



Testing Non-Solid Samples with the DTC-25 and DTC-300 Thermal Conductivity Meters

The TA Instruments DTC-25 and DTC 300 are designed primarily to test incompressible solids, however, with auxiliary containment vessels, they can determine the thermal conductivity of fluids and powders as well.

For fluids, there are two different containment vessels that are available, a Fluid Cup and a Paste Cup. The Fluid Cup is used for materials having low enough viscosity to flow due to gravity (oils, solvents), while the Paste Cup is used to accommodate higher viscosity materials requiring packing by a spatula (greases, epoxy, etc.). In each category, several different sizes are available to produce the required sample thickness. This variability is necessary to allow choosing a thickness that is appropriate for the viscosity and conductivity of the sample, to minimize convection and to produce a properly measurable temperature difference across it.

In principle, the Fluid Cup and Paste Cup consist of a high conductivity metal top and bottom plates connected with movable seals to a low conductivity side wall structure. When filled properly, a sandwich is formed: metal/fluid/metal, with the fluid in full contact. Provisions are made to keep the fluid thickness at a predetermined value and to allow for the expansion of the fluid when heated. A series of liquids with known thermal conductivity or solid reference materials are used to calibrate the cups.

A Polymer Cup is available for cases when the fluid undergoes polymerization or a polymer undergoes melting during the test. The construction of this cup, with the use of sacrificial components ensures that it can be disassembled and reused after such process.

To measure the thermal conductivity of aggregates, powders, or granules in a packed bed, a Powder Cup is available. It must be recognized, however, that such samples can not have an absolute thermal conductivity value assigned, as this will change with packing density, particle size distribution, etc. Nevertheless, as a comparative tool, it can be beneficial to provide engineering numbers.

TA Instruments

United States

159 Lukens Drive, New Castle, DE 19720 • Phone: 1-302-427-4000 • E-mail: info@tainstruments.com

Canada

Phone: 1-905-309-5387 • E-mail: shunt@tainstruments.com.

Mexico

Phone: 52-55-5200-1860 • E-mail: mdominguez@tainstruments.com

Spain

Phone: 34-93-600-9300 • E-mail: spain@tainstruments.com

United Kingdom

Phone: 44-1-293-658-900 • E-mail: uk@tainstruments.com

Belgium/Luxembourg

Phone: 32-2-706-0080 • E-mail: belgium@tainstruments.com

Netherlands

Phone: 31-76-508-7270 • E-mail: netherlands@tainstruments.com

Germany

Phone: 49-6196-400-7060 • E-mail: germany@tainstruments.com

France

Phone: 33-1-304-89460 • E-mail: france@tainstruments.com

Italy

Phone: 39-02-2742-11 • E-mail: italia@tainstruments.com

Sweden/Norway

Phone: 46-8-555-11-521 • E-mail: sweden@tainstruments.com

Japan

Phone: 813-5479-8418 • E-mail: j-marketing@tainstruments.com

Australia

Phone: 613-9553-0813 • E-mail: sshamis@tainstruments.com

India

Phone: 91-80-2839-8963 • E-mail: india@tainstrument.com

China

Phone: 8610-8586-8899 • E-mail: info@tainstruments.com.cn

Taiwan

Phone: 886-2-2563-8880 • E-mail: skuo@tainstruments.com

Korea

Phone: 82.2.3415.1500 • E-mail: ykson@tainstruments.com

To contact your local TA Instruments representative visit our website at www.tainstruments.com