Stealth Series

To meet the constant demand for yield improvement in the Displays market, Toho’s Stealth Series products offer cutting edge Macro-Inspection capabilities specifically designed to find imperfections, defects, residue commonly known as “Mura” effects in the Displays industry. Ideal for capturing and containing costly irregularities in film uniformity and thickness, chemical residue and evaluating crystalline structures, Stealth systems offer global inspection of the substrate able to detect Mura images across an entire glass substrate that often go missed by local inspection techniques. Through a unique and proprietary design, Toho Stealth systems utilize highly sensitive CCD cameras combined with a specialized array of blue LED lights to provide fast scans and accurate detections.

Benefits

Toho Stealth Systems Detect global Mura and other defects during various stages of manufacturing providing key benefits to the process engineer.

Greater Defect Detection

- Able to defect film mura and cleaner defects where standard fixed-point film thickness measurement systems cannot

Cost Reduction

- Re-treatable substrates—up until the Pre-etch process—determined unacceptable by macro-inspection can be re-worked to reduce costs

Early Detection & Yield Improvement

- From evaluating results of Mura defects on substrates, users can use this information to adjust Process Parameters to achieve higher yields

Capabilities

Toho Stealth systems are capable of a wide variety of measurements. Specializing in Maco-imaging, as opposed to micro defect inspection, Stealth systems detect large defects that can be difficult to detect over the entire surface area of the substrate.

Measurable Substrates

- Patterned Glass such as Color Filter or TFT
- Non-Patterned / Film on Glass such as Photo-resist, PI, LTPS, ITO, Nitrides, Oxides, etc

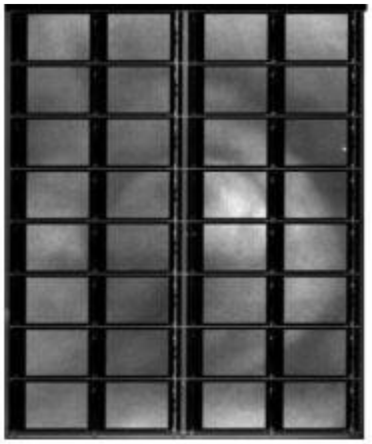
Film

- Patterned / OLED
- Non-Patterned / Resist, PI, ITO

Detectable Defects

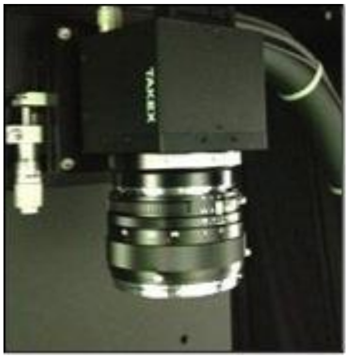
- Global Mura
- Film thickness non-uniformity
- Mask defocus, stitching defects
- Chemical Residue
- Large Voids (< 100 µm)

Uncut small-size panels
Raw images



Mura visible with
Stealth SW filter

Key components



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Stealth Systems use a highly sensitive line CCD sensor camera designed specifically for Toho to provide stable scanning on large area substrates.

- Built specifically to detect Mura and other Macro defects
- Minimizes random noise while maximizing brightness stability and uniformity for each pixel measured
- 8-bit, 255 brightness camera that stresses image contrast in order to maintain an average brightness of 128

A specialized Array of HB-LED’s has been designed to provide uniform light projection across the entire substrate surface.

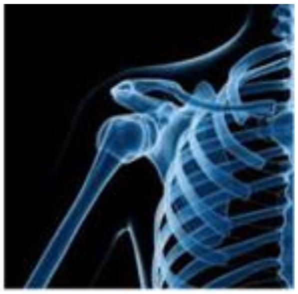
- Composed of multiple individual HB-LED
- Better than standard LED’s with varying light intensity
- Custom designed control box dynamically mange LED array stability

Applications

Stealth FP

- OLED film irregularities
- Patterned PS and Panel Defects
- Photo-Resist on Glass
- PI film on Glass
- LTPS crystal structure analysis

Flat Panel Display Markets



Medical Imaging Markets

Models

Stealth FP

Designed for the Flat Panel (FP) industry, this system is ideal for inspecting panels before it is too late to discover thin film irregularities, LTPS conditions, problems with PL processes and other issues.

Panel Sizes	Up to G6 glass sizes
Light source	LED Array
Sensor	High Resolution CCD Sensor
Options	1 min (camera count dependant)
Recipes	Customizable
Pass/Fail	Automated pass / fail
Traceability	Image saving function for traceability
Compliance	Class 1000 (higher level available with upgrades)