

**Epreuve du 1^{er} groupe****Innovative materials**

Airbus has pioneered the use of composites and other advanced materials in aircraft design and manufacturing, resulting in an industry-leading product line of economical and **environmentally-friendly jetliners**

5 Composite materials maximise weight reduction – as they typically are 20 per cent lighter than aluminium – and are known to be more reliable than other traditional metallic materials, leading to reduced aircraft maintenance costs, and a lower number of inspections during service. Additional benefits of composite technologies include added strength and superior durability for a longer lifespan.

10 To fully **leverage** these benefits, Airbus is continuously developing technologies to improve the speed of composite manufacturing, as it is more complicated than with traditional metallics.

Composites are corrosion-free, which lessens the quantity of chemicals necessary to protect structural components. The weight reductions from composites also result in lower fuel consumption during an aircraft's operational lifetime.

15 More than 50 per cent of the next-generation A350 XWB is made of composites, marking a significant milestone for aircraft production. This jetliner also represents the first Airbus aircraft that utilises a higher percentage of composite technologies than metallic applications. Its fuselage panels, frames, window frames, clips, and doors are made from carbon fibre reinforced plastic (CFRP), with a hybrid door frame structure consisting of this material and titanium being used for the first time.

20 By applying composites on the A350 XWB, Airbus has increased the service intervals for the aircraft from six years to 12, which significantly reduces maintenance costs for customers. The high percentage of composites also reduces the need for **fatigue-related inspections** required on more traditional aluminium jetliners, and lessens the requirement for corrosion-related maintenance checks.

Beyond the in-service inspection requirements, composite materials are evaluated during the manufacturing process through non-destructive testing (NDT) to guarantee "defect-free" qualities...

30 Airbus also recognises the individual operational advantages of both composites and metallics, and ensures that an overall airframe always will **feature** an optimum balance of both materials.

<http://www.airbus.com/innovation/proven-concepts/in-design/innovative-materials/>

READING COMPREHENSION

(9.5 marks)

A. Find in the text what the underline words refer to. **(1.5 marks)**

1. "these benefits":
2. "it":
3. "this material":

B. True / False: Justify by quoting from the text. **(4 marks)**

4. Airbus is the first aircraft manufacturing company to apply composites on airplanes.
.....
.....
5. Airbus is still finding processes to produce more composites.
.....
.....
6. The combination of the carbon fibre reinforced plastic and titanium makes up most parts of the AXWB.
.....
.....
7. Metallic materials are still applied on Airbus aircraft.
.....
.....

C. Complete the chart with information from the text. **(2 marks)**

Application of Composites on Airbus Aircraft

8. Amount of Composites on the A350XWB	a.
9. Composites used in the A350XWB	b. c.
10. Advantages of the application of composites	d. e. f. g.
11. Method for controlling the quality of Composites	h.

D. Circle the letter corresponding to the right answers. **(2 marks)**

12. "environmentally-friendly jetliners" are jetliners	a. with no negative impact on the environment b. with reactors consuming a fuel that does not pollute c. people are friendly with
13. "leverage" means to	a. search for the advantages b. take full advantage of c. identify the advantages
14. "fatigue-related inspection" is about	a. Following maintenance workers who are tired in the workplace. b. break or collapse condition of aircraft components making them unfit for work. c. how well the aircraft reactors work
15. "feature" means	a. show b. develop c. operate

LINGUISTIC COMPETENCE

(6.5 marks)

D. Reformulate the sentences using the prompts given.

(1 mark)

16. It is really a pity that Africans do not have the means to develop an aircraft industry.
I wish

17. Engineers are constantly working on new composites so that the quantity of chemicals on structural components can be reduced.

In order to

E. Put the verbs in brackets into the correct tense or form.

(2 marks)

If African countries had joined hands in an aircraft industry, they¹⁸
(**produce**) airplanes for the transport of people and goods in so large a continent. A continental aircraft industry¹⁹ (**better, serve,**) the interests of Africa. Unfortunately, evidence²⁰ (**show**) since independence that the efforts towards development²¹ (**undermine**) by internal conflicts.

F. Complete the sentences with words from the box.

(2 marks)

FEW / LITTLE / SOME / NO / MANY

22. The downing of the Malaysian airliner over Ukraine had left survivors.
The plane disintegrated in the sky.

23. was known about the exact place where another Malaysian airliner, the MH370, disappeared into the sea. A lot of means were put into the search but it was in vain.

24. For time, there was hope; but as the search remained unsuccessful, this hope faded away.

25. Technological developments have made it possible for to travel by air in safe conditions.

G. Complete the sentences with the right preposition.

(1.5 marks)

OFF IN ON UP

26. In Senegal now, we can board a plane to fly to Tambacounda or Ziguinchor.

27. It's still amazing to see a plane of hundreds of tons of weight take so easily like a bird.

28. Aircraft development requires settingdifferent production sites, each one manufacturing the 367.000 parts needed in a Boeing 767 for example.

WRITING

(4 marks)

Choose a topic and write a passage of not more than 150 words

Topic 1:

A friend of yours is planning to travel to Ziguinchor by sea but worries about safety. You advise her to take the plane. Give your reasons to show her why you think it's better to go by air.

Topic 2:

A lot of metal parts from old cars and metallic objects are abandoned and left everywhere in this country. Do you think that recycling would be a solution? Explain why.