



Annex 16 changes (Amdt. 9): Wind Speed Specifications – Terminology and Limits

Terminology for limits has been changed:

- Average wind speed (unchanged)
- Average cross-wind component
- Maximum wind speed
- Maximum cross-wind component



The limits themselves are unchanged:

	Jets & Hvy Props	All Helis	Small Props
Max (Overall)	15kts	--	--
Avg (Overall)	12 kts	10 kts	10 kts
Max X-Wind	10 kts	--	--
Avg X-Wind	7 kts	5 kts	5 kts



Annex 16 changes (Amdt. 9): Wind Speed Specifications – New Elements

New elements (affecting all types of aircraft noise cert):

- Time constant (of a first-order system)
- Distance constant (or response length)
- Wind speed sample (at a certain moment)
- Wind direction sample (at a certain moment)
- Wind vector (at a certain moment)
 - Obtained at least once per second
 - Broken down into “along-track” (u) and “cross-track” (v) components

Combined dynamic characteristics of wind speed & direction sensors / system:

- Equivalent to 1st-order system w/ time-constant < 3 seconds at 10 kt (5 m/s)





Annex 16 changes (Amdt. 9): Wind Speed Specifications – New Definitions

Average wind speed –

Determined from series of wind speed samples using:

Linear 30-second average centered around overhead

OR:

Continuous exponential averaging process; time-constant < 30 seconds, read out ~ 15 seconds after overhead

(Note that the intent is to obtain similar results to lin 30 sec avg)



Note that both Vector and Scalar averaging methods are acceptable for overall wind speed, but Vector averaging is required for determination of average cross-wind component.

Max wind speed –

The maximum value within the series of wind speed samples during a period spanning the 10 dB-down interval.

Max cross-wind component is the maximum value of the cross-wind (v) components of the wind samples.



Annex 16 changes (Amdt. 9): Wind Speed Instrumentation Specifications

Wind speed sensor/system:

Range 2 kt (1 m/s) to > 20 kt (10 m/s)

Linearity +/- 1 kt over specified range

Distance constant < 5 meters (for systems w/
dynamic behavior best characterized by a
distance constant)

or

Time constant < 3 seconds for wind > 10 kt (for
systems w/ dynamic behavior best
characterized by a time constant)





Annex 16 changes (Amdt. 9): Wind Direction Instrumentation Specifications

Wind direction sensor/system:

Wind speed operating range -
same as speed sensor

Linearity -
+/- 5 degrees over the specified range

Resolution –
5 degrees





Annex 16 changes (Amdt. 9): Wind Speed Specifications - Summary

Limits are basically unchanged

New specifications for sensors/ systems

New definitions for average and max



Sensor/system response approximately equivalent to a 3 second time-constant, sampled at least once per second

(This includes any physical inertia, electronic filtering, or algorithmic smoothing that is applied to obtain the 1-second samples)



Average wind speed uses series of samples

Either:

- single 30 second linear average

or

- continuous exponential average with time-constant no greater than 30 seconds