

Assignment 5

The costs and benefits of airframe weight reduction

Problem statement

Airframe design pushes weight-saving to the extremes. The last few decades have seen a steady rise in the amount of 'composite' materials used in the airframe of aircraft. These have added strength but lowered the overall weight of the aircraft. The use of composites in one new aircraft has generated a weight saving of 20% over traditional aluminium alloys. There are monetary, environmental and material trade-offs in the choices of airframe design. Circular design may add weight instead of reducing it. But how much? And in view of a full life-cycle, what is better? How much weight can be added to achieve a circular aircraft?

Research question(s)

- What are the monetary, environmental and material trade-offs in the choices for airframe weight reduction?

Suggested academic backgrounds

- Aerospace engineering (TUD)
- Industrial Design (TUD)
- Industrial Ecology (TUD/Leiden)

Expected type of work

Technical assessment