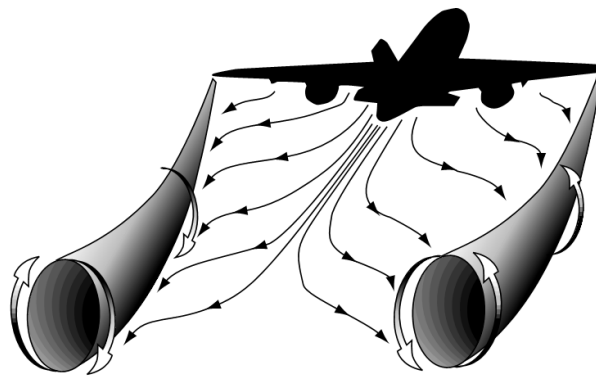




WAKE TURBULENCE SEPARATION MINIMA

1. Definition

Wake turbulence is turbulence that forms behind an aircraft as it passes through the air, causing wingtip vortices.



2. Radar wake turbulence separation minima

The following distance-based wake turbulence separation minima shall be applied to aircraft being provided with an ATS surveillance system (radar like IvAc) in the approach and departure phases of flight:

Succeeding Aircraft	behind	preceding aircraft	Separation minima
Heavy	behind	Heavy	4 NM
Medium	behind	Heavy	5 NM
Light	behind	Heavy	6 NM
Light	behind	Medium	5 NM
Heavy	behind	A380	6 NM
Medium	behind	A380	7 NM
Light	behind	A380	8 NM

These separation minima shall be applied when:

- An aircraft is operating directly behind another aircraft at the same altitude or less than 1000ft (300m).
- Both aircraft are using the same runway.
- Both aircraft are using parallel runways separated by less than 760m (2500ft).
- An aircraft crossing behind another aircraft, at the same altitude or less than 1000ft (300m).

Only air traffic control positions who can give air traffic control services using radar can define these minima. These minima are not applied for a tower controller for taking-off separation.

Note that in the IVAO network, IvAc will provide ATS surveillance system to all positions.

3. Non-radar wake turbulence longitudinal separation minima

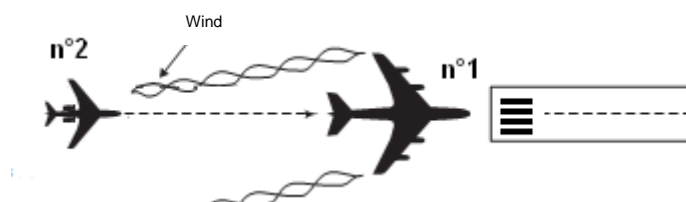
During non-radar en-route or arrival sequence and departure sequence of aircraft, an air traffic controller shall apply a minimum separation due to wake turbulence phenomena.

3.1. Arriving aircraft

3.1.1. Separation minima

The following separation minima for arriving aircraft shall be applied by the air traffic controller:

Succeeding aircraft	behind	preceding aircraft	Separation minima
Medium	behind	Heavy	2 minutes
Light	behind	Heavy	3 minutes
Light	behind	Medium	3 minutes
Medium	behind	A380	3 minutes
Light	behind	A380	4 minutes



Note that all Boeings 757 which category is MEDIUM shall be considered as HEAVY as first aircraft.

Wake turbulence separation minima	Version 1.2	31 December 2015	Page 2
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3.1.2. Applicability

An air traffic controller shall not be required to apply wake turbulence separation:

- For arriving VFR flights landing on the same runway as a preceding landing aircraft (heavy or medium)
- Between arriving IFR flights executing visual approach when the aircraft has reported the preceding aircraft in sight and has been instructed to follow and maintain own separation from that aircraft.

Note that in IVAO, a tower controller is not responsible of the wake turbulence for arrival separation. The approach controller is responsible of the separation during his approach sequence preparation.

3.1.3. Wake turbulence separation and pilot in command

The pilot-in-command shall be responsible for ensuring that the spacing from preceding aircraft of a heavier wake turbulence category is acceptable.

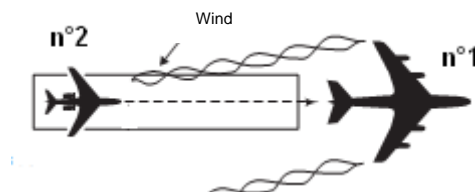
If it is determined that additional spacing is required, the pilot shall inform the air traffic controller accordingly, stating their requirements.

3.2. Departing aircraft

3.2.1. General case

The following separation minima for departing aircraft shall be applied by the air traffic controller:

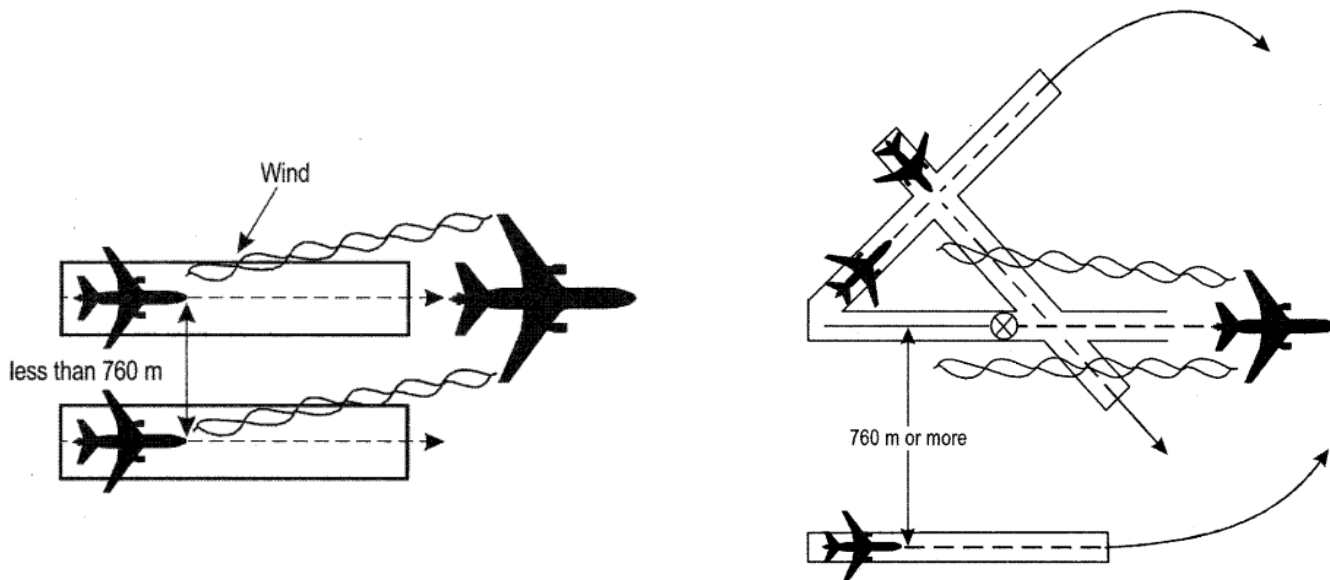
Succeeding aircraft	behind	preceding aircraft	Separation minima
Medium	behind	Heavy	2 minutes
Light	behind	Heavy	2 minutes
Light	behind	Medium	2 minutes
Medium	behind	A380	3 minutes
Light	behind	A380	3 minutes



These separation minima shall be applied only when aircraft are using:

- The same runway
- Parallel runways separated by less than 760m (2500ft)
- Crossing runway if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 1000ft (300m) below.
- Parallel runways separated by 760m (2500ft) or more, if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 300m (1000ft) below.

Wake turbulence separation minima	Version 1.2	31 December 2015	Page 3
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Images showing the condition applicable with the 2 minutes separation minima

Note that all Boeings 757 which category is MEDIUM shall be considered as HEAVY as first aircraft.

3.2.2. Departure from an intermediate part of the runway

If the second aircraft will take off from an intermediate part of the same runway or a parallel runway by less than 760m (2500ft), the separation minima time shall be extended.

Succeeding aircraft	behind	preceding aircraft	Separation minima
Medium	behind	Heavy	3 minutes
Light	behind	Heavy	3 minutes
Light	behind	Medium	3 minutes
Medium	behind	A380	4 minutes
Light	behind	A380	4 minutes

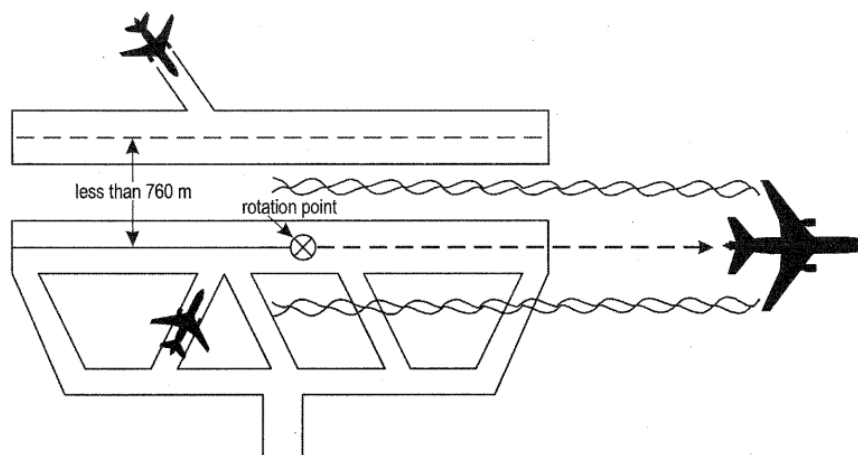


Image showing the condition applicable with the 3 minutes separation minima

3.2.3. Displaced landing threshold

A separation minimum shall be applied between a MEDIUM or LIGHT departing aircraft behind a HEAVY arriving aircraft when operating on a runway with a displaced landing threshold:

departing aircraft	behind	arriving aircraft	Separation minima
Medium	behind	Heavy	2 minutes
Light	behind	Heavy	2 minutes
Light	behind	Medium aircraft	2 minutes

A separation minimum shall be applied between a MEDIUM or LIGHT arriving aircraft behind a HEAVY departing aircraft when operating on a runway with a displaced landing threshold:

arriving aircraft	behind	departing aircraft	Separation minima
Medium	behind	Heavy	2 minutes
Light	behind	Heavy	2 minutes
Light	behind	Medium	2 minutes

3.2.4. Opposite direction

Sometimes due to local regulations and geographical constraints the runway must be used in an opposite-direction runway take-off.

A **separation minimum of 2 minutes** shall be applied between a LIGHT or MEDIUM aircraft and a HEAVY aircraft and between a LIGHT aircraft and a MEDIUM aircraft when the heavier is making a low or missed approach and the lighter aircraft is:

- Utilizing an opposite direction runway for take-off
- Landing on the same runway in the opposite direction
- Landing on a parallel opposite direction runway separated by less than 760m(2500ft)