

HotWork™



The most comprehensive and advanced software for analysing heat stress in the workplace

Subsurface ventilation specialists

HotWork™ is a comprehensive software package designed to help hygienists, ventilation staff, occupational health personnel, government regulators and others to assess heat stress in the workplace.

HotWork™ provides the following tools in one integrated, user-friendly package written in MS Visual Basic™:

- A powerful **Psychrometric** analysis package allows the user to calculate the full range of psychrometric properties of air in terms of dry and wet bulb temperature, dew point temperature, globe temperature, mean radiant temperature (for varying globe diameters and wind speeds), natural wet bulb temperature, relative humidity, moisture content of air, height above sea level from barometric pressure (and vice-versa), air density, air specific volume, Sigma heat, enthalpy, vapour pressure and saturated vapour pressure. Unknown values can easily be calculated from whatever known data is available.
- A full model of the **AIOH Heat Stress Standard and Documentation developed for Use in the Australian Environment**, which assesses workplace conditions under a wide range of factors, including: presence of hot surfaces, exposure period, confined space, task complexity, ascending/descending, distance from cool rest area, distance from drinking water, clothing, worker understanding of heat strain, air movement, respiratory protection, acclimatisation, metabolic work rate and WBGT value.
- A full model of **Thermal Work Limit (TWL)**, which predicts work capacity under any environmental condition and clothing parameters for hydrated, acclimatised workers. This also calculates deep body core and skin temperatures, sweat rates, skin wettedness and all the relevant biophysical parameters such as heat losses due to respiration, convection, radiation and evaporation. Adjustable limits for each of the fundamental physiological parameters such as deep body core temperature, mean skin temperature, sweat rate and skin wettedness can be set by the user. Recommended TWL limits and interventions are also provided.
- A full model of **ISO7933**, the current International standard for heat stress. This allows assessments of “warning” and “danger” limits, including allowable exposure times, for both unacclimatised and acclimatised workers for any given environmental conditions. Limits on sweat rate and deep body core temperature can be set along with maximum total water losses due to sweating and variable clothing properties.
- A **Wet Bulb Globe Temperature (WBGT)** model calculates WBGT from the fundamental environmental properties. It also provides the maximum work rates at this WBGT for acclimatised and unacclimatised workers according to the 1998 **ACGIH TLV**. The maximum wet or dry bulb temperature or radiant heat load for a given work rate can also be easily calculated.
- A model of **Air Cooling Power (McPherson formulation)** provides the maximum ACP for any given environment and clothing parameters. This model also shows the various biophysical and physiological values such as convective, evaporative, radiative and respiration heat losses, maximum skin temperature to ensure not more than a 1 in 1 million probability of heat stroke and other intermediate values.
- An **Effective Temperature (Basic scale)** model provides values of ET for any environmental parameters, along with limits recommended under original studies for acclimatised and unacclimatised workers.
- A **Wet Kata** model calculating values [W/m^2 or $mcal/(cm^2.s)$] for any given environmental parameters, along with limits traditionally used in South Africa.
- A **Work-Rest cycle** model calculates the work-rest cycles needed to avoid heat storage (hyperthermia, an excessive deep body core temperature) using any of the TWL, ACP, WBGT or ISO standards.
- In addition, the widely-disseminated and published **empirical charts** developed in the 1960s by MIM can be plotted with any of the above heat stress indices superimposed. These comparisons are useful as over 10 million manshifts were worked over a period of 30 years under the MIM protocols in temperatures above 28^0 wet bulb without any recorded case of heat stroke.
- A **comparisons chart** that displays, on the one chart, TWL, ISO, ACP(McP) and ACGIH values for any combination of wet bulb temperature, wind speed, barometric pressure and dry bulb and globe temperature differences. This is a powerful way to see how the different indices and standards vary over a range of environmental conditions.
- An **advanced “charting” routine** that allows the user to create, from simple menu selections, his own charts for any range of environmental conditions, with different heat stress zones separately coloured, user-defined names for each zone, and using any of 8 different heat stress standards.

HotWork™ was developed by Mine Ventilation Australia and is available for A\$295 plus GST.. **HotWork™** requires MS Windows™ and Excel 97™ or later as a platform. An evaluation version is also available free of charge via - email on application. Ph +61(0)7 3269 3733 or e-mail mvaust@mail@mvaust.com.au