

AIRWARE®

T A I L O R E D

P E R F O R M A N C E

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AIRWARE® — THE TECHNOLOGY TO MEET YOUR NEEDS



Backed by decades of pioneering research, this unique tailored technology made by Constellium unlocks the potential of aluminium to deliver top quality and unparalleled performance - lifting your engineering projects to new heights.

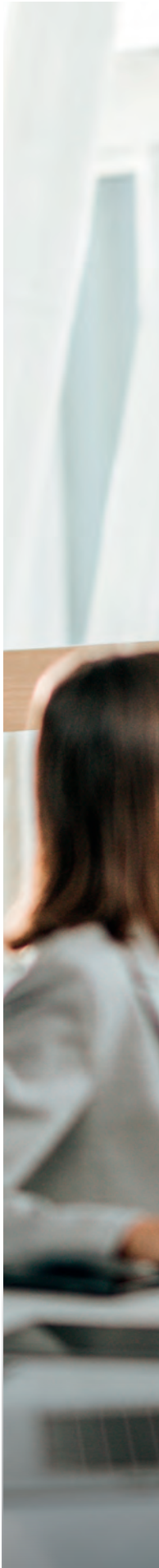
The aerospace industry is constantly evolving, so we work in partnership with industry leaders to develop customized aluminium-lithium alloy solutions that not only deliver top performance, but also promote efficient design and lean production processes.

AIRWARE®
IS THE PERFORMANCE
LAUNCHPAD FOR YOUR NEXT
AEROSPACE PROJECT

ALUMINIUM, REINVENTED

Airware® provides low density, strength, thermal stability, corrosion resistance, and more.

- Developed through over 20 years of R&D, Airware® pushes the boundaries of engineering to bring together a truly unique combination of benefits.





THE SWEET SPOT

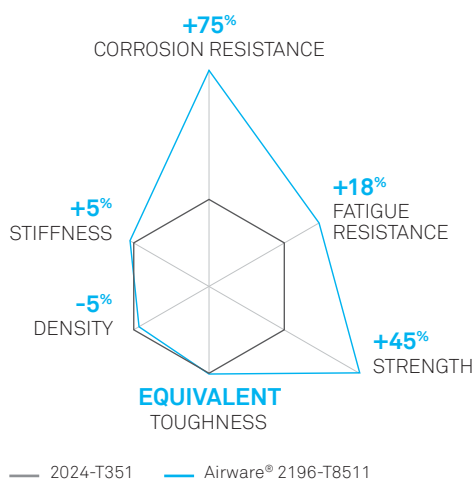
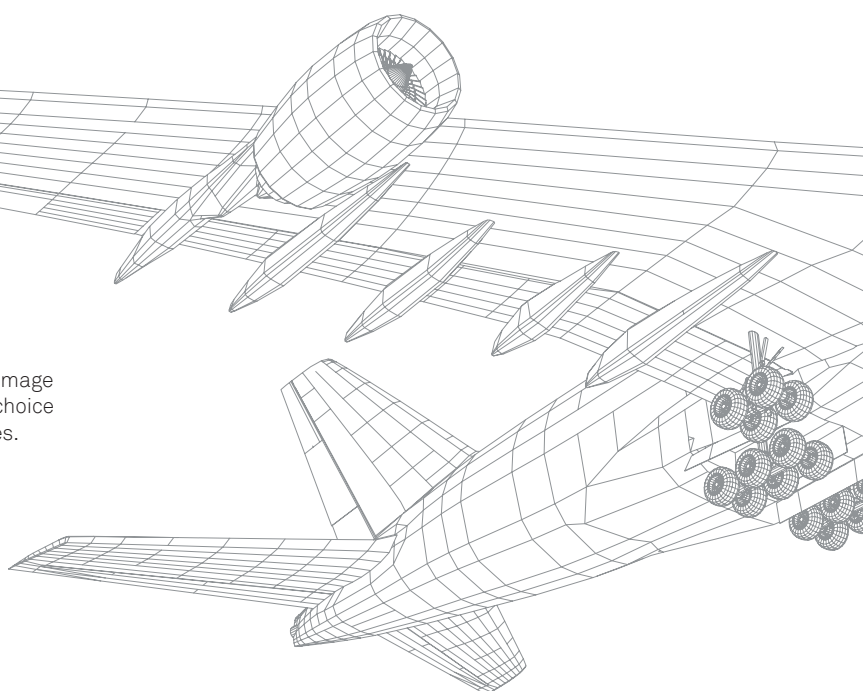
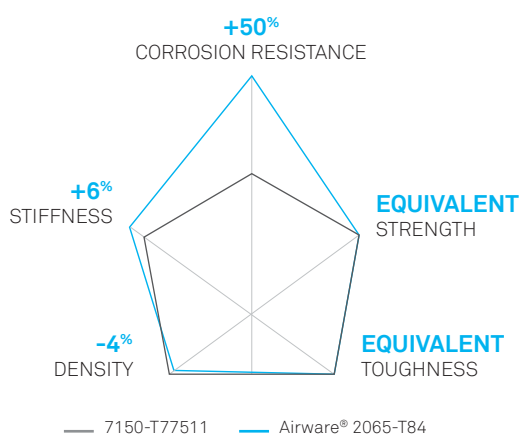
Airware® flies in a sweet spot in the Al-Cu-Li domain: it offers tailored property balance, easy processing and manufacturing, and endless recyclability.

TAILORED SOLUTIONS FOR YOU

The right material choice for aerostructures has a major impact on aircraft performance and manufacturability. Airware® not only delivers high-performance solutions; it can help you to achieve a leaner and more efficient supply chain too.

**Airware® 2065****FUSELAGE, WING, INTERNAL STRUCTURE**

Low density, high stiffness, very high strength and good damage tolerance make Airware® 2065 extrusions a very attractive choice for cargo beam, seat tracks, fuselage stringers and frames.

**Airware® 2196****FUSELAGE, WING, INTERNAL STRUCTURE**

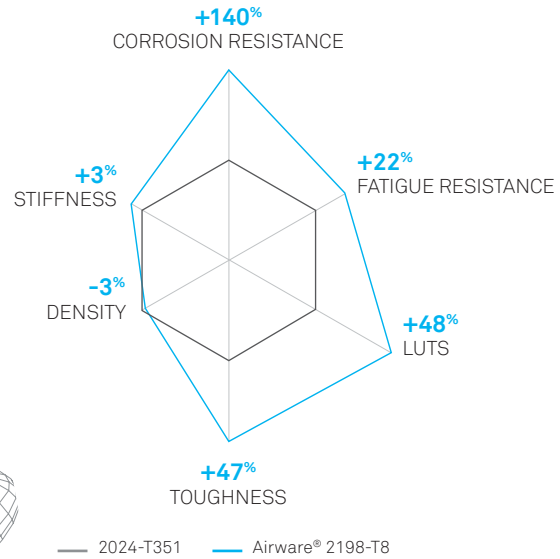
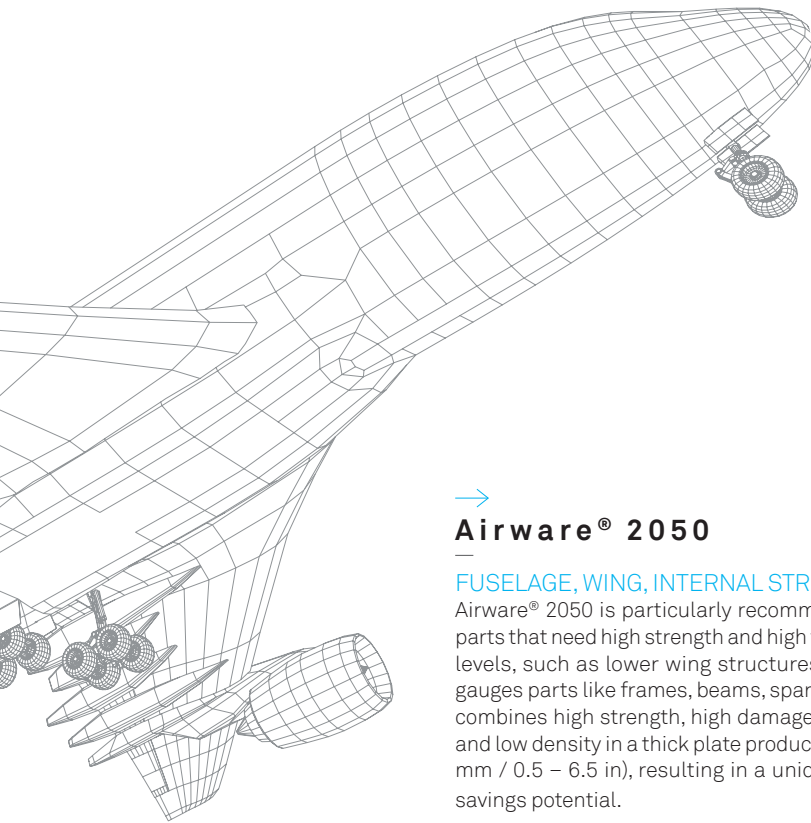
A balanced strength-toughness solution best suited to stiffening damage tolerant fuselage and lower wing skins. It is also used in buckling applications and recommended for inner structure parts. Its higher Young modulus allows an extra weight reduction in addition to lower density.



Airware® 2198

FUSELAGE

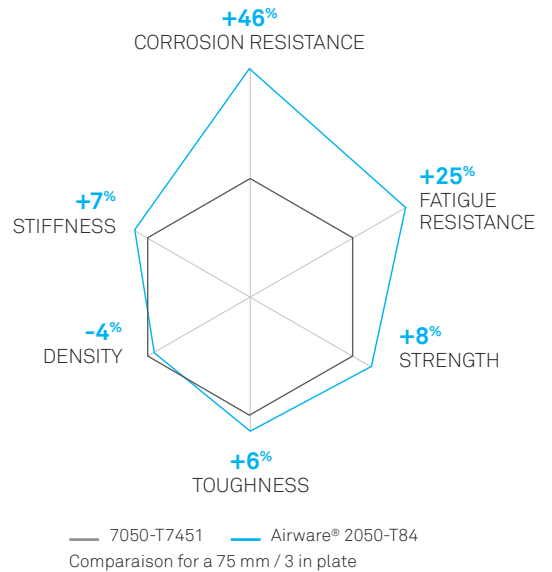
This low density solution is available in thin gauge and it offers high damage tolerance, high static properties, excellent fatigue and corrosion resistance. Its excellent corrosion performance, in both exfoliation and stress corrosion, leads to reduced maintenance costs.



Airware® 2050

FUSELAGE, WING, INTERNAL STRUCTURE

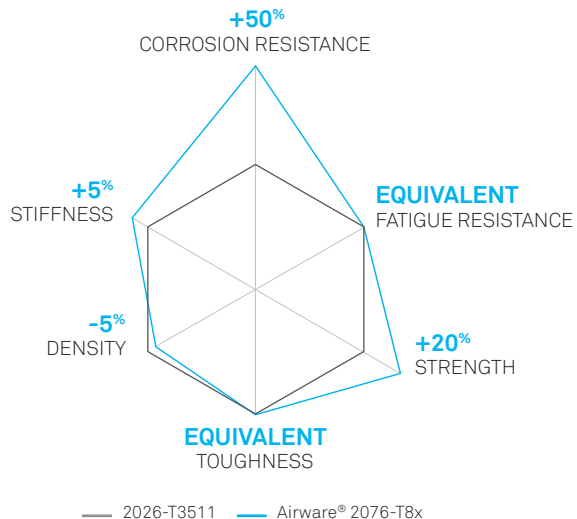
Airware® 2050 is particularly recommended for parts that need high strength and high toughness levels, such as lower wing structures or heavy gauges parts like frames, beams, spars or ribs. It combines high strength, high damage tolerance and low density in a thick plate product (12 – 165 mm / 0.5 – 6.5 in), resulting in a unique weight savings potential.



Airware® 2076

WING

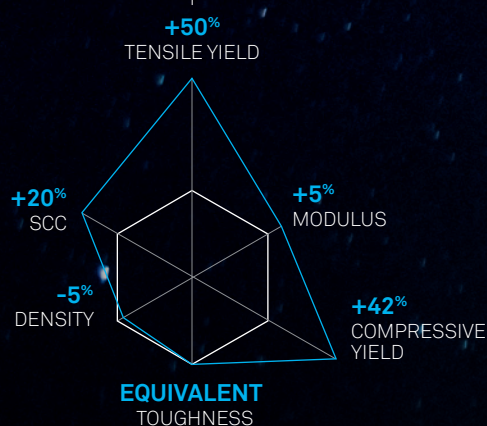
High damage tolerance extrusions for stiffening lower wing skins. Benefits include weight savings, easy integration with existing processes, and reduced maintenance.



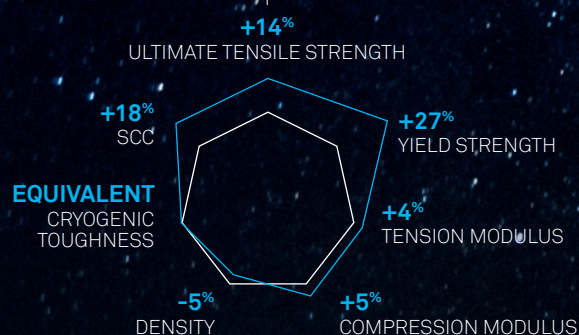
SPACE HAS NO LIMIT

Constellium is committed to offering innovative solutions that demonstrate the performance and benefits of Airware® in space applications. Industry leaders have responded by selecting Airware® technology for key structural materials to solve their design challenges.

Airware® 2195-T84 vs. 2219-T87
(Comparison for 25.4 mm/1.0 in)



Airware® 2050-T84 vs. 2219-T87
(Comparison for 50.8 mm/2.0 in)



— CURRENT SOLUTION | — AIRWARE® SOLUTION

→ Airware® first ventured into space in 1998, when it was chosen to replace legacy alloy 2219 for cryogenic components of the space shuttle external tank. In addition to many demanding material properties, Airware® 2195 offered enhanced damage tolerance and corrosion resistance. Its lower density also helped the program to substantially increase its payload capacity.

WEIGHT SAVINGS

Airware® 2195 enabled a redesign that represented weight savings of around 11%, i.e. 3,200 kg on an external tank with an original empty weight of nearly 29,600 kg.

LAUNCH PHASE

For the Orion crew module, NASA and its industrial partner, Lockheed Martin, selected Airware® as the key structural material. The aim: to deliver high-performance characteristics during the demanding launching phase and at the same time to have a lower density to facilitate the ascent to outer-space.

HIGH-PERFORMANCE

Light gauge Airware® 2195 plate delivers improved performance for cryogenic tankage by optimized Friction Stir Welding (FSW) joining technologies.

VERSATILITY

Tailored Airware® 2050 enables the use of a high-performance and balanced solution to replace incumbent alloys such as 2219 for space components between 50 mm – 165 mm (2.0 - 6.5 in).

PUSHING AIRWARE® PERFORMANCE
TO THE NEXT LEVEL

Constellium's
R&D team takes
a holistic approach
to innovation.

That's why we
look not only at
the material level,
but also at design,
manufacturing,
& sustainability.

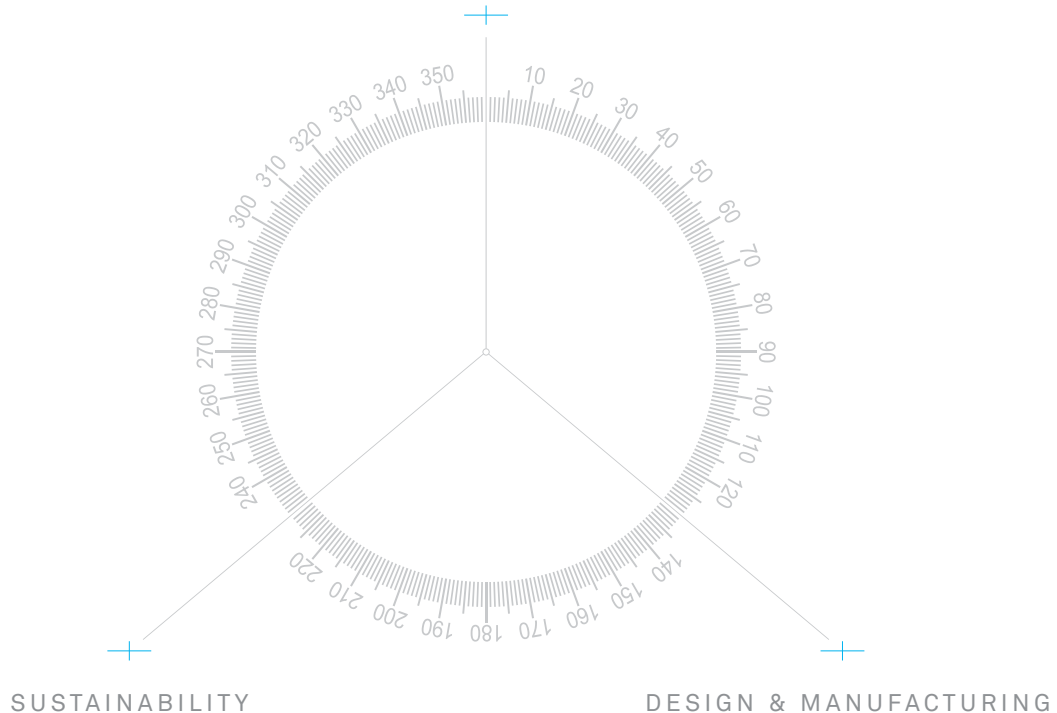


360° OF INNOVATION

MATERIAL

Reducing aircraft weight and delivering better material performance are key to creating game-changing aircraft in the future

We work in partnership with our customers to take Airware® performances to new heights. Our teams are focused on exploring other lines of alloys and improving existing ones to further deliver reduced density, higher stiffness, higher strength and improved corrosion and fatigue performance.



In order to optimize aircraft manufacturing processes, Airware® helps to save time, reduce part count and costs

Airware® allows for use of advanced manufacturing techniques such as friction stir welding and linear friction welding. By enabling near-net-shape blanks, these methods help to reduce the buy-to-fly ratio and enable material tailoring, making both design and manufacturing easier.

Recycling is key for allowing high-performance materials to be cost-effective, from production to end-of-life of an aircraft

Using recycled Airware® generates significant energy savings, as recycling uses only 5% of the energy needed to produce primary metal. Our experts are continuing to develop innovative processes and technologies to make Airware® even greener.

MEETING YOUR NEEDS

In close partnership with our customers, our R&D team continually adds new, customized alloys to the Airware® family of products. Each innovation is developed to meet your specific needs.

01

Constellium's game-changing Airware® technology bursts onto the scene, setting a new standard in aerospace aluminium technology

02

Airbus, Blue Origin, Bombardier and other major players in the aerospace industry establish strong partnerships with Constellium. We develop tailored solutions to meet their exact needs, leading to new innovations

03

Our partnerships with customers lead to the development of new ideas and materials, and an ever-growing offering of customized solutions

04

Thanks to its endless recyclability, Airware® can be used again and again for different applications, ensuring cost savings and sustainability

05

Airware® launches into space, bringing its unique benefits to spacecraft as well as aircraft

OVER TO YOU

Our customers' needs and ideas are what propel Airware® forward. Contact us to find out how we can bring tailored performance, efficiency, weight and cost savings, and more to your next project.

WHERE WILL AIRWARE®
TAKE YOU NEXT?

EXPERIENCE THE POWER OF TAILORED TECHNOLOGY



Backed by decades of the pioneering research, this unique tailor-made technology unlocks the potential of aluminium to deliver top quality and unparalleled performance - lifting your engineering projects to new heights. Airware® is the performance launchpad for the aerospace projects of the future.



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