

Fully Automatic Surface Planer

DFS8910

New Planarization Technology

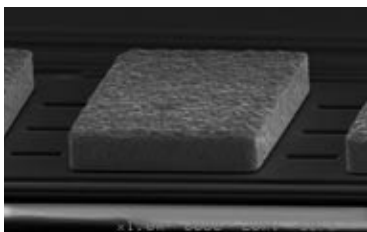


Precision planarization technology to reduce bump height variation

The DFS8910 solves the issue of bump height variation by planarizing the bump height of devices, such as LCD drivers, to below 2 μm within the wafer and to below 1 μm within the die.

Planarization solves bonding issues

- By planarizing to remove bump dimples and decreasing bump height variation, the distribution of the conductive particles improves and the possibility of bonding defects decreases, when the ACF bonds the LCD driver.
- This planarization process will realize lower stress (temperature, load) when bonding Au-Au in devices such as the next generation of SiP.



Before planarization



After planarization



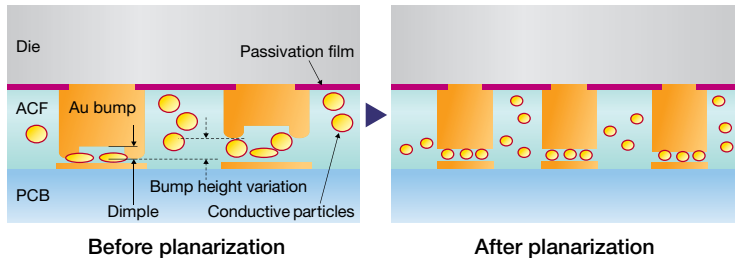
ISO 9001
JQA-0954



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Merits of LCD driver bump planarization

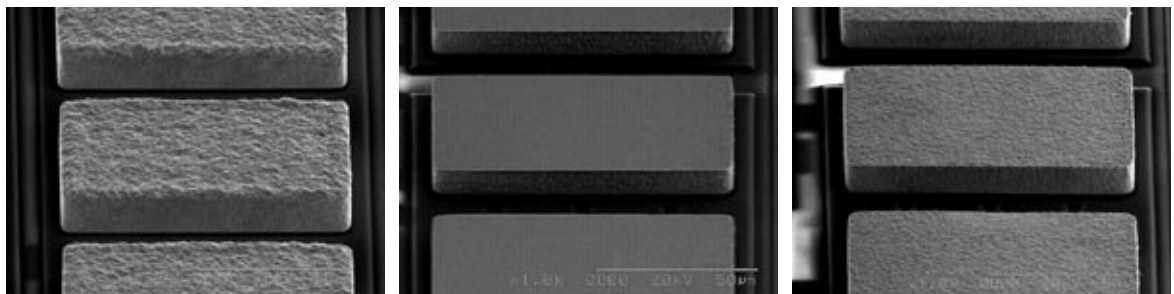


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| | Before planarization | After planarization |
|------------------------------|--|---|
| Diameter conductive particle | 4 μ m | 2 μ m |
| Dimple | 1.5 μ m | \approx 0 μ m |
| Merit | Before planarization it was difficult to miniaturize the conductive particles due to the dimple and height variation of the bumps. | With the ability to miniaturize the conductive particles by employing planarization, it is possible to decrease bonding defects and narrow the pitch between bumps. |

Au bump processing example



| | Before planarization | After planarization | After annealing |
|-----------------------------|----------------------|---------------------|-----------------|
| Bump height variation | 1.7 μ m | 0.5 μ m | 0.5 μ m |
| Bump surface roughness (Ra) | 0.242 μ m | 0.012 μ m | 0.081 μ m |

Supports planarization of electroplated structures

Pattern formation, based on electroplating using photolithographic techniques, is employed on high aspect ratio structure formation and fine pitch devices such as recent DNA microarray. In this case, the DFS8910 provides a low cost, productive process to planarize height variation of electroplated surfaces when they occur.

Able to support various shaped workpieces besides wafers

As a standard, the DFS8910 supports silicon wafers less than and equal to $\phi 8"$. As an option, it can also support various shaped workpieces such as squares.

Able to support wet and dry cutting

Using the same tool makes switching between wet and dry cutting possible.

Recovery of Au scraps for reuse is possible

The DFS8910 can be equipped with a cutting scrap collection unit (optional) to collect Au scraps that occur when Au bumps are cut. The Au scraps can be reused for bumping.

| DFS8910 | | |
|---------------------------------------|--|---------------------------|
| Wafer Diameter | - | Max. $\phi 8"$ * |
| Spindle | Spindle type | Water cooled air spindle |
| | Number of axis | 1 |
| Height gauge | - | Available |
| Chuck table | Chuck type | Vacuum chuck |
| | Number of chuck tables | 1 |
| Wafer transfer / cleaning unit | Number of cassettes | 2 |
| Process precision | Bump height variation within the wafer | μ m Less than 2.0 |
| | Bump height variation within the die | μ m Less than 1.0 |
| | Bump roughness surface | μ m Ra less than 0.02 |
| Utilities | Machine dimensions (W x D x H) | mm 1,200 x 2,670 x 1,800 |
| | Machine weight | kg Approximately 1,900 |

* For customers who would like to process workpieces greater than $\phi 8"$ in diameter, please contact your local Disco sales representative.

Environmental conditions

- Use clean, oil-free air at a dew point of -15°C or less. (Use a residual oil: 0.1 ppm. Filtration rating: 0.01 $\mu\text{m}/99.5\%$ or more).
- Keep room temperature fluctuations within $\pm 1^{\circ}\text{C}$ of the set value. (Set value should be between $20 - 25^{\circ}\text{C}$).
- Keep cutting water 2°C above room temperature (fluctuations within $\pm 1^{\circ}\text{C}$).
- Keep spindle cooling water the same as room temperature between $20 - 25^{\circ}\text{C}$ (fluctuations within $\pm 1^{\circ}\text{C}$).
- The machines should be used in an environment, free from external vibration. Do not install machine near a ventilation opening, heat generation equipment or oil mist generating parts.
- This machine uses water. In case of water leakage, please install the machine on the floor with sufficient waterproofing and drainage treatments.

* All the pressures are described using a gauge pressure.

* The above specifications may change due to technical modifications. Please confirm when placing your order.

* For further information please contact your local sales representatives.



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