

# Aircraft General Knowledge

how to use aircraft

1 of 14

## Principles of Flight and Aerodynamics



2 of 14

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## INTRODUCTION :

The Boeing 787 Dreamliner is a long haul passenger aircraft designed by Boeing Commercial Airplanes. It made its first flight in December 2009 and entered commercial service in 2011.



## **Design and Construction :**

The Boeing 787 Dreamliner is a long-haul, wide-body, twin-engine jet designed for efficiency, comfort. Its design emphasizes lightweight construction, with approximately 50% of the airframe made from advanced composite materials, primarily carbon fiber-reinforced polymers, reducing overall weight and improving fuel efficiency by around 20% compared to earlier models.



## Technological Innovations :

- 1. Composite Materials:** About 50% of the 787's structure (including the fuselage and wings) is made from carbon fiber-reinforced polymer.
- 2. Advanced Aerodynamics:** The aircraft features raked wingtips, flexible composite wings, and smooth surfaces that reduce drag and improve lift.
- 3. Large, Dimmable Windows:** Electrochromic smart windows allow passengers to adjust tint electronically, eliminating the need for traditional window shades.



## Passenger comfort :

The Boeing 787 Dreamliner is designed with passenger comfort as a top priority, featuring innovations that significantly enhance the in-flight experience. Its composite fuselage allows a lower cabin altitude of about 6,000 feet and higher humidity levels, reducing fatigue and dehydration during long flights.



## Performance and global effect :

The Boeing 787 Dreamliner delivers outstanding performance and has had a significant global impact on the aviation industry. Its advanced design, lightweight composite structure, and highly efficient engines enable up to 20% lower fuel consumption and CO<sub>2</sub> emissions.



## Conclusion :

The Boeing 787 Dreamliner is important because it represents a major leap forward in the efficiency, sustainability, and comfort of modern air travel. By using advanced composite materials and highly efficient engines, it reduces fuel consumption and carbon emissions by around 20%, helping airlines lower costs and shrink their environmental footprint.



THANK YOU

