

Polish fiber in bundle by milling machine (铣床)

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Fibers in bundle

- Fibers are hold in Nylon（尼龙）, inner radius is about 12mm
- 115 fibers in one bundle, which make sure the fibers hold tightly in Nylon
- Polished 3 bundles in all with same method



Polish process

pre-process

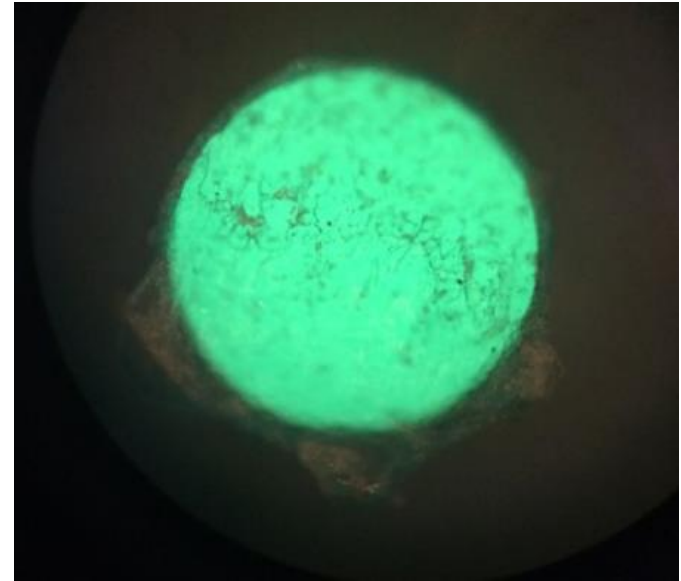
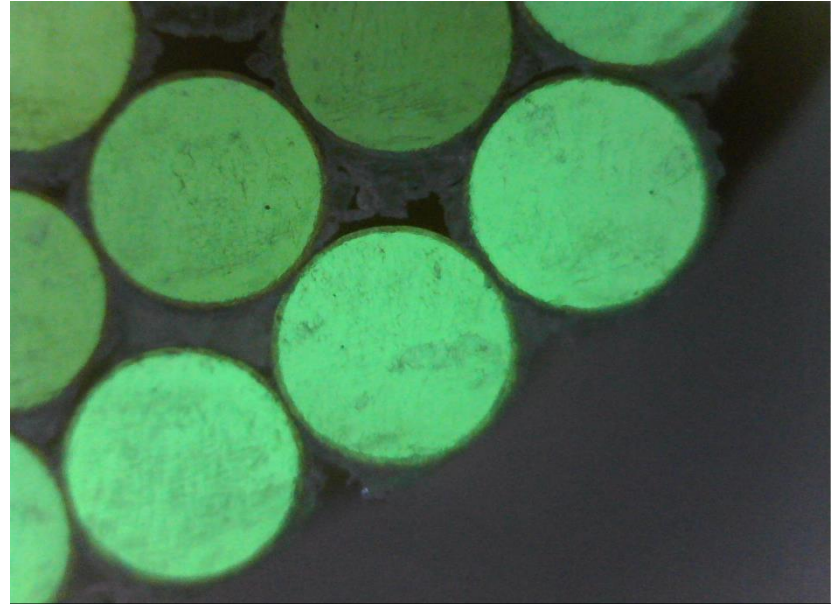
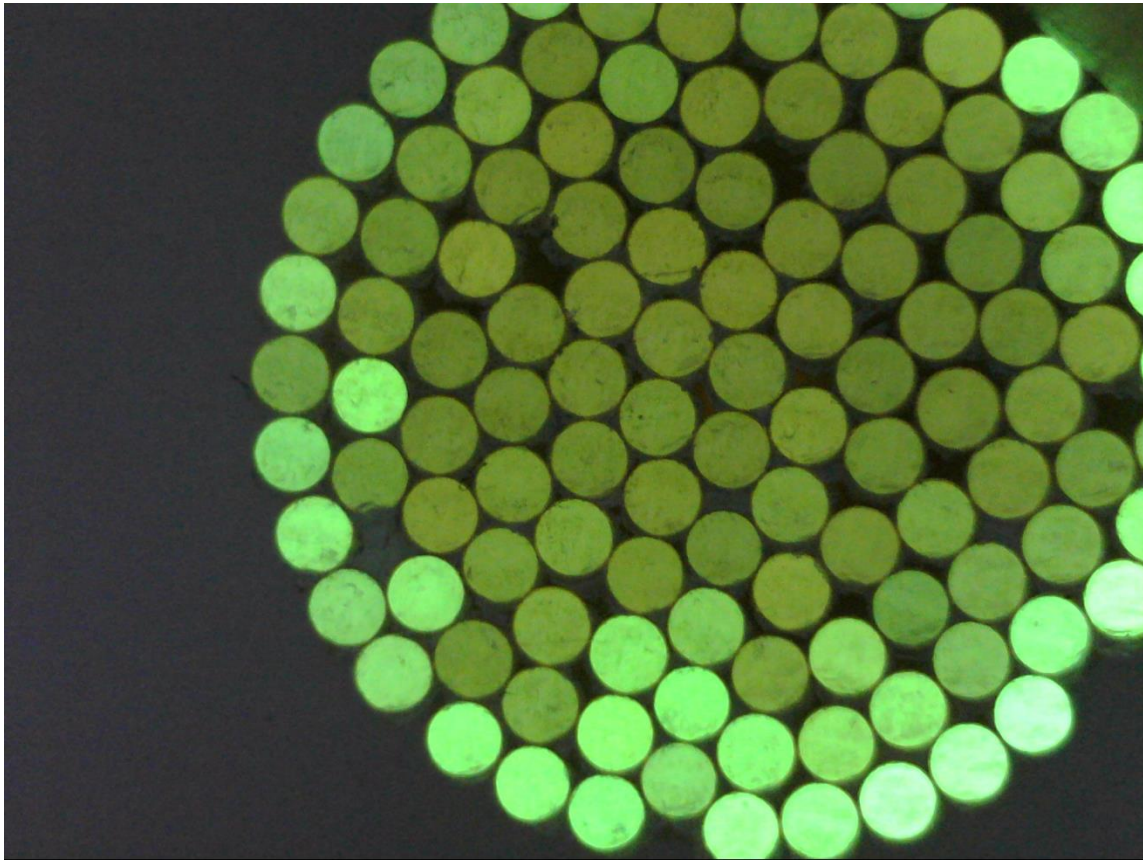
1. Dip the polish end in water
2. Freeze the bundle by dipping in liquid nitrogen(77K), and last 3~5min

- Polished by milling cutter(3cm diameter, not very ideal)
- Every polish process will cut 0.3mm(the machine could reach 0.1mm, but restricted by wide diameter), we cut three times for one bundle.
- We compared different polish process, such as polish speed, polish depth and the relative velocity direction of rotation and move.
- Use ultrasonic cleaner to clean fiber after polish(no significant improvement)



Polish result

Seems acceptable, should compare to other method.
The remaining cladding may influence plating.



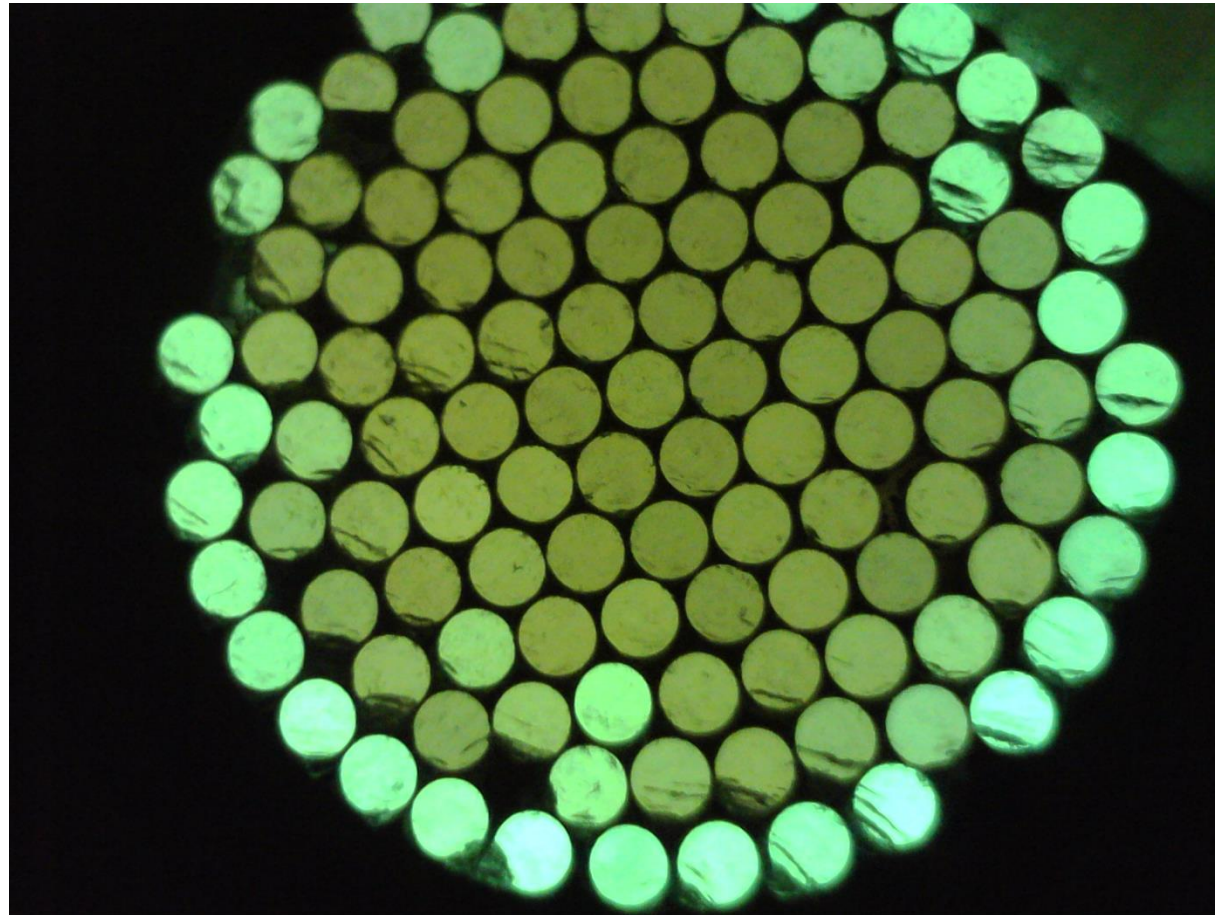
Single fiber observed by microscope

Next steps

- Update to **1cm diameter milling cutter** (higher rotating speed and shorter cut depth, already ordered)
- Send two bundles to plate aluminum layer
- Glue the other end and polish for
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- Finish one whole module and do some cosmic test before August Wuhan meeting

Backup
more fiber bundle pictures

One bad polished bundle



Fiber bundle with light from camera

