

WINDCHILL CALCULATOR

(TWC) version 1.0

for the HP49G(+)

by

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On November 1, 2001 the National Weather Service replaced the old Windchill formula based on the 1945 Siple and Passel Index with a new formula based on research done by the Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM).

Starting 03 October 2001 meteoLCD computes and displays the windchill together with wind speed and air temperature using the new formula accepted by the meteorological services of Canada and the USA.

The new formula is:

$$TWC = 35.112 + 0.6215 * T - 11.37 * V_{10m}^{0.16} + 0.3965 * T * V_{10m}^{0.16}$$

where TWC is the windchill, V is the wind speed in kilometers per hour at 100 meter, and T is the ambient air temperature in degrees Celsius. The V in the new windchill formula is the airspeed measured by a traditional 33 feet high anemometer: the reduction to face level is included in the numerical constants of the formula. (Take care, as this fact is not always clearly stated, and many sites seem to suggest that the V in the new formula is the speed at face-level)

The computation should only be done above a wind speed threshold of 5 kmph and a temperature equal or lower then 10 degrees Celsius. The values are also not valid at wind speeds exceeding 180 kmph and temperatures lower then -50 degrees Celsius.

The windchill calculator calculates TWC according to the new formula. Enter the ambient temperature and the wind speed in the INFORM window and press OK. Entering temperatures and wind speeds outside the limits of validity of the formula will generate an error message.

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Wind chill - Minutes to Frostbite								
The following are approximate values								
Temperature (°C)	-15	-20	-25	-30	-35	-40	-45	-50
Wind (km/h)								
10	*	*	22	15	10	8	7	2
20	*	30	14	10	5	4	3	2
30	*	18	11	8	5	2	2	1
40	42	14	9	5	5	2	2	1
50	27	12	8	5	2	2	2	1
60	22	10	7	5	2	2	2	1
70	18	9	5	4	2	2	2	1
80	16	8	5	4	2	2	2	1

* = Frostbite unlikely

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

Legend:

Frostbite possible in 2 minutes or less

Frostbite possible in 3 to 5 minutes

Frostbite possible in 6 to 10 minutes

2
5
10

In addition the program will give a frostbite warning when windchill temperatures reach dangerously low limits. These values are estimated using data published by the Meteorological Service of Canada and the US National Weather Service and are only global indications. The table to the left is from the Meteorological Service of Canada.

The program preserves the user's flag and mode settings.

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