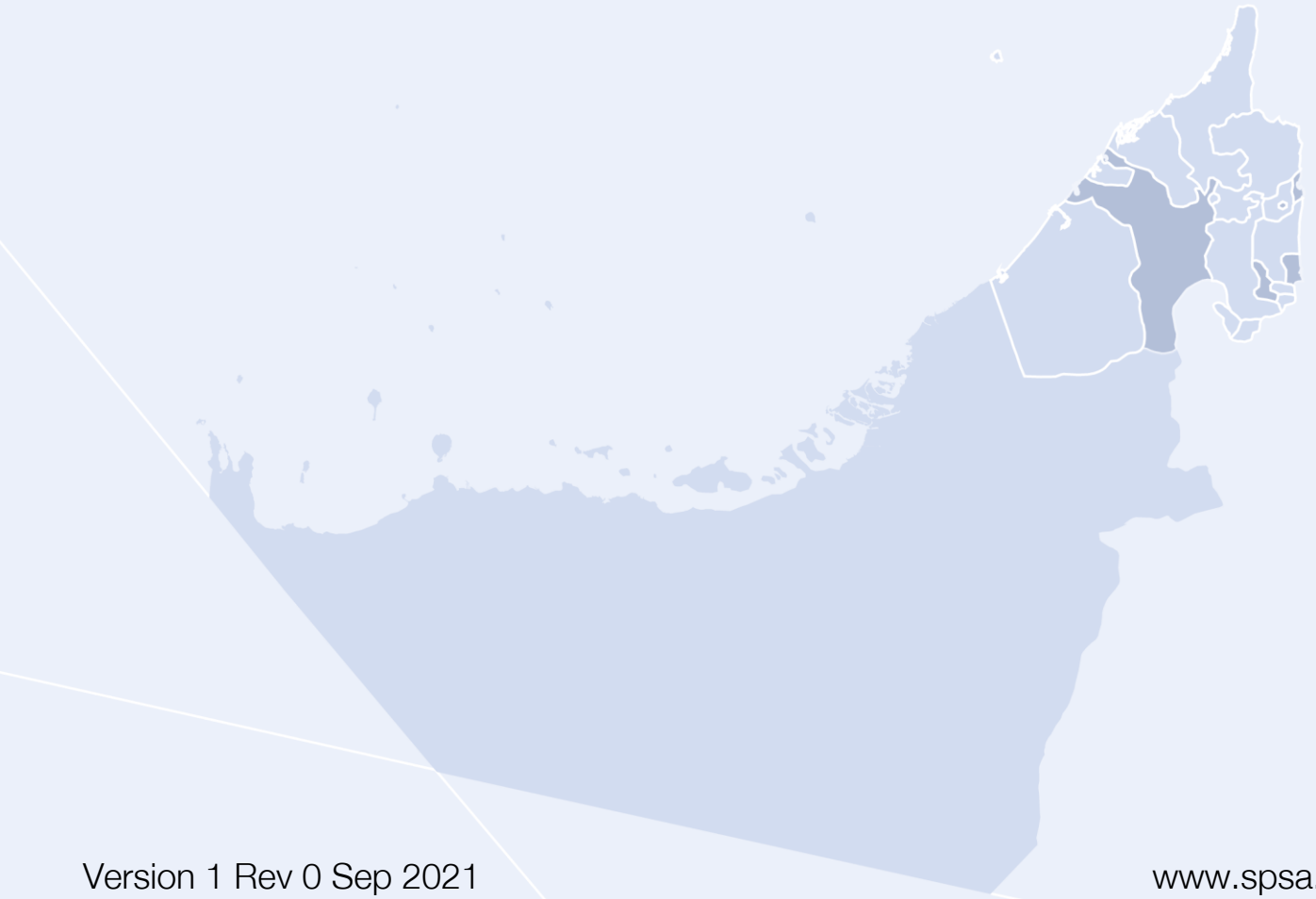
نظام الشارقة للسلامة والصحة المهنية
Occupational Safety & Health Sharjah

حكومة الشارقة
هيئة الوقاية والسلامة
Government of Sharjah
Prevention And Safety Authority

Guideline

Safety in Heat

OSHJ-GL-15



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1 Introduction

The Emirate of Sharjah has a hot desert climate with extremely hot humid summers and working in heat can involve adverse work conditions. This is of concern to entities because of the potential effects of heat related illness on employees.

Work involving excessive heat exposure is a serious occupational safety and health (OSH) hazard, which can lead to a range of health problems from dehydration to life threatening conditions.

2 Purpose and Scope

This Guideline document has been developed to provide information to entities to assist them in complying with the requirements of the Occupational Safety and Health System in Sharjah.

To achieve compliance in the Emirate of Sharjah, all entities are required to demonstrate a standard of compliance which is equal to or higher than the minimum acceptable requirements outlined in this Guideline document.

3 Definitions and Abbreviations

Entities:	Government Entities: Government departments, authorities or establishments and the like in the Emirate. Private Entities: Establishments, companies, enterprises and economic activities operating in the Emirate in general.
Risk:	Is the combination of likelihood of the hazard causing the loss and the severity of that loss (consequences).
Risk Assessment:	The process of evaluating risks arising from hazards and establishing practical control measures to reduce the risk to an acceptable level.
Hazard:	Anything that has the potential to cause harm or loss (injury, disease, ill-health, property damage etc).
Competence:	The combination of training, skills, experience, and knowledge that a person has and their ability to apply all of them to perform their work.
First Aid:	Immediate assistance provided to a person (or persons) suffering injury or ill-health before the arrival of emergency medical services; or addressing minor injuries or ill health where medical treatment is not required.
First-aider:	A person appointed by the entity and trained in first aid.
Workplace:	A place that the entity allocates for the performance of the work. This term shall also include the employees' resting places, their accommodation and similar places that the entity allocates to his employees.
Thermal Work Limit:	Is defined as the limiting (or maximum) sustainable metabolic rate that a well-hydrated, acclimatised individual can maintain in a specific thermal environment, within a safe body core temperature (< 38.2 °C or 100.8 °F) and sweat rate (< 1.2 kg or 2.6 lb per hour).

4 Responsibilities

4.1 Entity Responsibilities

- Undertake a safety in heat risk assessment, identify heat hazards, employees at risk and introduce control measures;
- Have an effective safety in heat plan;
- Ensure potable drinking water is available to employees at all times;
- Ensure cooling/ventilated rest areas are provided on sites;
- Ensure employees are acclimatised to hot working environments;
- Provide suitable lightweight clothing for employees working in hot environments;
- Provide information, instruction, supervision and training to managers, supervisors, employees and first-aiders on the safety in heat arrangements at the workplace;
- Provide resources for the implementation of safety in heat requirements;
- Provide immediate access to medical attention for employees suspected of heat illness;
- Have a system for employees to report heat related illness;
- Enforce the requirements for a midday break during summer months for employees working outside, which is supported and enforced by The Ministry of Human Resources and Emiratisation (MOHRE).

4.2 Employee Responsibilities

- Not endanger themselves or others;
- Follow precautionary control measures to ensure work activities conducted in heat are performed safely and without risk to health;
- Cooperate with the entity and receive information, instruction, supervision and training;
- Report any activity or defect which they know is likely to endanger the safety of themselves or that of any other person.

5 Guidelines

Prolonged or intense exposure to heat can lead to serious illnesses and possibly death. Heat related illnesses occur when a body cannot get rid of heat as fast as it is generated. When a bodies temperature is raised the body tries to cool itself by rushing blood to the surface of the skin and away from the brain, muscles and other organs. In addition, body fluid and critical electrolytes will be lost. If the body temperature is not immediately lowered, and the body is not hydrated, this can interfere with both your physical strength and mental capacity, allowing serious, critical or fatal heat related illness to occur. For the most common types of heat related illnesses, main symptoms and treatment see ***Appendix 1: Types of Heat Related Illnesses.***

5.1 Prevention of Heat Related Illness

The entity shall develop an effective safety in heat plan to reduce heat related illness, which will help protect employees from the hazards of working in hot and humid environments. Factors that should be considered in the plan, include but are not limited to:

- Conducting a risk assessment of heat hazards and introduce risk reduction measures;
- Provision of adequately shaded rest areas;
- Heat acclimatisation of new employees;
- Hydration solutions;
- First aid availability;
- Modified work schedules;
- Monitoring for signs and symptoms of heat related illness in employees;
- Safety in heat training;
- Communication;
- Emergency preparedness and response.

5.2 The Plan

The entity should be aware of the hazards of heat exposure to employees and control who can develop, implement, manage, and oversee the safety in heat plan, including but not limited to:

- Ensuring implemented processes for evaluating the environmental conditions and heat stress are in place, weather conditions can be assessed by gathering details of:
    - The official temperature;
    - The feels like temperature;
    - The wind speed.
- Communicating to employees the day to day current environmental conditions;
- Ensuring appropriate pre work briefings take place prior to shift to remind employees of the hazards of working in heat;
- Clearly identifying the control measures that must be implemented.

5.3 Risk Assessment

The entity shall conduct risk assessments to identify and evaluate the hazards and introduce effective control measures to reduce the exposure of heat related illness to employees, including but not limited to:

- The number of employees working in hot environments;
- The type of work activities, work demands and shift patterns;

- Access to emergency medical services;
- Clothing or personal protective equipment (PPE) provided;
- Lone workers;
- Employees with specific medical conditions;
- Ability of employees to recognise the signs of heat illness.

Further information on identifying hazards and how to conduct risk assessments can be found in OSHJ-CoP-01: Risk Management and Control.

5.4 Thermal Work Limit

Working under conditions of thermal stress has associated risks to employees. The protection of employees in hot environments requires a means of identifying conditions where excessive thermal stress places employee's health at risk. The thermal work limit (TWL) is measured in watts per square meter and is the maximum rate at which heat can be lost to the environment in the conditions. The TWL is a realistic and valid index of heat stress and is calculated from environmental parameters and assuming employees are hydrated and acclimatised to the conditions, and are self-paced.

Description	Measurement
Dry Bulb Temperature (ambient air temperature)	In degrees °C
Wet Bulb Temperature (determined by the humidity/evaporation)	In degrees °C
Globe Temperature (determined by radiant heat)	In degrees °C
Wind Speed	In meters per second

Table 1: Determination of TWL

There are two distinct ways to measure TWL:

- Single instruments that individually measure the dry bulb temperature (air temperature), Globe Temperature (radiant heat), Wet Bulb (evaporative cooling) and Wind Speed can be used and the individual readings entered into an online TWL calculator;
- Instruments that can calculate all of these measures and internally compute the TWL.

Definitions used in TWL Working Zones	
Self-Paced Work:	Employees must be allowed to adjust their work rate according to environmental conditions.
Paced Work:	When work rate is not under the employees control.
Unacclimatised Employees:	Employees that are not acclimatised are defined as new employees or those who have been off work for more than 14 days due to illness or leave.
Light Work:	Work involving sitting or standing, light arm work.
Heavy Work:	Work involving carrying, climbing, lifting, pushing, whole body work.

Table 2: TWL Working Zones Definitions

Management of TWL Work Limit Zones

TWL Working Zones	Recommended Interventions	Recommended Rehydration Schedule (per hour)	Recommended Work Rest Schedule (minutes)
TWL: <115 High Risk Zone	No ordinary work allowed Work limited to essential maintenance or rescue operations	1.5 Litres	Self-paced light work - 45 mins work, 15 mins rest Self-paced heavy work – 20 mins work, 40 mins rest
TWL: 115 to 140 Medium Risk Zone	Cautionary zone exists to identify situations in which environmental conditions may be limiting Any practical intervention to reduce heat stress should be implemented, e.g. providing shade, improved ventilation, etc. Acclimatised employees not allowed to work No person to work alone	1.2 Litres	Safe for continuous self-paced light work Self-paced heavy work – 40 mins work, 20 mins rest
TWL: 140 to 220 Low Risk Zone	No limit on self-paced work for educated self-paced workers Acclimatised persons allowed to work, but not alone	1 litres	Safe for all continuous self-paced light and heavy work
TWL: >220 Unrestricted Zone	No limits on work due to thermal stress	0.5 litres	Safe for continuous paced light and heavy work

Table 3: Thermal Work Limit Zones

5.5 Acclimatisation

Acclimatisation is a physical change that allows the body to build tolerance to working in the heat. It occurs by gradually increasing workloads and exposure to the heat and taking frequent breaks for water and rest in the shade. Full acclimatisation may take up to 14 days or longer depending on personal factors relating to the employee.

The entity should ensure that new employees and/or employees who return to work after a long leave are allowed to get acclimatised before they start their work activities full time in the hot environment. Th entity should develop a plan for acclimatisation of new employees and/or employees who return to work after a long leave.

5.6 Hydration

One of the most important factors in preventing heat related illness is ensuring the body is hydrated.

Good hydration is one of the most effective ways to reduce the risk of heat related illness. Employees should be encouraged by the entity to drink water before starting work and at frequent intervals throughout the day.

In normal working conditions each employee should be drinking 4-6 litres of water per day, in extremely hot and humid conditions drinking 2 (two) litres every 2-3 hours may be required to maintain hydration. Employees should avoid drinks containing caffeine such as, coffee, soft drinks and energy drinks.

5.7 Modified Work Schedules

The Safety in Heat program requirements for a midday break during summer months for employees working outside, which is supported and enforced by The Ministry of Human Resources and Emiratisation (MOHRE), states that, “employers must not allow workers to perform any outdoor activities from 12:30pm until 3:00pm”. This law will be applied for 3 months.

Altering work schedules can greatly help to reduce exposure to heat.

- Schedule more physically demanding work for the cooler parts of the day;
- Rotate employees work activities and split shifts.

Starting work very early or late at night can increase fatigue and create additional safety and health issues. Humidity levels can also be particularly high in the early mornings.

5.8 Monitoring of Symptoms of Heat Related Illness

The entity should establish a system to monitor and report on any heat related incidents and also any observed signs and symptoms of heat related illnesses. This will improve monitoring and early detection. Create and implement a “buddy” system to be used amongst employees and supervisors to aid them in watching for signs of heat illness.

5.9 Communication

The entity should devise a consistent effective communication strategy, including but not limited to:

- Ensuring that the safety in heat message is clearly communicated in a manner and language which is understood by all employees;

- Providing information on hydration and ensure that urine hydration education posters are prominently displayed in welfare and rest areas;
- Providing signage for rest and shade areas and where employees can obtain fresh potable water;
- Displaying signage on how to contact first-aiders and emergency medical services;
- Promoting the UAE Safety in Heat program requirements for a midday break during summer months for employees working outside, which is supported and enforced by The Ministry of Human Resources and Emiratisation (MOHRE).

6 Training

The entity should provide safety in heat information and training in languages and in a format that employees understand, including but not limited to:

- The hazards of working in heat;
- How to maintain good hydration;
- The benefits of eating a balanced diet with good calorific values;
- How employees should assess if they are hydrated;
- The adverse effects of consuming tea, coffee, alcohol and caffeinated drinks which increase fluid loss;
- Ensuring that employees are aware of the signs of heat related illness and how to respond to these signs by informing supervisors;
- How to respond to an emergency relating to heat related illnesses.

Periodic refresher training should be conducted to ensure employees competency is maintained, including but not limited to:

- Where training certification has expired;
- Where identified as part of a training needs analysis;
- Where risk assessment findings identify training as a measure to control risks;
- Where there is a change in legal requirements;
- Where incident investigation findings recommend refresher training.

The entity must record and maintain accurate training records of OSH training provided to employees.

Further information on training can be found in OSHJ-GL-26: Training and Competence.

7 Emergency Preparedness and Response

The entity should have an emergency plan in place and ensure that it is communicated periodically to all employees, including but not limited to:

- How to understand the symptoms and signs of different kinds of heat related illness;

- How to call for first aid assistance if they are showing signs of dehydration, heat rash or heat cramps;
- When and how to call for emergency medical services and what to do if the employee is not alert or seems confused and may be suffering from heat exhaustion or heat stroke;
- How long will it take for medical emergency assistance to arrive, if far from facilities or working in remote areas;
- Appropriately trained first-aiders with a valid training certificate and awareness of how to respond to and treat heat related illnesses should be available in all working locations;

For further information on first aid can be found in OSHJ-CoP-16: First Aid at Work.

Further information on developing an emergency plan can be found in OSHJ-CoP-18: Emergency Preparedness and Response.

8 References

OSHJ-CoP-01: Risk Management and Control

OSHJ-CoP-16: First Aid at Work

OSHJ-CoP-18: Emergency Preparedness and Response

OSHJ-GL-26: Training and Competence

9 Document Amendment Record

TITLE	Safety in Heat		
DOCUMENT AMENDMENT RECORD			
Version	**Revision Date**	**Amendment Details**	**Pages Affected**
1	15 SEP 2021	New Document	N/A

APPENDIX 1. Types of Heat Related Illnesses

Appendix 1: Types of Heat Related Illness

Heat Rash

Heat Rash is a common problem working in hot environments. It is a skin irritation caused by excessive sweating during hot and humid weather. Heat rash may appear on the neck, upper chest, groin, under the breasts and elbow creases.

Symptoms of heat rash include:

- Red bumps on the skin or tiny blisters;
- The skin may also have a prickly or itchy feeling to it;
- The skin in general may also be reddened with mild swelling.

Treatment of heat rash include:

- Moving the employee to a cooler less humid environment;
- Keeping the rash area dry; use dusting powder where possible, do not use ointments, creams or any other moist topical product;
- Encouraging the employee to bathe or shower in cool water without using scented products such as shower gel, then let the skin air-dry instead of drying with a towel.

Heat Cramps

Heat cramps are muscle pains usually caused by the loss of body fluids and salts due to excessive sweating, often brought on by strenuous work activity.

Symptoms of heat cramps include:

- Painful, involuntary muscle spasms, usually occurring in the legs;
- An indicator of which may be muscle twitching.

Treatment for suspected heat cramps include:

- Stopping all activity and moving the employee to a cool place;
- Drinking water or preferably sports liquids to replace lost salts and electrolytes;
- Practicing gentle stretching and gentle massage of the affected muscle group;
- Not permitting the employee to resume strenuous work activity for several hours or longer after heat cramps go away as this may worsen the condition and could lead to either heat exhaustion or heat stoke.

Note**:** If heat cramps do not subside within one hour following rest and the restoration of fluids, then seek medical attention.

Heat Syncope

Heat syncope is a fainting episode or dizziness that usually occurs with prolonged standing or sudden rising from a seated or lying position. Factors that may contribute to heat syncope include dehydration and lack of acclimatisation.

Symptoms of heat syncope include:

- Fainting;
- Dizziness;
- Light-headedness during prolonged standing or suddenly rising from a seated position.

Treatment for suspected heat syncope include:

- Sitting or lying down the employee in a cool, shaded area;
- Drinking fluids preferably sports liquids to replace lost salts and electrolytes.

Heat Exhaustion

Exposure to high temperatures can lead to excessive sweating causing dehydration through the loss of fluids and salt from the body. Employees having high blood pressure may be more prone to heat exhaustion.

Symptoms of heat exhaustion include:

- A high body temperature in excess of 38 degrees Celsius, or 100.4 degrees Fahrenheit;
- An altered behaviour such as fainting, dizziness or confusion;
- An altered physical state such as weakness or fatigue;
- Profuse sweating or clammy/moist skin;
- Nausea and/or vomiting or diarrhoea;
- Muscle or abdominal cramps.

Treatment for suspected heat exhaustion include:

- Moving the employee from the hot area and place them in a cool, shaded area;
- Giving plenty of liquids to drink, preferably sports liquids to replace lost salts and electrolytes;
- Removing any tight or unnecessary clothing;
- Applying any other cooling methods such as; fans or ice towels, have them take a cool shower or sponge bath.

Note: If an employee is suspected of having heat exhaustion then immediate help must be provided, if the employee does not respond to initial first aid treatment then request medical attention by calling emergency medical services.

Heat Stroke

Heat stoke is the most serious of heat related illness. It occurs when the body suffers from prolonged exposure to heat and the body loses the ability to cool itself. The core temperature of the body will rise to critical levels in excess of 40 degrees Celsius or 104 degrees Fahrenheit. Heat stroke may result in death or permanent disability and must be treated as a medical emergency, provide immediate first aid treatment and dial 999 for medical assistance.

Symptoms of heat stoke include:

- A high body temperature in excess of 40 degrees Celsius or 104 degrees Fahrenheit;
- An altered mental state or behaviour such as; confusion, agitation, slurred speech, irritability, delirium, hallucinations, seizures or coma;
- An alteration in sweating – it could be that the body has stopped producing sweat and feels hot and dry to the touch, or profuse sweating is now occurring;
- Nausea and/or vomiting or diarrhoea;
- Flushed skin, the skin may take on a more reddish colour;
- Rapid and/or shallow breathing;
- Rapid increased heart rate;
- Headache.

Treatment for suspected heat stroke include:

- Moving the employee to a shaded cool area;
- Removing as much clothing as possible;
- Applying cooling solutions such as: soaking the employee with cool water and circulate the air as much as possible to aid their body to cool;
- Placing cold wet clothes or ice all over the body.