

Engineered Surfaces Application

Superhydrophobic surfaces are self-cleaning as water drops easily bead up and roll off on these surfaces. As drop rolls off, it collects dust and dirt and carries them out. The superhydrophobic surfaces have various applications, e.g. drag reduction, corrosion inhibition, and heat transfer enhancement.

Superhydrophilic surface have applications in medical implants for biocompatibility improvement, anti-fog and anti-fouling applications and so on.

Oleophobicity has a wide application in self-cleaning paints, materials, glass and clothing.

Direct vs Indirect

In order to measure the contact angle there are two general methods:

Indirect methods find the contact angle by measuring the force (e.g. the Wilhelmy Plate method). Direct methods find the contact angle from the image (e.g. the Sessile drop method).

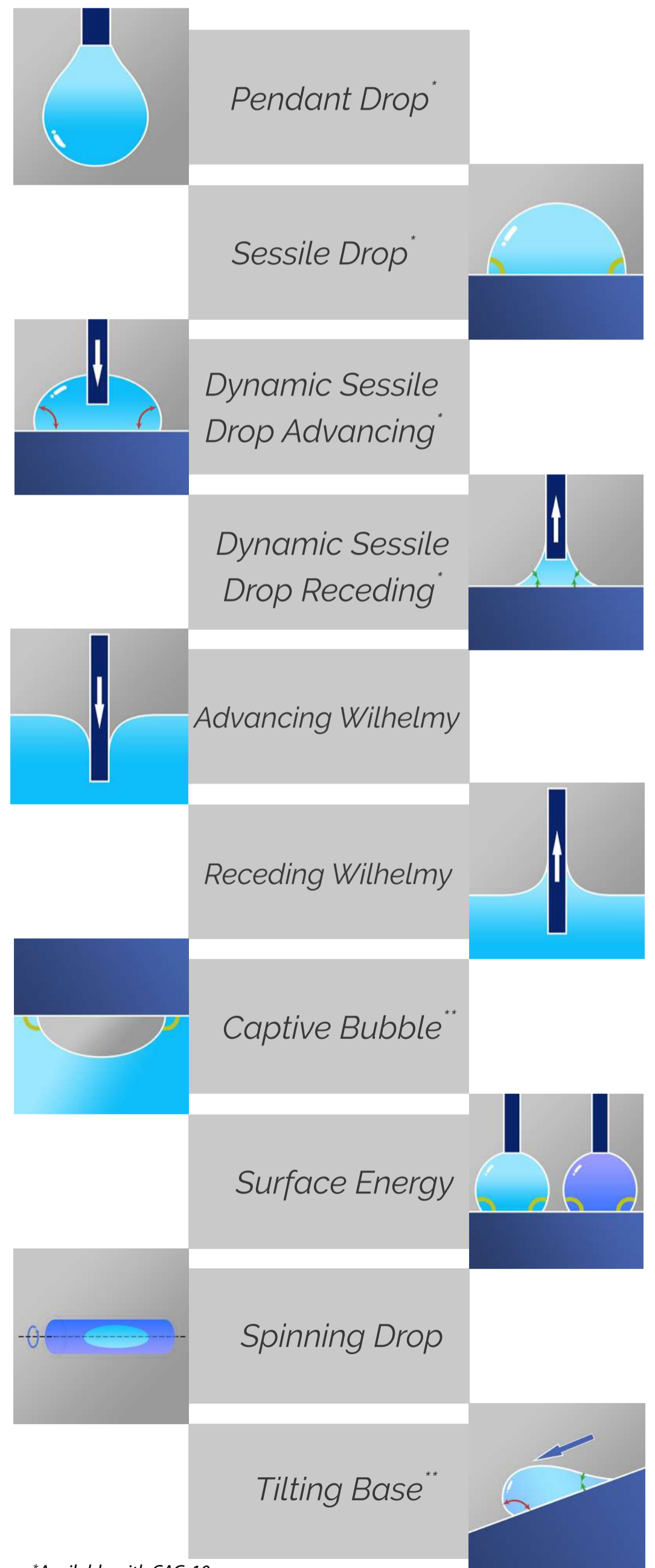
The direct methods are more common as they have higher precision and require less volume of liquid.

The sessile drop method and the tilting plate method are the main two methods to measure dynamic contact angles.

In the sessile drop method, the droplet is firstly injected on a horizontal sample, the injection continues and contact angle is measured during the contact line motion (advancing contact angle). The reverse procedure is used to measure the receding contact angle. For a smooth and homogeneous surface, the surface free energy could be calculated by the equation of state, through the sessile drop method.

In the tilting plate method, after the drop is formed on the surface, the stage (with the sample) starts to tilt. As soon as the drop starts to slide on the tilted surface, maximum (advancing) and minimum (receding) contact angles are recorded.

Measurement Methods



*Available with CAG-10

**Available with CAG-10 upon request