

Airplane Aluminum | Airplane Grade Aluminum

Aluminum is the perfect material to use when manufacturing airplanes, thanks in part to its unique properties and characteristics. It's strong, lightweight, predictable and inexpensive. Steel and iron are both stronger than aluminum, but strength alone isn't enough to justify its use in aerospace manufacturing. The problem with steel and iron is its weight. Both of these metals are much heavier than aluminum - and too much weight restricts an airplane's ability to takeoff and fly.

There are several different types of airplane aluminum used in aerospace engineering, but some are more suited to the aerospace industry than others, some of which include the following:

Aluminum 2024,
Aluminum 3003,
Aluminum 5052,
Aluminum 6061,
Aluminum 7075

2024 - The primary alloying element in 2024 aluminum is copper. 2024 aluminum can be used when high strength to weight ratios are required. Like the 6061 alloy, 2024 is used in wing and fuselage structures because of the tension they receive during operation.

5052 - The highest strength alloy of the non-heat-treatable grades, 5052 aluminum provides ideal expediency and can be drawn or formed into varying shapes. Additionally, it offers excellent resistance to saltwater corrosion in marine environments.

6061 - This alloy has good mechanical properties and is easily welded. It is a common alloy for general use and, in aerospace applications, is used for wing and fuselage structures. It is especially common in homebuilt aircraft.

6063 - Often referred to as the "architectural alloy", 6063 aluminum is known for providing exemplary finish characteristics, and is often the most useful alloy for anodizing applications.

7050 - A top choice for aerospace applications, alloy 7050 displays much greater corrosion resistance and durability than the 7075. Because it preserves its strength properties in wider sections, 7050 aluminum is able to maintain resistance to fractures and corrosion.

7068 - 7068 aluminum alloy is the strongest type of alloy currently available in the commercial market. Lightweight with excellent corrosion resistance, the 7068 is one of the toughest alloys presently accessible.

7075 - Zinc is the main alloying element in 7075 aluminum. Its strength is similar to that of many types of steel, and it has good machinability and fatigue strength properties. It was originally used in the Mitsubishi A6M Zero fighter planes during World War II, and is still used in aviation today.



Component	Material	Alloy Elements	Properties
Front legs of seat	Al 2017, Al 2024	Copper, Magnesium	Good machining, high strength, high fatigue strength, corrosion resistance
Wing leading edge	Al 2024		
Seat ejectors	Al 2024		
Backrests and armrests	Al 6xxx	Magnesium, Silicon	High strength, good formability weldability, corrosion resistance
Fuselage skins, stringers and bulkheads	Al 6013, Al 6050, Al 7050, Al 7079		
Wing skins, panels and covers	Al 7075	Zinc, Magnesium, Copper	Highest strength, high toughness, good formability
Rear legs of seat and seat spreaders	Al 7075		
Wing spars, ribs	7055-T77		
Wheels and loading gear links	7055-T77		
Horizontal and vertical stabilisers	Al 7xxx		
Upper and lower wing skins	8090-T86, 2055-T8, 2199-T8E80	Lithium, Copper, Magnesium	Low density, excellent fatigue and toughness, crack growth resistance
Floor sections of the aircraft	2090-T83, 2090-T62		
Sear structure	2090-T83		
Supporting members of fuselage structure	8090-T651, 2090-T651		

Why Choose Plane Aluminium Alloy in Aerospace Industry:

Light Weight — The use of aluminum alloys reduces the weight of an aircraft significantly. With a weight roughly a third lighter than steel, it allows an aircraft to either carry more weight, or become more fuel efficient.

High Strength — Aluminum’s strength allows it to replace heavier metals without the loss of strength associated with other metals, while benefitting from its lighter weight. Additionally, load-bearing structures can take advantage of aluminum’s strength to make aircraft production more reliable and cost-efficient.

Corrosion Resistance — For an aircraft and its passengers, corrosion can be extremely dangerous. Aluminum is highly resistant to corrosion and chemical environments, making it especially valuable for aircrafts operating in highly corrosive maritime environments.

