Data Display Group

Optical Vacuum Bonding & Vacuum Assembly

The revolutionary Technology

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In close strategic and technical co-operation with the Japanese Taica - Group we developed the latest generation of optical bonding and assembly technology.

For supply security and for support of your risk management we installed the identical machines and processes in Germering/Munich, Germany as well as in Ronkonkoma/NY, USA

**Vacuum Bonding doesn’t need:**
- Drying process / curing time
- Dam construction as wet bonding
- Comprehensive “optical defect specification”
- Stable mechanical structure of TFT
Advantages VacuBond:

- Perfect contrast and readability in sunshine by eliminating the air gaps between TFT display and cover glass / touch
- No condensation / fogging in air-gap
- Reduced danger of splintering during glass breakage
- Improved shock absorption, more robust construction
- Improved heat transmission via front-glass (up to factor 8)
- Cost-efficient and reliable bonding of small and sensitive TFTs in the range of 2.4” to 7” and of TFTs up to 27”+ in general
- “free air exclusion” bonding: we fill free space inside of the TFT by bonding (ex-protection)
- We can directly bond into your front-panel
- High precision in production due to production jig and automated process
- Our process is reversible, we can re-bond e.g. for repair

Advantages Assembly with VacuBond:

- Easy assembly of the fragile new generation TFT displays without metal housings
- Zero anomalies production (opaque, translucent) makes a cosmetic specification superfluous
- Assembly of protective glass of any thickness for increased ruggedness (drop ball tests, IEC60721-3-7as well as MIL STD 810F passed with VacuBond)
- Assembly of touch screens of all common technologies: resistive, glass/glass, AMR, projected capacitive
- Assembly at room temperature in contrast to assembly in autoclaves, which may exceed the maximum specified temperature of the touch screen.

Modern 3.2” TFT display assembled in VacuBond technology with a protective glass
Same 3.2” TFT display without protective glass: the very small bezel and the fragile mechanics do not allow for tape assembly or wet bonding
Superior Screen Uniformity

Mura comparison wet bonding versus **OPTαGEL**

Mura = Luminance non-uniformity (flashlighting, clouding...etc)

Mura relation **OPTαGEL** versus wet bonding: 0.46
Features:

- Bonding of all sizes up to 27”+
- Bonding of touch screens in all technologies
- Bonding of safety glasses & touch panels
- Bonding of pure TFT cell without bezel possible
- Perfect material stability over time (e.g. no yellowing)
- Fast sample production

Performance comparison OCA versus OCA Tape versus Opto-GEL

<table>
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<th>LOCA</th>
<th>OCA Tape</th>
<th>Opto-GEL</th>
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<tr>
<td>Gap Filling</td>
<td>Excellent</td>
<td>Limited / Poor</td>
<td>Excellent</td>
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<tr>
<td>Repairability</td>
<td>Can be done at pre-curing stage</td>
<td>Cannot be done</td>
<td>Can be done always</td>
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<tr>
<td>Assembly Process</td>
<td>Can be fully automated</td>
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<td>Is fully automated</td>
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<tr>
<td>Adhesion/Reliability</td>
<td>High</td>
<td>Low</td>
<td>High</td>
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<tr>
<td>Curing</td>
<td>Days</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>DAM necessary</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Inventory</td>
<td>Various liquid adhesives</td>
<td>Various pre-die cuts</td>
<td>Various pre-die cuts</td>
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## Optical Bonding Service

### Cover Glass / PMMA
- Schott Xensation™ (Thin & High Hardness)
- Corning Gorilla Glass™
- Toughened Safety Glass
- Ceramic or Organic Silkscreen
- PMMA slice

### Touch Screen
- Projected Capacitive Touch
- Resistive Touch Glass/Glass
- Infrared (IR) Touch
- Resistive Touch Film / Glass
- Analog Matrix Resistive MultiTouch

Visit our Website: [Optical Bonding of the most modern Generation: Vacuum Bonding](#)
The vacuum bonding process uses production jigs, is fully automated and therefore very stable in yield and precision.

- The Glass is larger than the TFT-Display
- The Glass is located directly on the edges
- The rear side of the TFT-Display is flat

- The Glass is not larger than the TFT-Module
- The TFT-Module located on an extension metal frame
- The rear side of the TFT-Module is not flat
JIG Tooling

Single based JIG

Multi Module based JIG in Vacuum Chamber

VACUBOND®

your specialist for flat screen solutions
Example 1:
Bonding a small, fragile TFT display with protective glass

OPTαGEL® on carrier foil

Protective glass
Examples

Fragile small TFT display

Protective glass with OPTGEL

VACUBOND®
your specialist for flat screen solutions
Examples

TFT Display with protective glass optically bonded with VacuBond®
Example 2:
Free-air-exclusion bonding of a large TFT Display with Cover Glass
Examples

TFT rear cover, open spaces filled with OPTA® Gel

vacuBond®
your specialist for flat screen solutions
Free-air-exclusion TFT Display with protective glass optically bonded with VacuBond®
Our company network supports you worldwide with offices in Germany, Great Britain, the USA, Italy and Turkey.

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