

TFC-9000™

Is it the Inks or is it the Lamps? Know for Sure with the Thin Film Calorimeter



Quality check your coatings, adhesives, and inks with CON-TROL-CURE's® TFC-9000™

You need a radiometer to ensure the performance and curing effectiveness of your UV lamps. So, how do you ensure the performance and curing effectiveness of your inks, coatings and adhesives? Up until now, it was mostly guess work. If you had curing problems and had ruled out your UV lamps as the culprit, your next target was most likely your chemistry. But there really was no cost effective and accurate way for you to quantitatively prove or disprove your hunch. That is no longer the case.

The CON-TROL-CURE's® TFC-9000™ system allows you to test your inks, coatings and adhesives to ensure that they are curing to your expectations and consistently, batch-to-batch. The Thin Film Calorimeter (or TFC) rapidly measures the exothermic heat reaction from a polymerizing sample through a highly sensitive sensor. Evaluating curing characteristics by using calorimetry is advantageous because measurements are not affected by crosslinking reactions and they offer direct measurement of the polymerization rate.



The TFC-9000™ offers a simple, hassle-free user interface.

The TFC-9000™ performs a rapid analysis of the incoming data to produce meaningful results. To perform the rapid 10-20 second sample analysis: simply apply the sample into the test station, insert the precision spacers, place the cover glass and exposure mask over the sample, and press the "Run Test" button (middle left image). Upon successful test completion, the TFC-9000™ displays 4 key measured test results as indicated in the LCD display (below left image):

- Time to reach peak temperature
- Peak temperature in BTU's
- Slope of the temperature rise
- Total energy emitted by curing reaction in BTU's



The TFC-9000™ delivers highly accurate, repeatable results to evaluate your chemistry.

Once the "Run Test" button is selected, the curing and evaluation process commences:

- Temperature recording starts
- The UV LED lamp automatically turns on
- The sample is cured
- Peak temperature reaction from the cured sample is reached and displayed
- Once the temperature reaches 75% of the peak, the lamp automatically shuts off
- Total test time is displayed (as are the 4 key measured results as detailed above)

Note: The system is sold complete with the UV LED lamp. If a different UV source is required, various UV lamp options are available for use with the TFC-9000™ system.

The TFC-9000™ works as a stand alone measurement system or can be connected to a computer through a serial port. The captured data can be exported and plotted to an Excel graph for quick and easy analysis.

24-HOUR PRODUCT SERVICES

Internet: www.uvprocess.com

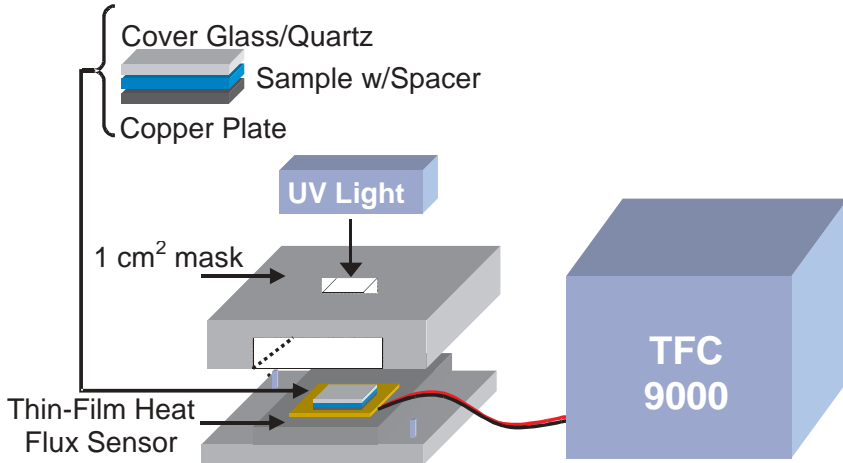
E-mail: info@uvps.com



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TFC-9000™

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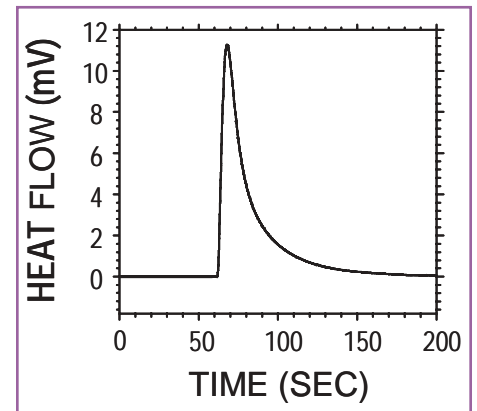


Surprisingly, there is no analytical tool which can quantitatively characterize the photopolymerization rates of pigmented UV inks. Pigmented UV curable coatings typically have reduced photopolymerization rates because the pigments absorb and scatter incident UV radiation. As a consequence, the photoinitiator efficiency is decreased and application thickness is limited to thin-films. In addition, commercial UV curable inks consist of pigment dispersed in reactive oligomers. The resultant concentration of reactive groups is low and consequently small quantities of heat are released upon polymerization making characterization difficult.

A unique benefit of the TFC-9000™ is the ability to accurately measure a very small stimulus. This

sensitivity, unavailable in much more expensive evaluation instruments, makes possible the quantitative analysis of photopolymerizable systems which evolve a small amount of heat. Direct implications of this phenomenon include characterization of films on the nano/micro size scale and thin pigmented UV curable ink formulations.

This instrument's precision and high sensitivity allow it to record exotherm reactions on films as thin as 2 micrometers. With a high heat tolerance, the TFC-9000™ is ideal for heated sample testing. The sensor has an upper temperature limit of 400°F (205°C.)



SPECIFICATIONS:

Dimensions:	12"W x 11.25"L x 6.25"H (30.5 cm x 28.6 cm x 15.9cm)
System Weight:	14.5 lbs (2.83 kg)
Sensor Resistance:	300 Ohms (Approx.)
Sensor Lead Wires:	10' (3.1m) Solid copper, teflon insulated
Nominal Sensitivity:	3.0 μ V/Btu/Ft ² -Hr
Max Rec'd Heat Flux:	30,000 Btu/Ft ² -Hr
Response Time:	0.6 sec
Temperature Limit:	400°F (205°C)
Thermal Capacitance:	0.03 Btu per Ft ² -°F
Thermal Resistance:	0.01 °F per Btu/Ft ² -Hr

PART NUMBER	DESCRIPTION
N008-030	TFC-9000 Thin Film Calorimeter

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