

THE AIRFISH 8 GROUND EFFECT FLYING BOAT

<https://www.dailymail.co.uk/sciencetech/article-5444107/Airfish-8-carry-8-passengers-water-120mph.html>

1) Stunning images have revealed an incredible flying boat that soars above the water on a cushion of air at speeds of up to 120mph (106 knots / 196km/h). The winged Airfish 8 can carry up to eight passengers and could revolutionize travel between thousands of islands in Indonesia, the Philippines, Polynesia and the Caribbean, among others. The firm behind its creation is currently in the process of designing and building a larger craft, which could carry up to 50 people.



AF8 is powered by a powerful yet compact seven-litre V8 500bhp racing car engine that runs on 95 Octane automotive-grade unleaded gasoline, cheaper than aviation fuel.

The AirFish 8 (AF8) is a wing-in-ground-effect (Wig) craft created by Singapore firm Wigetworks, designed to be operated by two crew and can carry between six and eight passengers. Wigs are technically boats rather than aircraft, but the vessels are capable of operating completely above the surface of the water.



2) A wing-in-ground (Wig) effect craft is technically a boat rather than an aircraft, but the vessels are capable of operating completely above the surface of the water. They glide on a cushion of air, created by aerodynamic lift due to the ground effect between the vessel and the water, around half a meter to six meters (1.5 to 19 feet) above the surface.

Ground effect is the increased lift and decreased aerodynamic drag that an aircraft's wings generate when they are close to a fixed surface.

3) Wig craft are much faster than conventional boats; they're capable of operating at speeds in excess of 100 knots (115 mph / 185 kph). This is compared to 10 or 20 knots (10 to 20 mph / 18 to 40 kph) in larger marine crafts. Wigs also consume less fuel whilst traversing at these faster speeds. As a waterborne vehicle, Ground Effect craft require no runway for take-off and landing. This minimizes set-up costs incurred by governments or private companies to operate the craft.

Wigs are also designed to minimize the risk of flight accidents. Should an engine hardware failure unexpectedly occur, the Wig is able to land immediately on an ever-present runway a few meters below. At a lower flight altitude and above sea-water, passenger altitude sickness or motion sea-sickness should also be significantly reduced.

In addition, berthing stations for Wigs can be built rapidly with relatively simple, inexpensive and traditional methods, including as wooden jetties and plastic pontoons. The small hull also means docking stations can be constructed in shallow waters near the shore line. This makes Wigs ideal vehicles for reaching places where traditional aircraft and ferry boats can't reach.

Speaking to Channel NewsAsia, executive director Kenneth Tan said: 'There are a lot of islands that do not have the funding to build infrastructure to take light aircraft or even bigger aircraft. 'And there are islands that are too far away, whereby conventional ferry travel could be too

long. And these islands are, most of the time, left deserted. 'With this craft, we're breaking into new frontiers, reopening up all these islands for future development.'



4)

<https://www.ship-technology.com/projects/airfish-8-wig-craft/>

The first prototype WIG marine craft, AF8-001, was originally built by Airfoil Development (AFD) in the 1990s. The prototype was acquired and transferred to Wigetworks in 2004. Refurbished by Wigetworks, the prototype underwent extensive sea trials in Singapore in 2007 and Thailand in 2008. The prototype was accepted for entry into Lloyd's Register Class in April 2010 and was awarded 100A1 WIG, MCH TYPE A Passenger class certification by Lloyd's Register in August 2010.

The maiden flight of the first pre-production vessel was conducted in October 2015, while the second pre-production marine craft made its first flight in November 2016.

Final design of the AirFish 8 WIG marine craft is expected was completed in the second half of 2018.

5)

AirFish 8 is made of carbon fibre reinforced plastic or sandwich composite materials. It is based on Dr Alexander Martin Lippisch's reverse delta wing design. Its design standards comply with International Maritime Organization (IMO) regulations.

The main fuselage of the AirFish 8 is similar to that of conventional aircraft. The AirFish 8 has an overall length of 17.2m, height of 3.5m and wingspan of 15m. It has a low waterborne draught

of 0.55m, which enables operations and berthing in shallow waters close to the shoreline with minimal support or infrastructure.

6)

The WIG marine craft can carry two crew members and up to eight passengers. It has a 360kg baggage capacity. The cabin is 4m-long and 1.4m-wide and can be installed with a six or eight-seat layout according to customer specification. The crew section is positioned in the front, while the passenger and baggage compartments are located in the middle and rear respectively. Seats are arranged in two rows, separated by a space leading to the luggage area at the rear. The main access door is located between the crew and passenger seats. An emergency exit hatch is located opposite.

7)

Based on a German prototype, the Air Fish 8 has a 17m by 15m (56 by 50ft) footprint and is two to three times faster than most ferries. It requires around 500m (1,600ft) to takeoff or land and has a range of around 300 nautical miles (300 miles / 926km). AF8 is powered by a powerful yet compact seven-litre V8 500bhp racing car engine that runs on 95 Octane automotive-grade unleaded gasoline, cheaper than aviation fuel.

AirFish 8 is powered by a pair of General Motors LS3 V8 engines burning unleaded gasoline. Each engine has a maximum power output of 500hp, coupled to a four-bladed reversible variable pitch propeller. In standard configuration, the engine uses approximately 70 litres of fuel per hour in typical flight conditions. The power-plant enables the marine craft to attain a maximum speed of 106 knots and a cruise speed of 80 knots, travelling at up to 7 m above sea level. The WIG marine craft can travel up to 300 nautical miles without any additional supplies.

The turning radius of the AirFish 8 is approximately 160m in ground effect mode and 100m in displacement mode. AirFish 8 requires a 500m take-off distance and a 300m-500m landing distance. It has a maximum take-off weight of 5,550kg and can carry 1,000kg of useful load and 200kg of fuel on-board.

ARE THE QUESTIONS BELOW TRUE, FALSE OR NG (NOT IN THE TEXT)? UNDERLINE AND NUMBER THE SENTENCES IN THE TEXT FOR EACH ANSWER.

- 1) Three versions of Airfish 8 were built by Wigetworks. T F NG
- 2) Ground effect is experienced when the Airfish is flying at a height of between 1.5 and 6 metres, whether over land or sea. T F NG
- 3) The Airfish is equipped to land on the ground as well as the sea. T F NG
- 4) The prototype of the Airfish was rebuilt by Wigetworks in 2008. T F NG
- 5) The Airfish can't take off vertically. T F NG
- 6) The passengers sit in front of the baggage compartment. T F NG
- 7) The emergency exit is located behind the passenger seats. T F NG

WRITE THE LETTERS OF THE CORRECT SENTENCE ENDINGS:

1. Ground effect craft are more economical to operate _____
2. Ground effect craft can be docked in places _____
3. It's easy and cheap to build _____
4. Because ground effect craft fly above the water _____
5. The Airfish 8 doesn't need to _____
6. The costs of operating Airfish are _____
 - a) passengers don't become seasick.
 - b) conventional aircraft and boats can't reach.
 - c) when flying at higher speeds.
 - d) docking stations for ground effect craft.
 - e) are less than for conventional airplanes.
 - f) land at an airport.

WRITE THE LETTER OF THE HEADINGS NEXT TO THE CORRECT NUMBERED SECTIONS

- ~~A. What the Airfish Is~~
- B. Advantages of The Airfish Compared to Conventional Craft
- C. Airfish 8 Design Details
- D. Engine & Performance
- E. How Do Ground Effect Craft Work?
- F. The Airfish: Development & Trials
- G. Cabin Details

SECTIONS 1. A. What the Airfish Is 2. 3. 4. 5. 6. 7.

