

OccuNomix International LLC
**THE DANGERS
OF HEAT
STRESS**

Objectives

Recognize


- Situations that can lead to heat stress and other heat-related illnesses.
- The differences as well as the symptoms of heat stress, heat exhaustion and heat stroke.

Know

- How the body reacts.
- What steps should be taken to prevent heat stress and other heat-related illnesses.
- What types of basic first aid can be helpful when dealing with fellow employees who experience heat-related illnesses.



Heat Stress – Quick Facts



- On average, 3,100 U.S. workers per year had a heat-related illness that caused them to miss work.

- Heat can build up in the worker's body and cause symptoms that range from headaches and dizziness to seizures, convulsions and death.

- Factors Leading to Heat Stress include: High temperature and humidity; direct sun or heat; limited air movement; physical exertion; poor physical condition; some medicines; inadequate tolerance for hot workplaces; and insufficient water intake.

- Types of heat disorders include: heat stroke, heat exhaustion, heat cramps and heat rashes

- Hot weather causes more fatalities than any other weather related source. According to the National Weather Service's 10-year average. There were 170 heat fatalities between 1998 and 2007. During the same period, the average number of fatalities caused by hurricanes was 117.

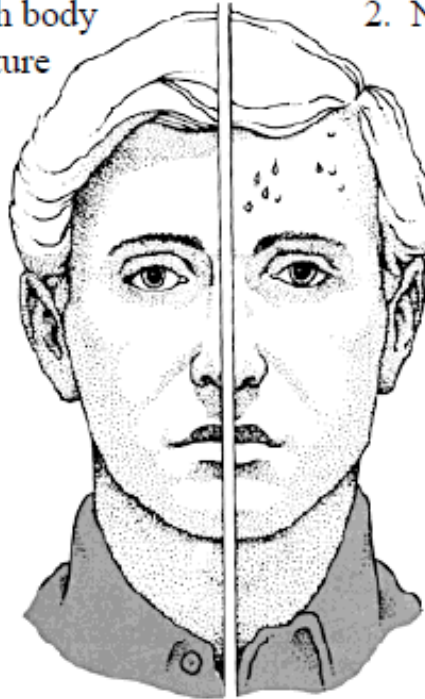
Heat Stroke vs. Heat Exhaustion

Heat Stroke

1. Dry, hot skin
2. Very high body temperature

Heat Exhaustion

1. Moist clammy skin
2. Normal or subnormal temperature



Signs and symptoms of heat stroke and heat exhaustion

Heat stroke: This medical condition is life-threatening. The person's cooling system, which is controlled by the brain, stops working and the internal body temperature rises to the point where brain damage or damage to other internal organs may result (Temperature may reach 105+°F).

Heat exhaustion: This condition often occurs when people exercise (work or play) in a hot, humid place and body fluids are lost through sweating, causing the body to overheat. (The person's temperature may be elevated, but not above 104°F.)

Heat Stroke vs. Heat Exhaustion - symptoms

Heat exhaustion symptoms

Heat Exhaustion comes from dehydration, the skin may be cool and moist. The victim's pulse rate will be fast and weak, and breathing will be fast and shallow. **If heat exhaustion is untreated, it may progress to heat stroke, which is a medical emergency.**

Warning signs of heat exhaustion include:

- Heavy sweating
- Paleness
- Muscle cramps
- Tiredness
- Weakness
- Dizziness
- Headache
- Nausea or vomiting
- Fainting



Heat Stroke vs. Heat Exhaustion - symptoms



Heat stroke symptoms

Symptoms of heat stroke can sometimes mimic those of heart attack or other conditions. Sometimes a person experiences symptoms of heat exhaustion before progressing to heat strokes.

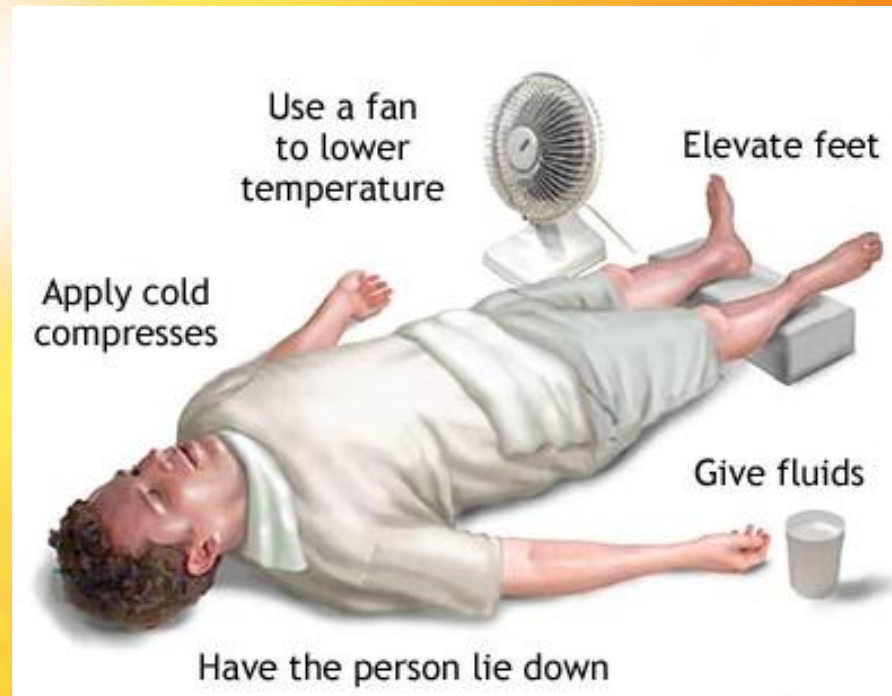
Symptoms of heat stroke include:

- Fever
- Irritability
- Dry hot red skin
- Confusion / Bizarre Behavior
- No longer sweating
- Fainting
- Rapid but shallow breathing
- Rapid but weak pulse
- Seizures

Over 20% of those who suffer a heat stroke die.

The key difference between heat exhaustion and heat stroke is the presence of mental status changes.

Respond Quickly



1. First, move the person out of the sun or hot environment and into a shady or air-conditioned space.
2. If fever greater than 102 F, fainting, confusion or seizures occur, dial 911 or call for emergency medical assistance.
3. Cool the person by covering him or her with damp sheets or by spraying with cool water.
4. Direct air onto the person with a fan or newspaper.
5. Have the person drink cool water, if he or she is able. $\frac{1}{2}$ cup water every 15 minutes is a good start.

If symptoms do not improve, seek medical help immediately.

Preventing Heat Illnesses

It is easier to prevent heat illness than to treat it once symptoms develop.

- If possible, acclimatize for up to a week when working in hot weather conditions. This allows your body to gradually adapt to the heat.
- Hydrate well before thirst kicks in. Once you are thirsty you are already dehydrated. Drink every 15 minutes (6-20 oz/hour).
- Do not drink alcohol or beverages with caffeine because they increase the rate of dehydration.



Preventing Heat Illnesses

It is easier to prevent heat illness than to treat it once symptoms develop.

- Wear light, loose clothing, such as cotton, so sweat can evaporate. Better yet, invest in wicking, or cooling garments, like Cool Zone Tech or MiraCool Bandana's.
- Use sunscreen to prevent sunburn, which can hinder the skin's ability to cool itself.
- Wear a hat that provides shade and allows ventilation.
- If you feel your abilities start to diminish, stop activity and try to cool off.



Test your knowledge!

True or False

1. Heat exhaustion can lead to heat stroke.
2. Heat stroke is life threatening.
3. Hot weather causes more fatalities than any other weather related source.
4. The most serious heat related illness is heat stroke.
5. Over 20% of those who suffer a heat stroke die.

For more information about heat stress visit
www.occunomix.com/avoidheat

True or False Answer Key

1. T, 2. T, 3. T, 4. T, 5. T

OccuNomix International LLC

**THE DANGERS
OF HEAT
STRESS**

Thank You!



Stay Safe and Cool
with

OccuNomix Cooling Gear

**SERIOUSLY
COOL**

Passive Body Cooling

Ice or Gel Pack Vests:

Usually consisting of a torso garment with pockets sewn onto the inside, next to the body, which hold ice or gel packs that must be frozen in a freezer. Body heat is absorbed by the ice packs.

Pros: Generally inexpensive
Portable; no umbilical device needed
Rechargeable

Cons: Grave risk of Vasoconstriction
Undergarment usually required protecting from frostbite
Bulkier to wear than umbilical systems
Requires freezer to chill packs (standard charge time 5 hours)
Heavy, typical 2 hour cooling duration units weigh 8 pounds plus
Limited duration cooling



Passive Body Cooling

Phase Change Vests:

Phase change material (PCM) vests consist of a torso garment similar to ice vests but the internal pockets are designed to carry PCM packs instead of ice or gel packs. Body heat is absorbed by thermally stable packs at temperatures substantially higher than ice or gel packs. The most common and effective temperature for phase change vests has proven to be 65° F, well above the vasoconstriction level.

Pros:

- Inexpensive
- Comfortable temperature that can be worn directly against the skin all day
- Portable; no umbilical device needed
- Rechargeable in ice water (20 min.) or in a refrigerator or freezer (1 hour)
- Dry technology
- Lightweight, usually half the weight of similar duration ice/gel vests

Cons:

- Bulkier to wear than umbilical systems
- Limited duration cooling



Evaporative Body Cooling

Evaporation Vests:

Generally a torso garment containing a water absorption material. The garment is soaked in water and then donned. The crystals within the garment swell up and begin to evaporate at a higher than normal level. The process simulates the body's natural evaporative cooling system as it evaporates the water held within the garment to the atmosphere. This is not a conductive heat transfer but rather a convective heat transfer as the evaporating water actually cools the air between the garment and the wearer. Effectiveness is extremely dependent on ambient humidity levels and does not work under PPE.

- Pros:**
- Most inexpensive
 - Relatively lightweight
 - Portable, no umbilical required
- Cons:**
- Requires the movement of dry air across vest to be effective
 - Will not work under protective apparel
 - Won't work in high humidity
 - Tends to be damp against the body
 - Can cause skin irritation, bacterial growth, mold and odor.
 - Can not determine a specific value for heat removal





Cool Zone Tech Products



Cool Zone Technology offers proven controlled-temperature technology that keeps you cool for up to four hours.

Our Value Line offers the same cooling technology as our pro line in an economically priced vest.

Anatomically designed cooling UniPaks™ in a rugged washable nylon vest. Allows for torso height adjustment at shoulders and on the front midsection providing a snug fit that yields high cooling efficiency with complete freedom of movement.

Product: 50D-VV

Colors: Navy, Khaki

Size: One

Suggested Retail:

\$180.00

Spare UniPaks™ available:
50D-VV-UPK



CZT Value Vest

Value Vest made with durable flame resistant fabric "Banox". Recommended for applications where flame resistant protective clothing is required. Fabric meets NFPA and ASTM standards. Designed to be worn under appropriate protective apparel.

Product: 50D-VVFR

Color: Navy **Size:** One

Suggested Retail:

\$192.00

Spare UniPaks™ available:
50D-VVFR-UPK



CZT FR Value Vest

Cool Zone Tech Products



The high temp specialized cool vest uses an aluminized silica outer shell lined with fire resistant Banox. The cooling UniPaks™ are encapsulated in fire resistant pockets, for added protection. Adjustable for torso height at the shoulders and neckline. Two Kevlar® side straps offer maximum chest protection for a secure fit



Specifically designed for use in extremely hot and direct flame environments - perfect for welding. Designed to be worn under appropriate protective apparel. Aluminized silica outer shell lined with fire retardant Banox. Adjustable for torso height at the shoulders and neckline, and Kevlar straps provide a secure fit for maximum chest protection. Proven to stay cool for up to 4 hours.

Product: 50D-HTV

Color: Silver

Size: One

Suggested Retail: \$440.00

Spare UniPaks™ available: 50D-PV-FR-UPK -L

Aluminized High Temp Vest



CZT – Quick Selling Points

- ✓ Relieves the potential of heat stress, heat fatigue, heat stroke & increases productivity
- ✓ Used as a First Aid personal heat stress “recovery” tool
- ✓ UniPaks™ are ergonomic, lightweight
- ✓ UniPaks can be recharged thousands of times
- ✓ 3 year warranty against factory defects on UniPaks; 1 year on vests



CZT – Quick Selling Points

- ✓ Value vest is a “General Duty” vest, worn under a work shirt to insulate coolness next to the body.
- ✓ Vests are best worn under level a-b-c suits for effectiveness, cleanliness & insulation
- ✓ Only manufacturer of patented, aluminized, hi-heat welder’s vest designed for furnace, high heat, smelting and welding applications. Can be used in ambient temperatures up to 1000 F, “short duration.”



CZT – Quick Selling Points

- ✓ Banox® Vest worn under an FR shirt or uniform used in a “potential fire hazard” environment.
- ✓ One size vest fits up to a size 58 (95% of population)
- ✓ Vests will not condensate (sweat) or allow worker’s garments to become damp or wet. Be sure to dry the packs after removing them from an ice cooler.



CZT – Quick Selling Points

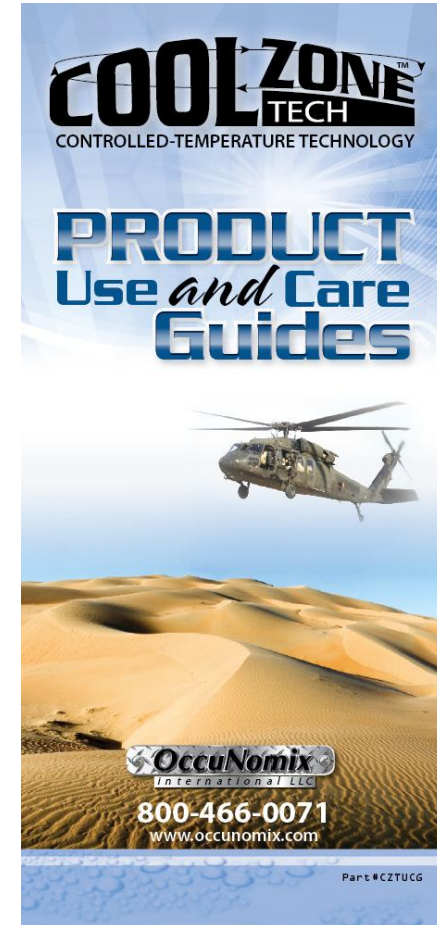
	ICE WATER CHARGE TIME	DURATION OF OPTIMUM TEMPERATURE	OPTIMUM TEMPERATURE
VESTS	15 – 20 MIN.	3 – 4 HOURS	55
SEATS	5 – 10 MIN.	4 – 6 HOURS	80
CAP COOLERS	7 – 10 MIN.	1 – 2 HOURS	HELMET-60 , BALL CAP-80
MEDICAL PRODUCTS	Not recommended	2 + HOURS	50
*All products may be charged in a refrigerator or freezer. This method takes slightly longer			

CZT – Get Started

- ✓ Literature Available



Item Number: 800-MTXA		Components: Aluminized Vest and P2L Liner™													
Short Description: Aluminized High Temp Vest		Cross Weaved Design													
Date of Introduction: Spring 2008		Product Dimensions: 2 lbs.													
ANSI Class: V-8		PPE: L: 1 1/4" W: 12" L: 21"													
Item Description: <ul style="list-style-type: none"> Proven to stay cool for up to 8 hours Outperforms aluminized fiberglass or asbestos Shirts hold up to 1100°F Resists burn-through by continuous flame High tensile strength and low constant of 4.9 to 6.4 Resists 50% molten steel System designed for most vests Class "A" fire resistant One Size fits most Color: Silver 															
Printed on Label: <table border="0"> <tr> <td> <ul style="list-style-type: none"> Cool Zone High Temp Aluminized Size Part# 800-MTXA © 2008 Manufactured By: The OccuNomix Company 30 Melrose, TX www.Occunomix.com 31-002-0003 800-466-0071 Material Safety Data Sheet MSDS # 0003A ATL-01 and NFPA 704 </td> <td> <ul style="list-style-type: none"> Heat flux only will cause skin to burn No direct or indirect chemical contact to skin </td> <td> WARNING: <ul style="list-style-type: none"> All persons exposed to unusual amounts of molten metal should avoid wearing the garment unless they are well acquainted with the properties of the molten metal. Do not use the garment unless you are a trained and qualified person. </td> </tr> </table>				<ul style="list-style-type: none"> Cool Zone High Temp Aluminized Size Part# 800-MTXA © 2008 Manufactured By: The OccuNomix Company 30 Melrose, TX www.Occunomix.com 31-002-0003 800-466-0071 Material Safety Data Sheet MSDS # 0003A ATL-01 and NFPA 704 	<ul style="list-style-type: none"> Heat flux only will cause skin to burn No direct or indirect chemical contact to skin 	WARNING: <ul style="list-style-type: none"> All persons exposed to unusual amounts of molten metal should avoid wearing the garment unless they are well acquainted with the properties of the molten metal. Do not use the garment unless you are a trained and qualified person. 									
<ul style="list-style-type: none"> Cool Zone High Temp Aluminized Size Part# 800-MTXA © 2008 Manufactured By: The OccuNomix Company 30 Melrose, TX www.Occunomix.com 31-002-0003 800-466-0071 Material Safety Data Sheet MSDS # 0003A ATL-01 and NFPA 704 	<ul style="list-style-type: none"> Heat flux only will cause skin to burn No direct or indirect chemical contact to skin 	WARNING: <ul style="list-style-type: none"> All persons exposed to unusual amounts of molten metal should avoid wearing the garment unless they are well acquainted with the properties of the molten metal. Do not use the garment unless you are a trained and qualified person. 													
Material Description: <table border="0"> <tr> <td>Blank Fabric: Zetex 600 HC, Aluminized Fabric 10 oz</td> <td>Inner Fabric: Ripstop</td> <td>Blank: 100% Cotton Ripstop: Navy 9.0 oz</td> </tr> <tr> <td>Closure: Kwiklok™ Tape (L) with Acetal Buckles</td> <td>Binding: Ripstop Ripstop, 100% Cotton Ripstop, Navy 9.0 oz</td> <td></td> </tr> </table>				Blank Fabric: Zetex 600 HC, Aluminized Fabric 10 oz	Inner Fabric: Ripstop	Blank: 100% Cotton Ripstop: Navy 9.0 oz	Closure: Kwiklok™ Tape (L) with Acetal Buckles	Binding: Ripstop Ripstop, 100% Cotton Ripstop, Navy 9.0 oz							
Blank Fabric: Zetex 600 HC, Aluminized Fabric 10 oz	Inner Fabric: Ripstop	Blank: 100% Cotton Ripstop: Navy 9.0 oz													
Closure: Kwiklok™ Tape (L) with Acetal Buckles	Binding: Ripstop Ripstop, 100% Cotton Ripstop, Navy 9.0 oz														
<table border="1"> <thead> <tr> <th>Sheet</th> <th>Back</th> <th>Length</th> <th>Width</th> <th>Weight</th> <th>Volume</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>17.0"</td> <td>23.0"</td> <td>23.0"</td> <td>0.20"</td> <td>0.10"</td> </tr> </tbody> </table>				Sheet	Back	Length	Width	Weight	Volume	1	17.0"	23.0"	23.0"	0.20"	0.10"
Sheet	Back	Length	Width	Weight	Volume										
1	17.0"	23.0"	23.0"	0.20"	0.10"										
<table border="0"> <tr> <td>No. of Pockets: 0</td> <td>Pocket Placement: N/A</td> <td>Collars Available? 1 (Liner)</td> </tr> <tr> <td>Adjustable: Yes, Hook and Loop</td> <td>Expandable: Yes</td> <td>UPC: 011448173002</td> </tr> <tr> <td colspan="3">Notes:</td> </tr> </table>				No. of Pockets: 0	Pocket Placement: N/A	Collars Available? 1 (Liner)	Adjustable: Yes, Hook and Loop	Expandable: Yes	UPC: 011448173002	Notes:					
No. of Pockets: 0	Pocket Placement: N/A	Collars Available? 1 (Liner)													
Adjustable: Yes, Hook and Loop	Expandable: Yes	UPC: 011448173002													
Notes:															
<p>High Temperature Fire Retardant Weave's Vest. Recommended for applications requiring heat reflectivity, the entry, proximity, approach suits and molten metal splash resistance. Typical industries include heavy general industry, steel, aluminum, copper and other metal foundry, combustion, chemical processing plants, petroleum refineries, automotive and maritime. Designed to be worn under the appropriate protective apparel. Aluminized silica outer shell must meet NFPA 704. Adjustable for torso height at the shoulders and neckline.</p>															



- ✓ Sample Program
- ✓ Sales Support
- ✓ MSDS available on all products



Other Heat Stress Products



Cooling Tie Hat



MiraCool Bandana



Neck Shade



Thank you!

OccuNomix International, LLC

visit us on the web at www.occunomix.com