

Pasquill Stability Classes



A: Extremely unstable conditions	D: Neutral conditions
B: Moderately unstable conditions	E: Slightly stable conditions
C: Slightly unstable conditions	F: Moderately stable conditions
G: Extremely Stable	

There are multiple ways to calculate the stability index, and HYSPLIT's method does not have a day/night dependence. HYSPLIT calculated stability index is based on comparing HYSPLIT calculated vertical mixing coefficient (Kz) with empirical ranges of Kz at the top of the surface layer based on Draxler, R.R., Estimating vertical diffusion from routine meteorological tower measurements, Atmospheric Environment, 13, 1559-1564 (1979): see [https://doi.org/10.1016/0004-6981\(79\)90065-9](https://doi.org/10.1016/0004-6981(79)90065-9) □.

READY/HYSPLIT stability classes based on vertical mixing coefficient Kz.

Pasquill Class	Kz Range
A	$130 \leq Kz$
B	$85 \leq Kz < 130$
C	$40 \leq Kz < 85$
D	$10 \leq Kz < 40$
E	$3 \leq Kz < 10$
F	$0.5 \leq Kz < 3$
G	$Kz < 0.5$

Meteorological conditions defining Pasquill stability classes.

Surface wind speed (m/s)	Daytime insolation			Night-time conditions	
	Strong	Moderate	Slight	Thin overcast or > 4/8 low cloud	<= 4/8 cloudiness
< 2	A	A - B	B	E	F
2 - 3	A - B	B	C	E	F
3 - 5	B	B - C	C	D	E
5 - 6	C	C - D	D	D	D
> 6	C	D	D	D	D

Source: Pasquill, 1961.

NOTES:

1. Strong insolation corresponds to sunny midday in midsummer in England; slight insolation to similar conditions in midwinter.
2. Night refers to the period from 1 hour before sunset to 1 hour after sunrise.

3. The neutral category D should also be used, regardless of wind speed, for overcast conditions during day or night and for any sky conditions during the hour preceding or following night as defined above.

PG classes for fluctuations in wind direction and the vertical temperature gradient.

Pasquill Class	Sigma Theta (degrees)	Delta T/Delta Z (Deg C/100 m)
A	25	-1.9
B	20	-1.9 to -1.7
C	15	-1.7 to -1.5
D	10	-1.5 to -0.5
E	5	-0.5 to 1.5
F	2.5	1.5 to 4.0
G	1.7	>4.0

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