

Wet Bulb Globe Temperature

Informational Guide

Background

Heat stress is commonly measured by the heat index or the “feels like temperature” which is representative of the temperature and moisture in the atmosphere. An alternative method is the wet bulb globe temperature (WBGT), which uses temperature, humidity, and other weather parameters. WBGT has been shown to be an effective indicator of heat stress for active populations.

The WBGT has been used for decades in many military agencies, by the Occupational Safety and Health Administration (OSHA), and organizations that facilitate marathons. The American College of Sports Medicine bases its guidelines for the intensity of sport practices on WBGT as well, and it is therefore utilized by athletic programs in many school districts.



Comparing WBGT and Heat Index

	WBGT	HEAT INDEX
Measured in the sun	●	●
Measured in the shade	●	●
Uses temperature	●	●
Uses relative humidity	●	●
Uses wind	●	●
Uses cloud cover	●	●

Who is WBGT Most Helpful for?

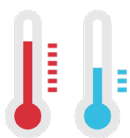
This parameter is best suited for active people such as outdoor workers, athletes, marching band, and others performing strenuous outdoor activities.

WBGT can be used to establish guidelines for activity modifications during exercise or outdoor work.

Guidelines vary geographically since temperatures fluctuate by region, and people’s response to exercising or working in heat may also vary by the geographic region.



solar radiation



temperature



relative humidity



wind speed



OSHA Recommendations

Protective Measures (engineering and administrative controls):

- Acclimatize workers starting the first day working in the heat and after any extended absences
- Provide shade for outdoor work sites
- Schedule work earlier or later in the day
- Use work/rest schedules
- Limit strenuous work (eg., carrying heavy loads)
- Use relief workers when needed

Source:

https://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_4.html



Supplemental Personal Protective Equipment (PPE):

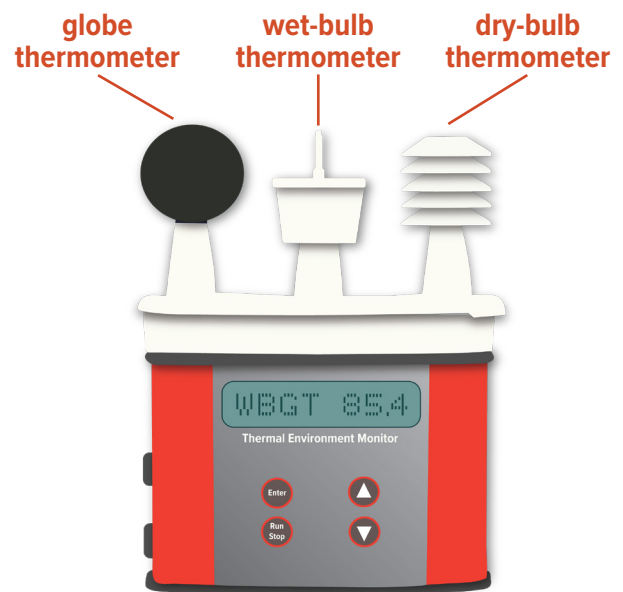
- Water-cooled garments
- Air-cooled garments
- Cooling vests
- Wetted over-garments
- Sun hats
- Light colored clothing
- Sunscreen



Why is it called Wet Bulb Globe Temperature?

The WBGT is derived from a combination of temperatures from three thermometers — wet globe for humidity, black globe for solar factor, and dry bulb for the ambient temperature.

A wet bulb temperature is measured by taking a thermometer that has a bulb covered by a water-soaked cloth. When air passes over the cloth to evaporate the water, the evaporative cooling shows the wet bulb temperature on the thermometer.



Example of WBGT Equipment