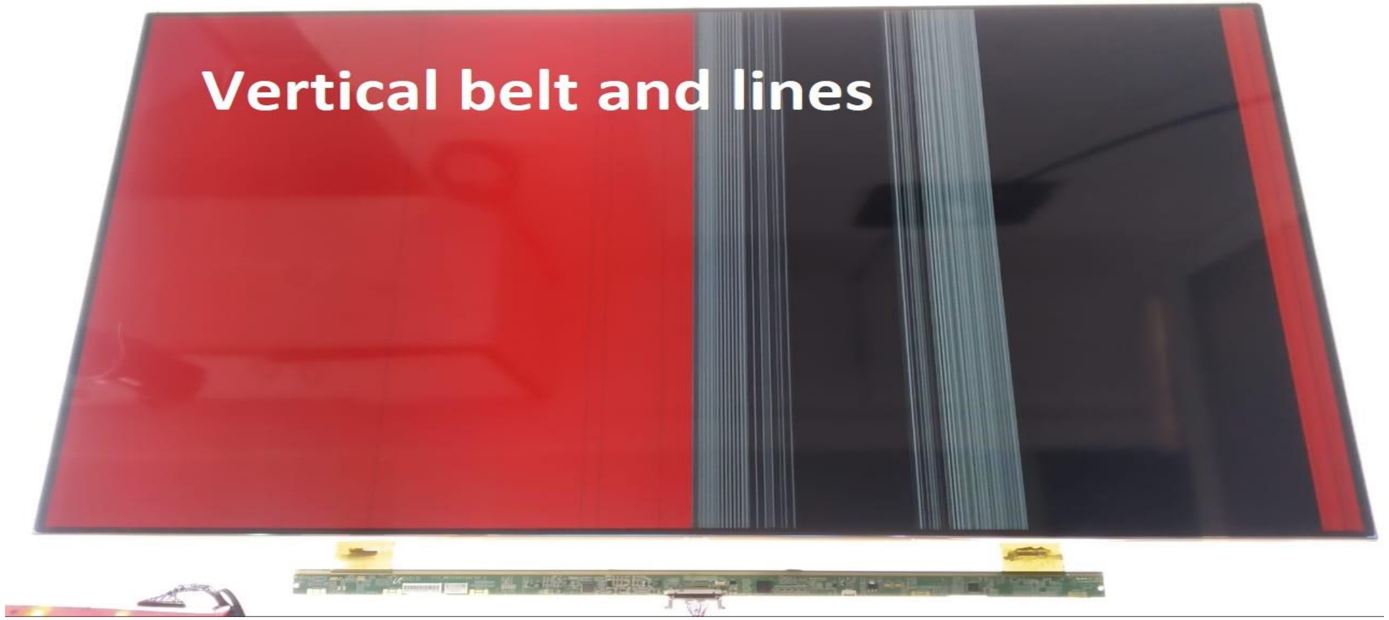
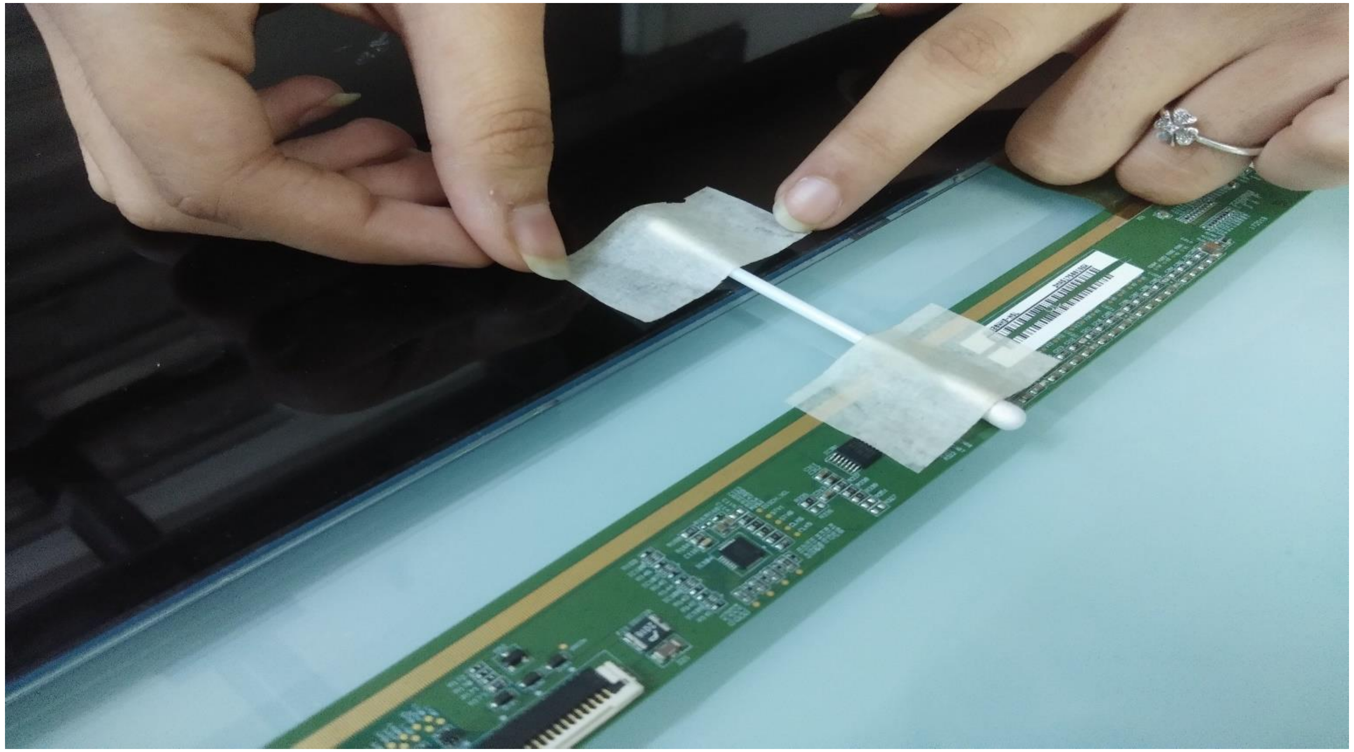
LCD COF TAB BONDING PROCESS STEPS:

1) LCD/LED fault mark :



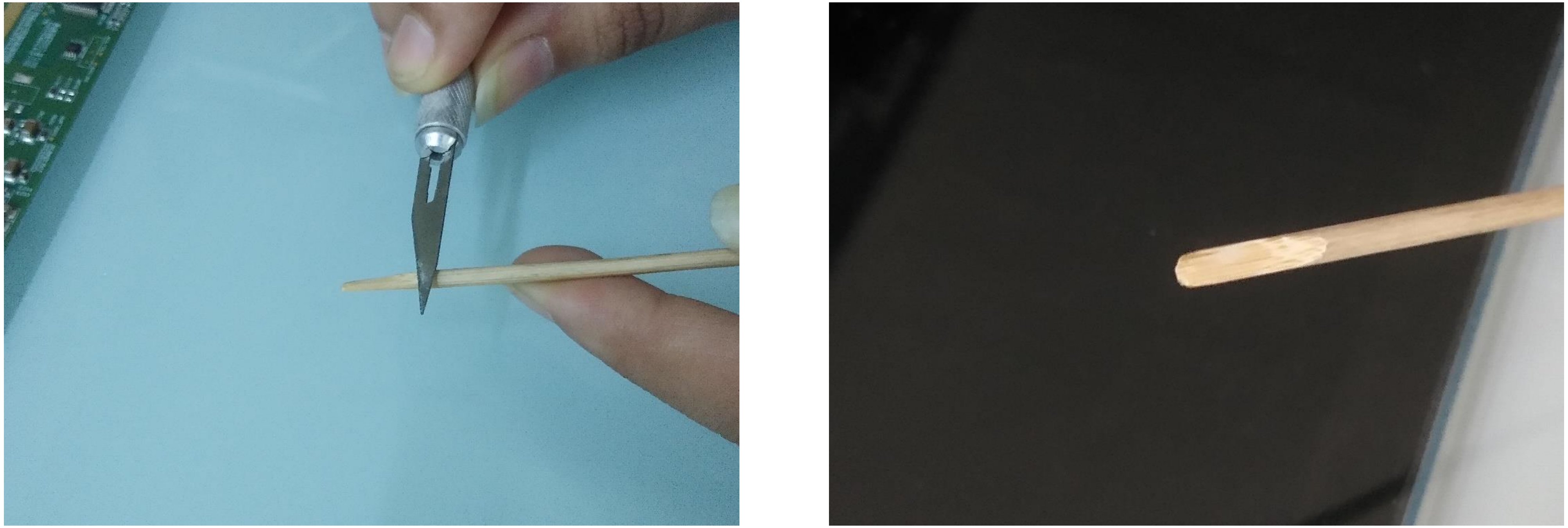
Make a mark on the screen where fault appear (Vertical line, belt; Horizontal line, belt), after bonding check again if the fault disappeared.

2) Glass and PCB fixation :



Make a fixation between Glass and Side PCB, this can prevent other COFs from damage during bonding process.

3) Tool for COF remove:

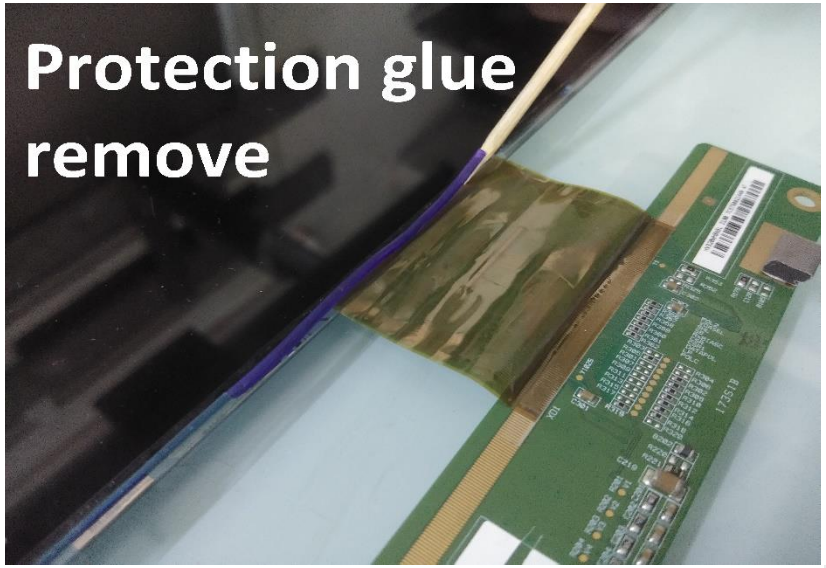


Before COF remove you have to make proper tool with perfect thickness and shape.

4) Hot gun parameter setting :

A properly parameter of the hot gun can make the COF flat, non-deformation, and unshrinking during removing.
Temperature Range: 330 degree.
Air flow of hot gun: 2-3 .

5) COF disassembly :

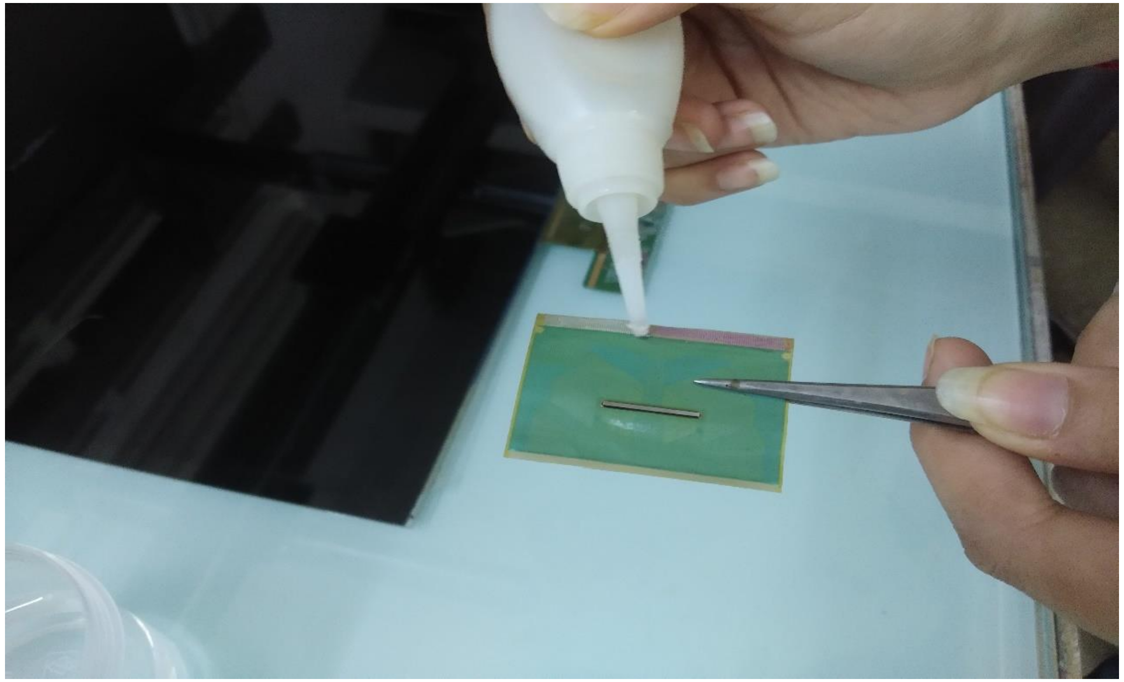

Protection glue remove


PCB side COF remove


Glass side COF remove

before disassembly, remove the sealing glue; When disassembling, right hand hold the blower, left hand take the disassembling tool, moving from left to right; Please note PCB side disassembly first and then glass side.

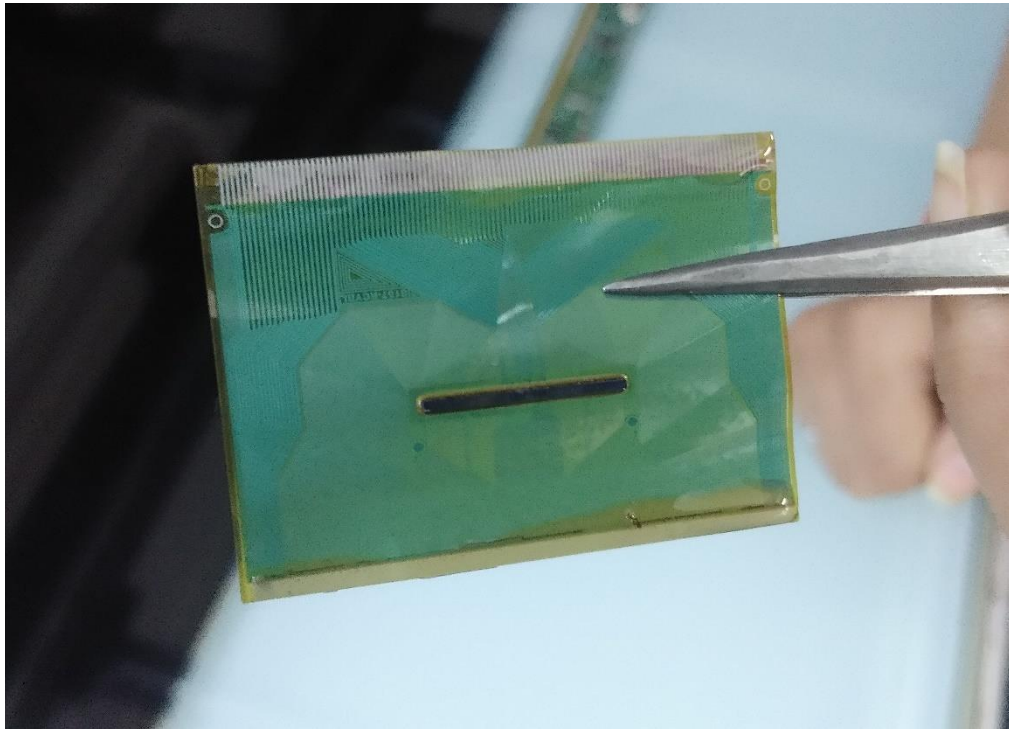
6) ACF remover liquid G750 apply on COF :



Please apply right amount of liquid on COF. Too less or too much is not working good. And also don't apply liquid on other part of COF, because the liquid is corrosion, will damage the green coting of COF.

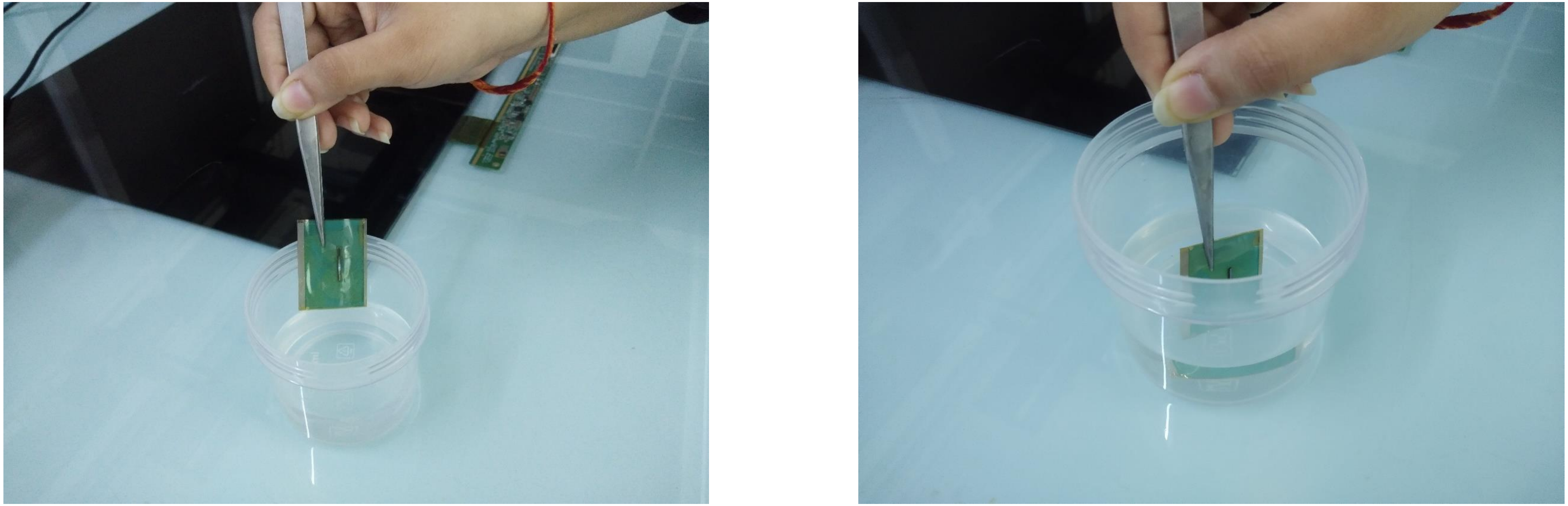
Don't touch the liquid with your finger or skin. If the liquid splash to skin, please washing with a lot of water. You can wear gloves to protect your hands.

7) ACF removing liquid chemical reaction :



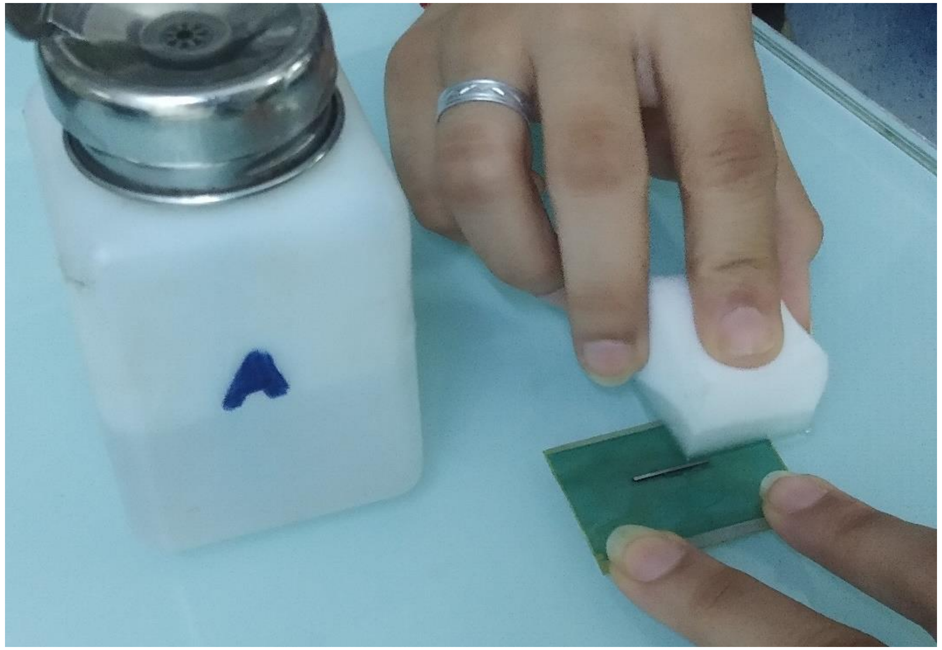
The principle of liquid is chemical reaction, which will make the ACF soft, loose and easy for cleaning. Please waiting a property time for the reaction. For G-750, reaction time is 10-15 sec, after reaction clean ACF by acetone.

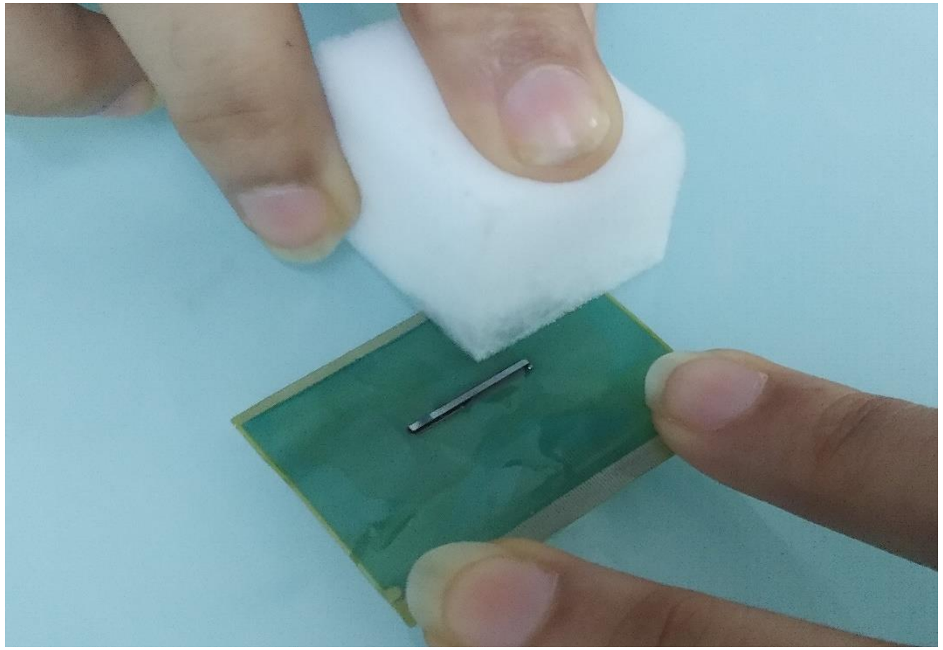
8) Wash in simple water :



We have to clean the COF in simple water so that ACF remover is remove from the COF.

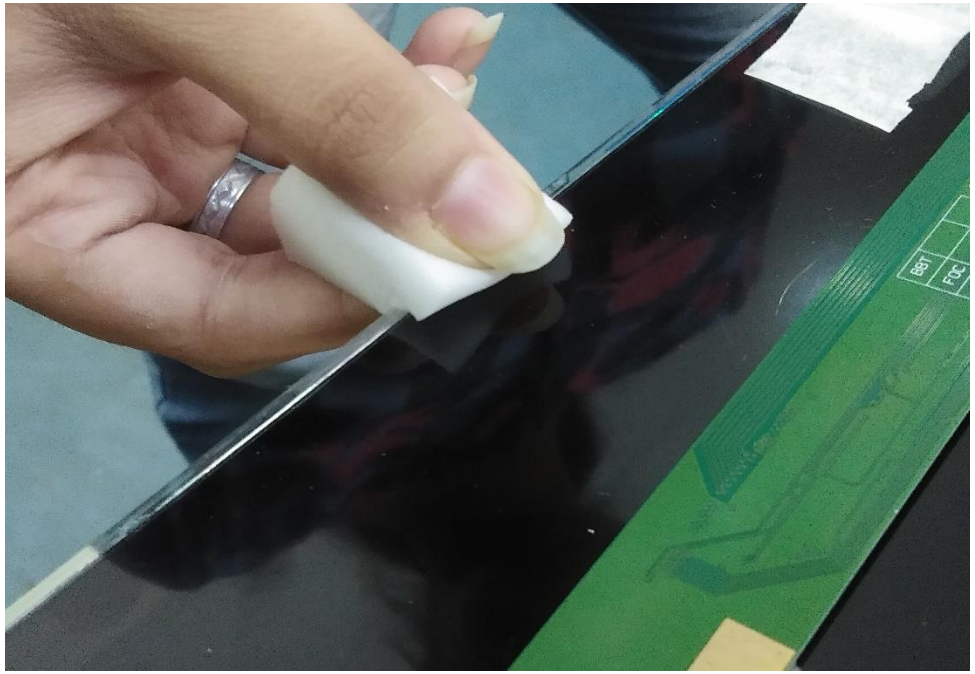
9) Old COF cleaning :





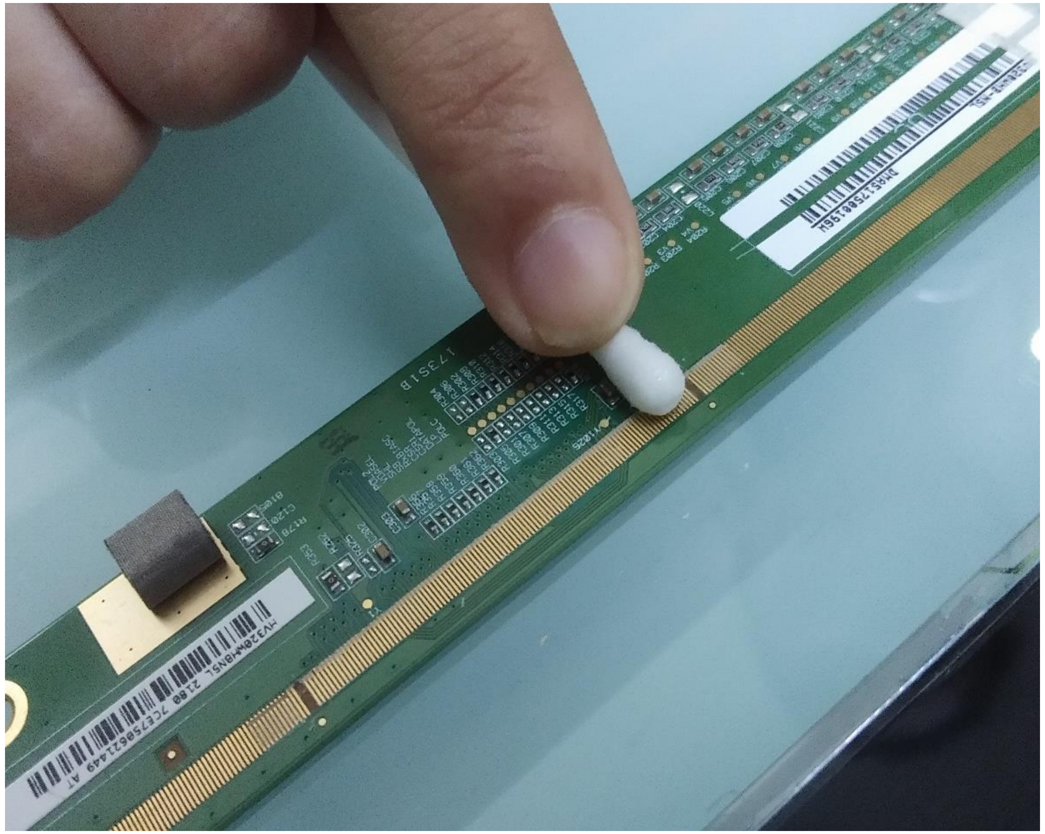
Because used COF is more lower cost than new one, and for some model can only buy used one from the market. But before bonding, please make sure the old COF is clean and not damaged.
1. Put the COF on a clean glass table;
2. Fix the COF by left hand finger (don’t touch the chip on COF, will damage it);
3. Right hand take a clean peace nano sponge with acetone;
4. Clean the ACF follow the direction of pins from inside to outside of COF. Please note only clean in one direction, don’t clear in vertical direction of the pin, or from outside to inside of COF.

10) Glass cleaning :



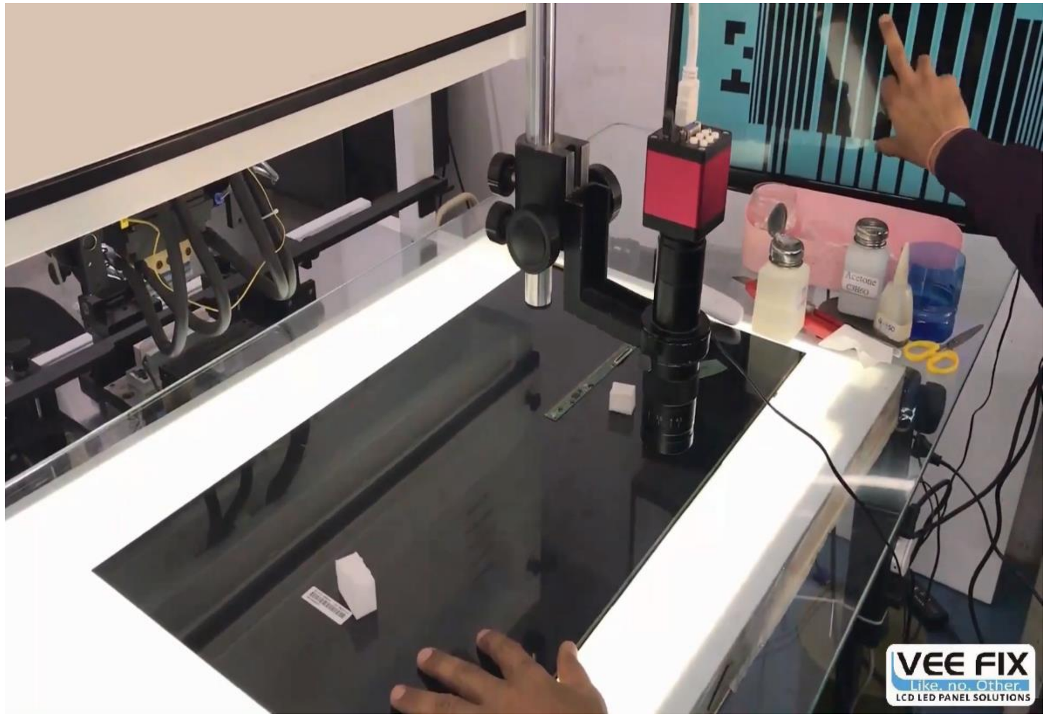
- Put the panel on a clean glass table;
- Fix the panel little bit outer of the table.
- Put left hand on the panel to support it take a clean peace nano sponge with IP ;
- Clean vertically with nano sponge;
- Repeat step 3 and step 4 until the Glass is clean.

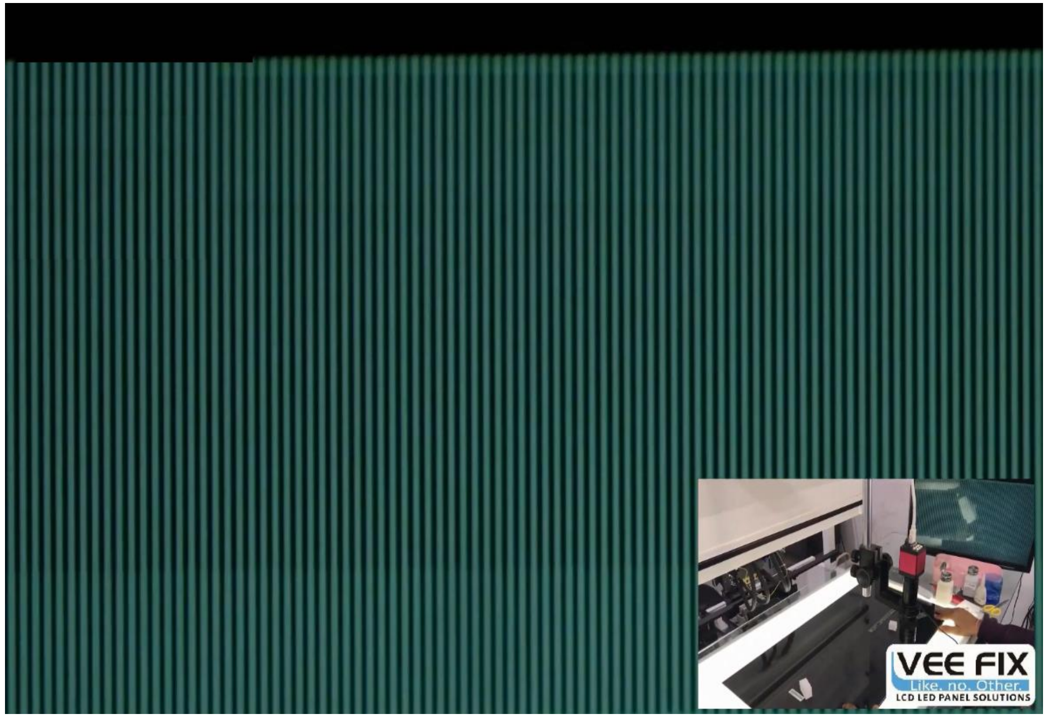
11) PCB cleaning :



Take ear bud/cotton swab with acetone and clean vertically.

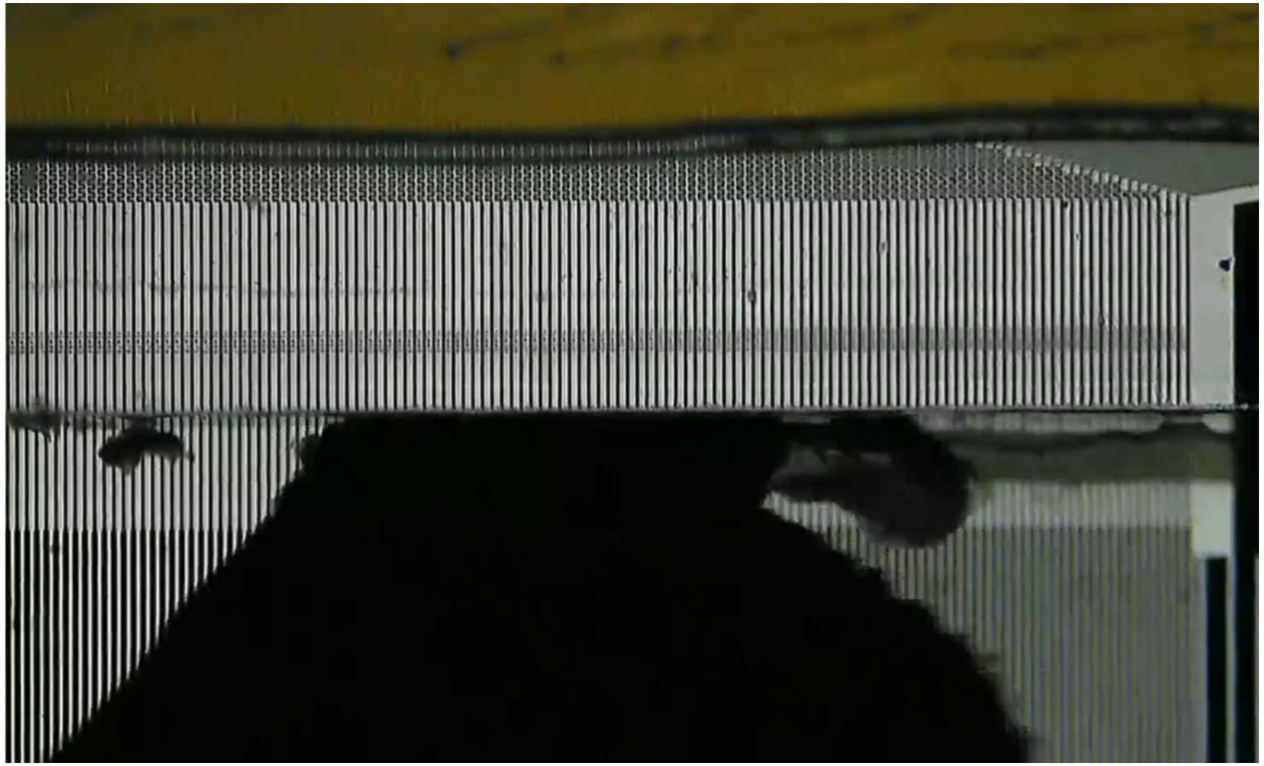
12) Glass checking :





Property magnification 200X with XY moving microscope , check if there is residual ACF or dirty tings on the glass, and also check if glass be scratched or corrosive before bonding.

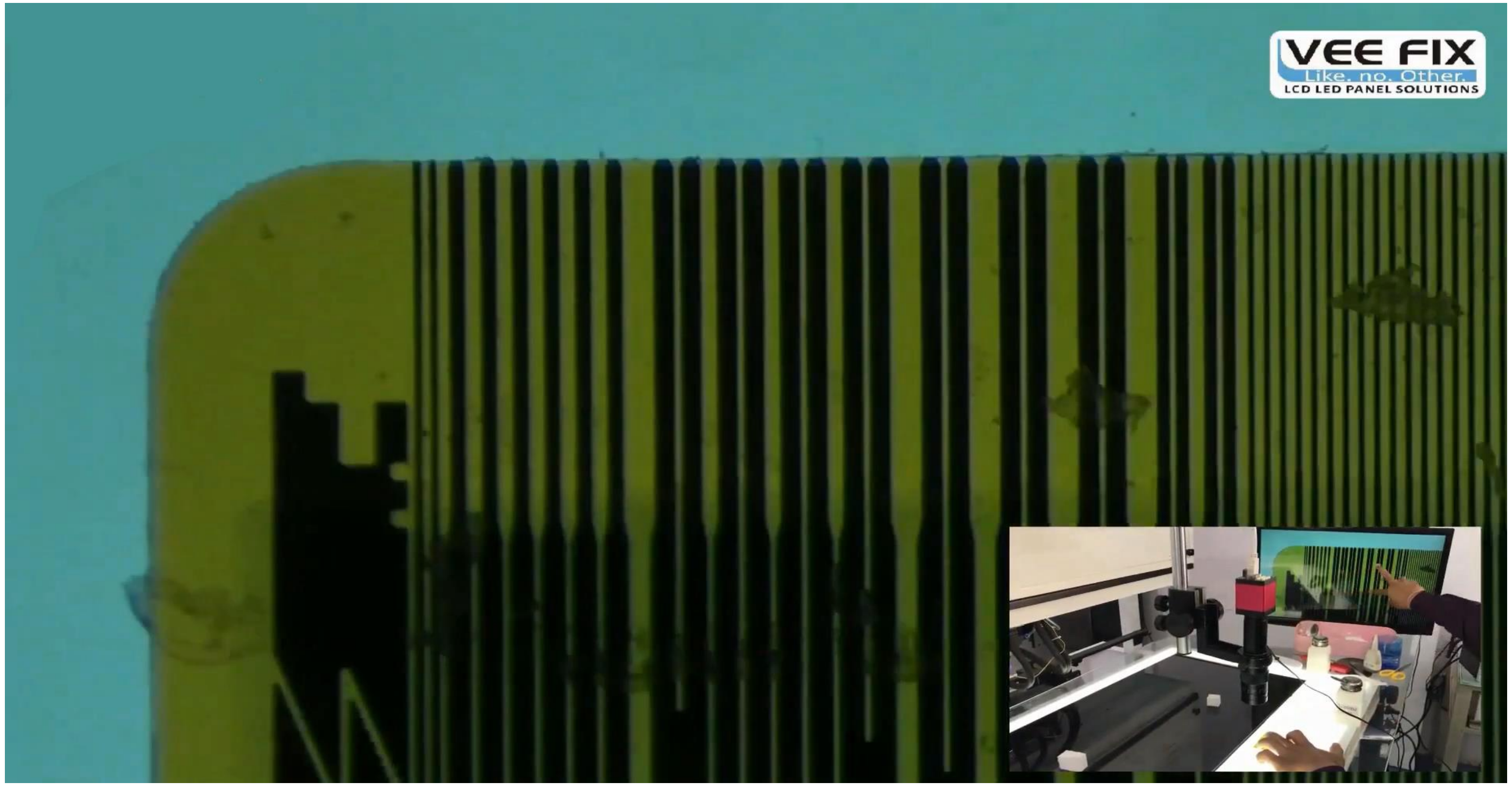
13) glass cleaning under microscope :



For some very small residual ACF and dirty tings, only can be check and clean under microscope.

Clean the ACF follow the direction of pins from inside to outside of glass with a properly direction and force, don’t hurt the pins, and then clean the glass with cotton swab and IP.

14) COF checking :



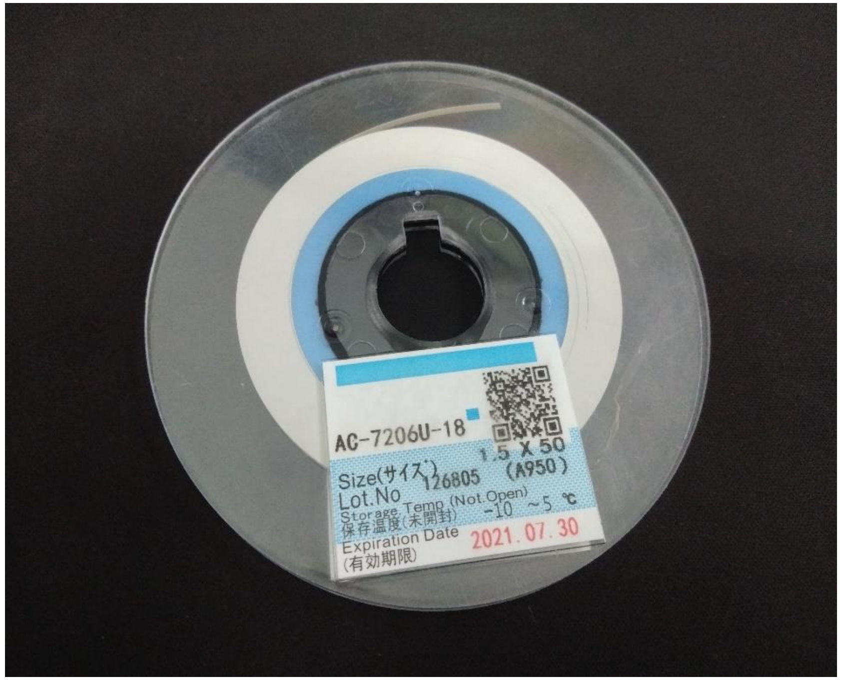
Check the COF under microscope.

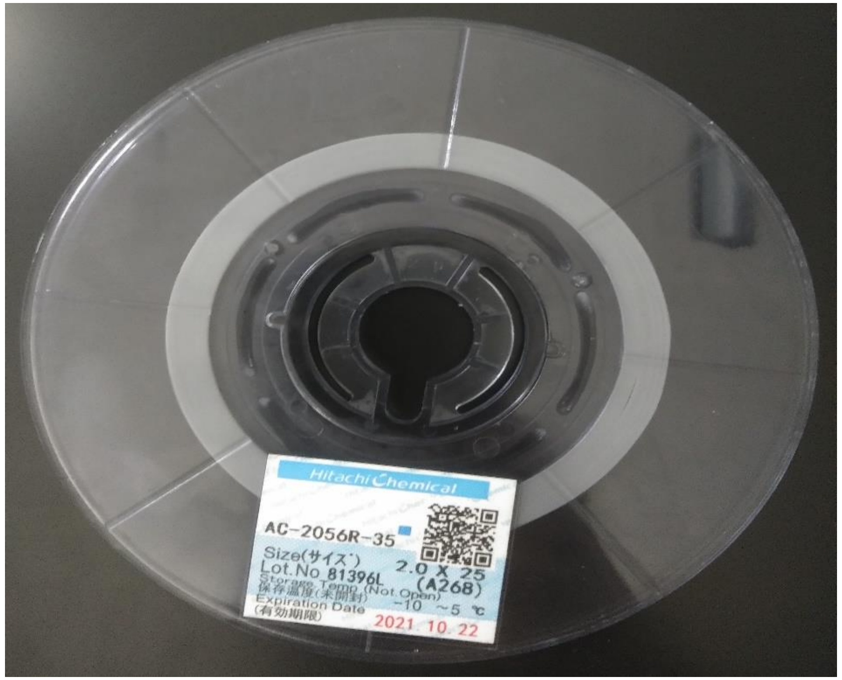
1. Check if there is residual ACF or dirty things on the pins, then scrape them by cotton swab carefully.
2. If the pins curved or broken, please drop this COF.

15) New COF cutting :

For new COF reel, should cutting them to separately before bonding.
1. Before cutting, please check the cutter if it is undamaged and sharp;
2. Put the COF reel under the cutter at properly position;
3. Cut the COF with fast speed;
4. After cutting, check the COF with microscope;
5. If COF not very clean, clean it with electrostatic cloth and acetone.

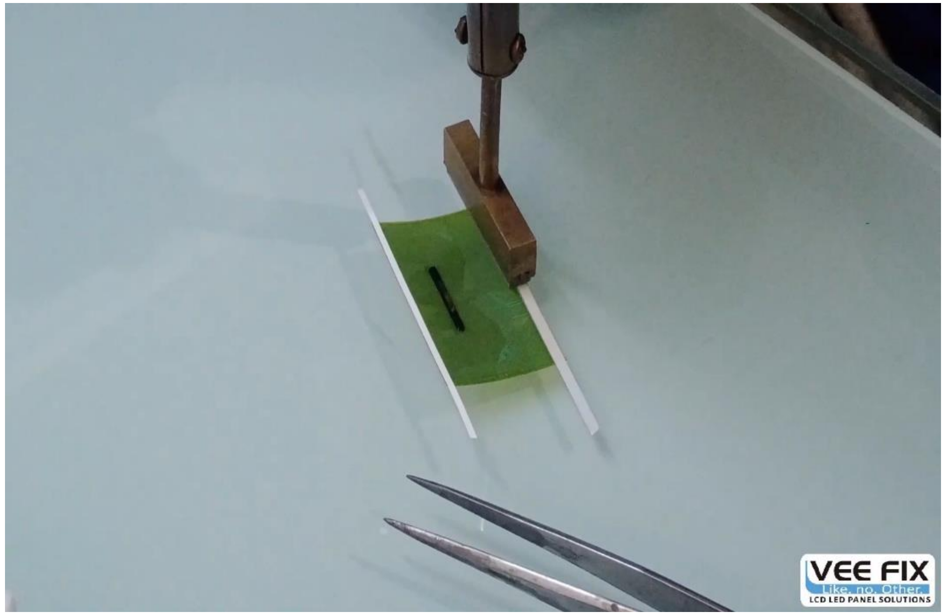
16) ACF model :





ACF is necessary for COF boding, the ACF will connect COF with Glass and PCB. Should choose the correct ACF before bonding. The ACF for Glass side and PCB side is different.
ACF should be stored in low temperature (like store in fridge), before open ACF should in freezing chamber, after open should in cold closet, and sealing with a hermetic bag. Waiting 15 min for thawing after pick ACF out from the fridge. Please noted the valid date of the ACF, which wrote on the ACF label. ACF should not be used when expired. Put ACF back to the fridge after every day work finished.

17) ACF attaching part 1 :

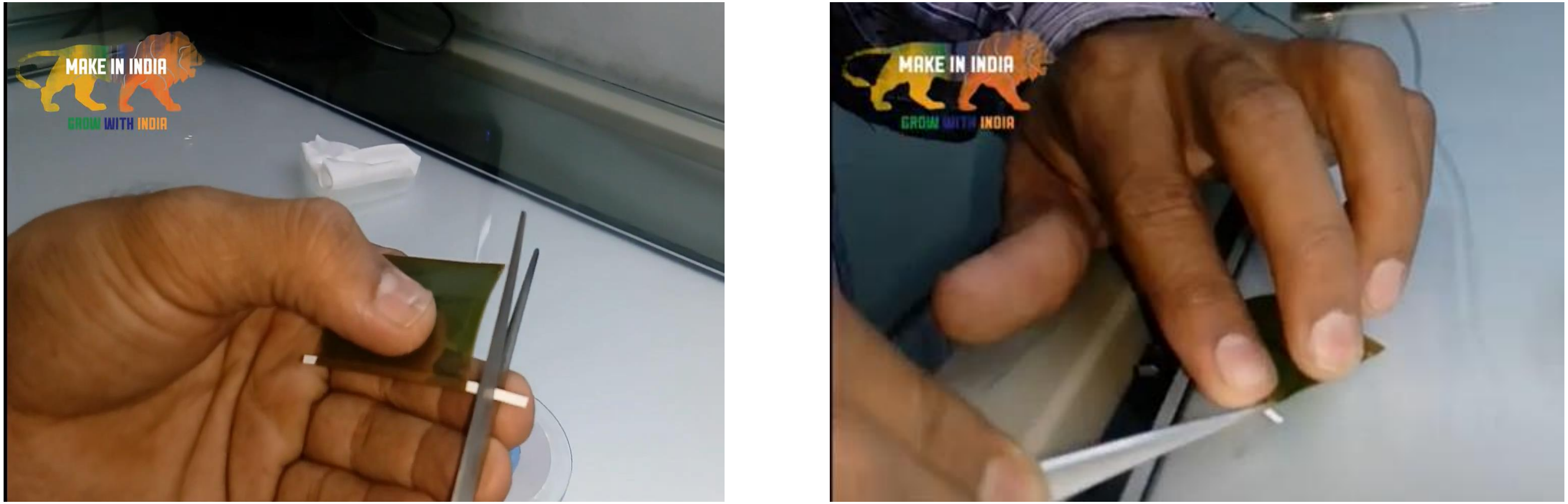


Cut the ACF from reel with a tweezers and scissors. The ACF should a little longer than the COF. And make sure the ACF very smooth and flat.

When attaching, fix COF on glass table by left hand, put ACF on COF pins with a tweezers, and make sure a perfectly alignment between ACF and COF pins.

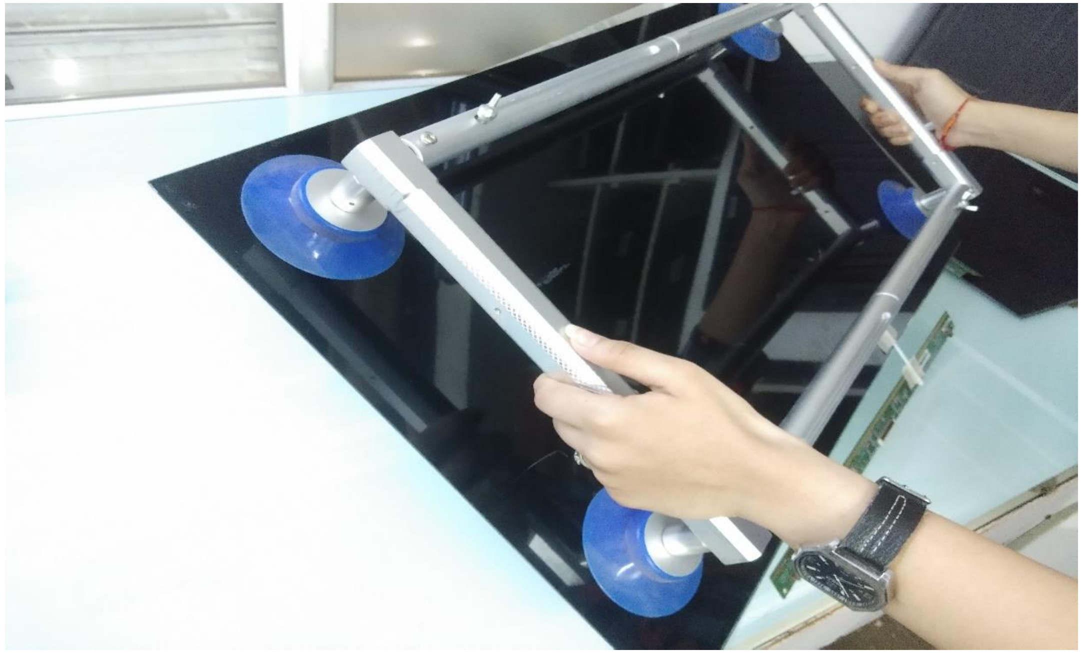
After attaching, pre-heating the ACF with a T type iron, this will make a good connection between ACF and COF, prevent ACF fall from the COF when moving.

18) ACF attaching part 2 :



After attaching, turn over the COF and scrape the left and right extra ACF from protection film by a tweezers.

19) Panel moving and placing :



After cleaning, move the ITO to bonding machine platform by two hands.
Please note should put two hands in the center of the ITO. Make sure the ITO is smooth and steady.
Take care when placing ITO on platform, don’t let it strike the quartz holder and other part of the machine.
For big ITO, can move it with suckers.

20) Bonding machine operation - parameter selecting :

PROFILE SELECTION 1 STANDARD

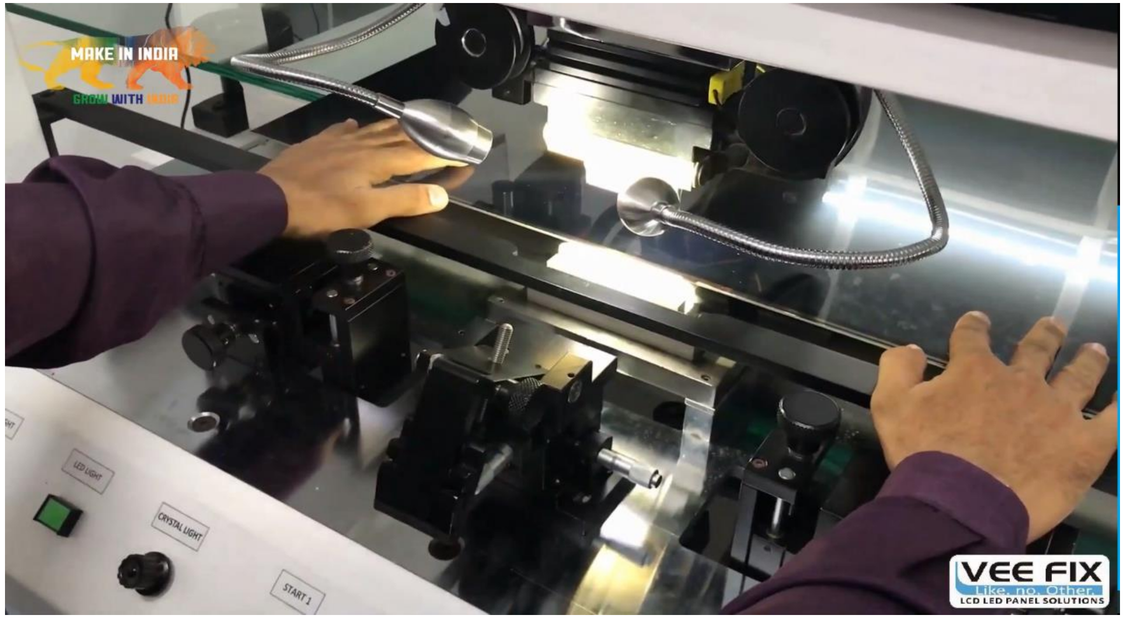
SV 190.0 SV 255.0 PV 25.2 C T1 15.0 S. 0.0 S. T2 10.0 S. 0.0 S.

PROFILE SELECTION 1 STANDARD

SV 100.0 SV 100.0 PV 25.4 C T1 10.0 S. 0.0 S. T2 10.0 S. 0.0 S.

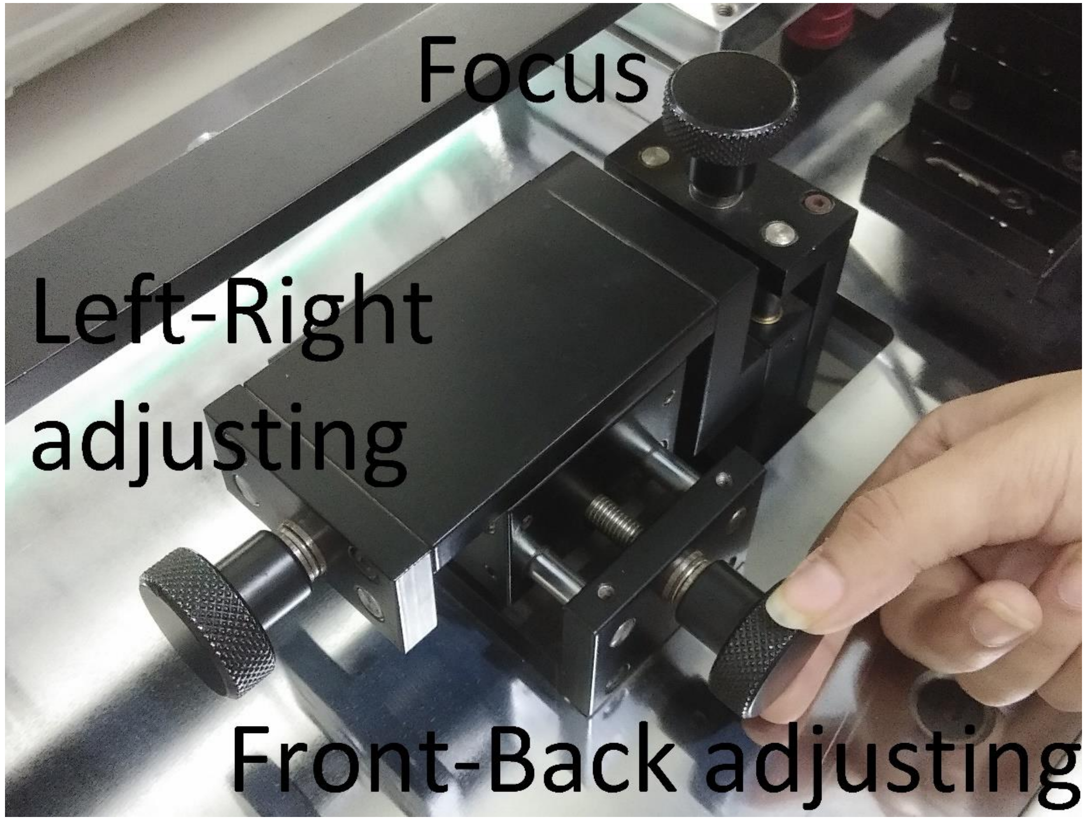
Before delivery, there are groups of default parameters are set properly. Usually no need to set them, but in some special case, you can modify them on touch screen.

21) Bonding machine operation - panel alignment :



Set the bonding area of glass properly between two markings on screen.

22) Bonding machine operation - camera adjusting :

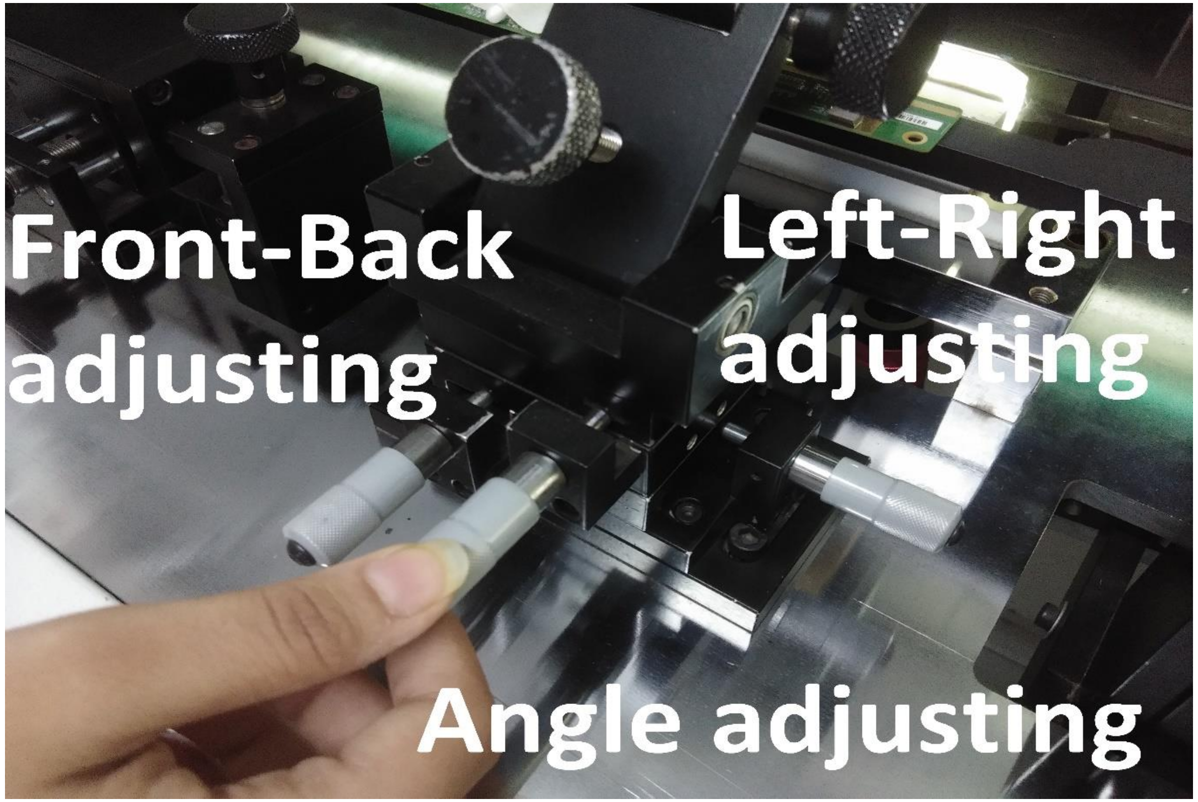


Adjust the camera with 3 screws, left and right, Front and back, focus, until there is a clear image on screen

23) Bonding machine operation – COF fixture :

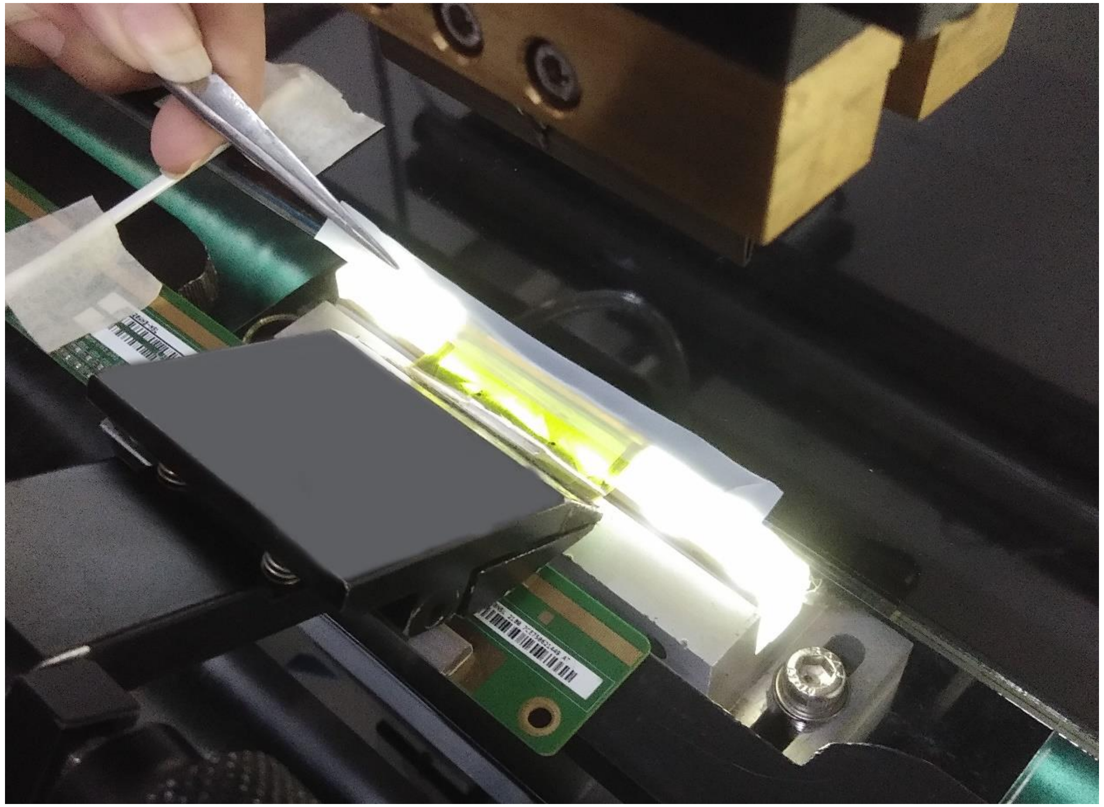
Open the COF fixture, put the COF in fixture, the fixture should not touch the chip on COF. Remove the protection film of ACF. Then put the COF on glass pins and align them.

24) Bonding machine operation – COF adjustment on XYZ direction:



Check the alignment quality through LCD screen, and can adjust the 3 adjustment screws on fixture to align Glass and COF pins. The Glass and COF pins should alignment perfectly

25) Bonding machine operation – Teflon tape:



After alignment of COF and Glass, put a Teflon tape on the top of COF, the Teflon tape should about 5mm longer than COF. The Teflon tape will protect the COF while bonding.

The bonding pressure should between 2.0Mpa~4.0Mpa, the pressure can be setting by the regulating valve.

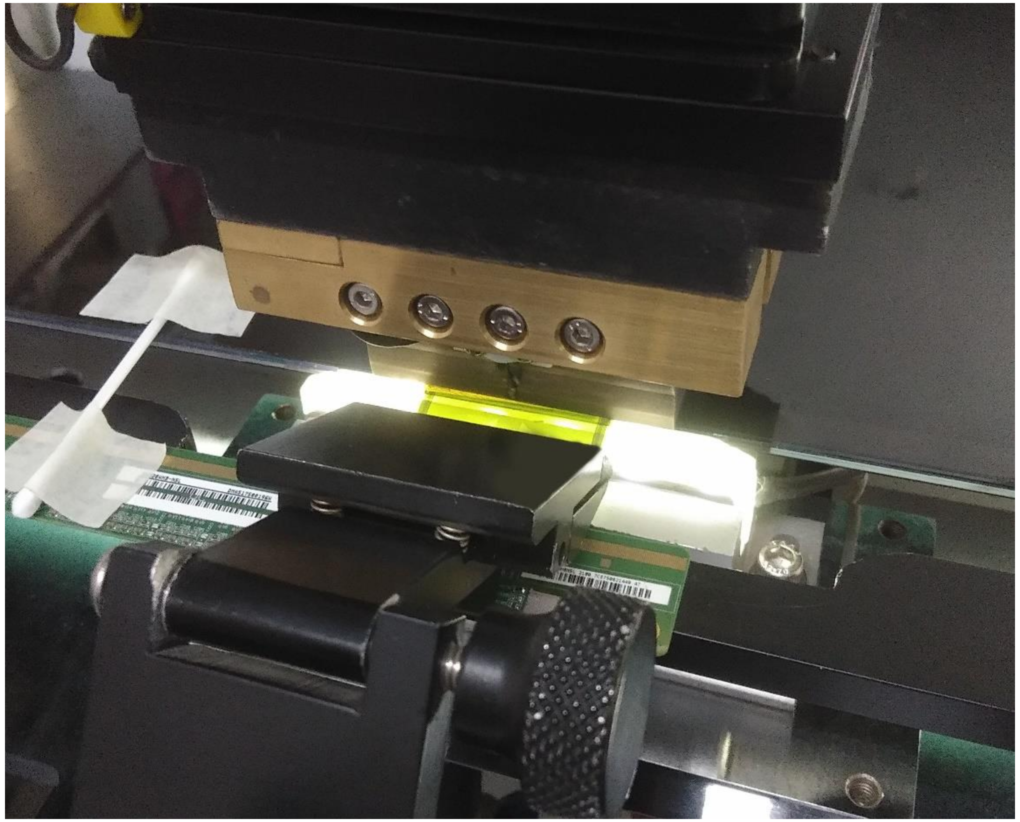
26) Bonding machine operation – alignment image :

Alignment is very important for bonding. Good alignment will make a good bonding, while bad alignment will make a failure bonding.
For new COF, alignment is more easy;
For used COF, is a little hard for aligning, because used COF will curved, shrink…

27) Bonding machine operation – double start :

Before bonding, make sure the alignment, parameter, pressure all in the right setting, change from manual to automatic bonding on touch screen, press the two start button at same time on panel to start the automatic bonding process. The head will begin heated to the start temperature, then come down with bonding pressure, keep heating to the bonding temperature, after waiting setting time, stop heating and cooled by air, when cooling finished, the head will goes up automatically, the bonding process finished. During the automatic bonding process, you can press the emergency button at any time to stop the process.

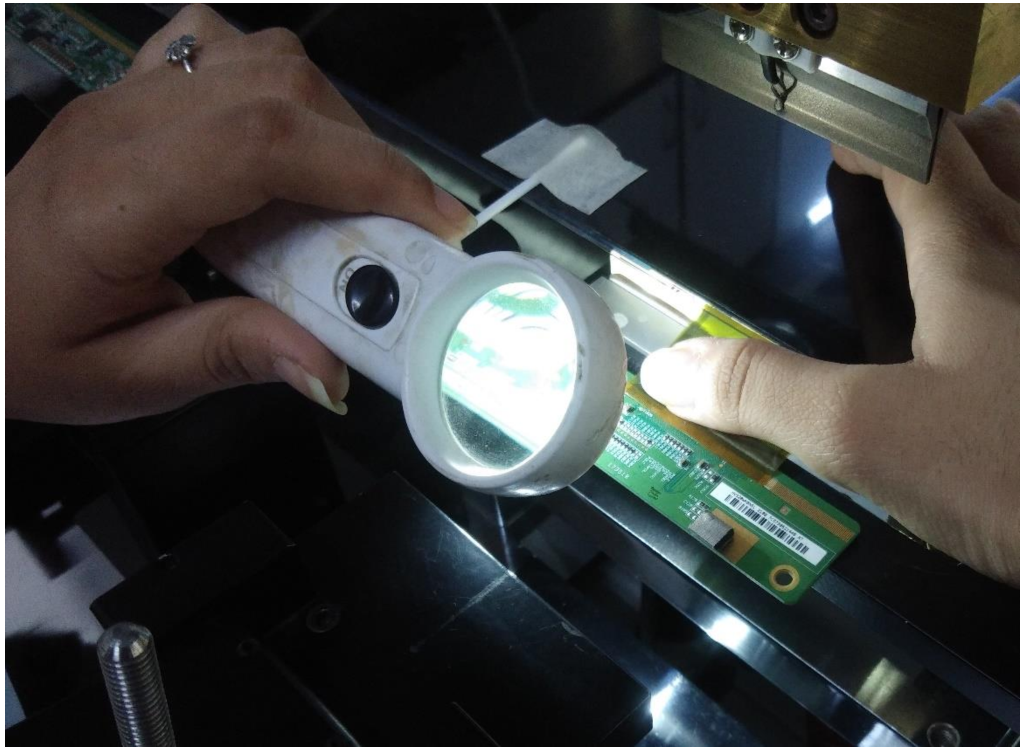
28) Bonding machine - automatic Bonding :



When bonding finished, can check the bonding effect with the screen, each pin on Glass and COF should connect in a good quality. If not connect very well, please disassembly the COF and re-bond it carefully.

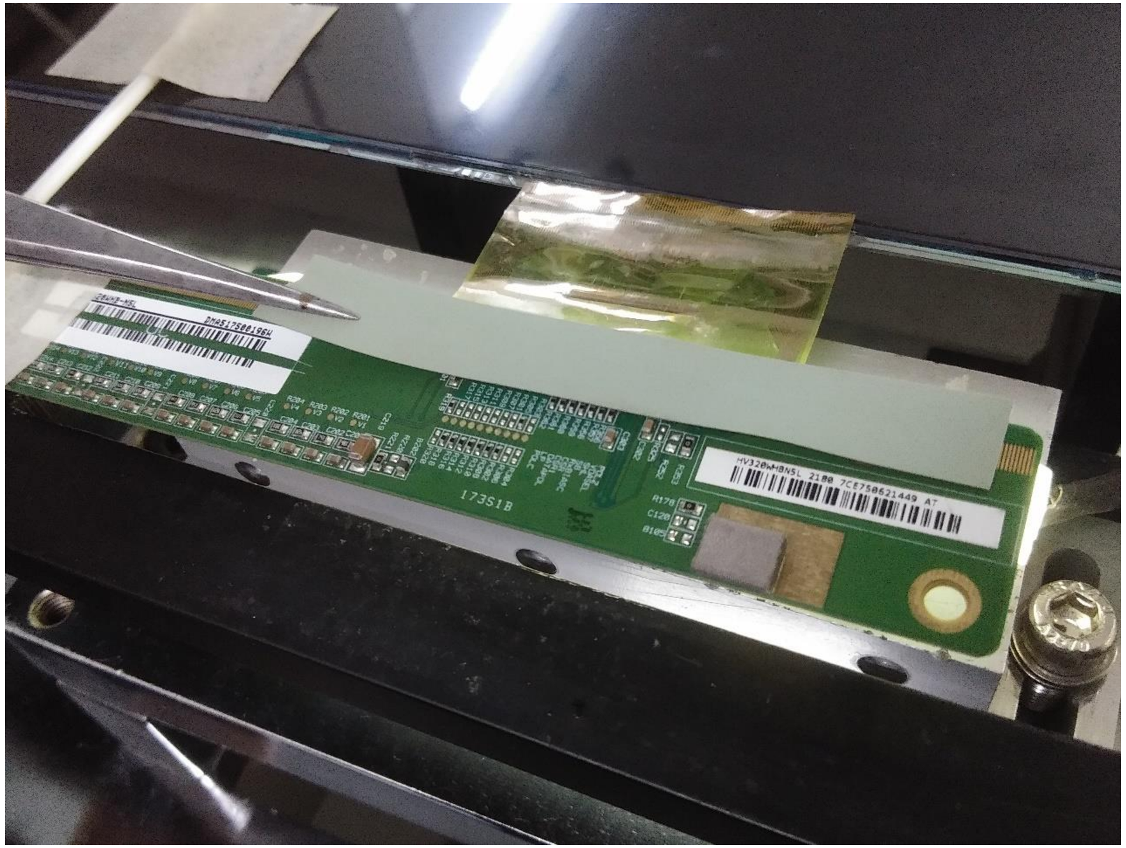
If OK, please do next step, PCB side bonding.

29) Bonding machine – PCB side alignment :



- Put the PCB bonding area under the middle of the head, the same operation as Glass side.
- The head should cover full bonding area.
- Align the PCB and COF pins, can assistant by a magnifying glass. There are marks on PCB and COF will help alignment.

30) Bonding machine operation – put silicon tape :

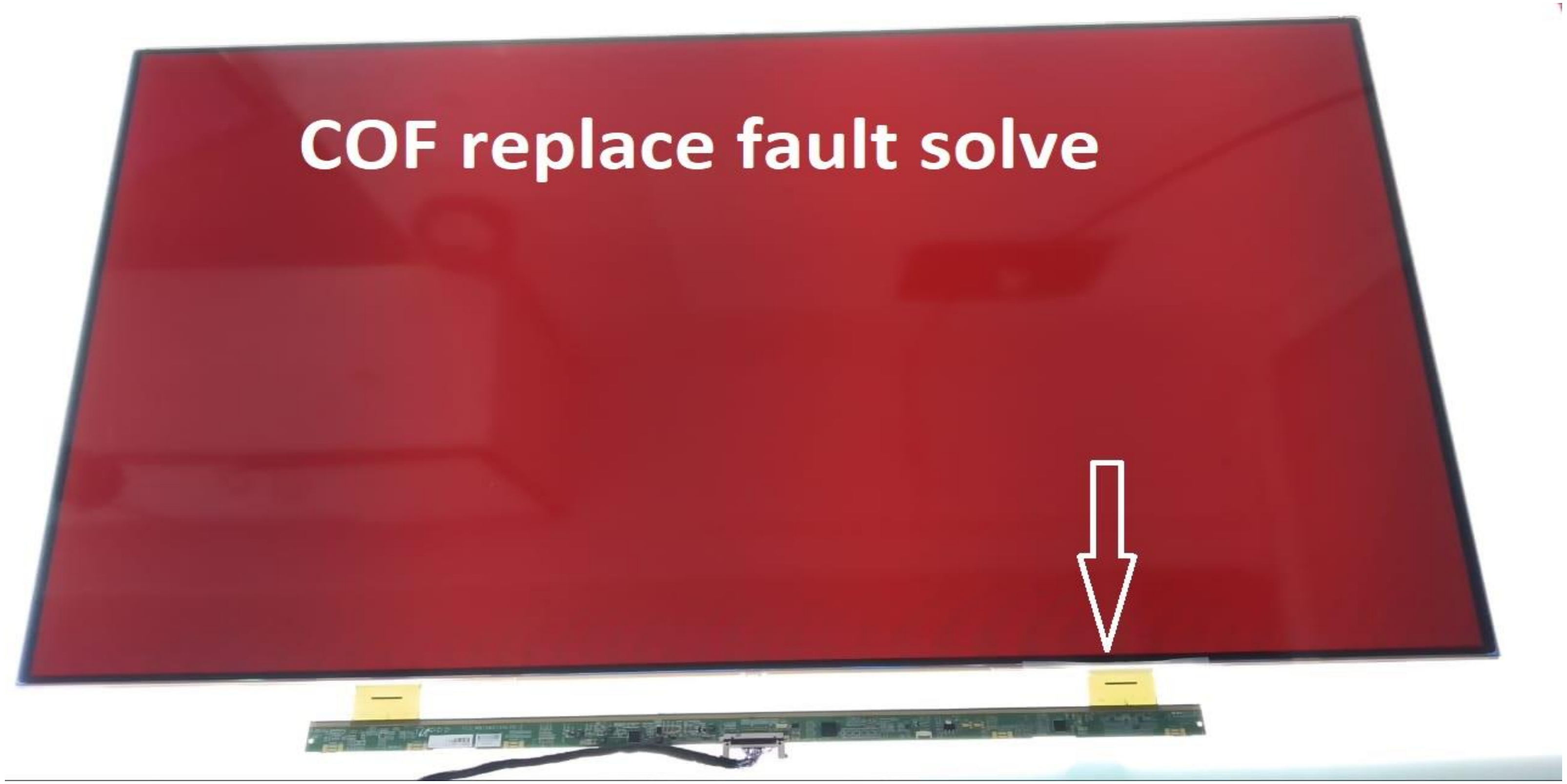


After alignment, put a silicone table on the COF, it will protect the COF and make the heating more uniform. Please note, ITO side use Teflon and PCB side use silicone.
The length of silicone tape should longer than COF length.

31) Bonding machine operation – PCB side automatic bonding :

Before bonding, make sure the alignment, parameter, pressure all in the right setting, change from manual to automatic bonding on touch screen, press the two start button at same time on panel to start the automatic bonding process. The head will begin heated to the start temperature, then come down with bonding pressure, keep heating to the bonding temperature, after waiting setting time, stop heating and cooled by air, when cooling finished, the head will goes up automatically, the bonding process finished. During the automatic bonding process, you can press the emergency button at any time to stop the process.

32) Testing after Bonding :



After bonding, do a testing with the screen, make sure the fault was repaired.
If not repaired, analyze the reason and repair again.
Usually bright line means short circuit; dark line means off circuit.