

ALUMINIUM

The backbone of lightweight airframe construction. Aluminium offers the best strength-to-weight ratio of any economically machinable structural metal, along with good corrosion resistance, formability and recyclability — which is why it remains the single most-used material in commercial and military airframes. Alltium Aerometrix carries the full aerospace spectrum across four alloy families, each defined by its principal alloying element. Temper designations (e.g. -T6, -T651, -O, -H111) denote the heat-treatment or work-hardening condition and are quoted on every certificate.

2000 Series (Al-Cu)

Copper as the principal alloying element gives heat-treatable, high-strength, high-fatigue alloys — the classic fuselage-skin and structural family. Corrosion resistance is lower than other series, so these are usually clad (Alclad) or anodised. Includes aluminium-lithium grades (2099/2195) that trade a premium for a further 5–7% weight and stiffness gain.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
2014-T6 AA2014 / AlCu4SiMg To-order	Cu 4.4, Si 0.8, Mn 0.8, Mg 0.5, bal Al	UTS 483 / YS 414 / El 13% ρ 2.80 g/cm ³ 135 HB Tmax 120°C	High strength, good machinability; loses corrosion resistance vs 6xxx (usually clad or anodised) Forms: Plate, Sheet, Bar, Rod, Forging, Extrusion Use: Aircraft structures, fittings, wheels, heavy-duty forgings
2024-T3 / T351 AA2024 / AlCu4Mg1 / Duralumin Day-one	Cu 4.4, Mg 1.5, Mn 0.6, bal Al	UTS 470 / YS 325 / El 20% ρ 2.78 g/cm ³ 120 HB Tmax 120°C	Excellent fatigue resistance & damage tolerance; the classic fuselage-skin alloy. Clad (Alclad) for corrosion Forms: Sheet, Plate, Bar, Rod, Extrusion, Wire Use: Fuselage skins, wing tension structure, fasteners
2219-T87 AA2219 / AlCu6Mn To-order	Cu 6.3, Mn 0.3, V/Zr/Ti, bal Al	UTS 475 / YS 395 / El 10% ρ 2.84 g/cm ³ 130 HB Tmax 200°C	Weldable, retains strength at elevated & cryogenic temperature; launch-vehicle tank alloy Forms: Plate, Sheet, Bar, Forging Use: Launch-vehicle propellant tanks, high-temperature airframe

2000 Series (Al-Li)

Aluminium-lithium: lithium additions cut density and raise stiffness, delivering primary-structure weight savings of ~5–7% over conventional 2000-series alloys. Used on next-generation airframes and launch-vehicle structure where every kilogram is costed.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
2099 / 2195 (Al-Li) Aluminium-Lithium To-order	Cu 2.5, Li 1.8, Zn 0.7, Mg, bal Al	UTS 560 / YS 490 / El 8% ρ 2.63 g/cm ³ 145 HB Tmax 150°C	~5-7% lighter and stiffer than conventional Al; premium weight-saving structural alloy Forms: Plate, Extrusion, Forging Use: Next-gen airframe, launch-vehicle structure (SLS/Falcon class)

5000 Series (Al-Mg, Marine)

Magnesium-strengthened, non-heat-treatable alloys hardened by cold work. They offer the best saltwater and cryogenic corrosion resistance of the common series and are highly weldable — the marine, defence-hull and LNG-tank family, led by 5083.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
5083-O / H111 AA5083 / AlMg4.5Mn Day-one	Mg 4.4, Mn 0.7, Cr 0.15, bal Al	UTS 290 / YS 145 / El 20% ρ 2.66 g/cm ³ 75 HB Tmax 65°C	Best seawater & cryogenic corrosion resistance of the common alloys; non-heat-treatable, highly weldable Forms: Plate, Sheet, Bar Use: Marine hulls, defence vehicle armour backing, cryogenic tanks, LNG
5086-H116 AA5086 / AlMg4 To-order	Mg 4.0, Mn 0.45, Cr 0.15, bal Al	UTS 290 / YS 207 / El 12% ρ 2.66 g/cm ³ 82 HB Tmax 65°C	High strength among marine grades; superb saltwater corrosion resistance Forms: Plate, Sheet Use: Marine structures, pressure vessels, defence

6000 Series (Al-Mg-Si)

The versatile all-rounder: magnesium and silicon give a heat-treatable alloy that is weldable, corrosion-resistant, readily extruded and easily machined. 6061 is the general-purpose structural standard; 6082 is the higher-strength European equivalent.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
6061-T6 / T651 AA6061 / AlMg1SiCu Day-one	Mg 1.0, Si 0.6, Cu 0.28, Cr 0.2, bal Al	UTS 310 / YS 276 / El 12% ρ 2.70 g/cm ³ 95 HB Tmax 150°C	The all-round structural alloy: weldable, corrosion-resistant, extrudable, machinable Forms: Plate, Sheet, Bar, Rod, Tube, Extrusion, Profile Use: Airframe secondary structure, tooling, jigs, general engineering
6082-T6 AA6082 / AlSi1MgMn To-order	Mg 0.9, Si 1.0, Mn 0.7, bal Al	UTS 340 / YS 310 / El 10% ρ 2.70 g/cm ³ 100 HB Tmax 150°C	Highest-strength 6xxx; European structural standard, excellent extrudability Forms: Bar, Tube, Extrusion, Profile, Plate Use: Structural frames, hydraulic manifolds, transport

7000 Series (Al-Zn)

Zinc as principal alloying element produces the highest-strength aluminium alloys, approaching the strength-to-weight of steel. Reserved for the most highly stressed structure — wing spars, fuselage frames and machined fittings. 7050 adds thick-section and stress-corrosion performance over 7075.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
7075-T6 / T651 AA7075 / AlZn5.5MgCu Day-one	Zn 5.6, Mg 2.5, Cu 1.6, Cr 0.23, bal Al	UTS 572 / YS 503 / El 11% ρ 2.81 g/cm ³ 150 HB Tmax 120°C	Steel-approaching strength-to-weight; the high-stress airframe workhorse (site headline grade) Forms: Plate, Sheet, Bar, Rod, Extrusion, Forging Use: Wing spars, fuselage frames, high-stress fittings, gears
7050-T7451 AA7050 / AlZn6CuMgZr Day-one	Zn 6.2, Mg 2.3, Cu 2.3, Zr 0.12, bal Al	UTS 524 / YS 469 / El 11% ρ 2.83 g/cm ³ 140 HB Tmax 120°C	Thick-section strength with superior stress-corrosion-cracking & fracture toughness vs 7075 Forms: Plate (thick), Bar, Forging, Extrusion Use: Bulkheads, thick wing skins, fuselage frames, landing-gear components

Forms by industry —

Aerospace: Plate, sheet, bar, extrusion, forging, wire — skins, spars, frames, fittings, rivets, tooling

Automotive: Extrusion, bar, sheet, forging — chassis, subframes, EV battery trays, motorsport

Oil & Gas: Bar, tube, plate — marine/LNG (5083), instrumentation