

Wake Turbulence Separation

Wake turbulence refers to **vortex turbulence** generated by aircraft, particularly during **takeoff and landing**. Controllers must ensure **minimum separation distances** to prevent accidents caused by wake turbulence.

When is Wake Turbulence Separation Required?

Wake turbulence separation applies in situations where **wake turbulence is expected**, including:

Enroute Separation (Radar-Separated Aircraft)

Separation is required if:

- An aircraft is directly **behind another aircraft** at the **same altitude** or **less than 1000ft below**.
- An aircraft **crosses behind another aircraft** at its **6 o'clock position**, at the **same altitude** or **less than 1000ft below**.

Approach and Departure Phases

Separation is required when:

- An aircraft is directly **behind another aircraft** at the **same altitude** or **less than 1000ft below**.
- An aircraft **crosses behind another aircraft** at its **6 o'clock position**, at the **same altitude** or **less than 1000ft below**.
- Both aircraft use the **same runway** or **parallel runways** less than **760m apart**.
- Aircraft use **crossing or parallel runways (760m or more apart)** and one aircraft flies **through the flight path** of the preceding aircraft at the **same altitude** or **less than 1000ft below**.

Exceptions: When Wake Turbulence Separation is NOT Required

Wake turbulence separation **does not apply to**:

- **VFR approach flights**.
- **IFR approach flights performing a visual approach**, where the pilot:
 - Has **reported the preceding aircraft in sight**.
 - Has been **instructed to follow it** and **maintain their own separation**.

In these cases, a wake turbulence warning must be issued: "CAUTION WAKE TURBULENCE".

Phases of Flight for Wake Turbulence Application

Departure Phase

A **VFR flight** remains in the **departure phase** until:

- Reaching **1000ft above aerodrome level**.
- Reaching **level flight**.
- Entering **right downwind**.

Approach Phase

A **VFR flight** is in the **approach phase** when:

- It is at or below **1000ft above aerodrome level**.
- It has entered the **traffic pattern**.
- It has begun its **final descent** within a **control zone**.

Special Cases:

A **touch-and-go** is considered an **approaching aircraft until touchdown**, after which it is handled as a **departing aircraft**. A **low approach** is considered **approaching until it crosses the runway threshold**, after which it is considered **departing**.

Wake Turbulence Categories (WTC)

Aircraft are categorized based on **Maximum Takeoff Mass (MTOM)**:

WTC	MTOM
Light (L)	≤ 7t
Medium (M)	7t < MTOM < 136t
Heavy (H)	≥ 136t
Super (J)	A388; A225

Aircraft in the **Super (J) category** are treated as **Heavy (H) above FL100**. WTC information is always available in the **flight plan**.

Minimum Wake Turbulence Separation Values

Wake turbulence separation can be **distance-based** or **time-based**.

- **Distance-based** separation is the **default standard**.
- **Time-based** separation applies **when distance-based separation is not feasible**.

Distance-Based Wake Turbulence Separation

Preceding Aircraft	Following Aircraft	Minimum Separation
Super	Heavy	5.0 NM
	Medium	7.0 NM
	Light	8.0 NM
Heavy	Heavy	4.0 NM
	Medium	5.0 NM
	Light	6.0 NM
Medium	Light	5.0 NM

Time-Based Wake Turbulence Separation

Time-based separation is used for **departing and approaching aircraft**.

If an aircraft departs from an **intersection** or **crossing runway**, **1 minute is added** to the separation value.

Departing aircraft

Preceding	Suceeding	Separation value	Separation value (intersection)
M	L	2 min	3 min
H	L	2 min	3 min
	M	2 min	3 min
J	L	3 min	4 min
	M	3 min	4 min
	H	2 min	3 min

Approaching aircraft

Preceding	Suceeding	Separation value
M	L	3min

H	L	3min
	M	2min
J	L	4min
	M	3min
	H	2min

Minimum Time Separation: Mixed Arrival/Departure Use with Displaced Threshold

Suceeding Aircraft	Preceding Aircraft	Time Separation
Departing Heavy	Super arrival	2 minutes
Departing Light/Medium	Heavy arrival	2 minutes
Departing Light	Medium arrival	2 minutes
Heavy arrival	Super departure	2 minutes
Light/Medium arrival	Heavy departure	2 minutes
Light arrival	Medium departure	2 minutes
Departing Light/Medium	Super arrival	3 minutes
Light/Medium arrival	Super departure	3 minutes

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