# STVision

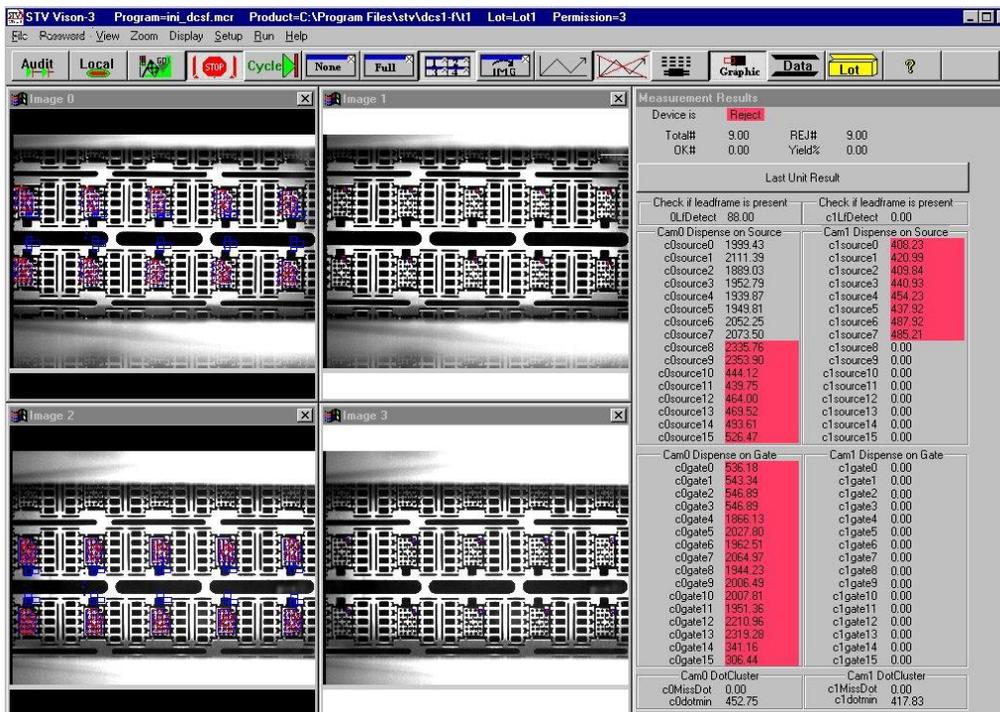**Sommer Technology for Vision**

Bergstraße 5 a
85410 Haag          TEL.  0049- 8167 – 8615
Germany             FAX  0049- 8167 – 957714
                      Mobil 0049- 178- 695 2889

STVision

# Vision 3 / DCS1F
# Dispense Check System for FlipChip Bonders
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Dispense of solder paste in small quantities is critical. Uneven dispense points may occur because of

- Air bubbles in the container,
- Air from changing the container,
- Uneven solder paste (old, not kept at the correct temperature),
- Block of the tool.

The process is getting even more critical with growing number of dots, which is typical for flip chip die attach, BGA, where the bumps must make contact to the dispense dot in the reflow.

The STV system measures every single dot size exactly in its size and volume. It executes a cluster analysis and position measurement to find misalignment of the dispense tool. It find the defect solder dots directly in the bonder, after the dispense step, and before the die attach. It can instruct to skip bond, and saves expensive material and increases the yield.

Small BGA dot arrays must utilize this vision system for 100% quality in the production.

## Operation Mode

Two modules include high resolution array cameras, illumination, and all necessary optical components. These modules are easily moved into the indexer track, or removed for service and maintenance.

Each camera view is the whole leadframe width. Matrix frames are la number of solder dots, such as this:
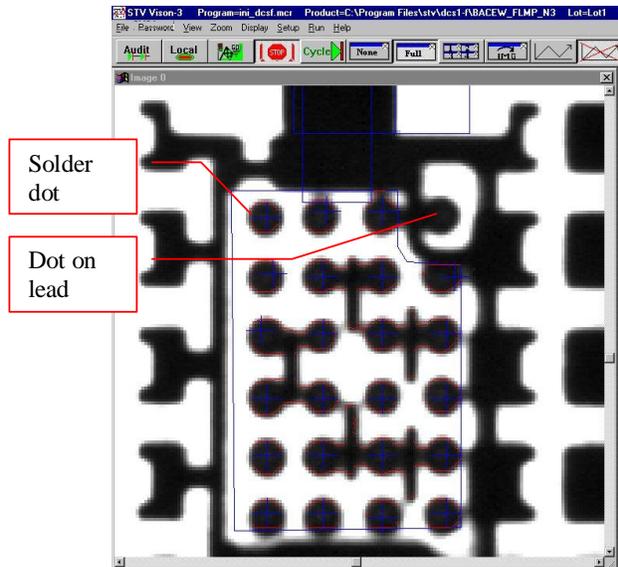


The dots may have some flux material around. The system ignores the flux, and calculates each dot size, its densitometric volume, its position (centering to the pad)with reference to its "ideal" position (defined in the CAD cluster table).

Most critical is the dot on the individual lead. Here the bond are is extremely small, so a perfect alignment is critical:
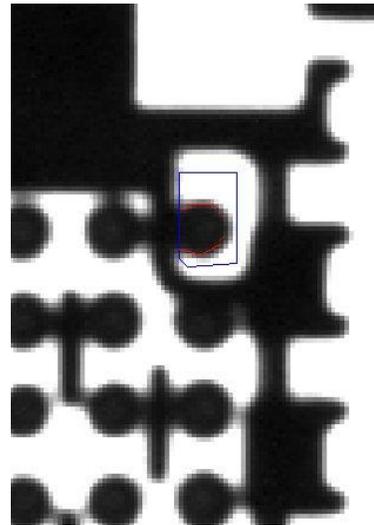


**Dispense Tool:** This tool measures the total dispense size for the pad, and for the individual lead. This includes all dots. Any variation in the viscosity of the past, temperature etc. is recognized. This tool monitors the "global" dispense process, and generates an alarm if these parameters are out of spec.

**Cluster Tool:** This measures the exact size of every single dot on the pad, and analyze a cluster analysis of each location. It rejects individual defect dots, e.g. caused by blocks in the individual nozzle of the tool. The total dispense volume may even be ok, since the past of the missing dot may be added to the other dots.

**Alignment tool:** The system calculates the centering of all dots relative to the position of the pad. Misaligned tools are immediately recognized.

## Technical Data

| Camera | Parameter | Dimension |
|---|---|---|
| Resolution | 1280 x 1024 | Pixel |
| Image | 50 x 40 | Mm |
| Pixel size (configurable) | 40 | Micron |
| Accuracy dot size | <= 5 | Micron |
| Min dot size | >= 80 | Micron |

| # of dots | Not restricted | |
|---|---|---|
| # of die per image | <= 30 | |
| Performance | 7000 | Cycles / sec |
| Interface to bonder | Custom | |