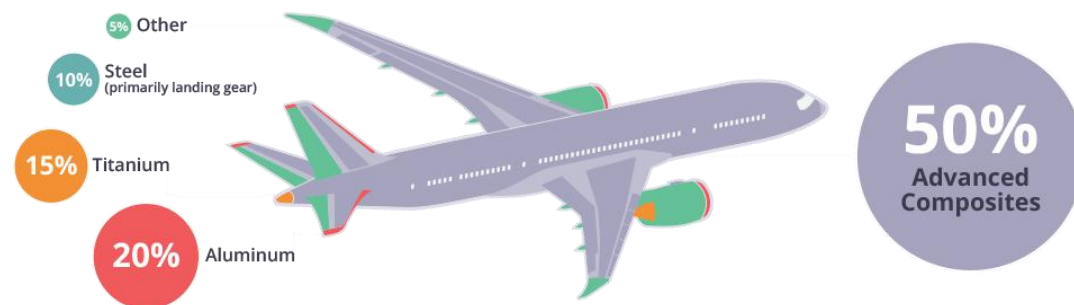


## Composites vs. Aluminum

As one of the most lightweight, malleable metals, aluminum has been used extensively throughout the modern world, most notably in aerospace applications. In recent years, however, composites have begun to supplant aluminum: Half of the Boeing 787 is made from advanced composites, while the remainder of the plane is constructed primarily of a combination of aluminum, steel and titanium

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By using composites to manufacture 50% of the Boeing 787's airframe, the aerospace leader knocked 20% of the weight off the aircraft compared to conventional aluminum designs.



Composites offer other advantages over aluminum, too:

- **Composites are excellent at handling tension** – In highly tension-loaded applications, such as the fuselage of airplanes, this helps decrease fatigue and maintenance. Aluminum is sensitive to tension loads.
- **Composites can create one-piece designs** – Fabricating a product in one piece, whether it's an airplane wing or a wind blade, reduces maintenance because there aren't any fasteners or joints.
- **Composites allow for precise weight distribution** – In an application such as baseball bats, this allows for either balanced loading that contributes to an effortless, fast swing or end loading, which helps power hitters gain more distance. Aluminum alloy bats have less precise weight distribution.
- **Composites are strong, yet flexible** – Composites ski poles, for instance, usually offer more flexibility and durability than standard aluminum ones: They can bend significantly without snapping.
- **Composites absorb vibrations** – Because they are non-elastic, composites dissipate the energy of vibrations, making them well-suited for applications ranging from equipment mounts to athletic shoe insoles. Aluminum doesn't absorb vibrations as well as composites.

The benefits of composites are easy to see, but if you're curious about what makes them so strong, light and flexible then delve into the **materials** behind these mighty products – resins, reinforcements, fillers/additives and core materials.