



## WIND-CHILL FACTOR

**F 131-1**

### WIND-CHILL FACTOR

Temp C	WIND SPEED KM/H						
	10	20	30	40	50	60	70
0	-3.3	-5.2	-6.5	-7.4	-8.1	-8.8	-9.3
- 5	-9.3	-11.6	-13.6	-14.1	-15.0	-15.7	-16.3
-10	-15.3	-17.9	-19.5	-20.8	-21.8	-22.6	-23.4
-15	-21.2	-24.2	-26.0	-27.4	-28.6	-29.5	-30.4
-20	-27.2	-30.5	-32.6	-34.1	-35.4	-36.5	-37.4
-25	-33.2	-36.8	-39.1	-40.8	-42.2	-43.4	-44.4
-30	-39.2	-43.1	-45.6	-47.5	-49.0	-50.3	-51.4
-35	-45.1	-49.4	-52.1	-54.2	-55.8	-57.2	-58.5
-40	-51.1	-55.7	-58.7	-60.9	-62.7	-64.2	-65.6

### WIND-CHILL EFFECT:

- 27     -     Risk of frostbite in prolonged exposures.
- 35     -     Frostbite possible in 10 minutes.
- 58     -     Frostbite possible in 2 minutes.
- 80     -     Frostbite possible in 1 minute

## **NORTHERN LIGHTS SCHOOL DIVISION NO. 69**

### **EMERGENCY CLOSING OF SCHOOLS**

#### **UNDERSTANDING**

##### ***WHAT WIND-CHILL REALLY MEANS***

WIND-CHILL is probably the most misunderstood and misused meteorological term we hear on the radio. During outbreaks of bitterly cold air, radio and television broadcasters compete with one another to see who can announce the lowest wind-chill temperature. But what is wind-chill and what is the wind-chill equivalent temperature?

The popularity of the term wind-chill largely stems from the fact that it's a fairly easy concept to understand. We all recognize that we're more comfortable in cold weather when the wind is not blowing than when it is. From that step it seems reasonable to ask "what lower temperature would it take with no wind to make me feel as uncomfortable as I am right now with the present wind?" Wind-chill is not a measure of the actual temperature but rather a perceived temperature. These problems arise because no two people will perceive the same coldness. How you are dressed for the cold is obviously one of the most important factors. Age, physical condition, nutritional state and state of health all play roles in our perceptions of how cold it is. Our state of mind is also important. Someone who is out cross-country skiing for the enjoyment will feel far less cold than someone who is going to work in the morning, even if they are dressed the same, which, of course, they rarely are.

One thing that must be stressed regarding wind-chill is it is not the real temperature - only a perceived temperature. Objects outside will never get colder than the surrounding air temperature. An outside air temperature of -30 C with a wind of 20 km/hr gives a wind-chill of -43. This is a totally fictitious value and nothing outside will get colder than -30 C. The antifreeze in your radiator is good to -40 C and will work perfectly fine.

In winter the body loses heat to the air three ways. The first; is by our own infrared radiative heat. This is the reason infrared cameras can be used to detect humans at night, because we give off infrared radiation (heat). The second; is by respiration - we can lose heat to the air when we breathe. The third is by convection. Our own body heats the air around it causing it to warm and become lighter and replaced by colder, heavier air. Body heat can produce a wind of one m/sec or 3.6 km/hr. Humans are also rarely standing still outside so using no wind in a wind-chill calculation would not be realistic. The base value for a wind-chill calculation is done using a wind of five mph or eight k/hr. So, wind-chill equivalent temperature is calculated using a wind of eight km/hr.

Humans generate heat internally and therefore physical activity can compensate for elevated heat loss to the air that is why it is important to keep moving when you are caught out in the cold and starting to freeze. In spite of all the shortcomings of wind-chill, it is still the best measure of how cold we might feel outside. People should not get hung up on the units, but rather simply relate to certain threshold values. We learned to do that for temperature over time.

People ask when it is dangerous to be outside and when they should cancel their event, but as mentioned before, it is dependent on how well you are dressed. Generally around -35 people should make an effort to dress warmer than they normally do. At -58 conditions are very dangerous. No one should have to be outside unless they have to be and only Arctic gear with complete head, hands and feet protection should be worn.