



# Physical-SH


## DSC (Differential Scanning Calorimeter)

Owner: [Qi Chen](#)

<b>Principle</b> :	The difference in heat flow derived from the temperature difference between a test specimen and a reference specimen is measured as a function of temperature or time while varying the temperature of the specimens in accordance with a controlled program. In this type of measurement, the difference in temperature between the test specimen and reference specimens is proportional to the difference in heat flow.	
<b>Capabilities:</b>	Melt Temperature Melt Enthalpy (latent heat of fusion) Crystallization Temperature Crystallization Enthalpy Glass Transition Temperature Specific Heat (Cp)	
<b>Asset:</b>		TA DSC25 ISO 11357 Thermal transitions in the range: -50°C to 500°C Equipped with autosampler
		METTLER 823e ISO 11357 Thermal transitions in the range: -20°C to 450°C


## Thermo Gravimetric Analysis (TGA)

Owner: [Qi Chen](#)

<b>Principle</b> :	<p>Thermogravimetric analysis or thermal gravimetric analysis (TGA) is a method of thermal analysis in which the mass of a sample is measured over time as the temperature increases.</p> <p>Samples can be either solids or liquids.</p>	
<b>Capabilities:</b>	<p>TGA can measure ash content, carbon fiber content, heat stability and decomposition. It also finds application to determine some parameters to compare two similar products as a quality control tool.</p>	
<b>Asset:</b>		<p>TA TGA550 ISO 11357 Thermal ramp up to 1000 °C</p>

## ThermoMechanic Analysis (TMA)


Owner: [Qi Chen](#)

<b>Principle</b> :	<p>Thermo Mechanic Analysis (TMA) is a method of thermal analysis in which one dimension of a sample is measured against the variation of temperature</p> <p>Samples are simple-shaped solids or thin films.</p>	
<b>Capabilities:</b>	<p>Coefficient of Linear Thermal Expansion (CLTE)</p>	
<b>Asset:</b>		<p>TA TMA450 ASTM E831 Thermal range from -70 °C to 400 °C</p>

## Vertical Flammability (UL94)


Owner: [Mengjun Guo](#)

<b>Principle</b> :	<p>Materials can be classified V-0, V-1, or V-2 on the basis of results obtained from the combustion of samples clamped in a vertical position. The samples are clamped in a vertical position with a 20-mm high blue flame applied to the lower edge of the clamped specimen. The flame is applied for 10 seconds and removed. A total of five bars are tested in this manner. The table below lists the criteria by which a material is classified in this test.</p>
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<b>Capabilities:</b>	Plastic materials can be classified with respect to their ability to withstand combustion by UL 94 flammability test.	
<b>Asset:</b>		<b>Motis</b> <b>Sample requirements: UL 94 bar*5</b> <b>(Length: 125mm; width: 13mm; thickness: typical 0.8 mm or 1.57mm)</b>

## Glow Wire Testing




Owner: [Mengjun Guo](#)

<b>Principle:</b>	<p>The test simulates conditions present when an exposed, current carrying conductor contacts an insulating material during faulty or overloaded operation. During the test, an electrical current is passed through a nickel-chromium loop in order to obtain a predetermined temperature. The sample is then brought in contact with the wire for 30 seconds. The test is passed if after withdrawal, the sample displays no flame or glowing, or if so, it is self-extinguishing after 30 seconds.</p>	
<b>Capabilities:</b>	<p>The glow wire test can characterize the ability to support and sustain ignition in plastic materials.</p>	
<b>Asset:</b>		<b>DMS-GWT</b> <b>Sample requirements: The dimensions of the planar sections of the test specimens shall be at least 60mm in length and 60mm in width.</b>

## Volume and Surface Resistivity

Owner: [Mengjun Guo](#)

<b>Principle:</b>	<p>The volume resistivity of a material is defined as the electrical resistance of a unit cube of material. The material is subjected to 500 volts DC for 1 minute, and the current through the material is measured.</p> <p>The surface resistivity of a material is the electrical resistance between two electrodes on the surface of the specimen. The material is subjected to 500 volts DC for 1 minute, and the current along the surface of the material is measured.</p>	
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<b>Capabilities:</b>	<b>Material volume and surface resistivity test.</b>	
<b>Assets:</b>		<p><b>Huace IT6834</b>  <b>GB1410 / ASTM D257</b>  <b>Tensile bar*5 for volume resistivity for moderate conductive material (&lt;10E4ohms.cm)</b></p>
		<p><b>Huace Hest-300</b>  <b>GB1410 / ASTM D257</b>  <b>Color chip*5 for volume resistivity for insulating material (&gt;10E8ohms.cm)</b></p>
		<p><b>ETS Model 871</b>  <b>GB1410 / ASTM D257</b>  <b>Color chip*5 for volume resistivity for insulating material (10E2-10E12ohms.cm)</b></p>

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