

# Wind chill - Minutes to Frostbite

## Minutes to frostbite for the 5% most susceptible segment of the population

Temperature (°C)	-15	-20	-25	-30	-35	-40	-45	-50
Wind (km/h)								
10	*	*	22	15	11	8	7	6
20	*	*	14	10	7	6	5	4
30	*	18	11	8	6	4	4	3
40	42	14	9	6	5	4	3	2
50	27	12	8	5	4	3	2	2
60	22	10	7	5	3	3	2	2
70	18	9	6	4	3	2	2	2
80	16	8	5	4	3	2	2	1

\* = Frostbite unlikely

Frostbite possible in 2 minutes or less

2

Frostbite possible in 3 to 5 minutes

5

Frostbite possible in 6 to 10 minutes

10

The wind speed, in km/h, is at the standard anemometer height of 10 metres (as reported in weather observations).

## Equation to approximate minutes to frostbite

valid for times of less than 15 minutes

$$t_f = \{ (-24.5 \cdot [ (0.667 \cdot V_{10}) + 4.8] ) + 2111 \} \cdot (-4.8 - T_{air})^{-1.668}$$

where:

$t_f$  = time to frostbite, in minutes, for the 5% most susceptible segment of the population

$V_{10}$  = Wind speed, in km/h, at the standard anemometer height of 10 metres (as reported in weather observations)

$T_{air}$  = Actual air temperature in °C