SDcam

You can get a picture of the visible thing and, also the thing which should be visible!

I2Labo

You can take a picture of exactly what is visible. It's easy to say this but not so easy to achieve. SDCAM is the product to satisfy this requirement very clearly and precisely.

The following image was taken the ant in SDCAM at about 30 times magnification.

You will note that because it is a shadowless shooting method, it does not reflect any shadow at all.

The next photograph is taken by the traditional method- with a camera and stereoscopic microscope, illuminated with ring light.

Further examples and explanation:

1) The full moon looks flat, you cannot see many craters, while with the crescent moon, the 3D nature or unevenness of the craters can be seen clearly.

2) This is because you are looking at a photograph which captures in two dimensions, the actual three-dimensional.

3) Stereoscopic effect will also be lost at the time of conversion from 3-D to 2-D (It's a quite natural. isn't it?). Therefore, it's important to devise how to apply the optimal light in order to take good pictures.

4) By giving "shadows" in the two-dimensional, three-dimensional impression will be created.

5) When you study Photography, you'll study the lighting at very beginning, which are like Direct lighting, Side lighting, Backlighting etc,.

6) SDCAM enables the camera to capture what you could not see by controlling the shadows.

7) In order to maximize the long shadow, it is needed that **the light should shed as much as possible from the side horizontally. (The first condition)**

8) **Vertical light should shed from any direction of around evenly as possible from each direction of 360 degrees. (The second condition)**

9) Because, it is not possible to predict at what direction of scratches and

unevenness on the object to create a shadow.

10) However, you cannot create any shadow with a light from the entire circumference simultaneously. Also, it is not sufficient lighting from only one direction.

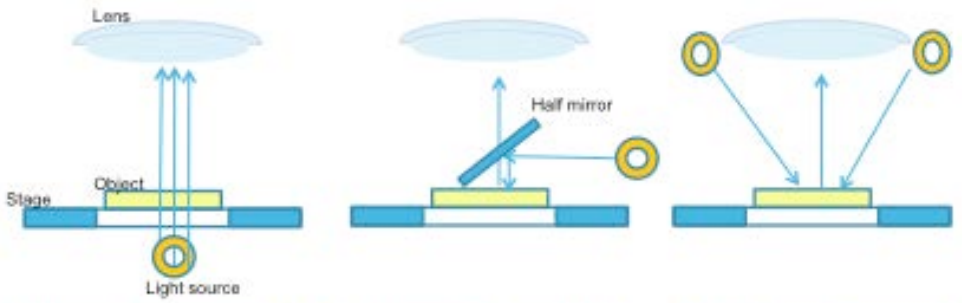
11) The problem will be resolved by shooting a photo by **applying a light shade to allow the entire circumference 360 degrees. (The third condition)**

12) **And by leaving off the shadow at the end**, shadowless image with the three-dimensional impression is completed. **(The fourth condition)**

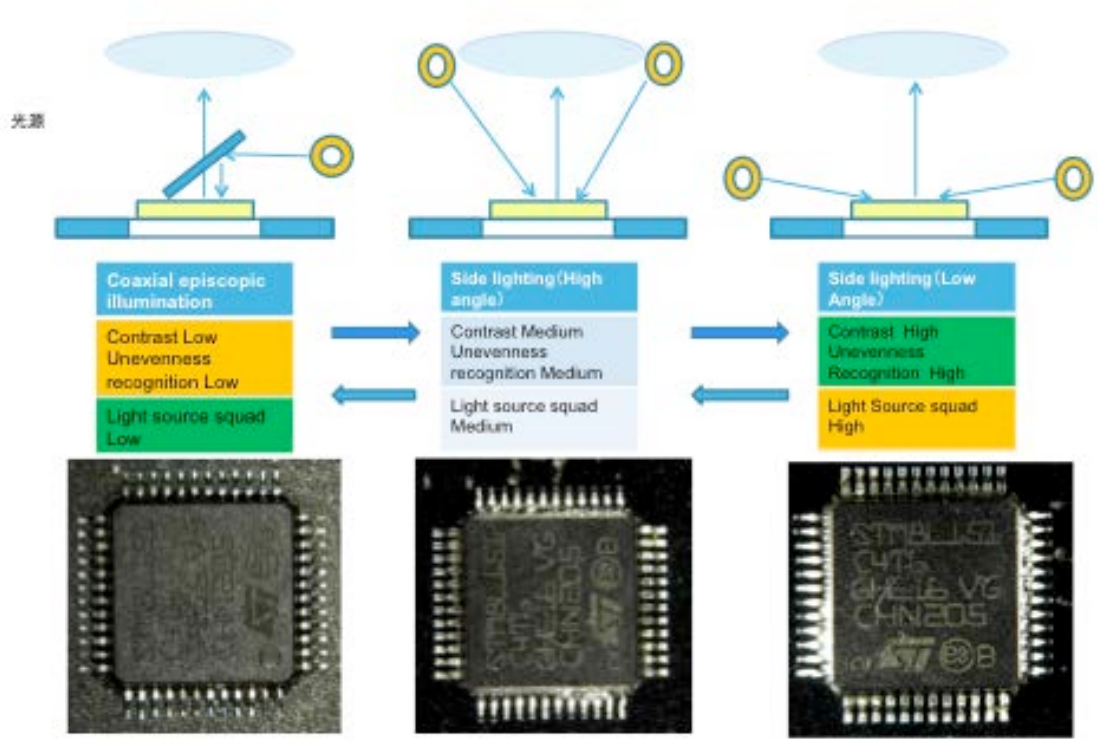
Is it possible to realize such thing?

Yes, SDCAM can achieve this dream. SDCAM can create the pictures that satisfies the all conditions of the first, second third and fourth of the above.

To study more, let's review Microscope illumination methods today. There are three typical ways as follow,



Kohler transillumination	Coaxial episcopic illumination	Side illumination
Object : Light is transmitted through	Object : Light is not transmitted through	Object : same as the left
Light source : Halogen LED Extra High-pressure mercury lamp	Light source : same as the left	Light source : Ring light, Led light transmitted through optical fiber cable
Appl. : Bio microscope	Appl : metallurgical microscope	Appl : Stereo microscope
Applicable to only high light permeative objects	Poor contrast affected by reflected light Not possible to display unevenness of surface Possible to display of bright and dark field	Difficult to setting up light position Illumination squad (impossible of uniform illumination)



1, The coaxial episcopic illumination effects a homogeneous illumination. However, there are some problems that cannot be ignored like,

* Poor contrast

* Poor ability of uneven Identification Three-dimensional impression does not come out. The image tends to be flat.

* Effects of unwanted reflection to the object is greater

2, Side illumination can provide the uneven discriminating ability by lowering the lighting angle. But,

* A lot of illumination squad (?)

*Create the same kind of problems of the coaxial episcopic illumination if increasing the illumination source angle

The Illumination system adopted in SDCAM resolves the disadvantages of conventional lighting approaches:

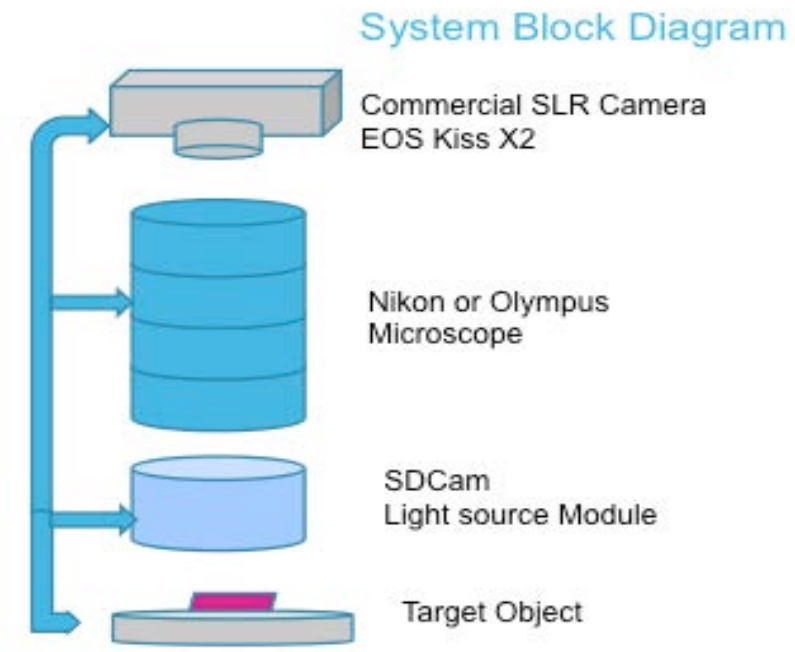
* Realize more homogeneous lighting without undesirable reflections than coaxial epi-illumination

* Excellent contrast

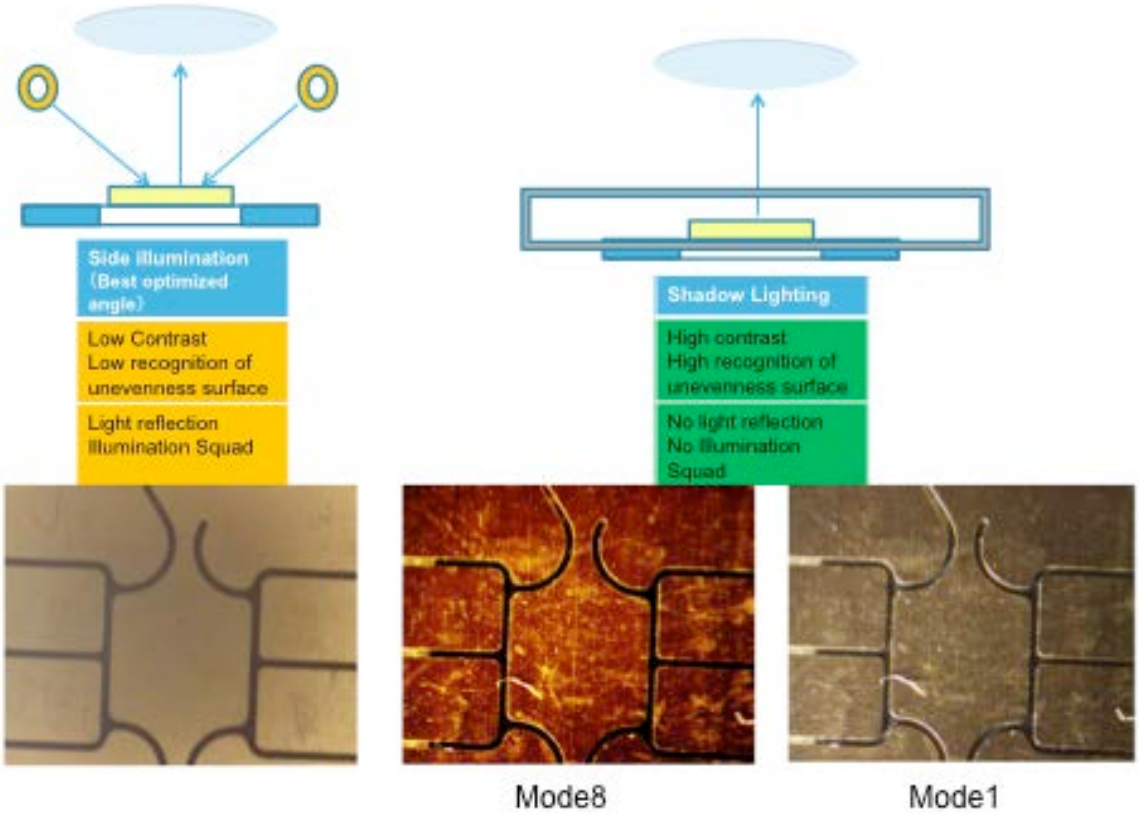
* Excellent ability of uneven Identification (The high discriminating ability for an external attached dust)

* Superior identification capacity exceeds the human eye. (Such as the detection of abrasion)

SDCAM consists of LED lighting system controlled by a microprocessor, Microscope, Camera and its controller.



Here is some comparison example of the pictures taken by different illumination systems of Side illumination and Shadow lighting (SDCAM).



Now, please look at additional SDCAM pictures as well as pictures captured by traditional illumination system. It's very certain you'll find the big diffrence.

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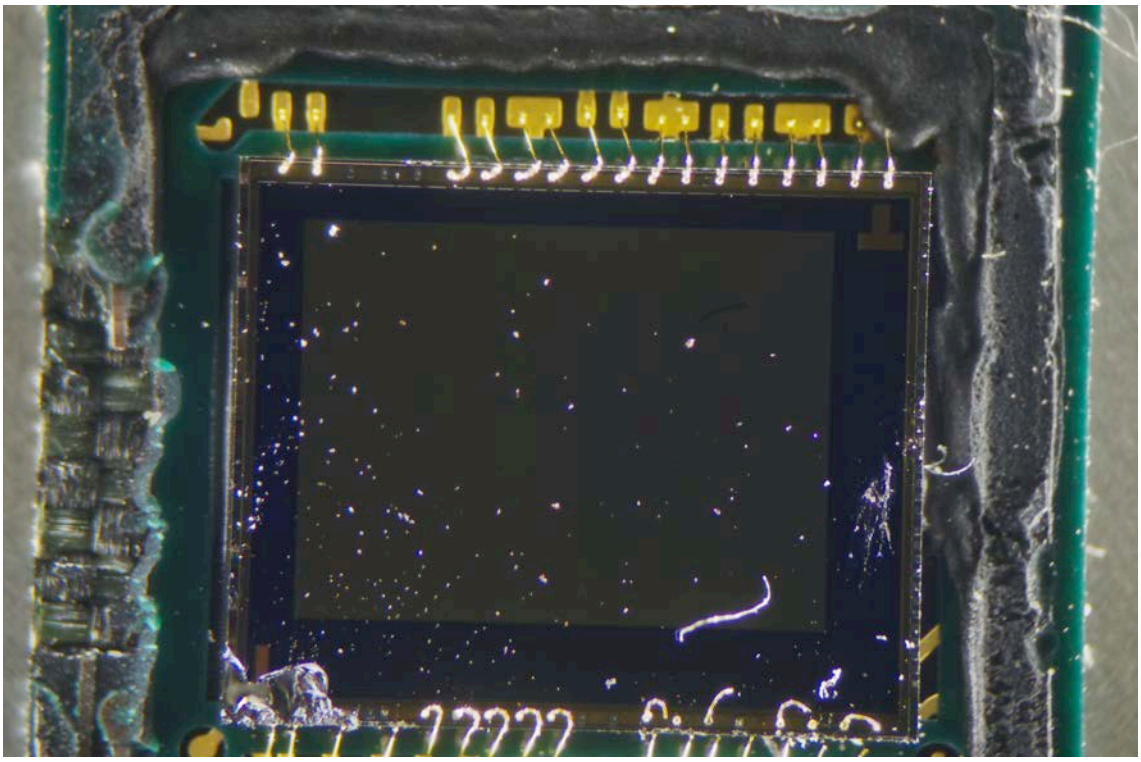
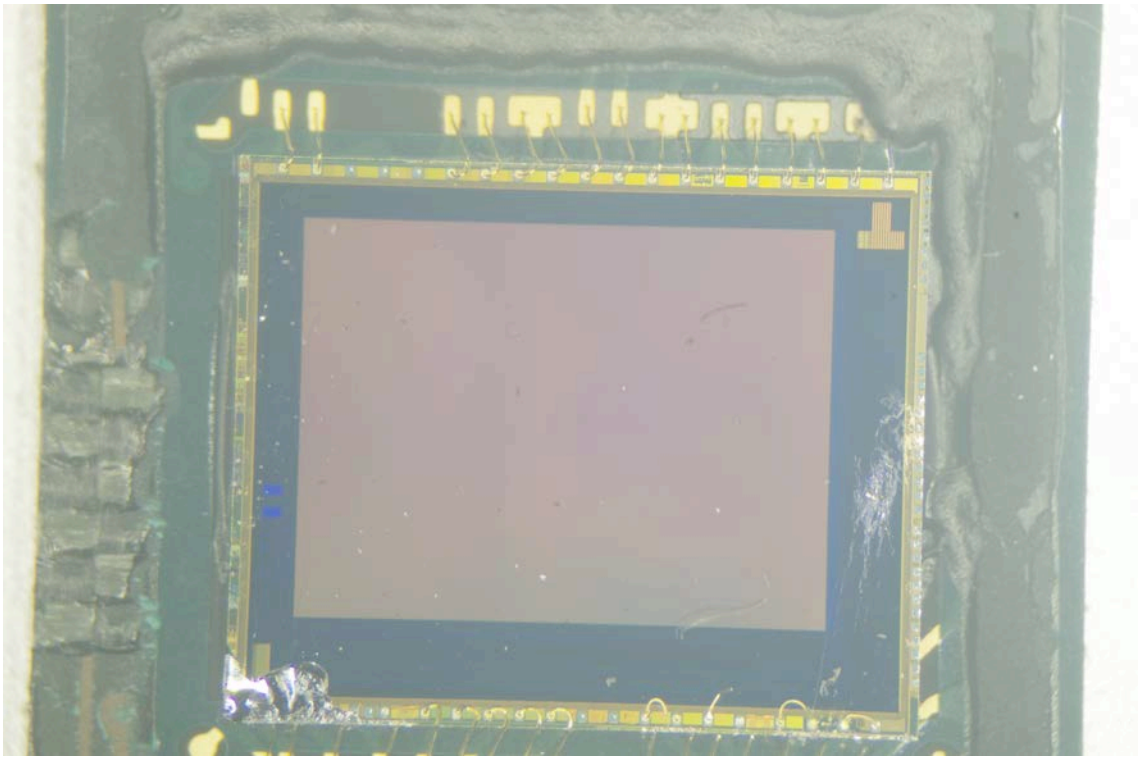
Ring Light

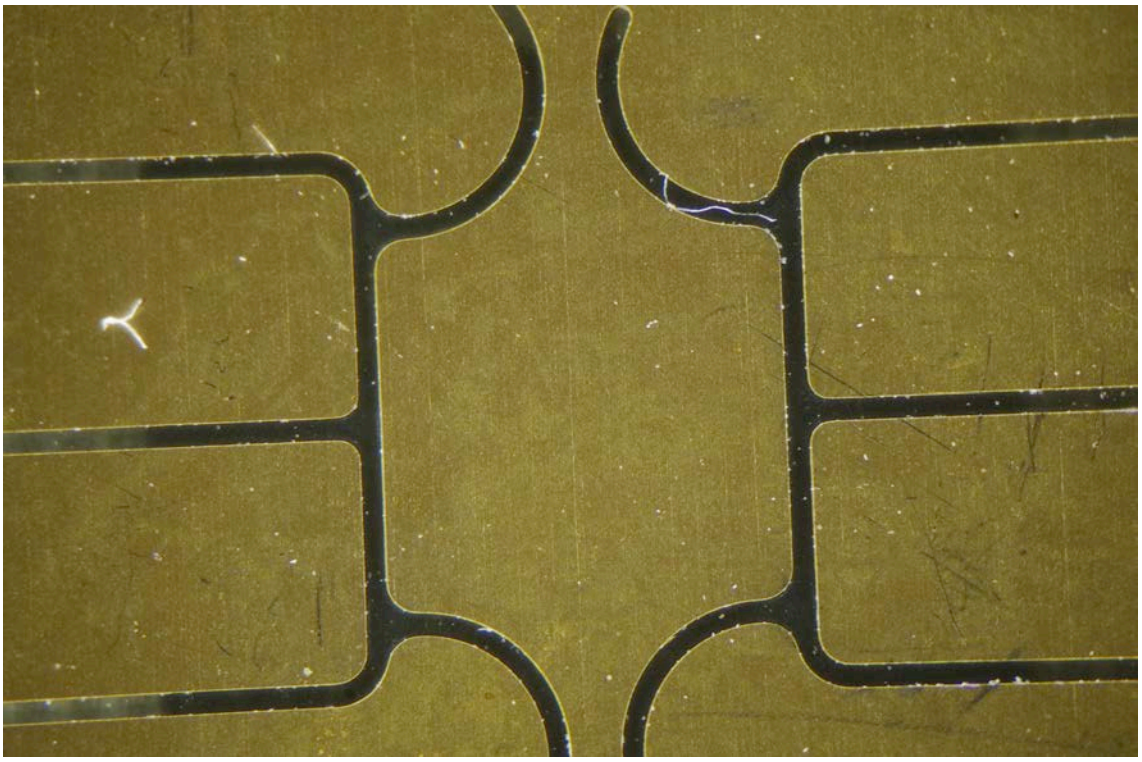
CMOS Sensor by SDCAM



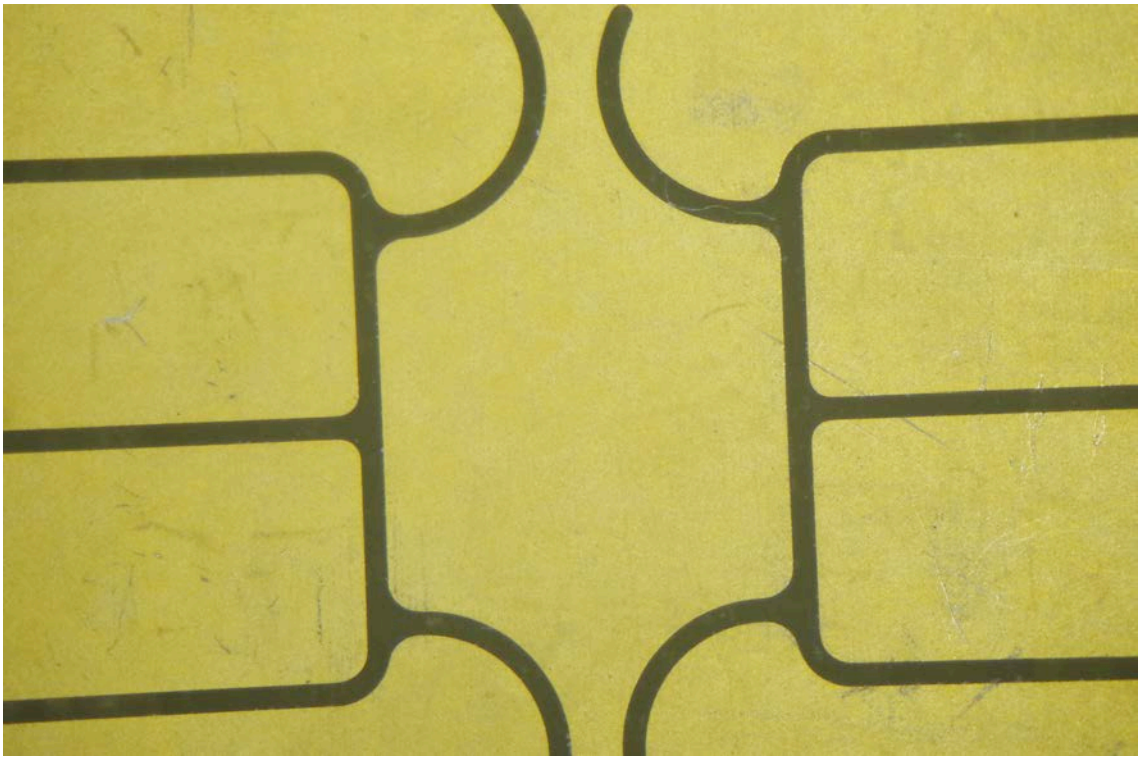
CMOS Sensor by Ring Light (Side lighting)



IC Chip on IC Card by SDCAM

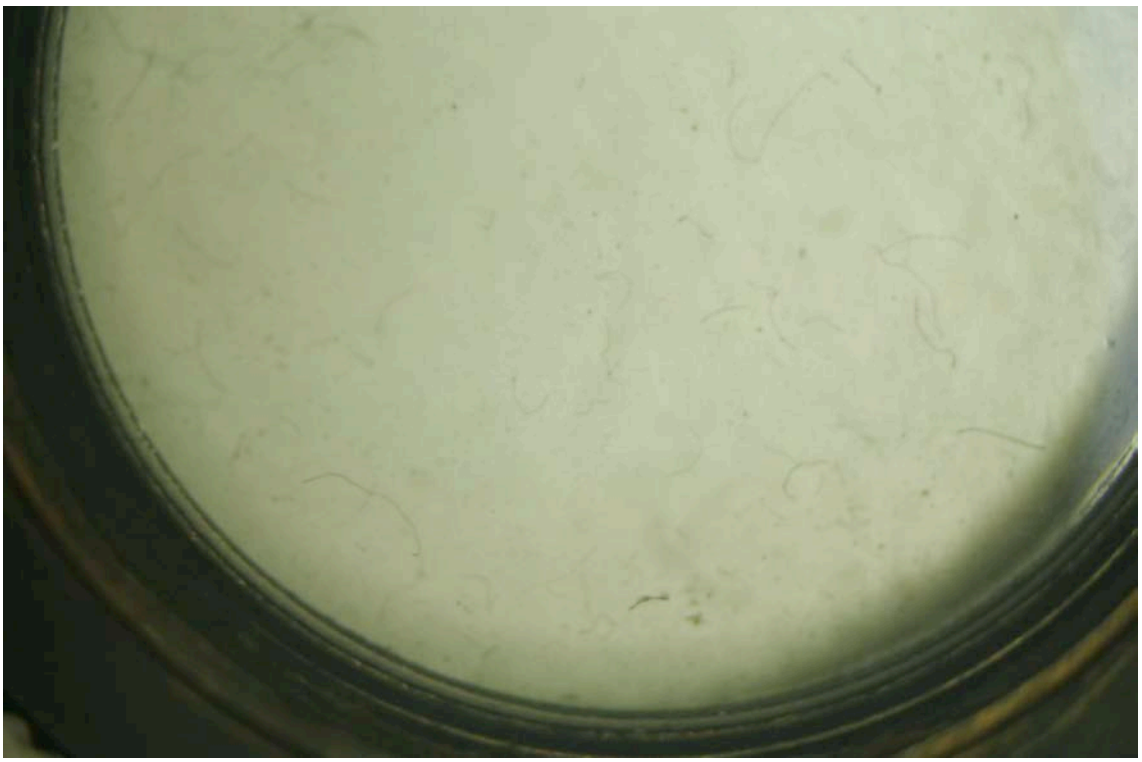


IC Chip on IC Card by Ring Light (Side Lighting)

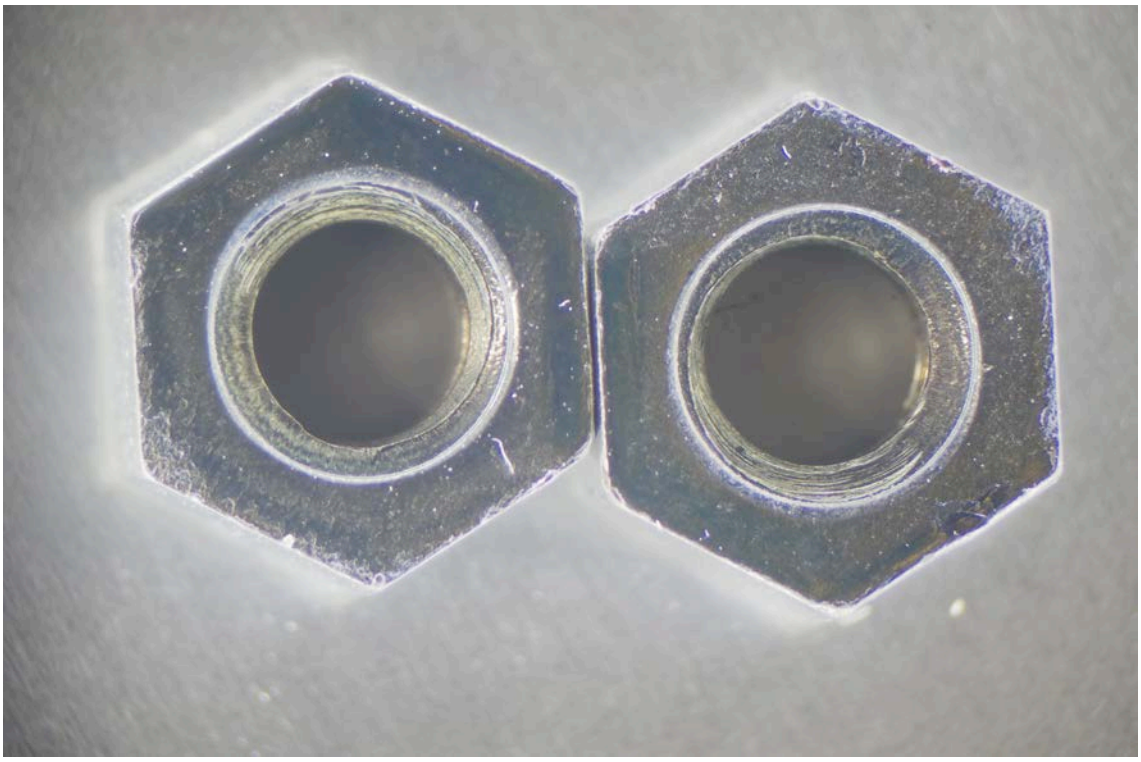


Dust on Camera Lens by SDCAM

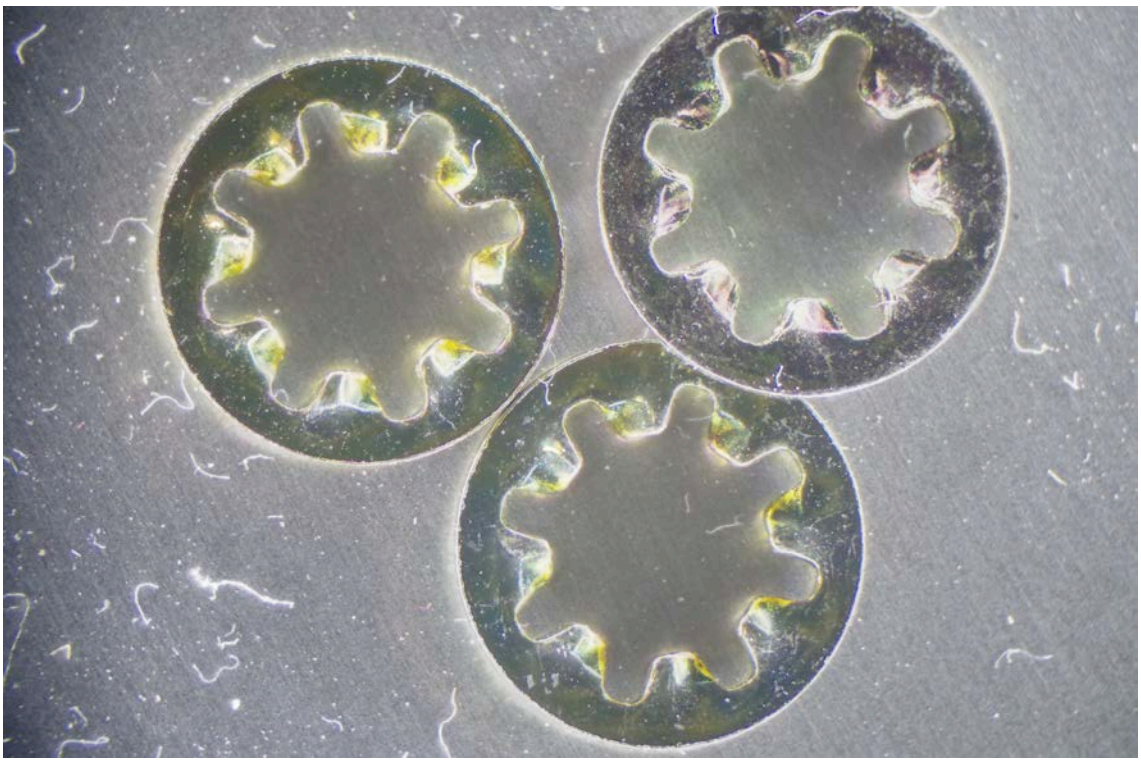
Dust on Camera Lens by Ring Light



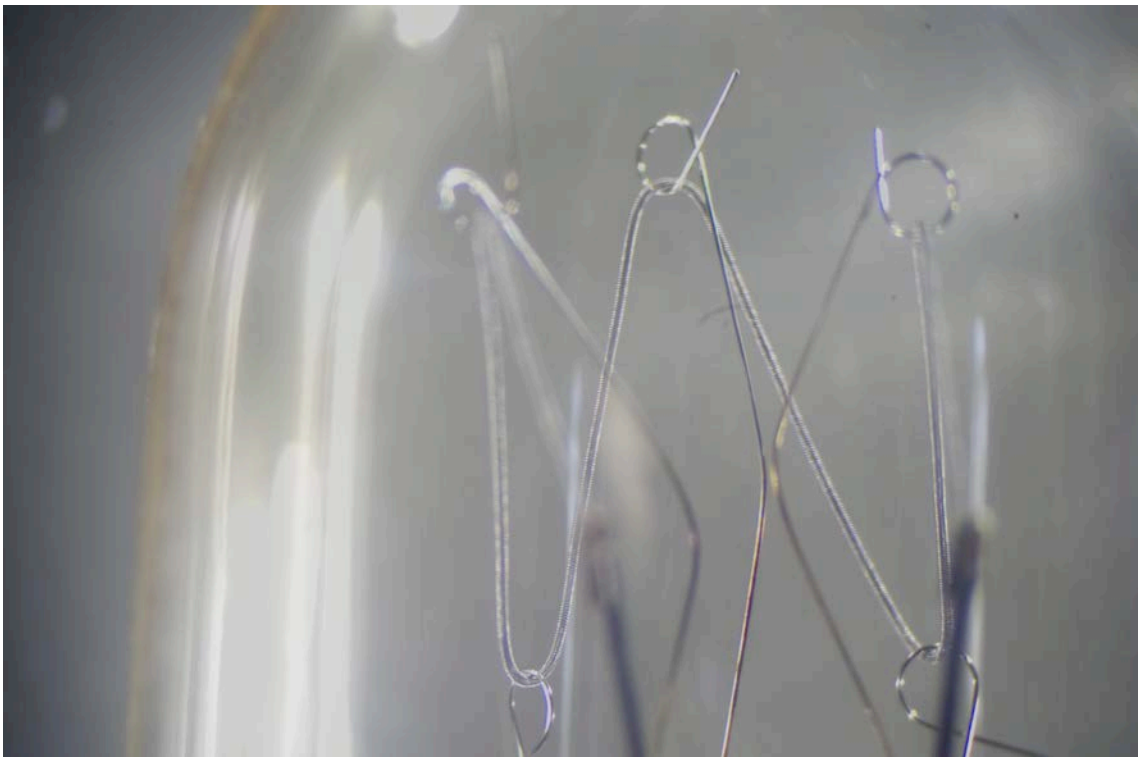
Screw Nut by SDCAM



Washer by SDCAM



Filament in Bulb by SDCAM



Solder by SDCAM