Sheet Size: 500 x 600mm

**Taichung (Taiwan)**
- Henghao Branch Office
- CFOC - Raw Glass/Cover Glass Chemical Strengthen Facilities
HengHao Strengths

- Glass Sensor
- Film Sensor
- LCM
- Lamination
- Assembly

MACTECH
- Scree Printing Process
- Plasma Series
- TP ACF Bonding M/C
- CNC Router

CFOC
- Mother Glass
- Cover Lens
- Flat/Curved Decoration
- Sapphire Crystal Glass

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Henghao Total Solution

- **Film Type:** ITO/Metal mesh/Silver Nanowire
- **Glass Type:** GG/OGS/G1

**System Integration**
- TP+LCM+AB cover

**Touch**
- Mother Glass Cutting
- FOG/COG Bonding
- BLM Assembly

**Direct Bonding (TP+LCM)**
- OCA
- OCR

**LCM**
- 0.6”
- 23”

**Phone**

**Wearable**

**Tablet**

**NB**

**AIO**

**Automotive**

**Camera**

**Industrie**

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Henghao Vertical Integration

Mother Glass Cover Lens
- CFOC (HH group)

OGS/Film Sensor
- OGS: G 4.5 (730x920 mm)
- Film: RTR (in house), F2 (out sourcing)

Strengthen of OGS
- 2nd/3rd strength in house (Both Chemical & Physical)

AF/AS Coating
- Spray type Coating

AR Coating (OGS)
- Enhance Optical performance

Printing
- 2nd BM, Logo, Ag

FOG Bonding
- Auto line

COG Bonding
- In-line

POL Attached
- Automatic

LCD Glass Cutting
- G6, G5.5...

BLM
- Assembly

Lamination
- Direct bonding with LCM

FPC bonding
- FOG Auto line
Contents

1. Company profile overview
2. Touch Technology
3. LCM
4. Lamination
## Touch Solution & Application Table

<table>
<thead>
<tr>
<th>Structure</th>
<th>GFF</th>
<th>GF2</th>
<th>GF</th>
<th>OGS</th>
<th>GG</th>
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<tbody>
<tr>
<td><strong>Structure</strong></td>
<td><strong>Cover Glass</strong></td>
<td><strong>Cover Glass</strong></td>
<td><strong>Cover Glass</strong></td>
<td><strong>Glass</strong></td>
<td><strong>Cover Glass</strong></td>
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<tr>
<td></td>
<td>OCA</td>
<td>OCA</td>
<td>OCA</td>
<td>Glass</td>
<td>OCA</td>
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<tr>
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<td>Conductive Layer</td>
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<td>Conductive Layer</td>
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<tr>
<td></td>
<td>PET Film</td>
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<td>PET Film</td>
<td>Isolation Layer</td>
<td>PET Film</td>
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<td>PET Film</td>
<td>PET Film</td>
<td>PET Film</td>
<td>Glass</td>
<td>PET Film</td>
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<table>
<thead>
<tr>
<th>Application</th>
<th>ITO Film</th>
<th>Metal Mesh</th>
<th>Metal Mesh</th>
<th>Metal Mesh</th>
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</table>

|-----------|---------------------|---------------------|-------------|---------------------|---------------------|

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## Optical Summary

<table>
<thead>
<tr>
<th>ITEM</th>
<th>OGS (CG:0.7)</th>
<th>GFF (CG:0.55)</th>
<th>GF1 (CG:0.55)</th>
<th>METAL MESH (CG:1.1)</th>
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</thead>
<tbody>
<tr>
<td>TT</td>
<td>93.8</td>
<td>91.5</td>
<td>91.7</td>
<td>87.2</td>
</tr>
<tr>
<td>T550</td>
<td>93.04</td>
<td>91.27</td>
<td>91.09</td>
<td>85.89</td>
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<tr>
<td>a*</td>
<td>-0.61</td>
<td>-0.25</td>
<td>-0.16</td>
<td>-0.44</td>
</tr>
<tr>
<td>b*</td>
<td>-0.65</td>
<td>1.09</td>
<td>0.8</td>
<td>1.05</td>
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</tbody>
</table>

![Graph showing optical properties across different wavelengths]
# Product Roadmap (sensor)

<table>
<thead>
<tr>
<th>List</th>
<th>Items</th>
<th>2015Q4</th>
<th>2016Q1</th>
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<tbody>
<tr>
<td>Glass Type</td>
<td>Thickness</td>
<td>0.55 mm</td>
<td>0.4 mm</td>
</tr>
<tr>
<td></td>
<td>L/S of Trace</td>
<td>20/20um</td>
<td>15/15um</td>
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<tr>
<td></td>
<td>$\Omega/\Box$</td>
<td>~12</td>
<td>~10</td>
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<tr>
<td>Film Type</td>
<td>Thickness</td>
<td>50um</td>
<td>23um</td>
</tr>
<tr>
<td></td>
<td>L/S of Trace</td>
<td>30/30um</td>
<td>20/20um</td>
</tr>
<tr>
<td></td>
<td>$\Omega/\Box$</td>
<td>~100</td>
<td>~70</td>
</tr>
<tr>
<td></td>
<td>Versatility</td>
<td>2D</td>
<td>2.5D</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3D</td>
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</tbody>
</table>
# OGS : Glass Surface Strength

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Type</th>
<th>CS (MPa)</th>
<th>DOL (um)</th>
<th>Result</th>
<th>Test Parameter:</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Min.</td>
<td>Test data</td>
<td>Result</td>
<td>Load Ring: 10mm</td>
</tr>
<tr>
<td>1.1</td>
<td>CT24</td>
<td>626</td>
<td>705.49</td>
<td>Pass</td>
<td>Support Ring: 20mm</td>
</tr>
<tr>
<td></td>
<td>Dragon trail</td>
<td>545</td>
<td>628.06</td>
<td>Pass</td>
<td>Speed: 5mm/min</td>
</tr>
<tr>
<td></td>
<td>Soda lime</td>
<td>500</td>
<td>589.54</td>
<td>Pass</td>
<td>Sample size: 25x25x0.7mm</td>
</tr>
<tr>
<td>0.7</td>
<td>CT24</td>
<td>626</td>
<td>684.46</td>
<td>Pass</td>
<td>Sample Break Phenomenon</td>
</tr>
<tr>
<td></td>
<td>Dragon trail</td>
<td>545</td>
<td>610.94</td>
<td>Pass</td>
<td>Soda lime 0.7mm</td>
</tr>
<tr>
<td></td>
<td>Soda lime</td>
<td>500</td>
<td>596.19</td>
<td>Pass</td>
<td>Test Parameter:</td>
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<tr>
<td>0.55</td>
<td>CT30</td>
<td>500</td>
<td>552.86</td>
<td>Pass</td>
<td>Load Ring: 10mm</td>
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<tr>
<td></td>
<td>Dragon trail</td>
<td>545</td>
<td>587.65</td>
<td>Pass</td>
<td>Support Ring: 20mm</td>
</tr>
</tbody>
</table>

**Stress Inspection Machine**

**FSM-6000LE**
**OGS : Glass Strength of B10**

- **Sodalime (1.1mm)**
- **Corning H-CT (1.1mm)**
- **Sodalime (0.7mm)**
- **Corning H-CT (0.7mm)**

<table>
<thead>
<tr>
<th>Process</th>
<th>Sodalime (1.1mm)</th>
<th>Corning H-CT (1.1mm)</th>
<th>Sodalime (0.7mm)</th>
<th>Corning H-CT (0.7mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grinding</td>
<td>176.51</td>
<td>201.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P.T.P</td>
<td>538.86</td>
<td>503.61</td>
<td>529.80</td>
<td>534.57</td>
</tr>
<tr>
<td>C.S.P.</td>
<td>648.24</td>
<td>644.63</td>
<td>(626 Mpa Min)</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- **2X~**
- **20%~**

**Definition:**
- **L:** Support span (50mm)
- **l:** Load span (25mm)
- **b:** Sample width
- **loading rate 10mm/min**
### Design Guide line for Glass manufacture

<table>
<thead>
<tr>
<th>項目</th>
<th>Unit</th>
<th>Spec</th>
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<tbody>
<tr>
<td></td>
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<td>Min</td>
</tr>
<tr>
<td>A</td>
<td>Glass Size</td>
<td>mm</td>
</tr>
<tr>
<td>B</td>
<td>Glass thickness</td>
<td>mm</td>
</tr>
<tr>
<td>C</td>
<td>Drill Hole Tolerance</td>
<td>mm</td>
</tr>
<tr>
<td>D</td>
<td>O.D Tolerance</td>
<td>mm</td>
</tr>
<tr>
<td>H</td>
<td>Drill Hole Diameter</td>
<td>mm</td>
</tr>
<tr>
<td>I</td>
<td>R angle Range</td>
<td>mm</td>
</tr>
<tr>
<td>J</td>
<td>Edge C angle Range</td>
<td>mm</td>
</tr>
<tr>
<td>L</td>
<td>凹槽 inside R angle range</td>
<td>mm</td>
</tr>
<tr>
<td>M</td>
<td>凹槽 deeply range</td>
<td>mm</td>
</tr>
<tr>
<td>N</td>
<td>Strip length range</td>
<td>mm</td>
</tr>
<tr>
<td>O</td>
<td>Strip width range</td>
<td>mm</td>
</tr>
<tr>
<td>P</td>
<td>Drill hole and position relationship</td>
<td>Ø1 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ø2 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ø5 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ø10 mm</td>
</tr>
</tbody>
</table>
OGS - GGNBT & Gorilla Glass Certification

Certificate of Approval

Presented to
Henghao Technology Co., Ltd.

July 17, 2013

This is presented to you in recognition of your efforts to demonstrate the capability to produce for Corning® Gorilla® Glass NBT™ in accordance with the required criteria.

James Hollis
Director of Sales and Applications Engineering
Corning Specialty Materials

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OGS - CT45-Edge coating testing result

Phase II: Applicable to TPMs that use their own edge coating material and/or application process AND those that adopt Corning’s recommended material and application process

Retained 4-pt bend edge strength after pendulum impact

Objective: to evaluate coating adhesion to ensure that the method/process of application is implemented properly

Sample: ITO cover glass (device size) with edge coating (15 pcs)

Pendulum impact test:
- Impact at midpoint of specimen’s long edge 1 time with 0.2J* energy
- Corning currently uses:
  - Impacting object: 8 mm dia. tungsten carbide cylinder
  - Arm length: 305 mm
  - Mass of striking head = 680 g
  - Specimen overhang ≤ 1 mm
- Criteria: No coating delamination in areas >1mm away from the impact site.

Subsequent retained strength measurement by 4-pt bend test after pendulum impact test:
- Position impacted location between the loading (upper) bars
- Place ITO-side under tension
- Use Corning’s guideline on test spans and crosshead displacement rate
- Criteria: 4-pt strength $B_{10} \geq 500$ MPa

*Applied Impact energy is dependent on glass thickness: 0.2J energy is currently used for 0.7mm and 0.55mm glass. Corning reserves the right to further review and change test protocols, parameters and criteria whenever deemed appropriate.
Verified result at Corning Lab.

Cross section

Sample #15

68.7 μm

4PB before Pendulum impact

Over 500Mpa

1. Pendulum impact test

2.5 mm

4.5 mm

4PB after Pendulum impact

Over 500Mpa
# Anti-Finger coating

## AF Coating Method.

<table>
<thead>
<tr>
<th>Process</th>
<th>Sputter</th>
<th>Spin</th>
<th>Spray</th>
</tr>
</thead>
<tbody>
<tr>
<td>Picture</td>
<td><img src="image1.png" alt="Sputter Picture" /></td>
<td><img src="image2.png" alt="Spin Picture" /></td>
<td><img src="image3.png" alt="Spray Picture" /></td>
</tr>
<tr>
<td>Equipment</td>
<td>X</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Cycle time</td>
<td>X</td>
<td>Δ</td>
<td>O</td>
</tr>
<tr>
<td>Performance</td>
<td>O</td>
<td>Δ</td>
<td>Δ</td>
</tr>
</tbody>
</table>

O : Excellent  Δ : Good  X : Normal

## AF Liquid Supplier.

<table>
<thead>
<tr>
<th>Material Number</th>
<th>Supplier</th>
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<tbody>
<tr>
<td>SR-xxxxx</td>
<td>TOPCO SCIENTIFIC</td>
</tr>
<tr>
<td>DC-xxxxx</td>
<td>DOW CORNING</td>
</tr>
<tr>
<td>DSX-x</td>
<td>DAIKIN</td>
</tr>
</tbody>
</table>

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Anti-Finger printing performance

Criteria:  
Times > 2000t  
Before : 110°  
After : 100°

Test condition:  
Steel Wood #0000 ;  
20mm*20mm  
Speed: 1 cycle/sec ;  
Distance: 50mm;  
Load: 1000g

<table>
<thead>
<tr>
<th>HH AF Coating</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Contact Angle</td>
<td>Initial</td>
<td>110°</td>
<td>110°</td>
</tr>
<tr>
<td>After</td>
<td>100°</td>
<td>100°</td>
<td>105°</td>
</tr>
<tr>
<td>Rubbing cycle time</td>
<td>1000t</td>
<td>2000t</td>
<td>2000t</td>
</tr>
</tbody>
</table>
**Scratch lift test (specific for active pen)**

**Test condition (A):**
- Test frequency: 10 times/min
- Test Force: 250 gf on rubber tip
- Test Distance: 10cm
- Rubber size: Φ1.4mm
- Test cycles: test to fail

**Test result (A):**
- 20000 times Pass, 25000 times Fail.
- Fail Note: use steam machine to examine.

**Test condition (B):**
- Test frequency: 10 times/min
- Test Force: 250 gf on rubber tip
- Test Distance: 10cm
- Rubber tools: touch pen
- Test cycles: test to Anti-Finger coating peeling

**Test result (B):**
- 6000 times Fail.
- Fail Note: use steam machine to examine.

<table>
<thead>
<tr>
<th>Cycle</th>
<th>1000</th>
<th>2000</th>
<th>3000</th>
<th>4000</th>
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<tr>
<td>Cycle</td>
<td>Friction marks</td>
<td>Friction marks</td>
<td>Friction marks</td>
<td>Friction marks</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cycle</td>
<td>5000</td>
<td>6000</td>
<td>7000</td>
<td>-</td>
</tr>
<tr>
<td>Cycle</td>
<td>Friction marks</td>
<td>Anti-Finger coating peeling</td>
<td>Anti-Finger coating peeling</td>
<td>-</td>
</tr>
</tbody>
</table>

SEM Analysis
Glass Sensor Process Flow (Front-end)

- PVD Sputter
- Etcher & Stripper
- PVD Robot
- HP/CP Robot
Film Sensor Process Flow (Front-end)

Annealing  
film attachment  
explorer  
development  
etch/strip  
printing/IR oven  

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Touch Sensor Process Flow (Back-end)

CNC

AS Coating

FPC Bonding

Film Lamination
# Film Product

<table>
<thead>
<tr>
<th>Item</th>
<th>Size</th>
<th>Stack up (mm)</th>
<th>Note</th>
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<tbody>
<tr>
<td>GF2</td>
<td>~27</td>
<td>Cover Glass OCA OCA OCA Film sensor ASF ASF</td>
<td>Metal mesh</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.1~1.8</td>
<td>0.075~0.1</td>
</tr>
<tr>
<td>GF</td>
<td>~8</td>
<td>Cover Glass OCA OCA ITO film ITO film</td>
<td>Single layer ITO film</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5~1.1</td>
<td>0.075~0.1</td>
</tr>
<tr>
<td>GFF</td>
<td>~23</td>
<td>Cover Glass OCA OCA OCA ITO film ITO film ITO film</td>
<td>Two layer ITO film</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5~1.1</td>
<td>0.075~0.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.05~0.175</td>
<td>0.05~0.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.05~0.175</td>
<td>0.05~0.175</td>
</tr>
</tbody>
</table>

On going project
**LCM Development Process**

**LCD Source**
- **Material**
  - Mother Glass (~6 G max)
  - Cell Only
  - Cell w/IC & POL

**Outsource**
- 減薄廠 1.0 -> 0.6 (0.4) mm

**Backlight Source**
- **Material**
  - BLU Structure
  - each Optical film
  - Frame/LGP

**HH In-house**
- **RD:**
  - FPCa Layout Design
  - EE electric Design
  - BLM Design
  - LCM 程式鑽 寫
  - Optical Study
  - IC Study

- **Manufacture:**
  - Mother Glass Cutting
  - Polarize attaching
  - COG Bonding
  - FOG Bonding
  - Assembly LCD/BLM
  - Testing fixture development
  - Lamination TP/LCM

**Reliability**
- **High Temp (Storage)**
  - 80°C; 240 hrs
- **Low Temp (Storage)**
  - -30°C; 240 hrs
- **High Temp (Power)**
  - 70°C; 240 hrs
- **Low Temp (Power)**
  - -30°C; 240 hrs
- **Thermal Shock**
  - -40°C~25°C~80°C / 50 cycle (30/3/30)
- **High Temp/Humidy**
  - 60°C/90%RH/240hrs
- **Package Shock test.**
- **Package Vibration.**
- **ESD**
- **Tumbler testing**
- **Particle Testing**
- **Drop test (Phone level)**
- **4-PB test**

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**LCM Capability**

- **Under 12”, we can provide total solution from G6 MS TFT glass.**

- **Over 12”, we can provide total solution from open cell TFT.**
Brightness Roadmap

LCD Transmittance: Mobil 3.5%, Tablet 5%

<table>
<thead>
<tr>
<th>Inch</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.0”</td>
<td>BLM: 9000 cd/m^2 (24 Led)</td>
<td>BLM: 10000 cd/m^2 (24 Led)</td>
<td>BLM: 11500 cd/m^2 (26 Led)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LCM: 450 nits, Tr: 5.0%</td>
<td>LCM: 500 nits, Tr: 5.0%</td>
<td>LCM: 517 nits, Tr: 4.5%</td>
<td></td>
</tr>
<tr>
<td>7.0”</td>
<td>BLM: 9000 cd/m^2 (24 Led)</td>
<td>BLM: 10000 cd/m^2 (24 Led)</td>
<td>BLM: 11500 cd/m^2 (12 Led)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LCM: 450 nits, Tr: 5.0%</td>
<td>LCM: 500 nits, Tr: 5.0%</td>
<td>LCM: 517 nits, Tr: 4.5%</td>
<td></td>
</tr>
<tr>
<td>6.0”</td>
<td>BLM: 7500 cd/m^2 (14 Led)</td>
<td>BLM: 9000 cd/m^2 (14 Led)</td>
<td>BLM: 10500 cd/m^2 (16 Led)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LCM: 350 nits, Tr: 3.5% (APCF)</td>
<td>LCM: 400 nits, Tr: 3.5% (APCF)</td>
<td>LCM: 470 nits, Tr: 3.5% (APCF)</td>
<td></td>
</tr>
<tr>
<td>5.5”</td>
<td>BLM: 11500 cd/m^2 (12 Led)</td>
<td>BLM: 12500 cd/m^2 (12 Led)</td>
<td>BLM: 20000 cd/m^2 (16 Led)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LCM: 400 nits, Tr: 3.5%</td>
<td>LCM: 435 nits, Tr: 3.5%</td>
<td>LCM: 440 nits, Tr: 2.2%</td>
<td></td>
</tr>
<tr>
<td>5.0”</td>
<td>BLM: 11000 cd/m^2 (10 Led)</td>
<td>BLM: 12500 cd/m^2 (10 Led)</td>
<td>BLM: 13500 cd/m^2 (10 Led)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LCM: 385 nits, Tr: 3.5%</td>
<td>LCM: 435 nits, Tr: 3.5%</td>
<td>LCM: 470 nits, Tr: 3.5%</td>
<td></td>
</tr>
<tr>
<td>4.7”</td>
<td>BLM: 11500 cd/m^2 (10 Led)</td>
<td>BLM: 12000 cd/m^2 (10 Led)</td>
<td>BLM: 14000 cd/m^2 (10 Led)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LCM: 385 nits, Tr: 3.5%</td>
<td>LCM: 435 nits, Tr: 3.5%</td>
<td>LCM: 470 nits, Tr: 3.5%</td>
<td></td>
</tr>
<tr>
<td>4.3”</td>
<td>(8 LED) BLM: 10500 nits, LCM: 370 nits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5”</td>
<td>(8 LED) BLM: 8500 nits, LCM: 2850 nits</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
High Brightness performance

- 12 chip <white LED>
- 17.4V / 20mA

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LCM Lamination Process

- **Sensor input**
- **Roller clean**
- **Appearance**
- **AOI**
- **OCA Lamination**

- **LCM input**
- **Roller clean**
- **AOI**
- **Vacuum chamber combination**

- **Packing**
- **Appearance**
- **Function Test**
- **Full-curing**
- **Auto clave**
- **Appearance**
Open Cell Lamination Process

Sensor input → Roller clean → Appearance → AOI → OCA Lamination

LCD input → Roller clean → AOI → Vacuum chamber combination

Appearance → Function Test → Full-curing → Auto clave → Appearance

Assembly BLM & Lamination TP → Function Test → Packing & Shipment

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Contents

1. Company profile overview
2. Touch Technology
3. LCM
4. Lamination
## OCA & OCR Lamination Ability

### Lamination size & material thickness

<table>
<thead>
<tr>
<th>Lamination Size</th>
<th>Under 8”</th>
<th>10.1”</th>
<th>13.3”</th>
<th>15.6”</th>
<th>17”</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 um</td>
<td>OCA</td>
<td>OCA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>175 um</td>
<td>OCA</td>
<td>(OCA)</td>
<td>(OCA)</td>
<td>(OCA)</td>
<td>NA</td>
</tr>
<tr>
<td>200 um</td>
<td>OCA</td>
<td>OCA</td>
<td>OCA</td>
<td>OCA</td>
<td>OCR</td>
</tr>
<tr>
<td>250 um</td>
<td>OCA</td>
<td>OCA</td>
<td>OCA</td>
<td>OCA</td>
<td>OCR</td>
</tr>
</tbody>
</table>

### OCR & OCA Material different process

**OCA**
1. 撕除輕離膜
2. 滾壓OCA膠於物件1
3. 撕除重離膜
4. 滾壓物件2於物件1上

**OCR**
1. 加壓脫泡
2. 搖壓物件
3. Lamination
4. UV
Lamination Ability & development

Direct bonding policy:

- OCR: recommend for TFT open cell input.
- OCA: recommend for LCM input.
- Also study the new OCR glue (UV type) to improve the cost effective. Plan to have the sample run by the end of September.
## STD LCM list

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Size</th>
<th>Resolution</th>
<th>Display</th>
<th>IC</th>
<th>LCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS-L015SR01-F5PA1</td>
<td>1.54”</td>
<td>240x240</td>
<td>IPS</td>
<td>ST7789</td>
<td>BOE</td>
</tr>
<tr>
<td>HS-M047HD01-N5PA1</td>
<td>4.66”</td>
<td>HD</td>
<td>IPS</td>
<td>OTM1284A-C10</td>
<td>IVO</td>
</tr>
<tr>
<td>HS-M047FW01-N5TA1</td>
<td>4.7”</td>
<td>FWVGA</td>
<td>TN</td>
<td>OTM8019A-C9</td>
<td>CPT</td>
</tr>
<tr>
<td>HS-M050SH01-N5PA1</td>
<td>5”</td>
<td>qHD</td>
<td>IPS</td>
<td>OTM9605A-C32</td>
<td>CTC</td>
</tr>
<tr>
<td>HS-M050FH01-N5LA1</td>
<td>5”</td>
<td>FHD</td>
<td>LTPS-IPS</td>
<td>R63315A0 EQQV</td>
<td>LGD</td>
</tr>
<tr>
<td>HS-M050HD01-O5PA1</td>
<td>5” (on cell)</td>
<td>HD</td>
<td>IPS</td>
<td>OTM1284A</td>
<td>HSD</td>
</tr>
<tr>
<td>HS-M050HD02-N5PA1</td>
<td>5” (薄化)</td>
<td>HD</td>
<td>IPS</td>
<td>OTM1284A</td>
<td>CPT</td>
</tr>
<tr>
<td>HS-M055HD01-N5PA1</td>
<td>5.5”</td>
<td>HD</td>
<td>IPS</td>
<td>OTM1284A-C10</td>
<td>IVO</td>
</tr>
<tr>
<td>HS-M055HD02-N5PA1</td>
<td>5.5”</td>
<td>HD</td>
<td>IPS</td>
<td>OTM1284A-C10</td>
<td>CPT</td>
</tr>
<tr>
<td>HS-M078WX01-N5PA1</td>
<td>7.85”</td>
<td>WXGA</td>
<td>IPS</td>
<td>NT35521H-DP/3AA</td>
<td>LGD</td>
</tr>
<tr>
<td>HS-M078WX03-N5PA1</td>
<td>7.85”</td>
<td>WXGA</td>
<td>IPS</td>
<td>NT35521H-DP/3AA</td>
<td>LGD</td>
</tr>
<tr>
<td>HS-M078WX04-N5PA1</td>
<td>7.85”</td>
<td>WXGA</td>
<td>IPS</td>
<td>OTM7291</td>
<td>LGD</td>
</tr>
<tr>
<td>HS-M080WX01-N5PA1</td>
<td>8”</td>
<td>WXGA</td>
<td>IPS</td>
<td>NT35521H-DP/3AA</td>
<td>LGD</td>
</tr>
<tr>
<td>HD-L101WX03-N5PA1</td>
<td>10.1”</td>
<td>WXGA</td>
<td>IPS</td>
<td>NT 65622/NT39212F</td>
<td>AUO</td>
</tr>
</tbody>
</table>
Thank you

High-technology
High-quality
Creativity