Thermal energy storage materials in particular with phase change property have been a main research topic for the last 20 years. The use of PCMs as thermal energy storage material depends on their latent heat capacity. The latent heat of fusion of a material is substantially greater than its sensible heat capacity. In other word, the amount of energy that a material absorbs upon melting is much greater than the amount of sensible heat energy which it absorbs during heating of material with a weak variation of temperature. Additionally, the temperature of the PCMs as well as the surrounding media remains nearly constant during phase change process. Consequently, phase change materials have cooling and heating effects, resulting with temperature-regulation ability. During the last years, several testing methods have been developed for measuring the temperatureregulating ability of PCMs.