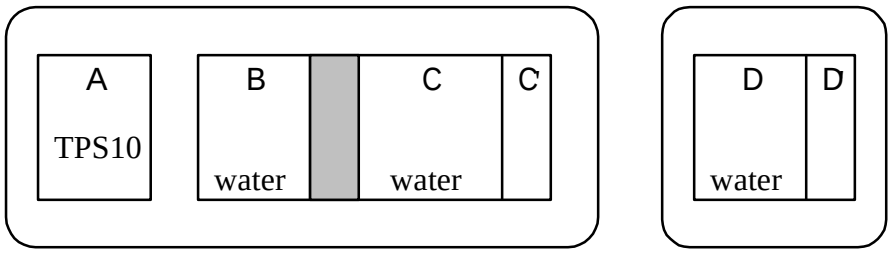
A. Purpose

This process is to prepare clean glass substrate for subsequent LCD fabrication procedures.

B. Equipment set-up

Branson Ultrasonic Cleaning System



There are totally 4 bathes on our Branson ultrasonic cleaner system. They are labeled to be bath A, B, C, and D. C' and D' are the heating baths for bath C and D respectively.

1. Fill bath A with detergent TPS 10 (diluted ten times). Set and wait for the temperature of bath A to reach 50 ^{o}C.

2. Fill bath C' with DI water and gradually fill bath B and C too. Set the temperature of bath C' to 50 ^{o}C. The water flow in rate should be such that there will be a steady flow of water from bath C' to bath C and then to bath B. The water level in bath B will be just touching the rectangular water outlet on the upper part of the bath. The temperature indicator would read ~35 ^{o} C.

3. Fill bath D with DI water such that the water level is in the middle of the circular water outlet. Maintain a steady flow. Set and wait the temperature to reach 50 ^{o}C.

The cleaner system is ready for use.

C. Process

1. Ultrasonic clean with detergent.
Immerse the whole carrier of glasses into bath A for detergent clean. Soak for 30 minutes with ultrasound frequency and filter on.

2. Ultrasonic clean without detergent.
Transfer the batch of glass into bath C and soak for 30 minutes with ultrasound frequency on. Agitate the glass plate up and down 5 times every minutes.

3. Spray rinse.
Transfer the batch of glass into bath B and soak for 30 minutes with the spray on. Agitate the glass plate up and down 5 times every minutes.

4. Final rinse.
Transfer the batch of glass into bath E and soak for 30 minutes with ultrasound frequency, filter and heater on. Agitate the glass plate up and down 5 times every minutes.

5. Dehydration.
Put the glass in the cleanroom oven at 105 deg C for dehydration about 15 min to 30 min.

D. Inspection
1. The glass plates should be free of dirt, oil droplets, and water marks.
2. Plates should have no cracks and chips.

Remark: The water level in each bath is not constant, they will vary owning to the varying incoming water flow rate. Observe the water levels (they should be higher than the outlets) and maintain a continuous flow of DI water.

E. Equipment shut down

The detergent in bath A can be used for sometime and it does not need to be replaced everytime. Just keep it in the bath and it will be ready for use next time you are doing glass cleaning.

For equipment shut down, just power off the system and turn off the water input valves. Then drain baths B, C and D by opening bottom valves respectively.