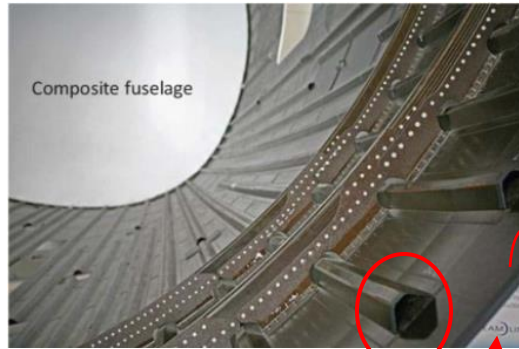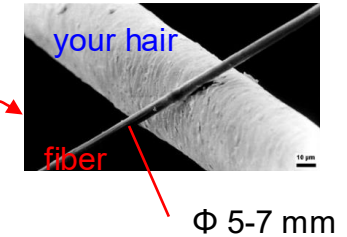# Composite Materials



Continuous fiber reinforced polymer laminate

t ~ 0.1 mm

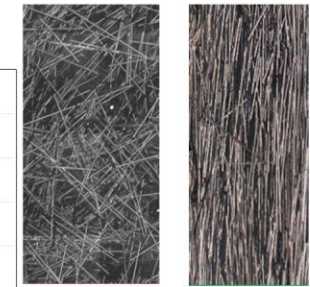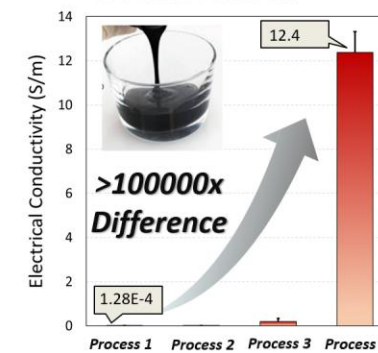Unidirectional ply

Fiber

Matrix

your hair

fiber

Φ 5-7 mm
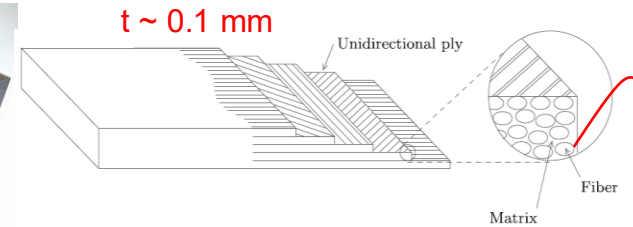
Reinforcement details
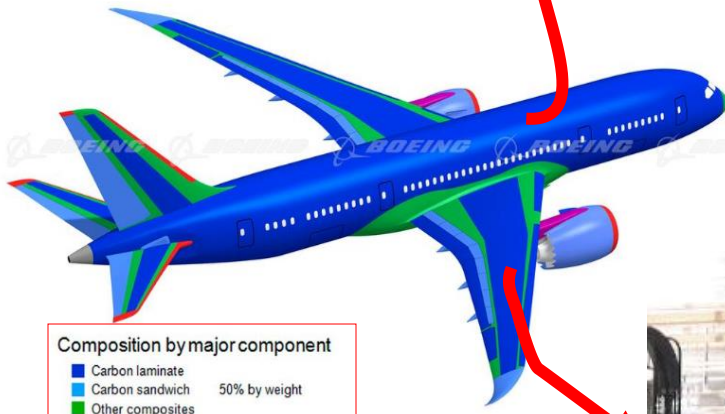
**Research on**

- Continuous fiber laminates
- Conductive composites
- High fidelity FEM

Electrical Conductivity of 3D Printed C-Fiber Ink

12.4

>100000x Difference

1.28E-4

- Same Ink/Material !!!
- Only change printing parameters
- **100000x** change in conductivity
- Conductor to Insulator Transition

Composition by major component
- Carbon laminate
- Carbon sandwich — 50% by weight
- Other composites
- Aluminum, 20%
- Titanium, 15%
- Titanium/steel/aluminum Steel, 10%
- Other, 5%

Permalink: http://www.boeingimages.com/archive/Boeing 787 Dreamliner Composition by Major Component-2JRSXLJW4ZHP.html
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View Photo/Video Only

**Enabling**

- In-house code for rapid virtual design and test composite aircrafts
- Creation of optimized structures with embedded damage detection layer for 24-7 monitoring
- Powerful surface layer for de-icing, anti-lightning strike etc.,
- Coupled with AI/ML for rapid search of optimal designs