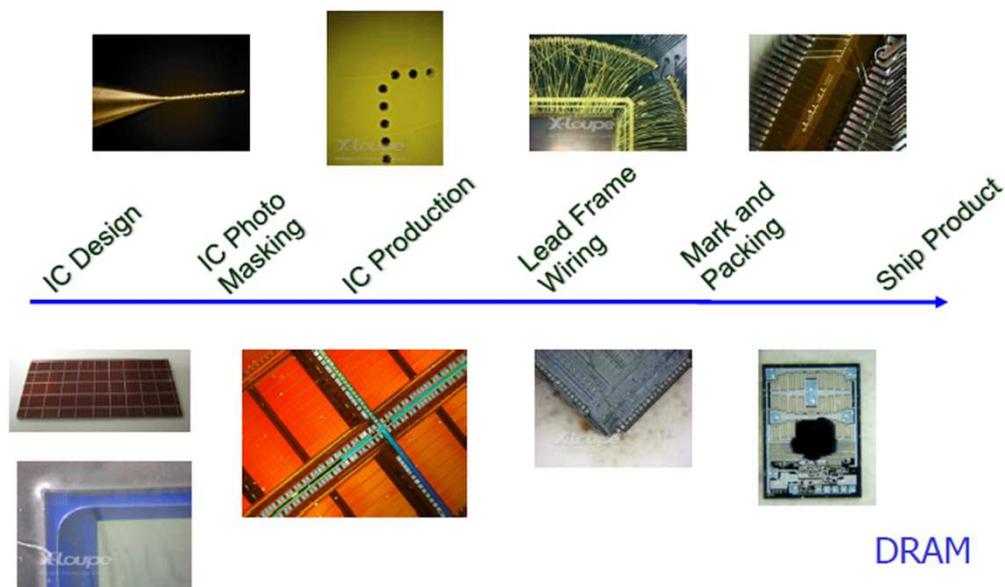


## Portable Microscope

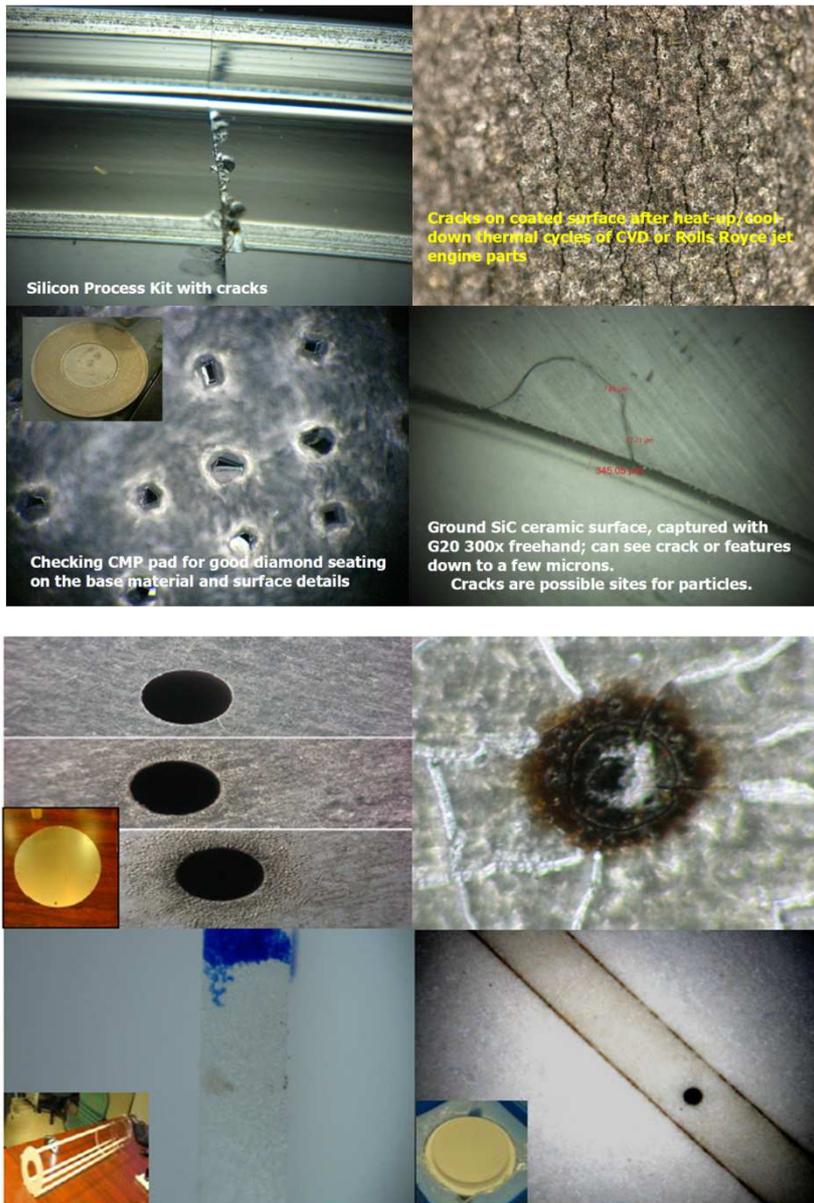
The point-and-shoot microscope was designed for simple and easy to use for our customers. For Scientists, Engineers, Inspectors, Marketing, Field Service staff, we fulfill your needs for :

- Seeing macro to micro images **quickly**
- **Clearer** documentation and analysis reporting with micro pictures in minutes
- Troubleshoot micron-scale issues by seeing details during Incoming / Outgoing Quality Control (IQC/OQC) & In-process Manufacturing Inspection
- Material Analysis and Characterization - checking for cracks, grain boundaries, failures, shapes, irregularities, etc.
- Check surface material variation throughout time.
- Study & document change and process via our microscopic video function
- Perform all these functions in **real-time**: on the fields, factory floor, large facility, outside of labs
- No need to transport large, heavy, fragile, or delicate objects to the microscope in the lab, but bring the **small** microscope to the object where the action/defect takes place.



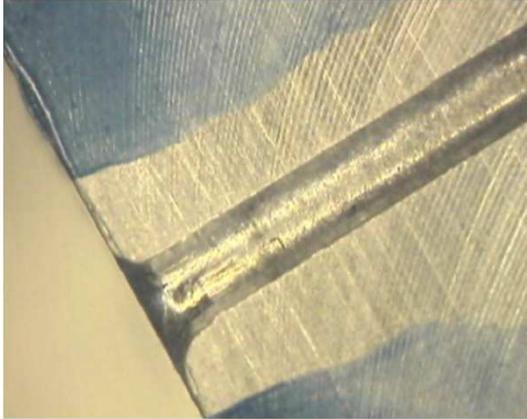
## Surface Inspection

Our customers use this tool to see cracks in materials, to determine the surface features of the specimen, failure mechanism of equipment, piping, corrosion mechanism and haracterization, grain boundary change throughout time of metal, ceramics, quartz, silicon, graphite and engineering plastics.

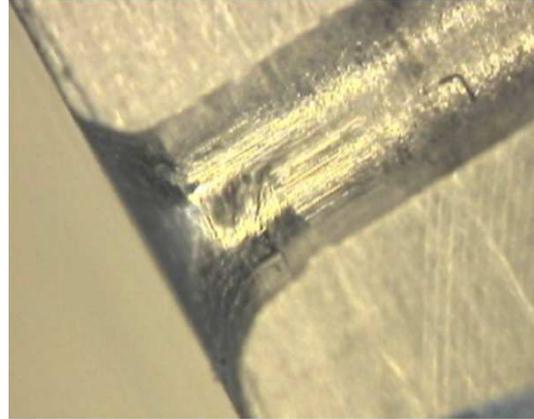


Showerhead anodization erosion by plasma, arc marks on parts, quartz wafer carrier defects, and ceramic laser-drilled hole on e-chuck

## Quality Inspection of Precision Machinery Parts and Semiconductor Failure Analysis



60x



60x



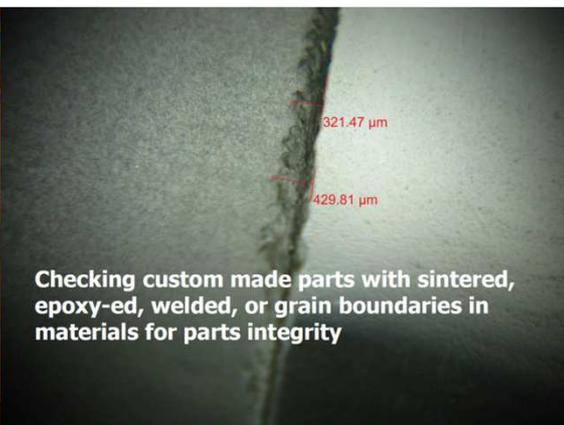
150x



150x



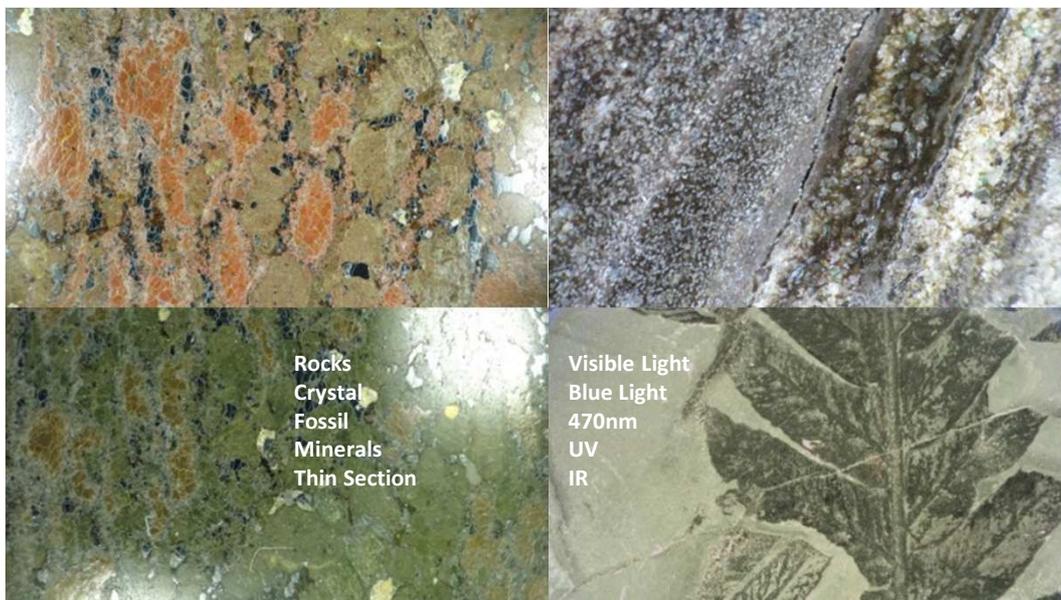
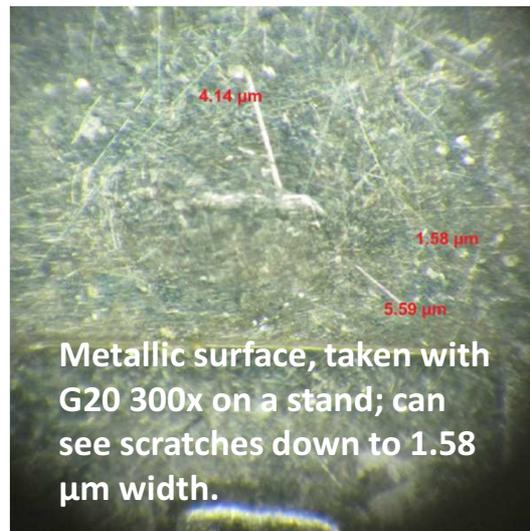
Checking DRAM details



Checking custom made parts with sintered, epoxy-ed, welded, or grain boundaries in materials for parts integrity

## Material Observation

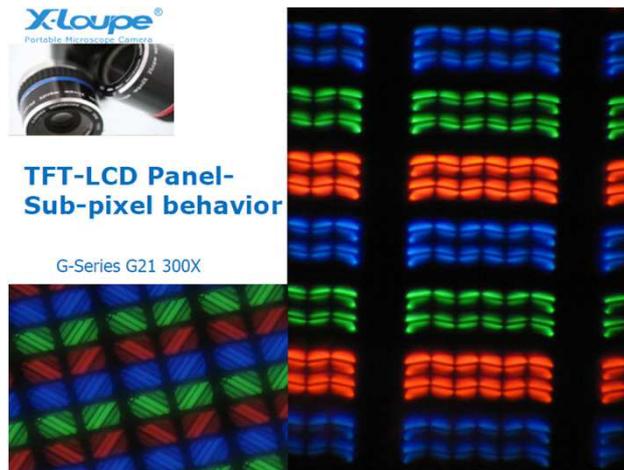
These portable microscopes are most convenient for bringing the lab to the working area in the fields where the objects are. For example, geologist can document a good history of a rock sample, by taking a normal picture of the natural and original setting with our attached digital camera, and then install the microscope lens to take the micro images of the rock surface of interest to document the series of stories.



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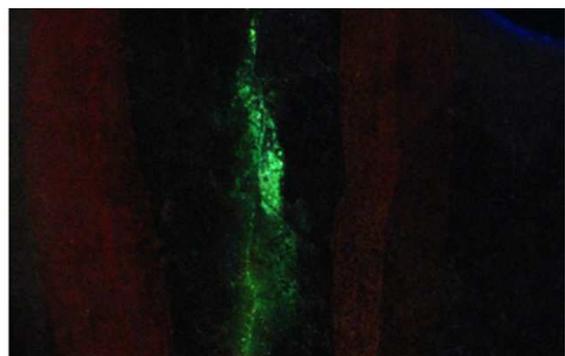
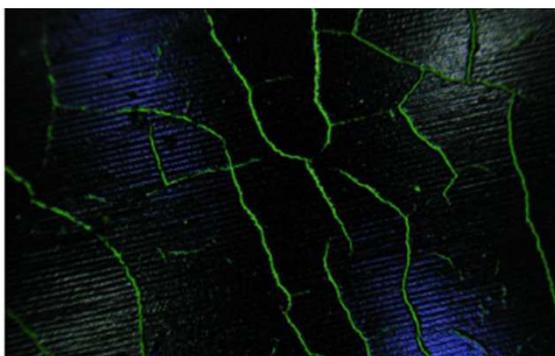
## LCD Panel Inspection

Also, this portable microscope is used in the flat panel display factories to inspect equipment parts for failure on-site, avoiding the hassle of taking the 300 pound failed part down from the machine with 10 person carrying it to the lab. It is much easier to take the images with one person, 10-60 second point and shoot.



## UV Assisted Inspection

In other industries, we have used UV sensitive liquid to swipe onto a suspected surface area, then we use squeegee or ruler to wipe off the surface and leave some liquid in the cracks. Then micro images. But in semiconductor industry, due to contamination issues, this might need some work, but the concept might work.

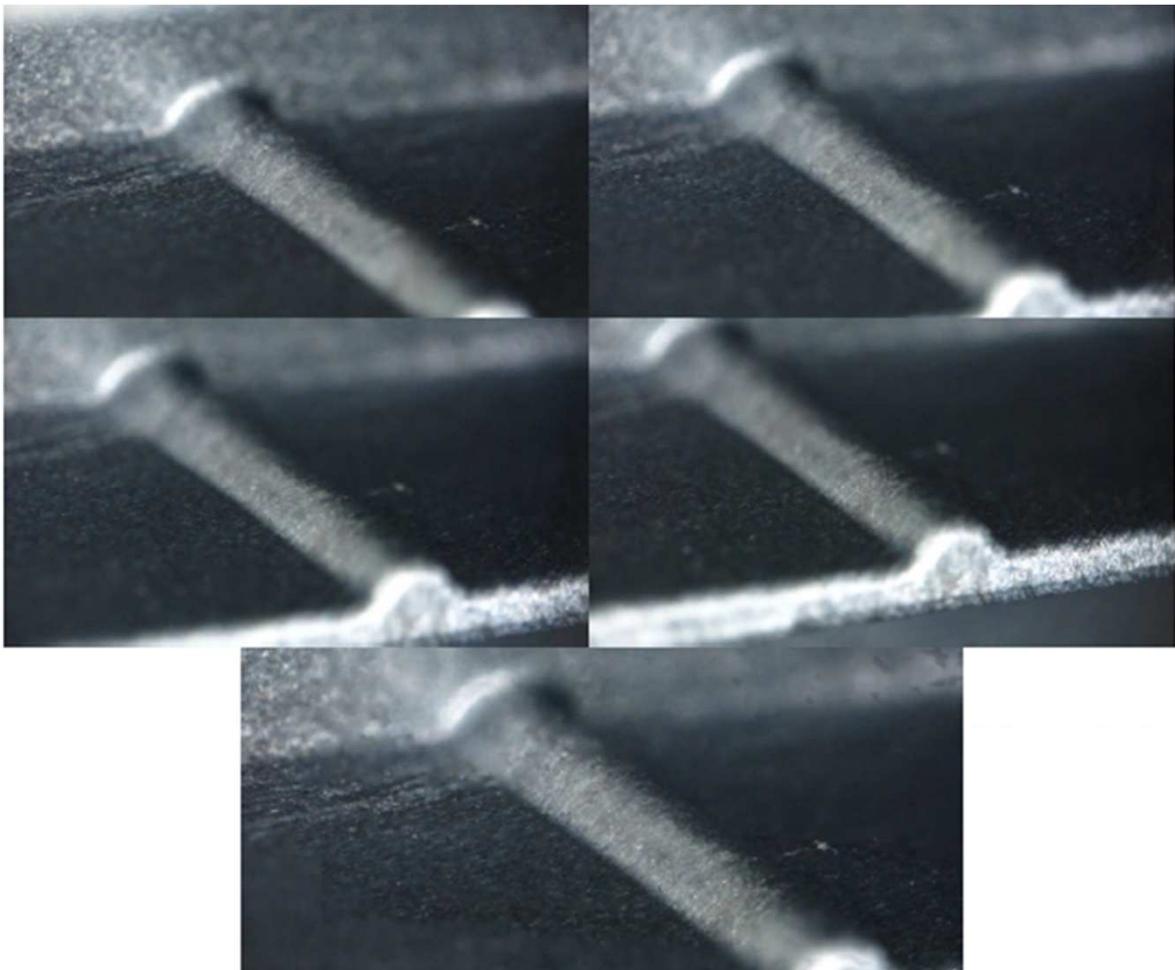


## Story: Wear behavior of FOUP after long-term usage

Our customer found FOUP has a lifetime. They change out every so often. There are pads where wafers would sit on the FOUP and the pads would wear out after so many wafers. Customer is not sure whether there is particle issue from the wear behavior. Customer is asking us to come up with a solution to observe and characterize how to judge the wear out condition of the pads on a FOUP. We borrowed one 12" and one 18" experimental plastic covers. We took some pictures, and verified the feasibility of each step, hand/arm postures, or accessories needed to see the pads clearly. We provide a portable digital microscope with 60X lens, took out the lens cap and LED light guide. We used our small tripod to assist us, when space constraint or postures makes it difficult for us to hold position.



So we came up with this simple solution to observe the pads, provide a way to record and document the wear condition with pictures, so that engineers can judge when to clean or replace old FOUPs, or extend the life of FOUP instead of regular period specified for the life of FOUP. So our solution can save money used for buying FOUP in the long run. When there is particle event, this is also a way to document the problem sources.



We used software to combine different focus photos.

## Scan an Area

We can consider in Photo or Video mode

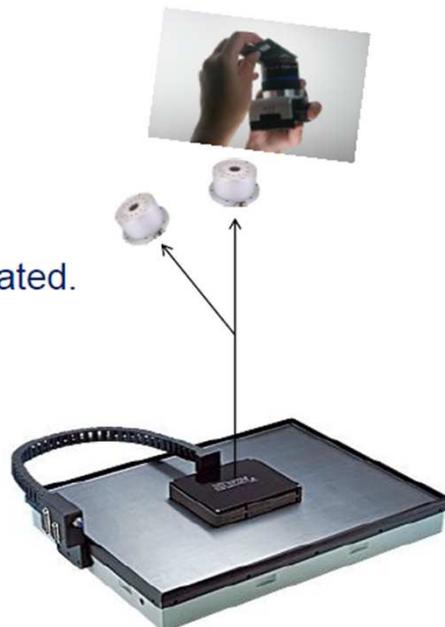
- Simple C-2 stand or long-arm vibration-damping tripod with X-Y table, using hand adjustment. More than 50 other stands and tripods are available.



- More sophisticated free 2-D moving stage for programmed area scans, with X-Y and theta, with human assistance or automated.

(Custom design per request)

- Or somewhere in between the two versions



## Side Shots

We can consider in Photo or Video mode

- Simple tripod or long-arm vibration-damping tripod, using hand adjustment.
- More than 50 other stands and tripods are available.



- More sophisticated free 2-D moving stage for programed area scans, with X-Y and theta, with human assistance or automated.  
 (Custom design per request)
- Or somewhere in between the two versions
- This can be rotated to install for side-shot purpose.



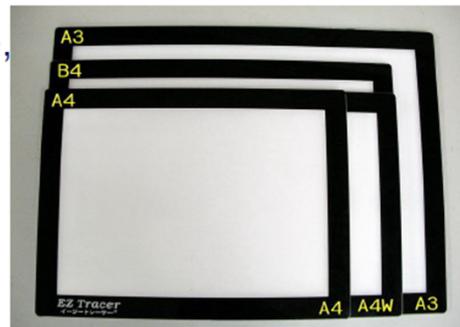
## Place Camera on Surface

- The black lens protective contact barrel can be taken out easily to gain 0.8m ~1cm room.
- Similarly, the LED light guide can be taken out by 2 screws. It will gain another >5cm working distance.
- By gaining this working distance, you lose the accuracy of taking pictures, when focusing. But maybe the trade-off is worth it, since it might still be pretty fast.



## Increase Contrast

- Some small features might be seen better when adding light contrast on the objects, or when directing light at an incident angle.
- This planar light source might help to provide uniform lighting at your designed condition, angle, location to increase the intensity or contrast.



## Specification



	A500	G20
No. of Lens	3	3
Magnification	60X/100X/150X	60X/150X/300X
Lens design	Schott lead-free optical glass	
Resolution	10MP	12MP
Built-in Illumination	8 White-light LED	16 White-light LED (8 Coaxial ; 8 low angle)
Weight with DSC	<300g	<660g
UV Lens extension	available	available
Field of Vision	8x10.5/4x3/2x1.5mm	
Coaxial light adjustable	-	Yes(6 modes)
Low angle projection	-	Yes(6 modes)
Quadrant controllable	-	Yes(9 modes)
Aperture	-	Larger(more efficient light collecting and higher resolution)

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