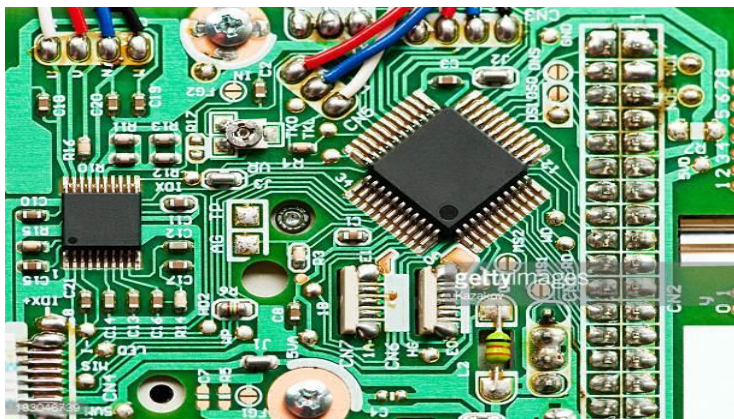


## ROLE OF CONTACT ANGLE METER IN MOBILE PHONE ASSEMBLY LINE



China, Taiwan & South Korea are three nations where electronic assemblies and sub-assemblies are done in very big factories.

Almost all the mobile phone companies in the World have their assembly sections in one of these countries.



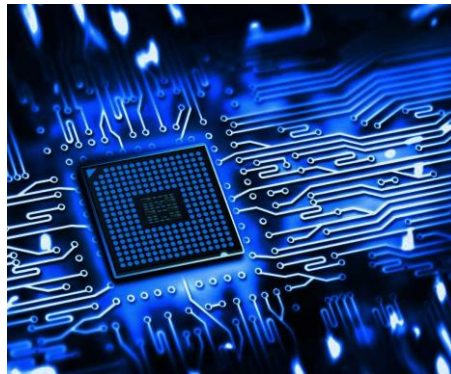
We all know that the mobile phones need variety of cutting-edge parts and components to complete their assembly and these include high-resolution flat panel displays, semiconductor parts, electronic devices, printed circuit boards and batteries. Those parts and components must be manufactured in the clean rooms of high-end class in particle free environment because even attachment of a micro particle and/or molecular layer contaminations can cause defect of thin film coating and power distribution.

**CONTACT ANGLE** is one of essential techniques to evaluate cleanliness of surface of those parts and components. That is, a drop of liquid would be injected onto the part and the camera of the system would capture the image. This image would be processed and the Contact Angle would be calculated. The total time taken for such an analysis is less than a minute typically.

This is an easy-to-use, non-destructive method to find out the cleanliness of the part. When the Contact Angle is within the specs, it is passed. If not, remedial measures would be taken.

Especially, Contact Angle of drop of water is so sensitive to organic contamination that it can show significant difference even due to a layer contamination over the surface. Besides, data of Contact Angle with some probe liquids can calculate **SURFACE FREE ENERGY**, which present very effective data for adhesive properties.

The typical evaluation of the relevant parts and components with Contact Angle are:



- In flat panel display manufacturing:
  - Cleanliness of glass surface after dry cleaning toward further coating processes
  - Characterizing surface property of coated films
  - Adhesiveness of surface after finishing by **SURFACE FREE ENERGY** analysis for assembling others and bonding
  - Hydrophobicity of top-coating of display for anti-finger print, etc.
- Semiconductor parts and electronic devices
  - Cleanliness of wafers after cleaning toward further coating processes
  - Adhesiveness of surface after finishing by **SURFACE FREE ENERGY** analysis for bonding
- Printed circuit board:
  - Surface condition after cleaning and/or finishing the surface of printed board toward the further plating processes of copper or other metal materials

Similar evaluation of printed circuit board toward the further bonding of electronic parts and semiconductor Chips.

For assembling such parts and components to complete mobile phones, further sensitive bonding of the terminals and the connectors are required to wire them, and checking rightness of surface conditions are essential for incoming parts. Contact Angle Meter is also being used in such applications.



The assembled mobile phone must be typically proof to water and any contamination and low Surface Free Energy will be preferable on the body and the display. Those evaluations are also accomplished with a Contact Angle Meter.

Many of **KYOWA's** Contact Angle Meters have been widely used in those three nations for the objectives described above. And a few of **KYOWA's** clients even use up to 20 systems in one assembly plants thus.