Wind Chill Temperature (NWS 2001 Formula)

Wind chill temperature, how cold it feels on exposed skin, from air temperature and wind speed by the US National Weather Service formula of 2001.

Method: US National Weather Service wind chill (2001): 35.74 + 0.6215T − 35.75V^0.16 + 0.4275TV^0.16; °F and mph

Input parameters

Unit system: SI

Parameter	Value	Unit
Air temperature	-10.000	°C
Wind speed (at 10 m)	30.000	km/h

Calculated results

Parameter	Value	Unit
Wind chill temperature	-19.495	°C
Felt below the air temperature	9.4947	K

Notes for this case

- The formula is meant for cold, windy weather; in mild or calm air it has no meaning.

Formula and method

$$T_{wc} = 35.74 + 0.6215T - 35.75V^{0.16} + 0.4275TV^{0.16} \quad (°\mathrm{F},\ \mathrm{mph})$$

Variables

T	Air temperature	K
v	Wind speed (at 10 m)	m/s
T_{wc}	Wind chill temperature	K
ΔT	Felt below the air temperature	K

Method and standards

NWS 2001.

Assumptions and limits

- The NWS defines wind chill only for air temperatures at or below 10 °C (50 °F) and wind speeds of at least 3 mph (1.34 m/s); the page accepts a wider range for convenience but warns outside it.
- Exposed face skin.

References

- US National Weather Service wind chill (2001): 35.74 + 0.6215T − 35.75V^0.16 + 0.4275TV^0.16
- °F and mph

Report details

Report reference	FCC-YGTE-D3V9 (the same inputs always give the same reference)
Generated	17 November 2026, 19:48 UTC
Calculator	Wind Chill Temperature (NWS 2001 Formula)
Method last reviewed	12 November 2026
Software release	FireCAD Calc, release of 17 November 2026
Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/hvac/psychrometry/wind-chill

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.