

TPP Test Device



Will your material system protect against a 2nd degree burn? The Thermal Protective Performance (TPP) Test Device was developed to measure the time elapsed for convective and radiant heat to penetrate through a protective composite fabric system - resulting in damage to human skin.

The TPP device features a heat source that consists of two propane burners and a 9-bulb quartz infrared heat lamp assembly. The system is automated by using a pneumatically actuated sample carriage, water-cooled shutter, and a mass flow controller. Additional benefits include three thermocouple inputs and an integrated sensor cooling stand for improved testing through-put.

System includes PC laptop computer with ThermDAC data acquisition and control system with burn prediction. During testing, ThermDAC control software continuously records and displays a real-time graph of the average temperature rise, depicted as a curved line representing increasing temperatures as heat penetrates through the composite fabric materials to the sensor.

After the test is completed, results are automatically compared to the Empirical Performance Curve (also known the Stoll Curve), which predicts a second degree burn to human skin as a function of heat and time. The point of intersection between sensor data and the Empirical Performance Curve provides the composite fabric's TPP rating.

ASSOCIATED TEST METHODS

- ISO 17492
- ASTM F2700
ASTM F2700 is an updated version of ASTM D4108
- ASTM F2703
- CAN/CGSB 155.20
- NFPA 1971, 1977, and 2112

FEATURES AT A GLANCE

- Evaluates the potential for skin burns associated with a fabric's ability to block convective and radiant heat penetration
- Automatic test operation provides repeatable and precise results
- Independently controlled radiant heat source and convective heat source
- Supports up to three copper disk calorimeter sensor assemblies
- Integrated air-cooled sensor stand quickly prepares calorimeter sensor for next test
- Water-cooled shutter is pneumatically actuated for precise exposure control
- Automatically predicts time to second degree burn, with results shown as a real-time numerical and graphical display of sample performance compared to the Empirical Performance Curve
- Compact size fits in most standard fume hoods



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Specifications

Standard

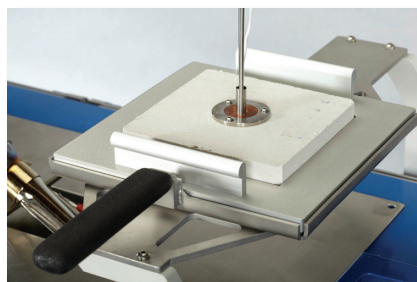
- Water-cooled radiant heat source with 9 quartz (500W) infrared lamps
- Two gas burners with flame detection auto ignition
- Includes mass flow controller for precise gas control
- Computer controlled lamp and burners
- Water-cooled protective shutter
- Pneumatic sample carriage and shutter assembly
- Two removable sample holders
- Integrated sensor cooling stand (air cooled)
- Up to 7.5 x 7.5 inch (19x19cm) sample size
- Emergency stop cuts gas flow, power to lamps and pneumatics
- Tinted tempered glass shield protects operator
- Software safety interlocks monitor water flow, carriage position, burner ignition
- Signal conditioning electronics and USB interface
- Power and control cabling
- Dell Laptop installed with ThermDAC software

Additions

- Copper slug calorimeter sensors (ASTM or ISO)

Range / Performance / Accuracy

- $\pm 0.75^{\circ}\text{C}$ temperature measurement
- $\pm 3\%$ radiant heat flux measurement



Model Information

- Device Dimensions: 42"x20"x18"H (107 x 51 x 46cm H)
- Space Requirements: 46"x26"x24"H (117 x 67 x 61cm H)
- Power Requirements: 208-265 VAC, 50/60Hz, Single-phase
- Maximum nominal current 20 Amps
- Compressed Air: Clean/dry air at 70-90 PSI, (145 PSI max)
- Cooling Water: Cooling water required, chiller or tap water source is acceptable
- Propane Requirement: Regulated supply @ 15 PSI (minimum)

ThermDAC Control Software

ThermDAC is a Windows-based application providing full device control, fault detection, data logging and analysis capabilities: TPP system configuration and burn prediction calculations are also contained within ThermDAC.

- Define non-standard test conditions and custom tolerance criteria
- View multiple device and ambient variables on a single graph screen
- Apply real-time statistical functions to test data over any user-selected time range

Service

All systems come with a one year warranty. Please ask about these service options:

- Startup installation and training
- Extended warranty
- Annual Service Care Package—a periodic maintenance and service contract designed to keep your Thermetrics equipment calibrated and in top operating condition

