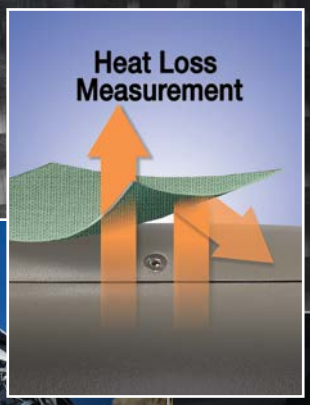
Thermetrics

We make life more comfortable.



Thermetrics

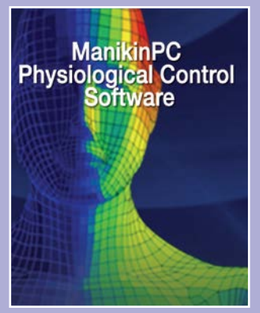
We make life more comfortable.

Many companies take a minimalist approach to textile and garment testing, and simply focus on meeting the relevant ASTM and ISO standards. But Thermetrics believes today's customer is looking for much more than that. They want to know, on a more personal level, how a garment will perform for them. ***Will I be comfortable? Will I stay protected? Will this product perform as promised?***

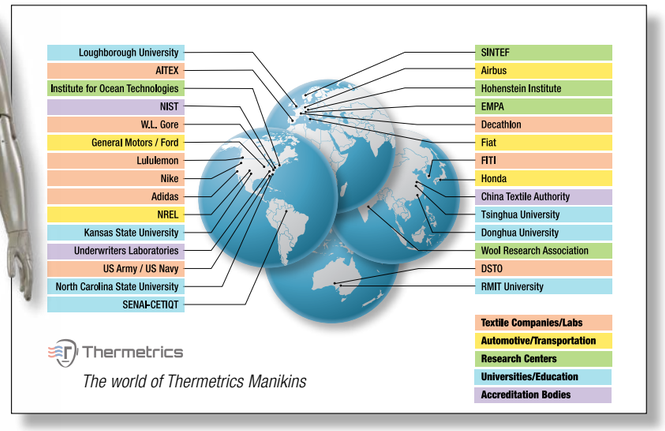
By answering these questions, textile and garment testing becomes more than data points that checkmark a requirements box. Testing becomes the supporting framework for a story of interaction between the user and the garment. A story of thermal comfort and performance that your customers need to hear.

In today's competitive world, companies with compelling messages have a powerful advantage. And thermal performance claims are nothing without proof.

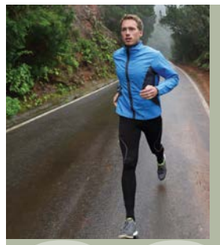
How can we help you tell your story?



ManikinPC predicts human thermal sensation and comfort in a variety of garment and environmental scenarios, including outdoor exposure, vehicle cabins, or indoor environments. This software model simulates human metabolism while sleeping, resting, working, or exercising by computing the thermal state of a simulated human at variable activity levels you input. This includes real-time prediction of core temperature, shivering rate, perspiration rate, and average skin temperature.

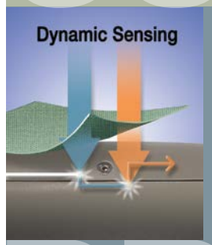


I_m T_{eq} T_{core} EHT R_{ct} Berkeley Comfort T_{skin} R_{et} Berkeley Sensation



Thermetrics thermal manikin systems are designed to simulate the human thermoregulatory system. They can predict the thermal comfort of sport performance and cold weather apparel, uniforms, sleeping bags, protective clothing, climate control systems, and more.

Thermal COMFORT



Thermetrics comprehensive suite of test instruments measure the thermal characteristics of textiles, garments, and closed environments. We support all major test standards for measuring thermal transmission, thermal protection, and moisture permeability.

Thermal PROPERTIES

Thermetrics thermal protection systems evaluate a fabric's ability to resist transmitting heat to the wearer. We provide a variety of flame and radiant test systems for characterizing the performance of FR fabrics, garments, and protective clothing ensembles.

Thermal PROTECTION

Thermetrics

We make the outdoors more comfortable.

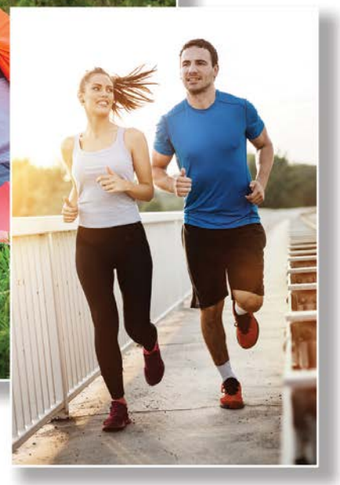
Simulating the human experience.

Designing apparel to keep humans safe and comfortable in heat, cold, wind, rain and snow is your job. Helping you measure and evaluate the thermal performance of fabrics and apparel is our job. Using the industry's most sophisticated sensing technology and control software, Thermetrics systems can simulate human physiology with remarkable precision. Go ahead and make our manikins uncomfortable. Your customers will enjoy the benefits.

- ANDI, our most advanced manikin, is a high-tech marvel that takes comfort simulations far beyond what's ever been possible.
- Precision sweat control, active cooling technology and rapid, dynamic heat flux sensing help you prove how effective your garments and textiles are.

We'll help you understand how your garments perform in diverse and changing conditions. Our manikins can handle the extremes.

Perceived thermal comfort, for any region of the body, is measurable with our technology.



Understand how sweating affects product performance with Thermetrics precision sweat control features.

To learn more about all Thermetrics products, including specifications and capabilities of the instruments shown on these pages, please visit:

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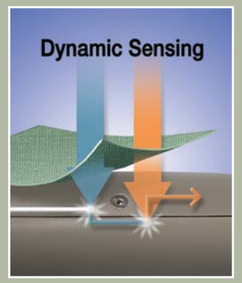
Simon sleeping bag thermal manikin.



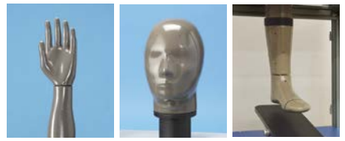
Data to back up your claims.

Consumers are savvy, and they do their homework. Earn their confidence by backing up your claims with the hard evidence our thermal manikins and hotplates provide including:

- Dry Thermal Resistance (R_{ct})
- Evaporative Resistance (R_{et})
- Permeability Index (I_m)
- Equivalent Temperature (T_{eq})
- Vapor Pressure
- Work Cycles
- Cooling Rate
- And more

Thermetrics designs and manufactures the world's most advanced biophysical instruments. Whatever you need to test, we have a thermal manikin, guarded hotplate, or drying rate system that fits. If we don't, we'll design one for you.

ANDI thermal manikin



Hand, Head, Foot thermal manikins

Child and Baby thermal manikins

Dry, Sweating, and Dynamic hotplate systems

Our Drying Rate Testers follow the latest AATCC standards to assess a fabric's quick-dry and fast-wicking characteristics. (not shown)

Thermetrics

We make transportation more comfortable.

And energy efficient.

Explore new ways to keep people comfortable while saving energy. From measuring the effectiveness of a HVAC system, to the thermal comfort and moisture management of passenger seating, Thermetrics systems generate the data that researchers need.

Evaluating human comfort in controlled environments is a complex endeavor. Variables include local air temperature, air velocity, relative humidity, temperature and geometry of surrounding surfaces, clothing layers and their insulation value, metabolic rate, perspiration rate, as well as solar intensity and its direction.

Thermetrics understands your challenges. We've designed comfort testing solutions for cars, aircraft, snowmobiles, motorcycles, and farm equipment.

What do you need to test?

Analyze HVAC system effectiveness as well as the thermal comfort and moisture management properties of passenger seating.

We've designed comfort testing solutions for almost every kind of vehicle from cars and aircraft to snowmobiles and farm equipment.

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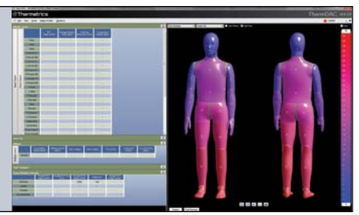

Exclusive ThermDAC control software features real-time data display and automatic data logging.

Thermetrics manikin systems for the transportation sector.

Our **STAN seat test manikin** evaluates the thermal and moisture management characteristics of automobile, truck, and airplane seating.

- For heated seats STAN data is based on actual energy transfer, not just surface temperature.
- For ventilated seats, STAN's realistic perspiration capabilities allow for accurate cooling assessment.

The **HVAC automotive manikin** measures how effectively heating and air conditioning systems perform to keep drivers and passengers comfortable. A matrix of surface-mounted sensors measure boundary conditions and can link this data to our ManikinPC software for real-time predictions of thermal comfort.

STAN features an integrated sweating skin system to precisely measure the heat and moisture exchange properties of seat designs.

ANDI thermal manikin with ManikinPC software simulates a human occupant with unprecedented responsiveness and accuracy.

HVAC manikin with 46 sensor zones measures boundary conditions in dynamic thermal environments like automotive passenger cabins.

Thermetrics

We make sports more comfortable.

Helping athletes perform at the highest levels.

When the heat is on. When rain, snow or wind assaults the field. Innovative apparel is critical to an athlete's performance.

Makers of the most advanced sports apparel use Thermetrics systems to rigorously analyze the thermal properties of their textiles and garments. Complex batteries of thermal resistance and moisture permeability tests help them evaluate and maximize the thermal comfort interaction of fabrics and clothing designs. With our sweating manikins and guarded hotplates, you can measure how apparel responds to hot or cold temperatures, sweat, or movement, and in the process create innovative garments that will protect athletes and maximize their performance under any condition.

Measure how apparel responds to heat and cold, sweat and movement, with our sweating manikins and guarded hotplates.

Our test data helps you design fabrics and clothing features that maximize an athlete's comfort.

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Sweating guarded hotplates are available in two sizes and in multi-zone configurations.

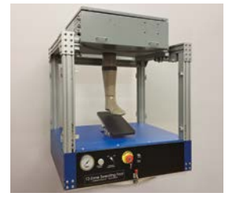
Measuring moisture management.

Perceived thermal comfort is related to complex interactions between fabric, climate, physiological states and psychological variables, but a material's evaporative resistance (moisture conductivity) is a key comfort factor.

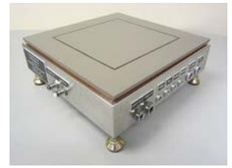
The moisture management properties of a fabric or garment should be measured using a sweating guarded hotplate or sweating thermal manikin. Controlling ambient temperature, humidity, and wind speed creates a variety of climatic test conditions for fabric or garment evaluation. Use the resulting thermal comfort and heat stress indices to compare the thermal characteristics of different materials.

ANDI with walking motion stand

Thermal hand



Thermal foot



Dynamic hotplate

Drying Rate Tester

Thermetrics

We help protect those who protect us.

Send our manikins into the most dangerous territory and test the boundaries of safety.

Avoid the risks of human subject testing and let Thermetrics manikin systems absorb the punishment of flash fires, high-energy flames and radiant heat exposures. Our thermal and flame test manikins will help you predict–and work to prevent–heat stress and skin burns in protective firefighter ensembles, hazmat suits, survival systems, FR uniforms and more.

In recent years, Thermetrics manikin, flame, and hotplate systems have contributed to significant advances in protective garments. Breakthroughs include new FR fabrics for firefighters, surgical gowns that provide doctors and nurses with greater protection against infection from blood and biological agents, as well as more effective and comfortable outerwear to help safeguard hazmat workers from dangerous chemical exposure.

Beginning with the delivery of our first Thermal system to the US Army in 1988, Thermetrics technology can now be found in commercial, government, and certification labs all over the world.

Use our data to design uniforms that protect first responders without sacrificing comfort.

Thermetrics has contributed to significant advances in FR fabrics for firefighters by predicting and helping prevent serious burns.

Safeguard hazmat workers from dangerous chemical exposure with outerwear designs that Thermetrics manikins test first.

Sensors and systems designed and built by the experts.

First, second, or third degree burns are extremely serious. Thermetrics manufactures precision copper calorimeter sensors that safety certification labs around the world rely upon to measure the level of protection provided by FR materials and fabric composites. Our sensors are optimized to absorb heat at a rate similar to human skin and are used in the Flame Test Manikin, Flash Fire Cylinder, RPP, TPP, CCHR and Stored Energy test devices.

"Burnie" Flash Fire Manikin system

TPP – Thermal Protective Performance device

Flash Fire Test Cylinder

RPP – Radiant Protective Performance device

CCHR – Conductive and Compressive Heat Resistance device

Flash fire hand and Stored Energy Test device (not shown)

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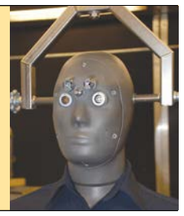

NEMO is our submersible thermal manikin for testing marine survival gear and dive suits. It's available in both male and female versions.

We ♥ custom projects.

If your organization is involved in a research project that falls outside the standard range of thermal testing equipment–call us! Thermetrics got its start back in 1986 creating custom thermal test systems, and to this day we look forward to opportunities that either push the envelope for existing technologies or lead us in new directions.

Every problem has a solution, and Thermetrics has a long history of developing innovative solutions that bring new data collection and thermal analysis capabilities to the textile world. Simply put, our design engineers love a challenge and it would be an honor to create a customized solution for your research needs.

This "Sweating Thigh" tests the comfort of wraps and connectors necessary for users of prosthetic limbs.

NEMO, first developed as a custom project for the US Navy, tests marine survival suits, life rafts, diving suits, and other marine-related gear.

The IPEMS manikin was a joint development project with Boston Dynamics and the US Army to create a self-supporting robotic manikin for chemical exposure suit tests.

Humidified breathing systems have been created to bring additional realism to human simulation tests, particularly indoor environmental comfort assessments.

This custom Legs-only motorcycle manikin was created to measure how radiant engine heat impacts riders.

Our first thermal hand, designed and delivered to the U.S. Army in 1988, is still in service today.

Thermetrics

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