

# Results for Korea Tech K4 Front, back and cross sectional (based on the post analysis results of K3-6)

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By:

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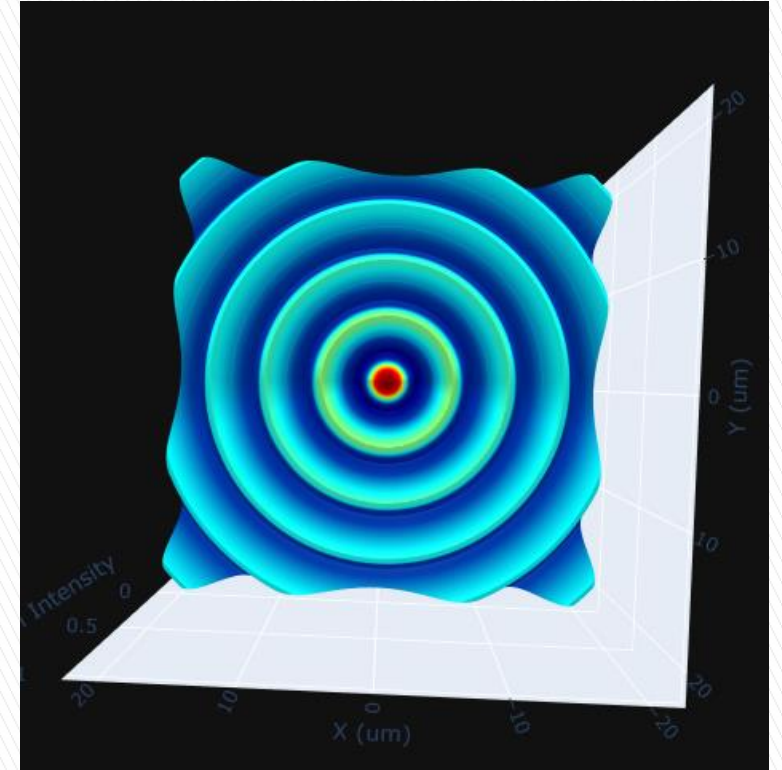
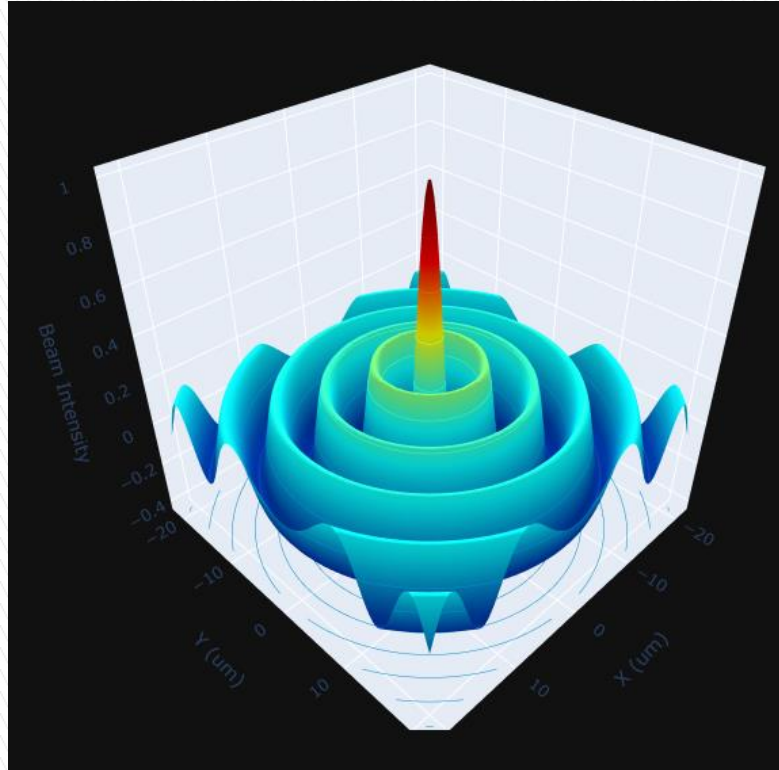
## Machining conditions

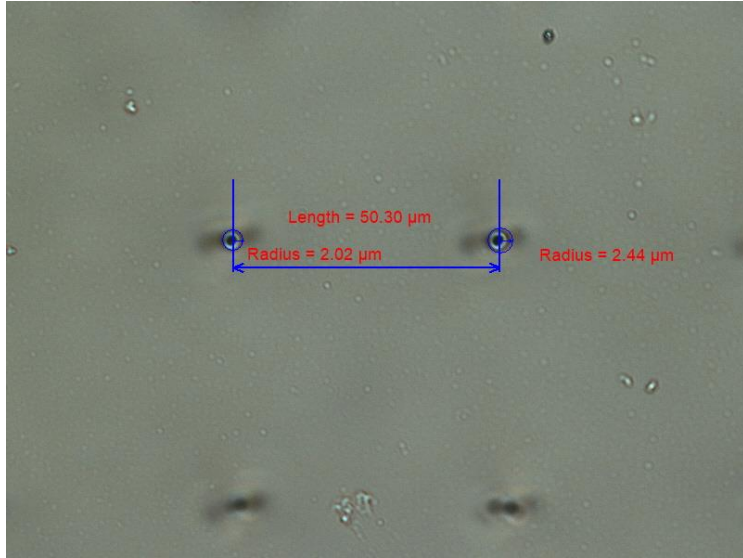
### Sample:

- Material: Borosilicate
- Thickness: 0.5mm = 500um

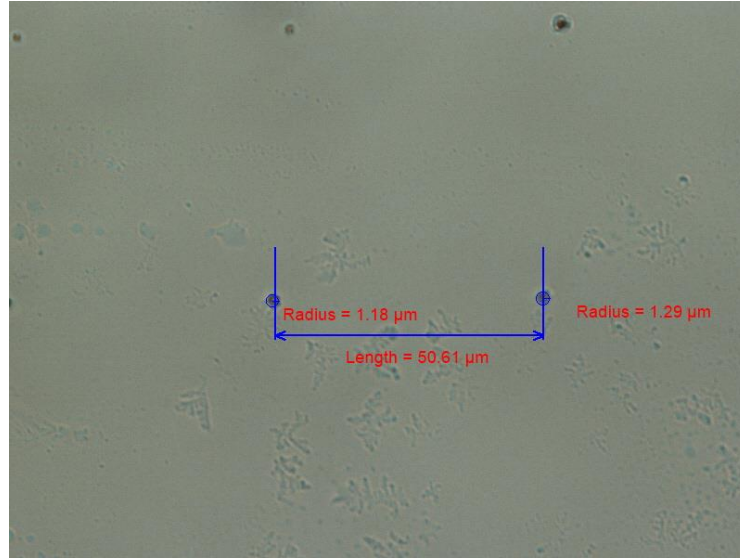
### Bessel Beam size:

- Length = 1.33mm
- Diameter = 4.279 um

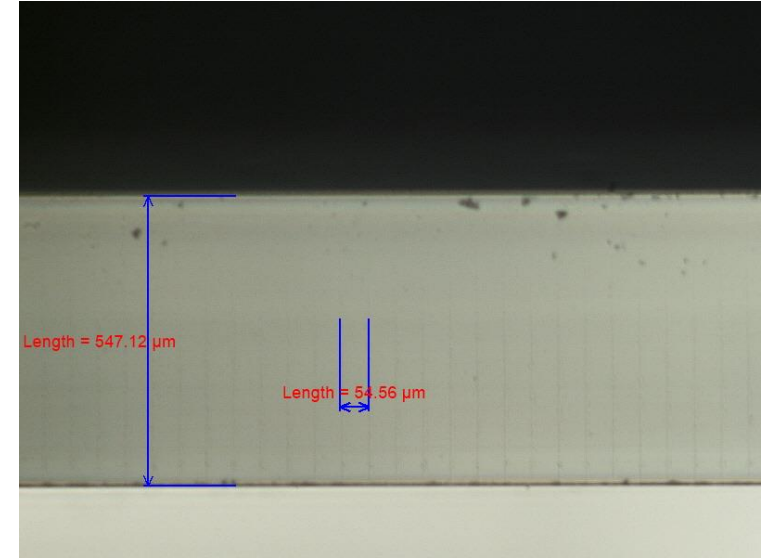





Front

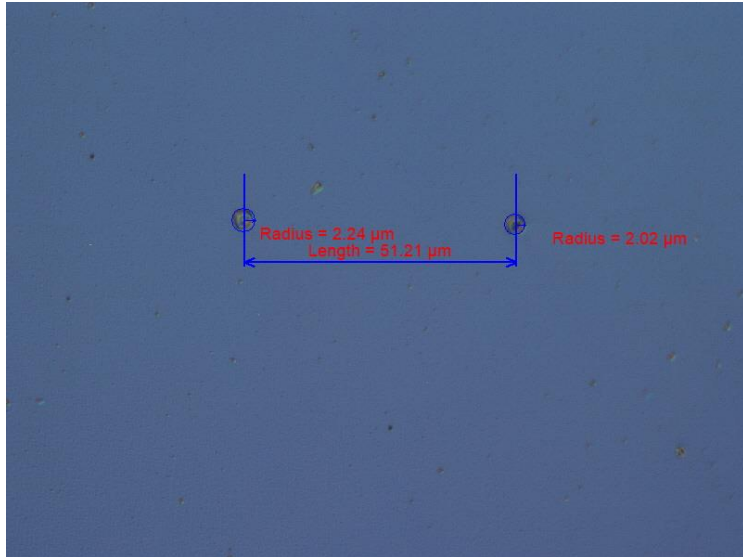


Back

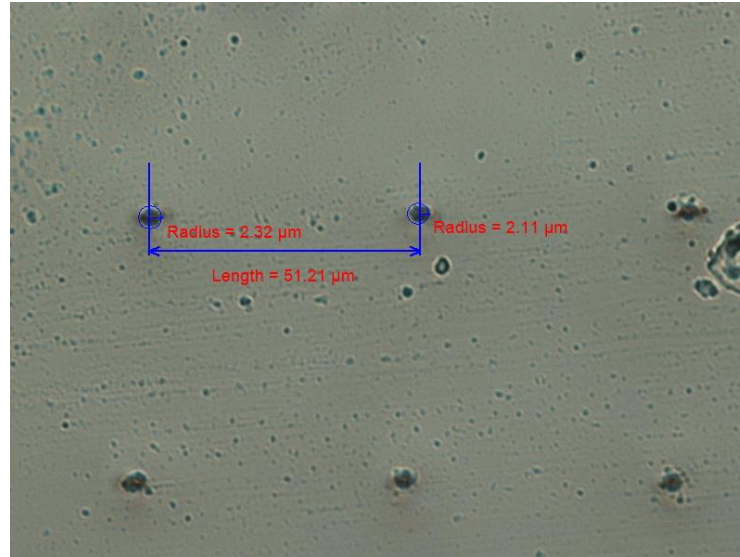


Cross sectional

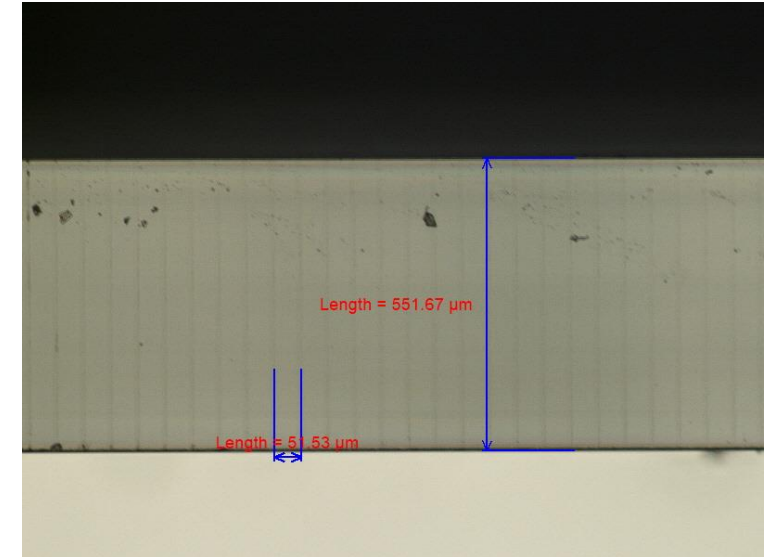
TGV shape	Shape
Straight	




Front

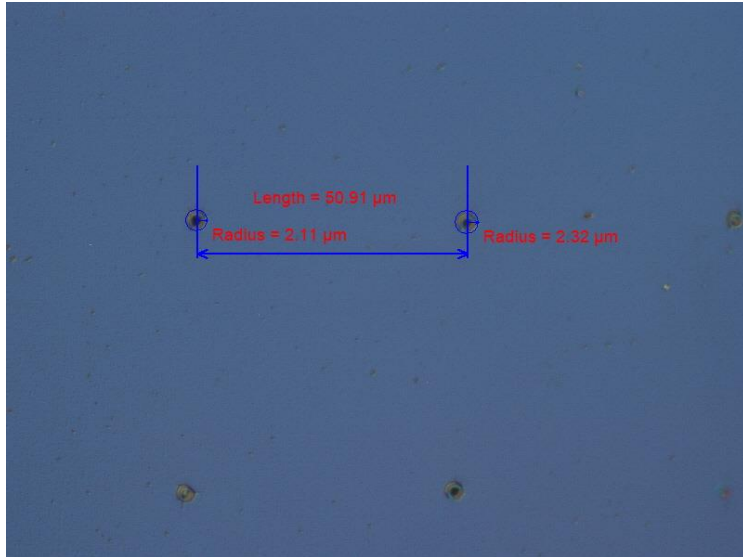


Back

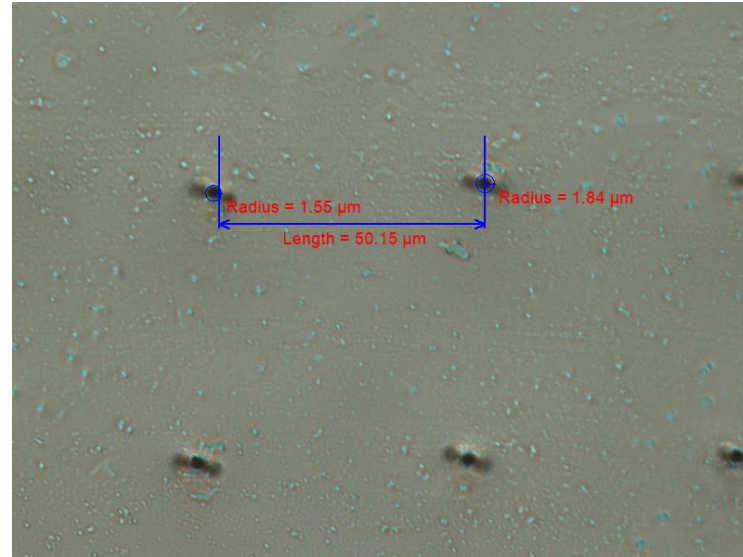


Cross sectional

TGV shape	Shape
Hour-glass	




Front



Back



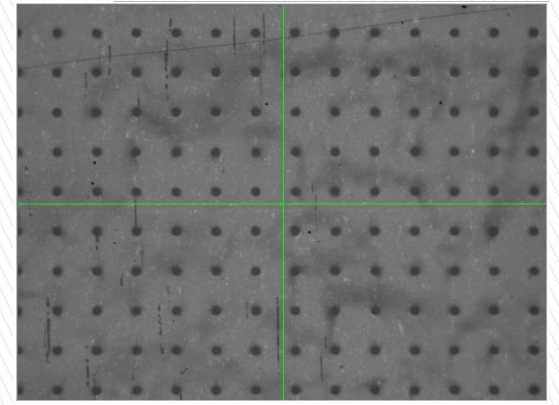
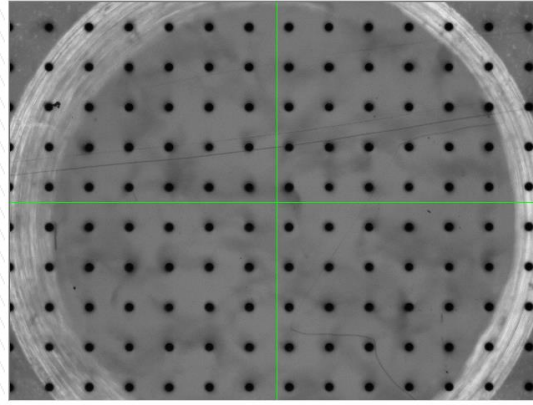
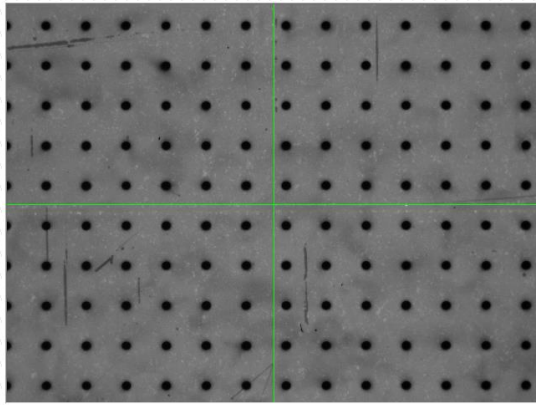
Cross sectional

TGV shape	Shape
Isosceles	

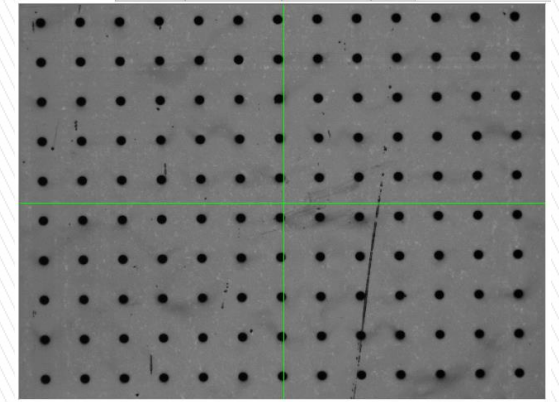
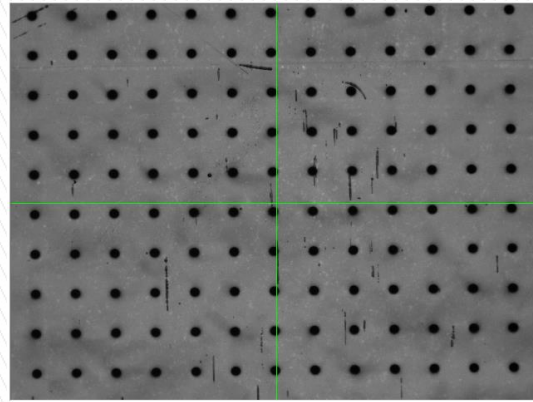
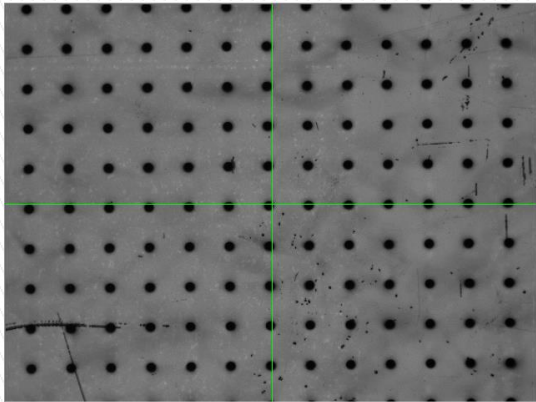
# Comparison of both side CCD Camera Results, 1 pulse

Single Shot

Front Side



Back Side



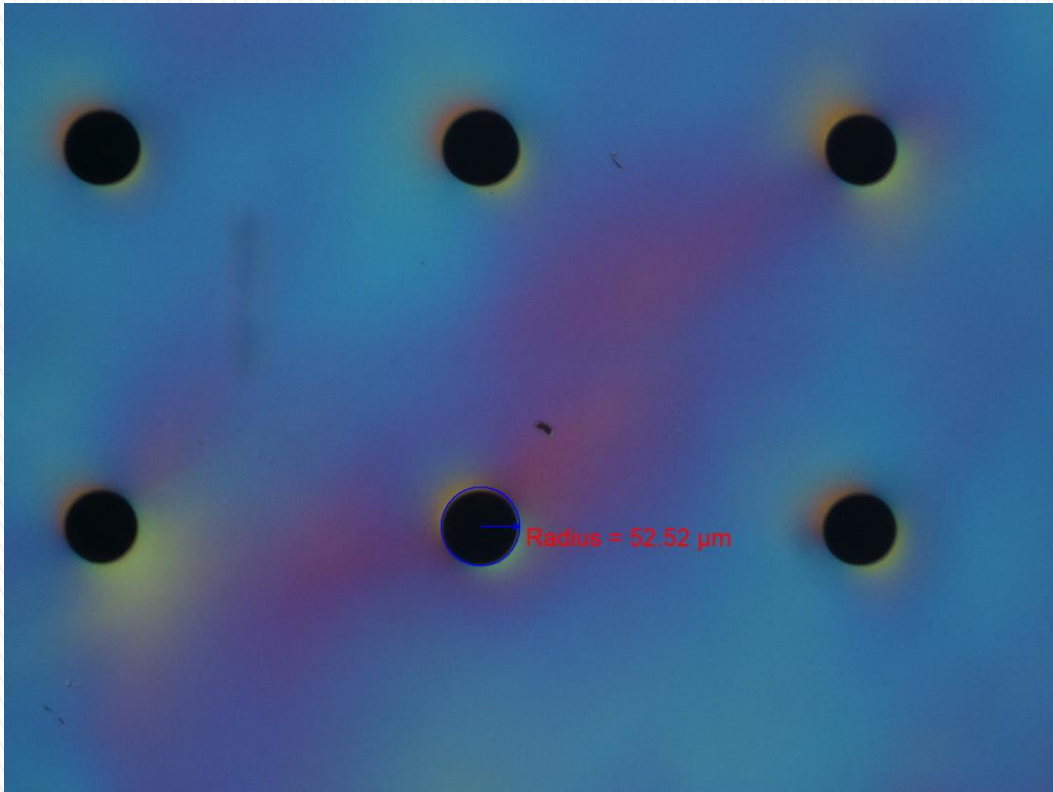
Front Focus

Center Focus

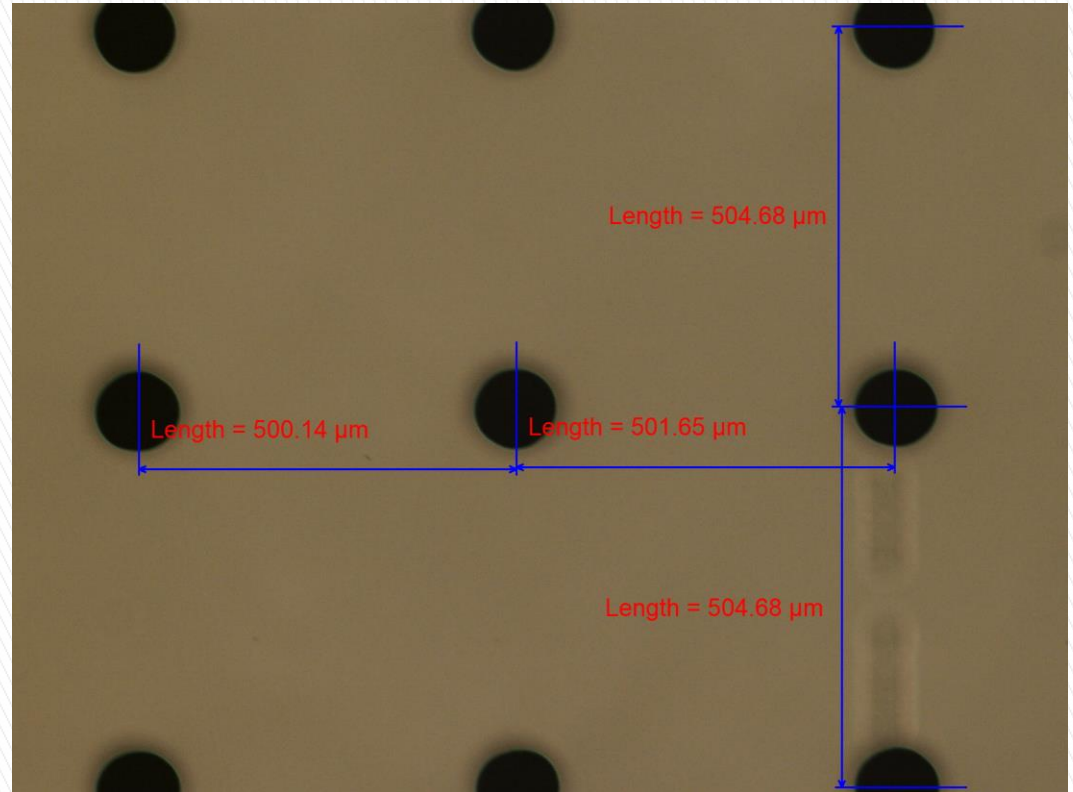
Back Focus

# Front Side Microscope Results

- Single Shot
- The interval set between the holes was 500  $\mu\text{m}$ .



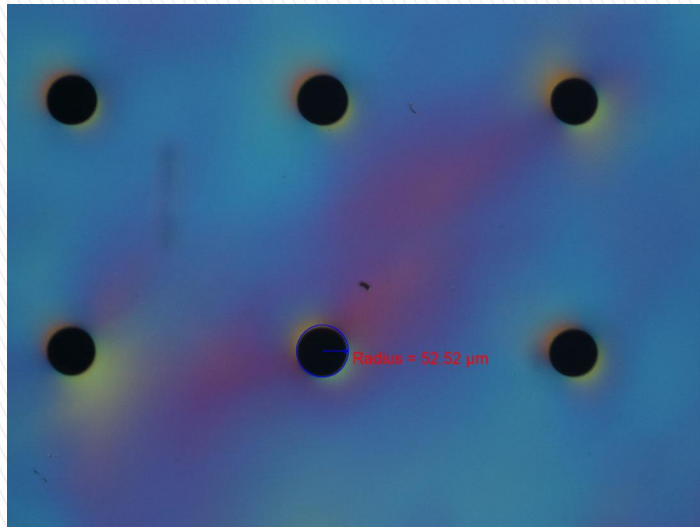
Front Light ON



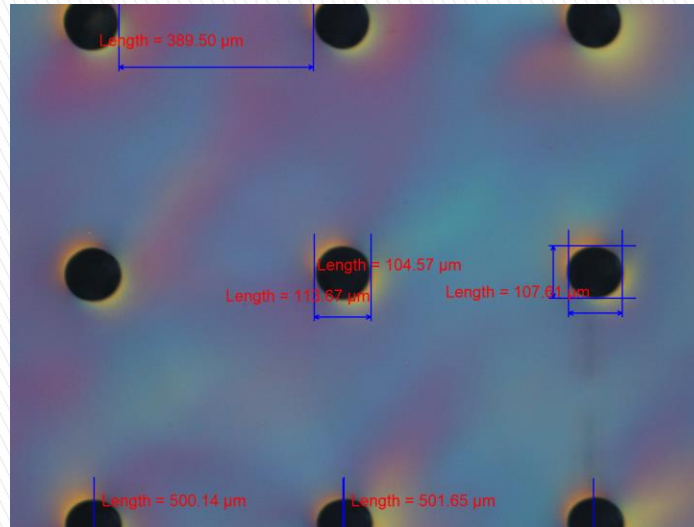
Back Light ON

# Front Side Microscope Results

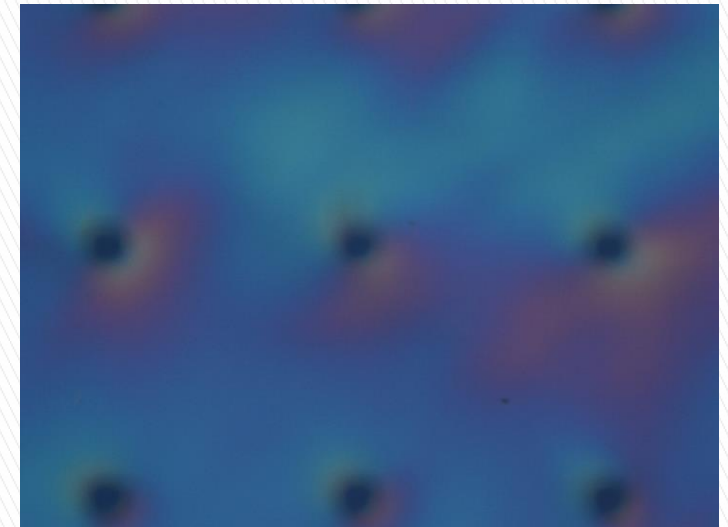
- Single Shot, these are the results capture at front side using front light of microscope



Front Focus



Center Focus



Back Focus



## Front Focus Back Side Under Microscope Results

- Single Shot, Repetition Frequency 500 kHz
- These results shows that the light is coming from behind which means there is fully etched area in the center

Note: The chemical etching is done only for 30 mins with 5% HF

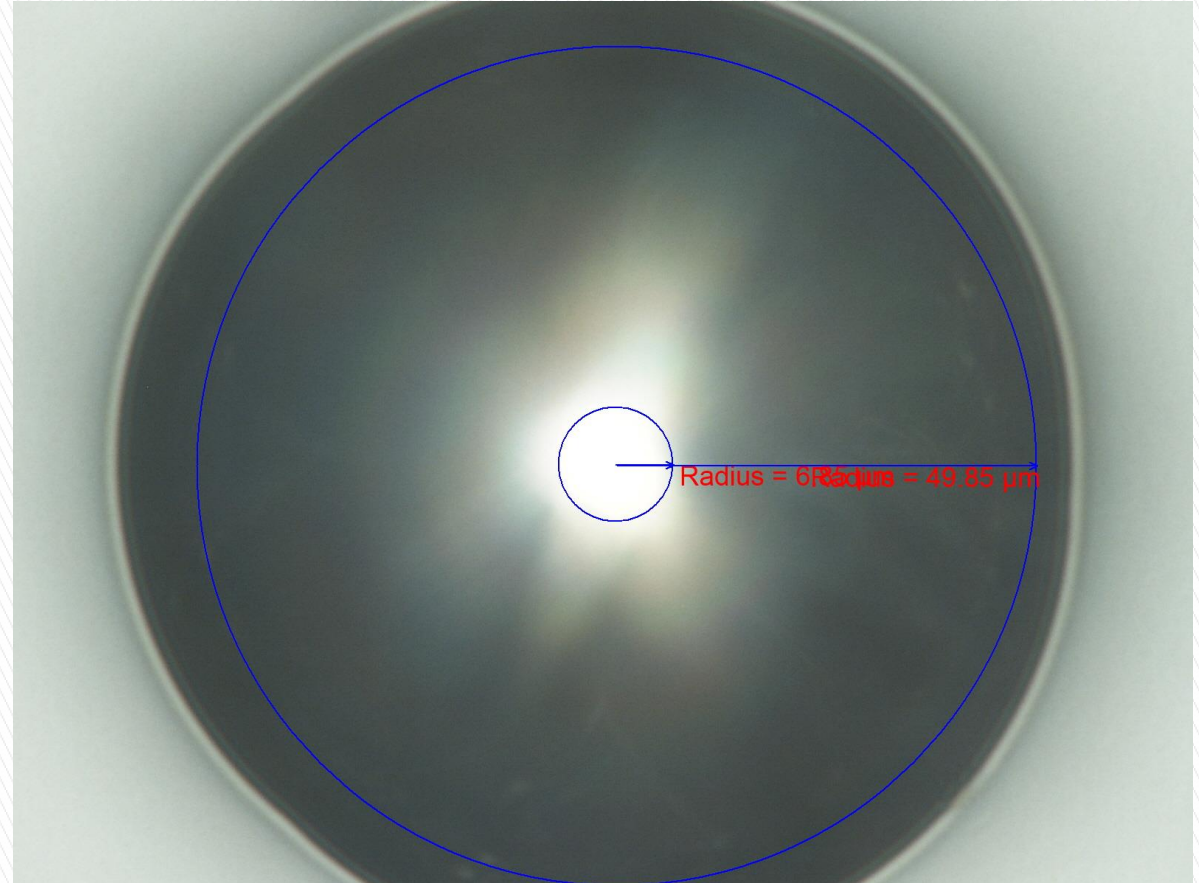


Back light on of Microscope

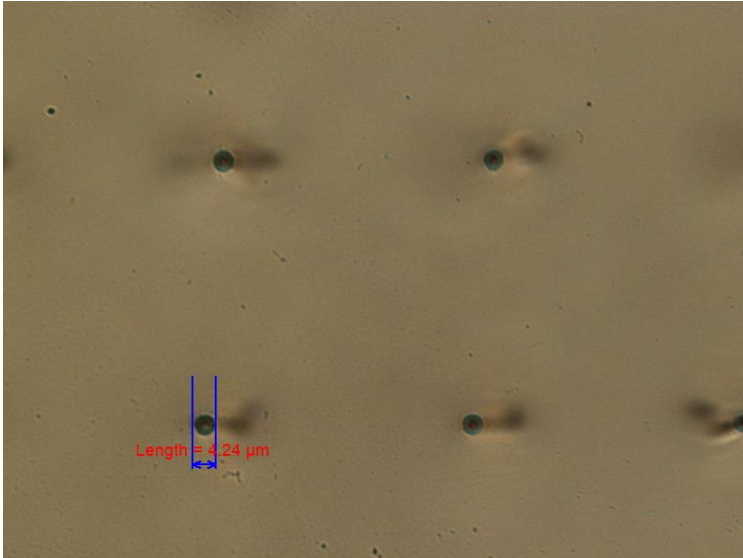
## Front Focus Back Side Under Microscope Results

- Single Shot, Repetition Frequency 500 kHz
- Magnified result of single hole show that about 6 $\mu$ m hole is there where the light is coming from

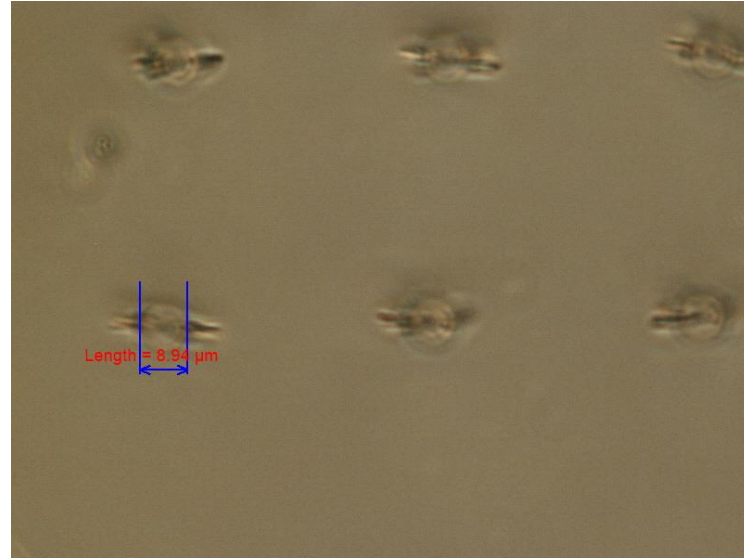
Note: The chemical etching is done only for 30 mints with 5% HF



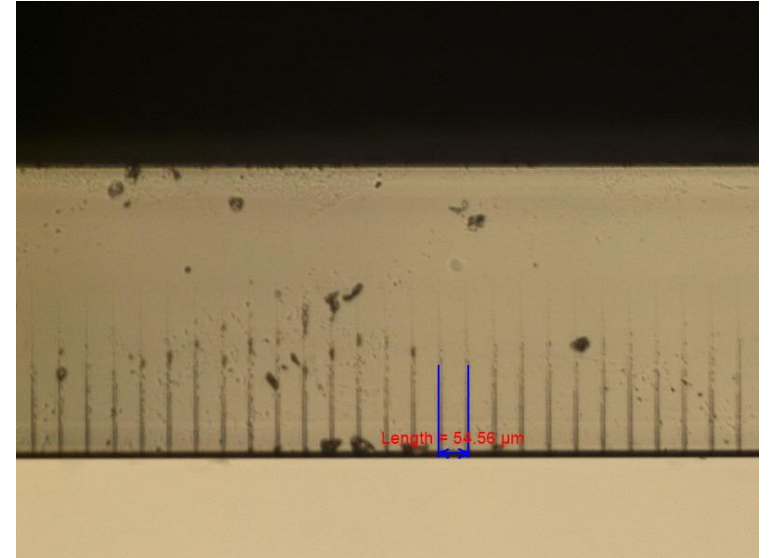
Back light on of Microscope



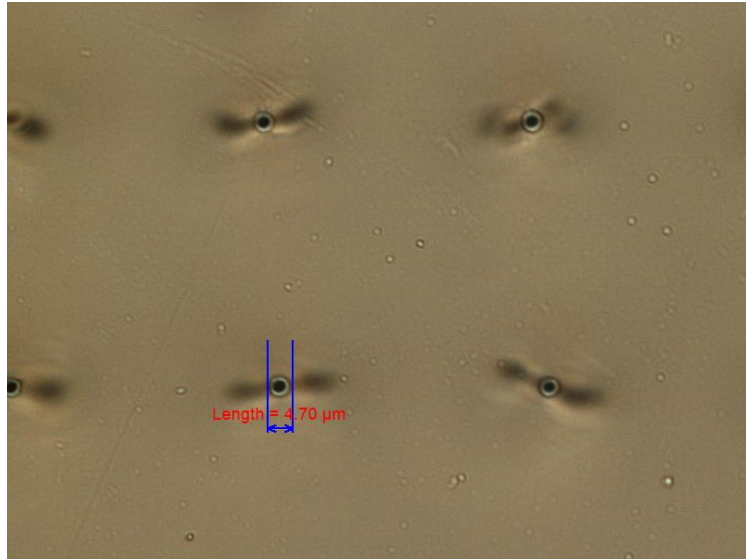
Front



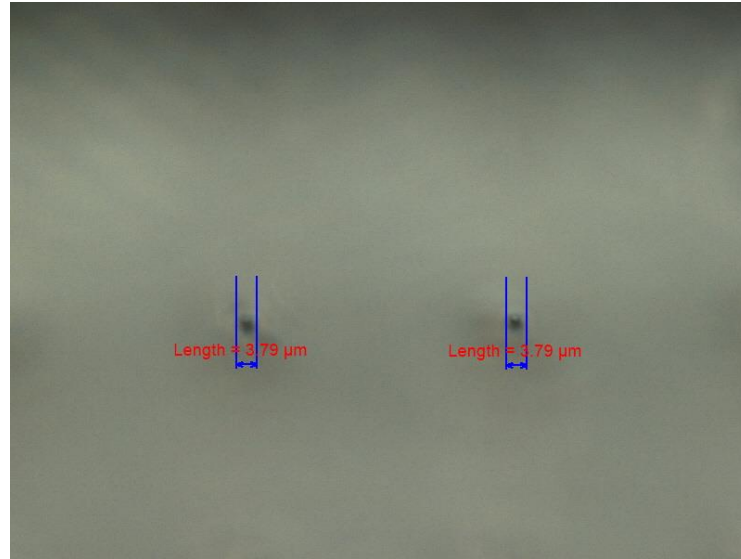
Back



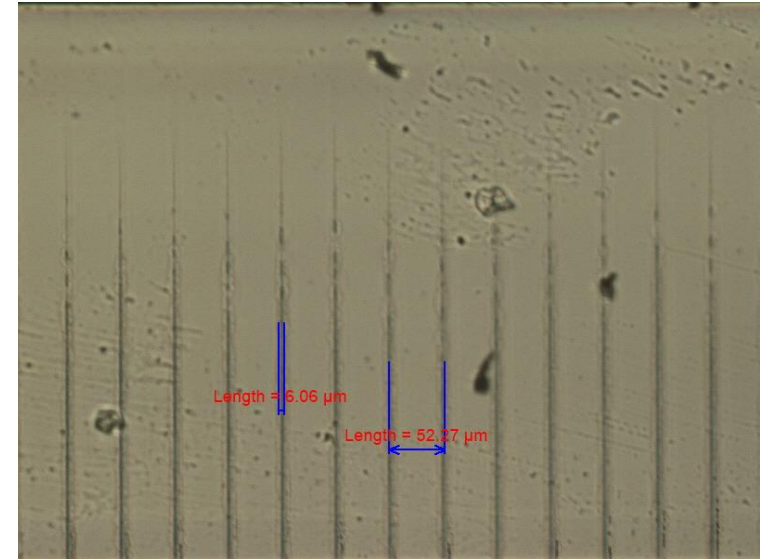
Cross sectional



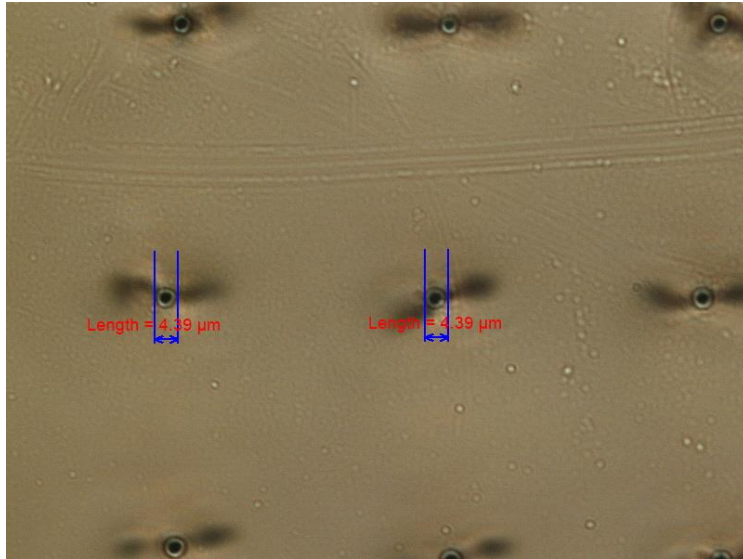
Front



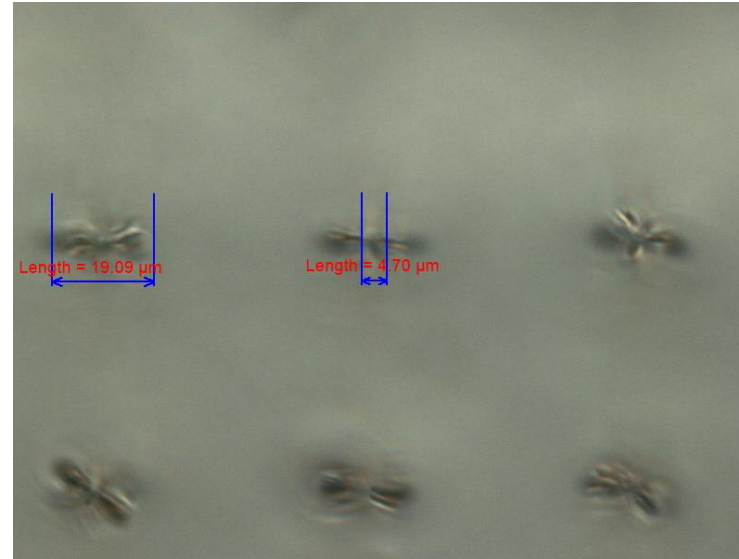
Back



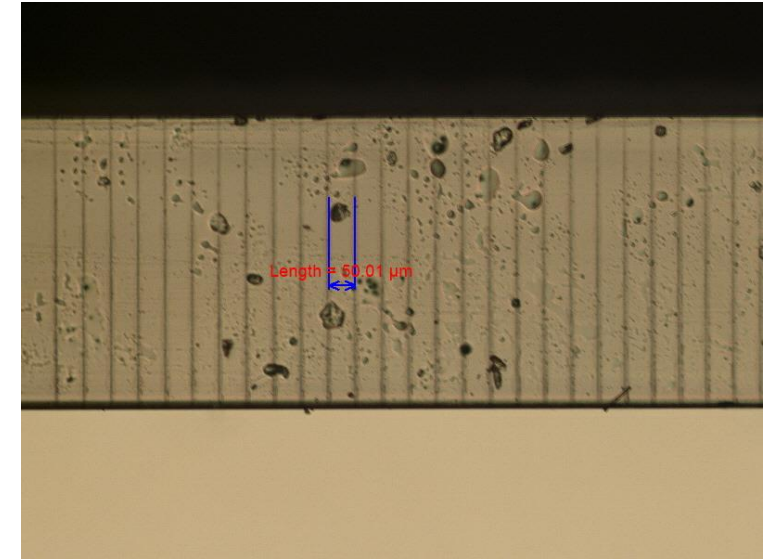
Cross sectional



Front



Back



Cross sectional

- Based on the results of K3-6, the test conditions have been changed
- Now the back effect of center focus also improved and clearly visible
- The results for 1 pulse are more uniform than 2 pulse
- The diameter of the front and back main hole effect varies from 4 to 6 um



감사합니다.