Wind Chill Temperature Measurement – Quick Tips

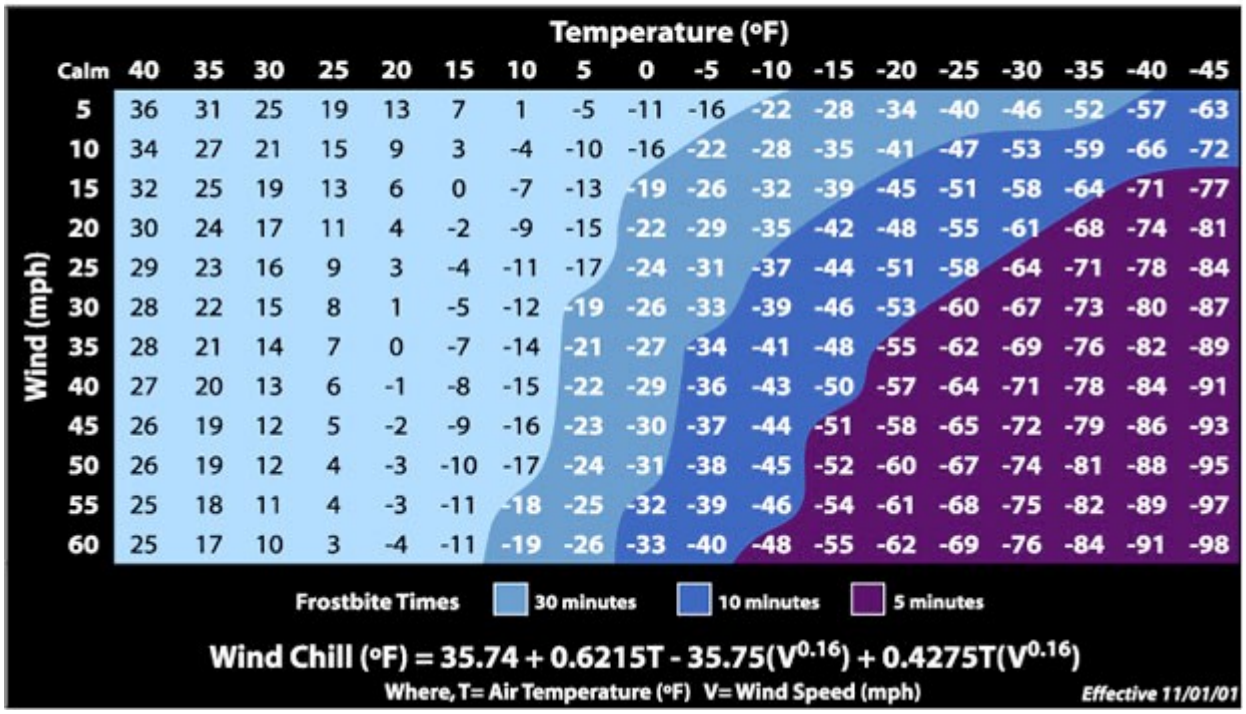
On blustery winter days, it’s not uncommon to see two temperature readings on your local weather report. That’s because the air temperature taken alone doesn’t always tell the whole story. Some seemingly moderate days will feel much colder simply because the wind is blowing. This effect is known as the wind chill factor. The wind chill index is a method that compensates for the wind chill factor using wind speed to calculate a measurement called the wind chill temperature (WCT). The wind chill temperature measurement is a more realistic number in terms of how the cold feels to human skin. This is essential information for anyone gearing up to work or play outdoors. For additional safety, the method also includes a frostbite danger index.

The wind chill index used in the U.S. and Canada was developed using advances in science, computer modeling and technology. The index is based on:

- Wind speed measured at an average face height of 5 feet off the ground, where the face is the most likely part of the body to be exposed to the wind
- A consistent standard for skin tissue resistance
- Heat transfer theory (heat loss from the body to surroundings during cold windy periods)
- A calm wind threshold of 3 mph
- Assumption of no heat impact from the sun (clear night sky conditions)

Referring to the chart below, we see that a temperature of 10°F with a wind speed of 20 mph results in a wind chill temperature of -9°F. This variation could make a big difference in the type of clothing you’d choose to wear when spending time outdoors.

Wind Chill Chart



If you know the air temperature and wind speed, the wind chill temperature and frostbite risk can easily be determined using this reference chart. For more information on the chart and other winter related resources, please click on this National Weather Service Wind Chill Chart and Winter Resources link.

Commonly Asked Questions

Q: What is the wind chill temperature?

A: Wind chill temperature is the temperature it feels like outside to people and animals. Wind chill is based on the rate of heat loss from exposed skin caused by the combined effects of wind and cold.

Q: What is frostbite?

A: Frostbite is the result of the body tissue freezing and most frequently affects the extremities such as fingers, nose and toes. Symptoms include a pale white appearance and loss of feeling in these extremities.

Q: What is an anemometer?

A: An anemometer is a device for measuring wind speed.

Q: What is hypothermia?

A: Hypothermia occurs when the body temperature falls below 95°F. Hypothermia is caused by exposure to cold and is aggravated by wet conditions, wind and exhaustion. Warning signs include uncontrollable shivering, disorientation, memory loss, slurred speech, incoherence, drowsiness and exhaustion.

Q: Is frostbite possible when the temperature is above freezing but the wind chill is below freezing?

A: The air temperature has to be below freezing in order for frostbite to develop on exposed skin. Wind chill cannot bring the temperature to below freezing for humans and animals when the thermometer shows it is above freezing, so you will not get frostbite; however, you might get hypothermia from exposure to cold. You can only get frostbite if the actual air temperature, not the wind chill temperature, near your skin is below freezing.

Additional information on cold weather safety:

https://www.osha.gov/dts/weather/winter_weather/index.html

Source

NOAA-National Oceanic and Atmospheric Administration

Source: Grainger Know How – https://www.grainger.com/know-how