



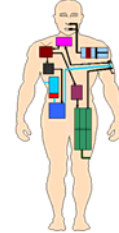
**TPP and RPP systems now available!**



**New Chamber and a new Thermal Child.**



**MIST system at NC State University.**



**Our latest installations, and more.**

# Measurement Technology NeWs

Newsletter published by Measurement Technology NW

Fall/Winter 2010

**Measurement Technology NW** (Seattle, Washington), proudly introduces our new Thermal Protective Performance (TPP) and Radiant Protective Performance (RPP) test devices. These advanced devices feature smart, clean, user-friendly designs that automatically test and calculate the thermal protection ratings of composite fabrics.

Both devices do so by measuring the time elapsed for convective and/or radiant heat to penetrate through a fabric sample - resulting in damage to human skin. During testing, our exclusive ThermDAC control software continuously records and displays a real-time graph of the average temperature rise, depicted as a curved line representing higher and higher temperatures as more heat penetrates through the sample to the sensor.

After a test sequence is completed, the results are automatically compared to Stoll's curve, which represents the blister point of human skin as a function of heat and time. The intersection point between these two curves provides the composite fabric's TPP or RPP (RHR) rating.

## TPP Test Device - Key Features

- 9 quartz tubes provide the radiant heat source, while two propane burners provide the convective heat source.
- Supports up to three copper calorimeter sensor assemblies, for faster turnaround between tests.
- Safety features include software interlocks controlling gas flow/ignition, cooling water flow, and sample carriage/protective shutter return. Our TPP design also includes mass flow controller, (manual) emergency stop, automatic ignition detection, and a tinted polycarbonate shield for operator protection (shield not shown in photo).
- Device fully complies with ASTM F2700, ASTM F2703, NFPA 1971, NFPA 2112, and the ISO 17492 test standards.

## RPP Test Device - Key Features

- 5 quartz tubes provide precisely controlled radiant heat.
- Interface supports up to two copper disk calorimeter sensor assemblies.
- Includes two snap-on, snap-off sample trays for fast and easy test setup - perfect for high-volume labs.
- Device fully complies with ASTM F1939 and ASTM F2702.

## Additional Features on both TPP and RPP Devices

Water-cooled shutters are pneumatically actuated for precise exposure control. Integrated air-cooled receptacles quickly prepare the calorimeter sensors for their next test - for faster operator throughput rates! TPP and RPP tests can be run in automatic or manual modes, and in each case burn results are shown as a real-time numerical and graphical display of sample performance compared to Stoll curve. *To see a video of the TPP device in action, go to [www.mtnw-usa.com](http://www.mtnw-usa.com).*



4211 - 24th Avenue West  
Seattle, WA 98199 USA  
206-634-1308

Measurement Technology NW manufactures a wide range of precision instruments for measuring and evaluating the thermal comfort of textiles, garments, and dynamic thermal environments such as aircraft, truck, and automobile interiors. Our complete line of thermal manikins and guarded hotplate systems are designed to support all current industry test standards for thermal insulation and moisture permeability.

# A New Integrated SGHP Chamber...

# ...and a Sweating Child Manikin!

Measurement Technology NW's exciting new Integrated Chamber for the SGHP-8.2 and SGHP-10.5 sweating guarded hotplates is a compact, high quality chamber tuned to meet all ASTM and ISO standard conditions for hotplate tests.

The chamber features an insulated stainless steel interior and an efficient, space-saving design that translates into less expensive shipments and easy transportation through lab hallways and doorways. Yet our new Integrated Chamber is also a tough, durable, laboratory workhorse. With heavy-duty hardware and reliable airflow conditioning equipment, powder-coated sheet metal exterior, and a large insulated door with viewing window, this chamber is built to perform.

When used with either the SGHP-8.2 or SGHP-10.5 hotplate, both hotplate and chamber are fully integrated as one unit and can be operated using our ThermDAC control software.



The hotplate is built into the chamber by way of a sealed lower flange, and its test plate surface rests at a comfortable 42" (107cm) above the floor for improved operator safety. The hotplate's test surface can be covered with a protective floor plate (provided) for times when the chamber is used in manual mode for non-hotplate tests.

The SGHP also utilizes the chamber's water source for sweating tests, so a separate fluid reservoir is not necessary. Performance was tuned for ASTM and ISO testing, with a 10-60 °C temperature range and 30-70% RH, limited by dewpoint temperature.

The newest member of our MTNW thermal manikin family is a 15-zone sweating/walking Child Thermal Manikin, built for AITEX in Alicante, Spain. Standing 55 inches tall (139 cm) and designed to represent the average body form of a ten year old child, our little Child Manikin is a fully articulated model with joints at the shoulders, hips, knees, elbows, and ankles, along with MTNW's computer-controlled sweating skin system and walking motion capabilities. Imagine a full featured Newton thermal manikin system, only smaller!

The Child Manikin's modest physical dimensions presented quite a challenge for our engineers – who were tasked with designing the internal electrical and fluid supply components so they would fit into a body form that is significantly smaller than Newton's; along with scaling down the walking motion stand without affecting its performance or harmonic stability. In the end everything came together as planned, and our engineers were as happy as any new parents could be.

Newton's DNA is readily apparent in the individual zone controls for heating and sweating; the thermally-conductive carbon fiber-epoxy shell with embedded heating and sensor wires; and the ThermDAC control software used to incorporate data logging, real time statistics and data analysis, individual zone control, and diagnostic/calibration functions into one user-friendly computer interface.



Installation and commissioning of the system went very smoothly at AITEX, and with their new Child Thermal Manikin working alongside their existing Newton Thermal Manikin, AITEX can now offer comprehensive garment testing services for adult and child clothing sizes – a claim very few testing organizations can make!

Measurement Technology NW's powerful ThermDAC 8.0 control software is the industry's premier solution for generating fast, precise, repeatable thermal test results. ThermDAC is included with every hotplate, manikin, and flame test system we build.

# Recent thermal installations and other good news.

New products, and continuous product improvement, are major driving forces here at MTNW, and we take great pride in the development of new features and superior quality control processes for all our manikin and hotplate models.

MTNW thermal manikin and guarded hotplate systems can be found across the globe, with new installations springing up in Europe, North & South America, Asia, and Australia.

A few special highlights from our recent shipments include a set of new TPP and RPP devices installed at **Vartest (USA)**, where they are happily co-existing with a SGHP-10.5 sweating hotplate system that was delivered earlier in the year.

As noted in the story on page 3, **AITEX (Spain)** added a sweating/walking Child Manikin to their testing laboratory, and **Central Michigan University (USA)** received a very advanced 46-zone Newton system that will be the perfect complement to their extensive research database of human subject (IR) imaging. **Japan's Ministry of Defense** took ownership of a 21-zone aluminum NEMO submersible thermal manikin. Ministry researchers had been trying to secure funding for NEMO since 2006, but after years of negotiations things came together quickly in late 2009. The "catch" was that because of government regulations associated with the end of Japan's fiscal year, MTNW engineers had to design, build, test, and ship this custom 50th percentile (Japanese Male) sweating NEMO system in less than 14 weeks! It was a hard deadline, but we made it.

And last but not least, **NIKE (USA)** is staying ahead of the competition using data generated by their new 30-zone sweating/walking Newton manikin with physiological software model (see Manikin PC2 story, also on this page).

Other equipment deliveries include a new SGHP-8.2 system to **ATIRA (India)**, a custom SGHP-8.2 for subzero research tests being undertaken by **SINTEF (Norway)**, and a smaller SGHP device requested by **Kraton Polymers (USA)** for testing prototype fabric and membrane materials.

These, and other projects not mentioned here, have kept us busy throughout 2010, and for that we are very thankful! If your lab has need of new thermal comfort testing equipment, please give us a call. 2011 is just around the corner....

## 8I3M Conference ([www.i3mmeeting.com](http://www.i3mmeeting.com))

The Eighth International Meeting for Manikins and Modeling (8I3M) was deemed a great success by all the conference attendees. The August 22-26 event, in Victoria, BC, Canada, enjoyed the happy combination of superb weather, first-class facilities, highly relevant presentations, lively discussions, and really good food. As part of the conference, MTNW engineers presented the following research papers:

DEVELOPMENT OF A ROBOTIC THERMAL MANNEQUIN FOR EVALUATION OF INDIVIDUAL PROTECTIVE ENSEMBLES

APPLICATION OF MODEL-CONTROLLED MANIKIN TO PREDICT HUMAN PHYSIOLOGICAL RESPONSE IN FIREFIGHTER TURNOUT GEAR

FURTHER VALIDATION OF THE MODEL CONTROLLED NEWTON THERMAL MANIKIN AGAINST HISTORICAL HUMAN STUDIES



## Manikin PC2

Is your manikin REALLY comfortable? Now there's a way to add thermoregulation to any Newton manikin! ManikinPC2 (**Manikin Physiology Control and Predictive Comfort**) software is a new closed-loop feedback control package that accurately mimics the human thermoregulatory system and provides metrics for comfort and sensation.

The ManikinPC2 control system permits variable activity levels that simulate the human metabolism while sleeping, resting, working, or exercising. Any level of activity can be input and appropriate metabolic wattages will be imposed onto the manikin. Newton's skin sensors provide real-time measured inputs of skin temperature, which factor into the sensation metrics used to determine vasodilation and vasoconstriction responses. The new ManikinPC2 software responds in real-time with appropriate thermal response to inputs, mimicking the transient behavior of a human body.

[www.mtnw-usa.com](http://www.mtnw-usa.com)

Measurement Technology NW has established relationships with top thermal instrumentation companies around the world. These representatives help us provide ongoing consultation, project coordination, installation assistance and service support.

In South Korea: Technox, Inc., (Mr. Her, Young-Chul), E-mail: [tni@technox.co.kr](mailto:tni@technox.co.kr)

In Taiwan: Tien Shiang Scientific Instruments Company LTD, (Mr. C. S. Yao), E-mail: [tinshing@ms16.hinet.net](mailto:tinshing@ms16.hinet.net)

In Turkey: Kontrol LTD, (Mr. Serhan Tozar), E-mail: [kontroltest@ttnet.net.tr](mailto:kontroltest@ttnet.net.tr)

In Japan: IDS-ENV, (Mr. Masahiro Kajioka), E-mail: [kajioka@ids-env.co.jp](mailto:kajioka@ids-env.co.jp)

In China: Test International, (Mr. David Pan), Email: [davidpan@test-tech.com.cn](mailto:davidpan@test-tech.com.cn)

In Western & Central Europe: Mesdan S.p.A., (Mr. Claudio Bertolotti), Email: [sales@mesdan.it](mailto:sales@mesdan.it)

In Eastern Europe: Romegatest SRL, (Mr. Florin Dumitrache), Email: [florindm@rdslink.ro](mailto:florindm@rdslink.ro)

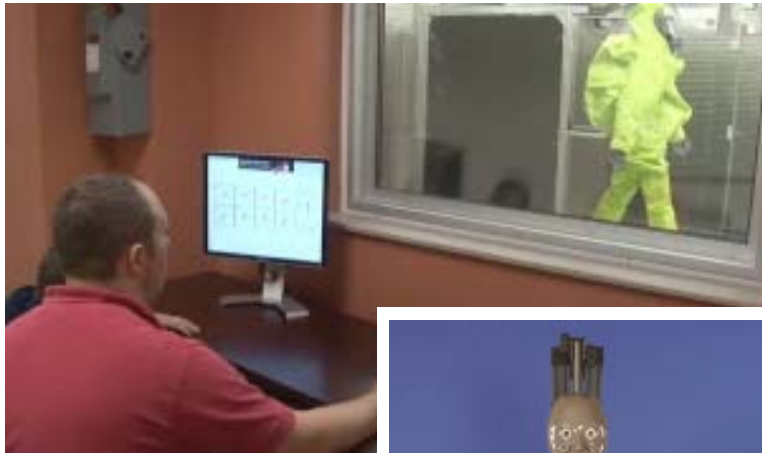
## The new Man-in-Simulant Test (MIST) laboratory, located at North Carolina State University's College of Textiles, includes a 34-zone Newton manikin!

The new Man-in-Simulant Test (MIST) laboratory, located at North Carolina State University's College of Textiles, allows researchers to realistically evaluate the capabilities of first responder protective garments against non-toxic vapors that resemble harmful chemical and biological agents. The MIST facility is the only one of its kind located at a university in the United States, and represents another step in the evolution of NC State's Textile Protection and Comfort Center (TPACC).

A sophisticated 34-zone sweating, walking, and breathing "Newton" thermal manikin system from Measurement Technology NW was built for the MIST facility to provide researchers with the capability to run repetitive and long-term performance tests that human subjects weren't suitable for.

The MIST facility allows protective garments to be tested in a functional manner within an environment that can be controlled for temperature, wind speed and simulant vapor concentration. In the main testing chamber, researchers test for the penetration of chemical vapors through protective clothing, using special pads placed underneath the clothing that absorb any simulant infiltration. Pads are then analyzed to determine vapor penetration levels through the fabric as well as at potential failure points such as garment seams and closures.

The MIST facility's Newton includes an external lung/breathing system, also manufactured by MTNW, that consists of pneumatic cylinders which are cycled in and out by a linear actuator to replicate the cycle, frequency, and volume of human breathing. Each cylinder volume is approximately 1.4 liters, for a total volume of 2.8 L. This breathing system connects to the manikin with hoses for inhaling and exhaling. Hoses are routed out through a fully sealed head mounting post, to eliminate the need for penetrations in the tested garment. Breathing patterns can be easily set for nose only (in/out), mouth only (in/out), or nose/mouth, in any combination.



During the past decade, TPACC research has led to many advances in protective garments; including new fire- and heat-resistant fabrics for firefighters, surgical gowns that provide doctors and nurses with greater protection against infection from blood and other biological agents, as well as more effective, more comfortable outerwear to help safeguard HAZMAT workers from dangerous chemical agents.

Measurement Technology NW is honored to have been selected as the supplier for much of the thermal comfort test equipment used at TPACC. This equipment includes two 34-zone Newton thermal manikin systems; one SGHP-10.5 sweating guarded hotplate; one 8-zone thermal hand manikin for testing the insulation and moisture transmission qualities of mittens and gloves; two (soon to be six) high temperature hand forms for flash-fire and radiant heat protection tests; and last but not least, two Stored Energy Test (SET) devices - developed in combination with NC State researchers for the new ASTM 2731 test standard.

As TPACC moves into new research areas requiring ever-more-specialized test equipment, MTNW has kept pace - providing the most innovative, high performance, user-friendly thermal testing systems available from any manufacturer. If MTNW's comprehensive line of hotplate, thermal manikin, flame test, and environmental comfort evaluation systems aren't quite right for you, our engineers would be happy to customize any system to your exact specifications. Call us!

**Measurement Technology NW**  
**4211 - 24th Avenue W, Seattle, WA 98199 Tel: 206 634 1308 Fax: 206 634 1309**  
**thermal@mtnw-usa.com, www.mtnw-usa.com**