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THE WORLD'S MOST ADVANCED
INSTRUMENTS FOR TEXTILE AND BIOPHYSICAL TESTING

THERMAL MANIKIN - BODY PART SWEATING TORSO

The Sweating Torso is an upright standing cylindrical test apparatus, simulating the human trunk with thermal guards on the upper and lower ends. This versatile instrument has been developed in collaboration with Empa to align with their existing torso system and test method.

The Sweating Torso has the ability to measure thermal insulation (thermal resistance), cooling properties (initial cooling, cooling delay, sustained cooling, and post cooling), moisture uptake, evaporated moisture, and drying rate.

Sweating Torso components include a temperature controlled measurement cylinder with upper and lower thermal guards, 54 sweat pores (with volumetric flowrate control) that are distributed over the measurement surface, two precision balances, a multi-fan array for wind speed control, and Thermetrics exclusive ThermDAC software.

The Sweating Torso device streamlines sample preparation because test specimens can be simple, easily made sewn tubes or unsewn fabric swatches that are wrapped around the test cylinder. Spacers can be added to simulate air gaps.

A complete system consists of the Sweating Torso, balances, multi-fan system for wind speed control, fluid reservoir, lower shroud, power supply, and laptop PC with ThermDAC. Just add your own climate chamber for a comprehensive testing solution.



Test Methods Supported

- ISO 18640 Part 1





Torso Specifications

- Overall diameter 11.8 in./30 cm
- Length 46 in./117 cm
- Upper guard length: 10.5 in./26.7 cm
- Measurement cylinder length: 18.1 in./46 cm
- Lower guard length: 17.4 in./44.3 cm
- Base material: Aluminum
- 500 W power output, adjustable
- -20°C to +50°C operating range
- ± 0.1°C temperature measurement and setpoint control, 0-100% R.H. including condensation
- ± 3% relative humidity measurement
- Balance scales: 1) Torso weight, ± 1.0g
2) Reservoir weight, ± 0.1g
- Fan array: designed to generate a wind speed of 1.0 m/s, ± 0.1 m/s, at the surface of the torso
- Fluid reservoir: 5 liter, distilled or DI water only

System requires 85-265 VAC, 50/60Hz, Single-phase.
Maximum nominal current 10 Amps

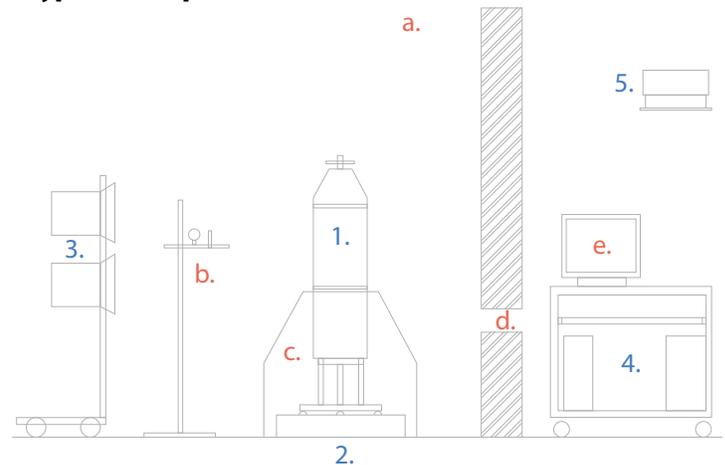
Base Products Include:

- Cylindrical torso instrument with heaters and sensors
- Control electronics
- Two ambient temperature sensors
- Laptop loaded with ThermDAC control software
- Power and control cabling
- One relative humidity sensor
- One omni directional wind-speed sensor
- Manikin transport chair
- Standard one-year warranty

Torso Feature Highlights & Benefits

- Multi-functional device performs tests that would traditionally require a sweating guarded hotplate *and* a thermal manikin.
- 54 sweat pores simulate perspiration rates from 0.0 l/h•m² to 1.5 l/h•m²
- Two precision balance scales monitor the weight of the torso and the sweat reservoir during experiments, yielding valuable data on moisture uptake and evaporated moisture.
- Test samples can be prepared as sewn tubes or as fabric swatches that are wrapped around the test cylinder.
- ThermDAC control software provides graphical test results in real time and automatically logs test data.
- The Sweating Torso system has been developed for scientific use by Empa, Swiss Federal Laboratories for Materials Science and Technology. The first scientific prototype was commissioned by Empa in 1995.

Typical set-up shown below



- | | |
|------------------------|--------------------------|
| a. Climate chamber | 1. Torso |
| b. Ambient sensors | 2. Torso balance/scale |
| c. Air turbulence fins | 3. Fan system |
| d. Chamber wall | 4. Operator station |
| e. Laptop computer | 5. Sweat water reservoir |



ThermDAC Control Software

ThermDAC is an engineered user interface for thermal manikin systems providing real-time device control, automated testing, and flexible display and logging capabilities, including:

- Manikin control by skin temperature, constant heat flux, comfort equation
- User-programmable test configurations, stability criteria, linked work cycles
- Automatic steady-state detection
- Color-coded manikin pictorial displays, selectable for any manikin variable
- Zoomable time-history graph of multiple device and ambient variables
- Real-time statistical analysis over any user-selected time range
- Logging of raw data, statistical analysis, user-reports
- Device calibration and fault detection



3-D rendering of the sweating torso

518 - Thermal Manikin - Body Part - Sweating TORSO	Item #	Description	Product Name
Semi-Custom Base Product	19-51801	EMPA Sweating Torso System	518-XXX_C

 *Don't see what you need above? Contact Thermetrics to customize your perfect system. Keep your Sweating Torso in tip-top shape. Discuss service plan options and point-of-sale discounts with us at sales@thermetrics.com.*