



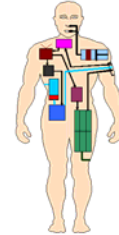
Flame Test Manikin with Burn Chamber



New! Elliptical Motion Stand for Newton



USARIEM celebrates its 50th year!



Our latest installations, and more

Measurement Technology NeWs

Newsletter published by Measurement Technology NW

Summer/Fall 2011

Measurement Technology NW (Seattle, Washington), is pleased to announce the installation and commissioning of a sophisticated Flame Test Manikin and Burn Chamber system at Donghua University in Shanghai, China. What makes the system so advanced? First, the manikin is fully articulated, with joints at the shoulders, elbows, hips, knees, and ankles. Better yet, the manikin shell was constructed using a special ceramic composite material that is completely flame-proof and will not degrade with use. This is a significant advantage over manikins constructed using high-temperature epoxy materials, because the required nude calibration burns prior to each test will carbonize/erode the surface of these manikins - leading to periodic repair and replacement issues.

talking about - the new modular burn chamber we designed is also quite an achievement. Developed to fit inside an existing (interior) building space at the university, the burn



Also worthy of note is the Flame Test Manikin's head connection point. All power and communication cables are routed through a mounting post at the top of the manikin head for less garment interference and improved cable protection.

Our engineers even developed a new, robust copper-disk calorimeter sensor with ceramic shell

sockets for more accurate measurement, more reliable performance, and easier maintenance. Sensor calibration has been simplified through use of a hand-held radiant heat gun that allows for fast, *in-situ* calibrations. All-in-all, MTNW's new Flame Test Manikin is setting a new standard for flame test research capabilities and performance. But the manikin is not the only part of Donghua University's installation worth



chamber is a fully ventilated, fire-resistant enclosure with viewing windows plus an access door with a window, housing the manikin and a 12-burner torch array. Chamber size is larger than the ASTM F1930 minimum requirements to provide sufficient space for uniform flame exposure, better combustion and ventilation, and enough room for safe movement around the manikin without accidentally jarring and displacing the burners. A system of propane gas piping, pressure regulators, valves, and pressure sensors safely delivers fuel to the ignition system and its 12 exposure torches, allowing the system to generate the range of heat fluxes necessary to meet the requirements of ASTM F1930.

The burn chamber is controlled using a highly automated control system with safety interlocks designed to protect the system and its operators. Also of interest is that the chamber was constructed and tested in the USA, then dis-assembled, shipped, and re-assembled onsite at Donghua University.



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Measurement Technology NW manufactures a wide range of precision instruments for measuring and evaluating the thermal comfort of textiles, garments, and protective apparel. Our line of advanced Thermal Manikins, Dry and Sweating Guarded Hotplates, and Radiant/Flame Test systems are designed to support all current industry test standards for thermal insulation, moisture permeability, and burn injury prediction.

Elliptical Walking Motion capability now available for Newton manikins

For a specialized US Army research project that required a more natural manikin walking motion technology, MTNW engineers designed and built a 20-zone Newton thermal manikin system that included an all-new Elliptical Walking Motion Device.

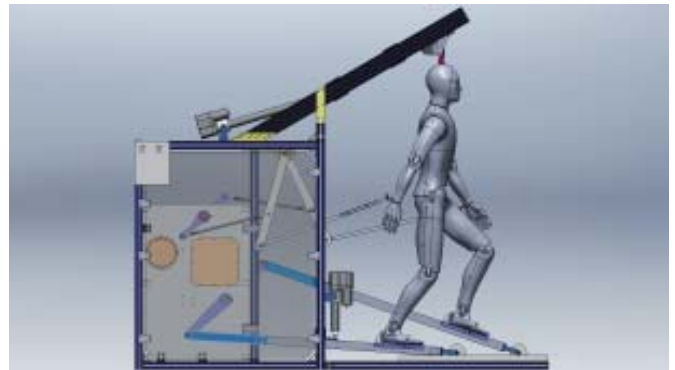
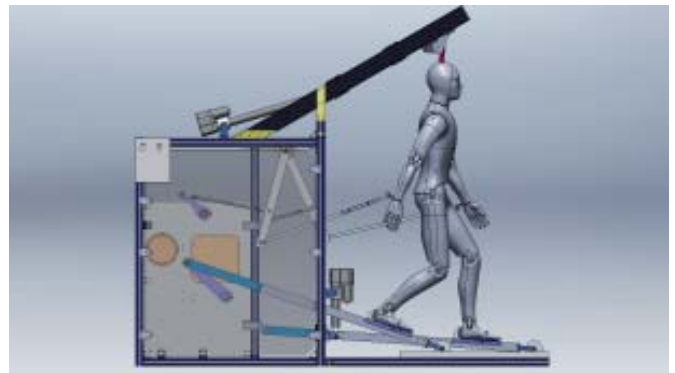
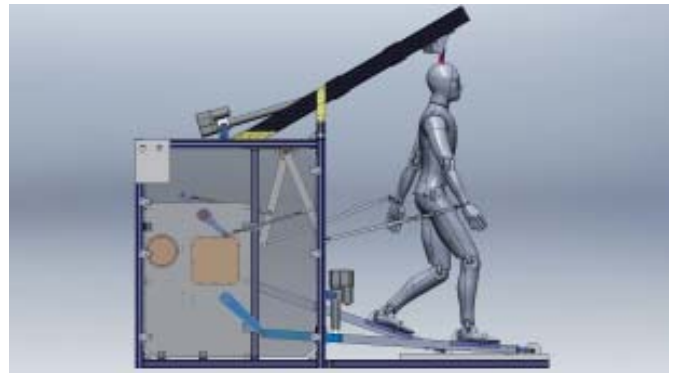
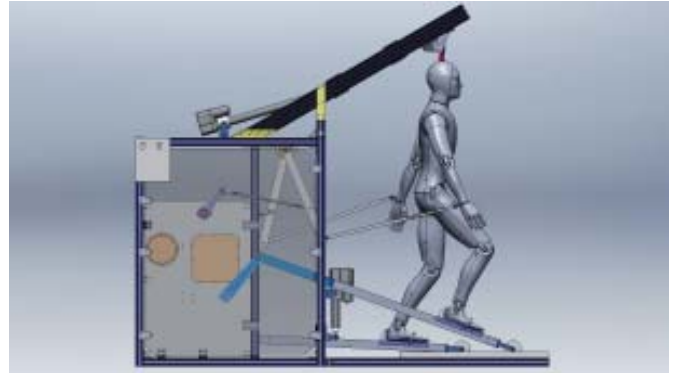
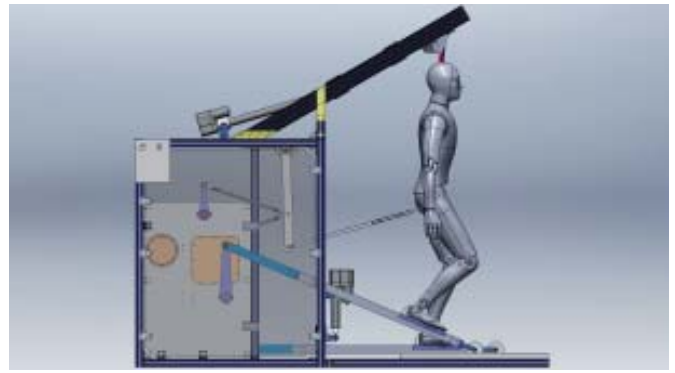
CAD modeling was used to determine the range of motion and identify the correct geometry for the actuation levers, to ensure a smooth elliptical walking motion. As with Newton's standard EN 342 walking motion systems, walking speed is variable from 0-55 double steps per minute (approximately 70 meters/minute). The new elliptical walking system can also accommodate shoes of varying heel/sole heights.

This 20-zone Newton thermal manikin system was outfitted with our new **ManikinPC2** (Manikin Physiology Control and Predictive Comfort) software. ManikinPC2 operates under ThermDAC as a closed-loop feedback control package that accurately mimics the human thermoregulatory system and provides metrics for thermal comfort and thermal sensation. The software 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.

It is always fascinating to see a project's design evolve from the early conceptual stages to a final product build, and the new Elliptical Walking Motion Device was a classic example. Early design permutations had the motor placed in front of the manikin, with a completely different actuation scheme. But, as is often the case with concepts, once the final project scope was defined and design work began, the device quickly took on its current form due to research needs and geometric constraints imposed by the manikin.

The complete system was recently installed at the Army's Picatinny Arsenal research laboratory. Project funding was coordinated through SOSSEC.

If you have a research need which cannot be addressed by one of our standard instrument packages, please let us know. MTNW is always interested in custom engineered systems that make use of our core competencies and serve to advance our in-house expertise, open new markets, or offer a simply irresistible challenge



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.

Our new TPP and RPP test devices have been embraced by some very particular testing labs, and among the new users is a TPP installed at the **Fire Research Division of NIST** (National Institute of Standards and Technology), and an RPP installed at **CTT Group** (Canada).

Defence R&D Canada received three specialized manikin systems - an 8-zone sweating Thermal Head, a redesigned 9-zone sweating Thermal Foot with support frame and sole compression capability for testing shoes and boots as tall as 15 inches (38 cm), and an advanced 14-zone sweating Thermal Hand. All systems were installed at the Cord Group's research facility in Dartmouth, Nova Scotia.

An unusual 12-zone upper-body Newton (head, torso, arms) was constructed for **INCDTP** (Romania). This Newton was designed so that if, in the future, INCDTP wishes to add legs and sweating skin it will be easy to expand the system into a complete 26-zone Newton sweating thermal manikin.

Central Michigan University asked if MTNW engineers could find a way to retrofit their Newton thermal manikin to permit testing of female undergarments - primarily bras. Our solution to the problem was a breast cover piece that fits over Newton's upper torso. In use, the 2-zone breast cover piece fits over the existing torso zones (which are disabled in Newton's control software) and data from the breast cover is recorded instead. When the breast cover is disconnected and removed, the underlying zones again function as normal. Newton's new shape met CMU's requirements, with a 40" bust and a 33" underbust.



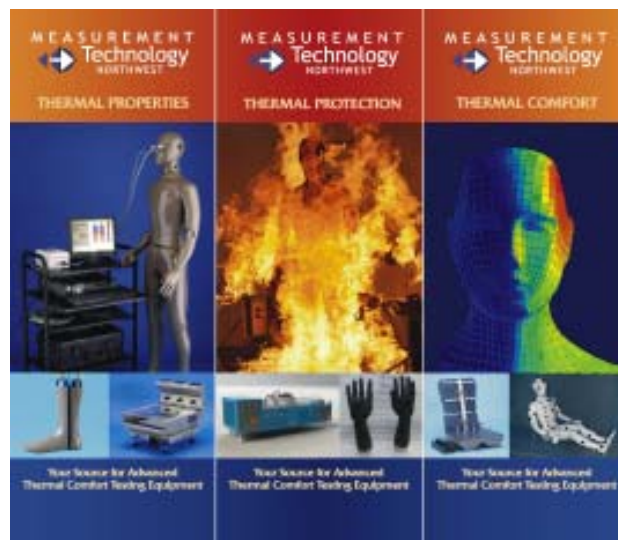
ITMA 2011 September 22-29 Barcelona, Spain

The big ITMA show only happens every 4 years, and for the first time it will include Measurement Technology NW. For our European clients and anyone traveling to Barcelona for a look at the latest advances in textile technology, look for MTNW at **Hall 2, Booth A164**. On display will be a 26-zone Newton sweating thermal manikin with physiological model control, a SGHP-8.2 sweating hotplate, and an RPP (Radiant Protective Performance) test device.



IFAI Expo
October 25-27
Baltimore, Maryland
USA

Measurement Technology NW returns to the annual IFAI Expo (**Booth 2509**) with a display that will include a 26-zone Newton sweating thermal manikin with physiological model control, our new SGHP with Integrated Chamber, and a TPP (Thermal Protective Performance) test device. Look for us!



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
- In Taiwan: Tien Shiang Scientific Instruments Company LTD, (Mr. C. S. Yao), E-mail: tinshing@ms16.hinet.net
- In Turkey: Kontrol LTD, (Mr. Serhan Tozar), E-mail: kontroltest@ttnet.net.tr
- In Japan: IDS-ENV, (Mr. Masahiro Kajioka), E-mail: kajioka@ids-env.co.jp
- In China: Test International, (Mr. David Pan), Email: davidpan@test-tech.com.cn
- In Western & Central Europe: Mesdan S.p.A., (Mr. Claudio Bertolotti), Email: sales@mesdan.it
- In Eastern Europe: Romegatest SRL, (Mr. Florin Dumitrache), Email: florindm@rdslink.ro

Measurement Technology NW's customer USARIEM celebrates its 50th anniversary!

MTNW has been blessed with many good customers over the years, but few have been with us longer than **USARIEM** (United States Army Research Institute of Environmental Medicine), in Natick, Massachusetts. And this year USARIEM reached a major milestone - yes, the big 5-0.

USARIEM was activated July 1, 1961 as a research laboratory under the U.S. Army Medical Research & Development Command (now called the U.S. Army Medical Research & Materiel Command). USARIEM was created from elements associated with several outstanding federal and academic laboratories, including the Harvard Fatigue Laboratory in Cambridge, Massachusetts, the Armored Medical Research Laboratory at Fort Knox, Kentucky, the Climatic Research Laboratory in Lawrence, Massachusetts, as well as the Quartermaster's Environmental Protection Research Division and Earth Sciences Division at Natick.



L-R: James Bogart, Dr. Harwood Belding, Dr. Ralph Goldman and J. Robert Breckenridge, Natick 1972

USARIEM can trace its roots back to the Harvard Fatigue Laboratory, which was established in 1927 in the basement of the Harvard Business School. Many of today's basic thermal comfort formulas and precepts were developed here, under now-familiar names like Dill, Talbott, Darling, Sargent, Russell, Belding, and Folk.

Research activities remained at Harvard until the mid-1940's when the group was absorbed by and relocated to the U.S. Army Quartermaster General Climatic Research Laboratory, where it remained until 1954. That year brought another move, to the Environmental Protection Research Division, QREC, at Natick, and seven years later - still at Natick - the research group was officially established as the USARIEM we know and love today.



MTNW to win research contracts for other thermal comfort testing equipment and, as they say, the rest is history!

Today, USARIEM's Natick laboratory operates several MTNW products, including two 20-zone Newton sweating/walking thermal manikins, a 9-zone Thermal Foot, and a SGHP-10.5 sweating hotplate. Our engineers have also upgraded many of USARIEM's 1950's/1960's-era testing equipment - including their multi-zone copper feet, and two of the lab's GE-built all copper manikins: "George" (similar to manikin in the center of photo at left) and their iconic walking manikin, "Uncle Wiggly".

USARIEM has overseen many significant advances that have reduced the thermal burden, weight, and bulk of military CIE (Clothing and Individual Equipment).

Here at MTNW it has been an honor and a pleasure to play a small role in their efforts to develop better clothing systems for our soldiers.



Our company's association with USARIEM began in 1988, with delivery of a Thermal Hand manikin system used to test gloves and protective handwear for soldiers. This project not only helped USARIEM advance the science of soldier protection, it also launched Measurement Technology NW into the thermal comfort test equipment business. Expertise gained through the development of the Thermal Hand manikin allowed

Measurement Technology NW

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