



BEAT THE HEAT

AN ERGODYNE WHITE PAPER

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BEAT THE HEAT

// WORKING WHEN THE HEAT IS ON

Longer hours and increasing climate levels are transforming worksites into dangerous heat zones. OSHA recently reported approximately 4,200 cases of injury and 61 deaths caused by extreme heat in 2011. Shocking as these stats are, they are even more unacceptable when the cause is 100% preventable. Ignoring early warning signs like mild heat discomfort, sweating or excessive thirst can quickly lead to heat-related illness (HRI) extremes, including heat stroke and death. Planning and preparedness are no longer luxuries but necessities when it comes to HRI prevention. Bottom line: Heat stress is a growing problem for workers and it's time to address this issue head-on.

// IN THE ZONE

No two workzones are the same. Outdoor workers encounter a multitude of diverse environments and often suffer the most from temperature extremes. While outdoor hazards may be the most obvious, indoor workers should not be forgotten as they can suffer from the very same extreme temperatures.

Unfortunately, the safety concerns at an indoor workzone often go unnoticed because the environment isn't perceived to be as extreme as an outdoor environment. Regardless of the location or the job, it's critical to first look to engineer out the issue and work to limit the risk as much as possible. When that isn't feasible, a combination of administrative controls and Personal Protective Equipment (PPE) are the recommended approach.

The list of solutions may include:

- » Access to shade or ventilated cooling areas
- » Access to drinking water and electrolytes
- » Education and training for workers and supervisors
- » Written procedures in case of emergency
- » Personal protective equipment

Shade: One preemptive method to ensure that workers are protected on the job is to implement onsite areas that serve as a refuge from the heat. Within these "zones", there should be easy access to shade, fluids for drinking, and an air-conditioned (AC) room or a well-ventilated zone where workers can rest. Tents, fans, AC-equipped trailers, and drinking stations are all effective solutions to keep workers cool and safe. In certain states, such as California, mandatory shelters are enforced when the temperature reaches 85 degrees Fahrenheit (29 degrees Centigrade).

Hydration: Workers lose an average of 2-3 gallons of fluid through sweat while working in heat. So in addition to providing these safety zones, it is important for workers to actively hydrate before, during and after their shifts while also monitoring the fluid levels at certain intervals of the day. A weigh-in program done before, after and during shifts can help determine if any fluid has been lost. When replenishing, a worker should drink 2 cups (1/2 quart) of water for every pound lost during a shift. Additionally, monitoring urine color with a chart can be an effective way of helping keep hydration a priority, as urine color is often the first sign of dehydration. Employers should place urine charts in bathrooms for workers to keep hydration top of mind. Remember, water is the best fluid to use when maintaining fluid levels; however, if cramping occurs, electrolyte solutions should be substituted. Caution should be used when choosing drinks, as sugar can severely limit absorption of liquid in the body. Drinks with more than 9 grams of sugar/12oz serving should be avoided. Providing workers with personal hydration solutions that they can carry with them to their jobsite (if conducive) will also help encourage hydration. Reusable water bottles or hydration packs are perfect solutions that provide water "on the spot," so workers don't have to leave their workzone.

Education & Training: Educating the workforce is mission critical for executing a successful HRI prevention program. Specific objectives for both workers and supervisors should be clearly outlined and enforced. For workers, heat stress training should be required for all new hires as well as for current staff at the beginning of every warm weather season. Worker training should cover:

- » Environmental and personal risk factors for heat-related illness.
- » Importance of hydration; encouraging frequent consumption of small quantities of water, up to 1 quart per hour.
- » Location of water source.
- » Importance of "acclimatization" which means temporary adaptation of the body to work in a new environment.
- » Different types of heat-related illness and their common signs and symptoms.
- » Importance of immediately reporting to their supervisor any symptoms or signs of heat-related illness.



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- » Procedures for responding to symptoms of possible heat-related illness, including: when and how to contact emergency medical services should it be necessary and transporting workers to a place where they can be reached by an emergency medical service provider.
- » In the event of an emergency, clear and precise directions to the worksite should also be detailed and provided as needed to emergency responders.

For supervisors, training should occur prior to starting in an administrative roll and before the start of every warm season. Training should cover best practices that a supervisor is responsible for, including:

- » Providing and maintaining sufficient quantities of water and adequate sources of shade.
- » Ensuring training or training materials are provided for each new employee on the first day of employment.
- » Enforcing the importance of “acclimatization.”
- » Educating the workforce on procedures to carry out when an employee exhibits symptoms consistent with possible heat-related illness.

Written Procedures: Emergency procedures should be posted in written form at every worksite location, so they are available for workers and any state OSHA representative to see. These procedures should detail how the company will:

- » Provide access to water and shade
- » Monitor the weather
- » Institute high-heat procedures and address lack of acclimatization
- » Train all employees and supervisors
- » Respond to heat-related illnesses without delay
- » Provide first aid and emergency services
- » Provide clear and precise directions to the worksite

These procedures are based on the California OSHA standard (Title 8, section 3395) addressing heat stress prevention. Specific requirements related to warm weather procedures vary by state, so employers should consult their state occupational safety & health board for details.

PPE: Along with knowing the signs and symptoms of heat stress, it is important to know how to protect against the physical factors of hot environments. Personal Protective Equipment (PPE) is another way to limit worker susceptibility to HRIs. Brimmed hats and light-colored material are two examples of reducing direct exposure to the sun. Additionally, incorporating fast-drying absorptive material helps keep workers cool and trap sweat, preventing it from getting in workers' eyes and on their hands.

Evaporative cooling bandanas, headbands, triangle hats and hard hat inserts keep workers cool using an evaporative cooling process that holds a significantly cooler temperature than ambient air. Placing either one of these products in an area where large blood vessels are located near the surface of the skin can help keep workers' core body temperature in check. Options for placement are on the neck, crook of the arm, groin or armpits. Cooling vests can also be worn to help maintain a safe core body temperature, especially if an application requires workers to wear heavy protective gear such as body armor or full body protective suits.

// PREVENTION IS KEY

Heat-related illness is a serious issue for workers, worksite managers, and administrators – but the good news is that it's 100% preventable. Taking a few key steps for planning to prevent HRI is far better than planning how to deal with it once it becomes an issue. Providing proper training, facilities, equipment, and administrative SOPs for HRIs; being aware of the early warning signs; and following steps to minimize workplace risks are all key components to keeping productivity thriving and safety priority number one – even when the heat is on.



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// NOTES, REFERENCES AND MORE

1. "OSHA Renews Heat Illness Prevention Campaign," Occupational Health & Safety, accessed February, 2013, <http://ohsonline.com/articles/2012/05/07/osha-renews-heat-illness-prevention-campaign.aspx>
2. "U.S. Bureau of Labor Statistics." Table A-9, accessed March, 2013, <http://www.bls.gov/iif/oshwc/foi/cftb0267.pdf>
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4. "Heat Related Illness Prevention," State of California Department of Industrial Relations, accessed February, 2013, <http://www.dir.ca.gov/DOSH/HeatIllnessInfo.html>
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