wipro | wipro 3D

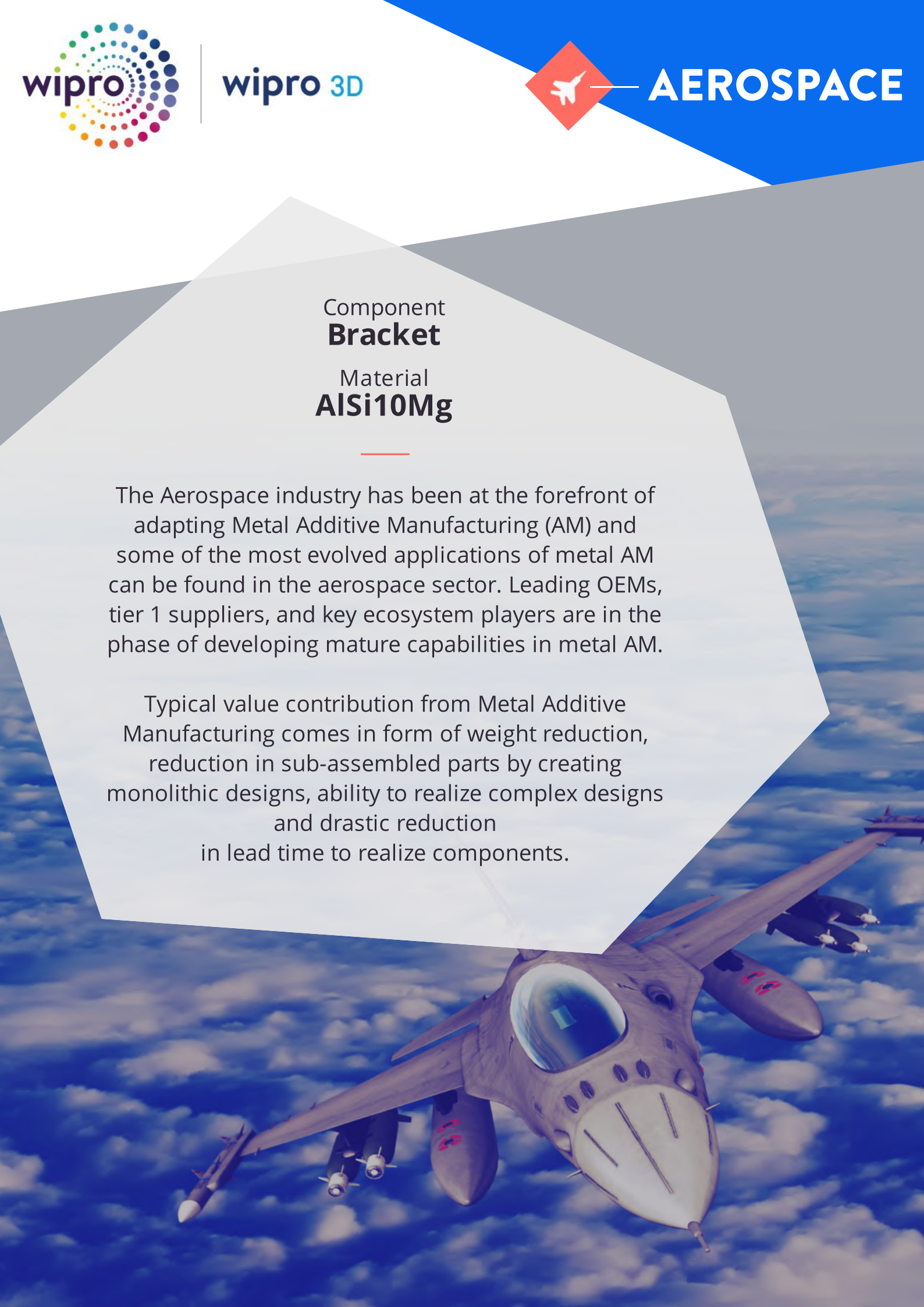
AEROSPACE

Component
Bracket

Material
AlSi10Mg

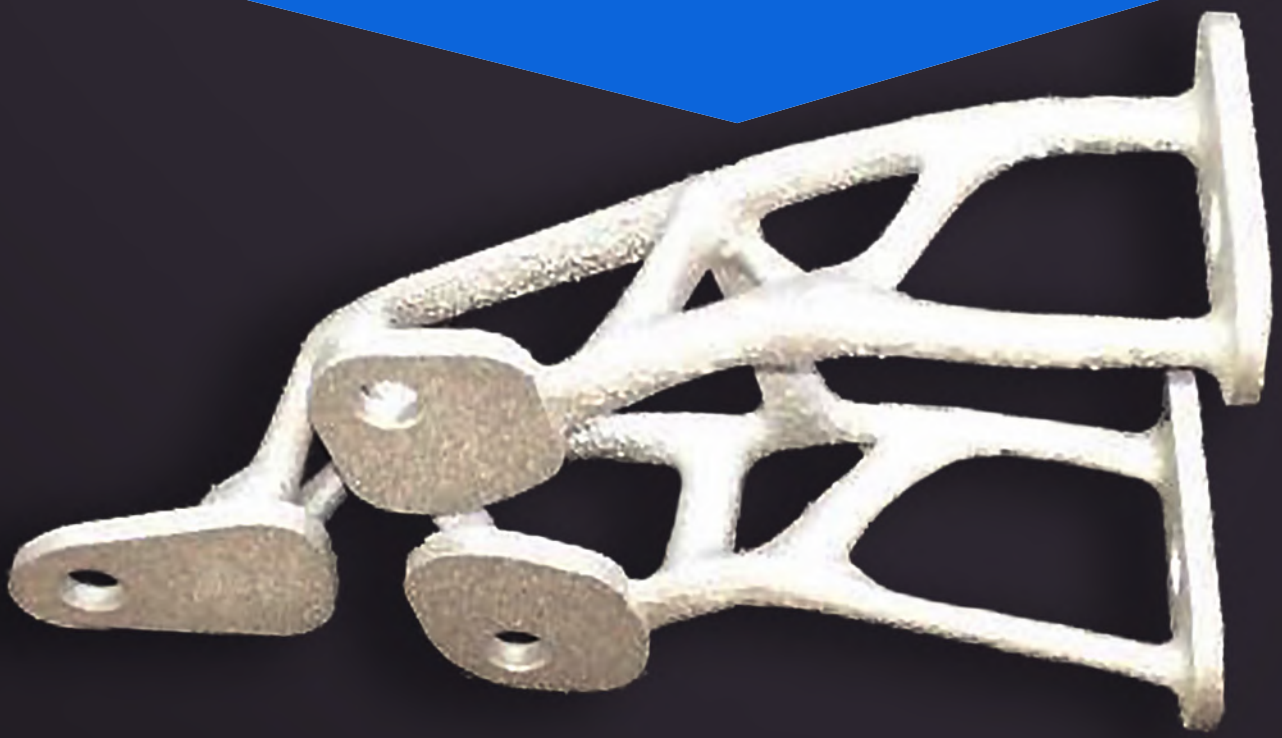
The Aerospace industry has been at the forefront of adapting Metal Additive Manufacturing (AM) and some of the most evolved applications of metal AM can be found in the aerospace sector. Leading OEMs, tier 1 suppliers, and key ecosystem players are in the phase of developing mature capabilities in metal AM.

Typical value contribution from Metal Additive Manufacturing comes in form of weight reduction, reduction in sub-assembled parts by creating monolithic designs, ability to realize complex designs and drastic reduction
in lead time to realize components.



ABOUT THE PROJECT

The ‘Bracket’ was chosen as a low-risk structural element to reduce weight, to be later scaled to a variety of parts. In order to reduce deflection and weight of the ‘Bracket’, a sizeable amount of its mass had to be reduced. Wipro 3D, in collaboration with a partner, determined the stress plot based on boundary conditions and loading conditions, which was then used to reduce mass not integral to the part’s function. An innovative bio-design composed of features with evolving diameters was arrived at. The Additively Designed Bracket was then manufactured using Wipro 3D’s proprietary Additive Thinking Framework and was realized in hours. The ‘Bracket’ is currently under meticulous testing for Airworthiness Qualification.



AM COMPETENCIES USED

The initial design contained a lot of mass in the bracket. With the stress plot as a foundation, Additive Design was used to eliminate more than 50% of the mass.

ADDITIVE DESIGN & ENGINEERING

POST PROCESSING

A series of well-planned post processing activities were coordinated and executed to achieve the Bracket's desired surface finish and mechanical properties.

BUILD TECHNOLOGY

Due to its interwoven structure, the component was challenging to realize in AM. Wipro 3D used its proprietary Additive Thinking Framework to design innovative supports and realize the 'Bracket'.

AM VALUE ADDITION

Structural integrity was drastically improved as the deflection was reduced by 74%.

Owing to Wipro 3D's redesign 53% of weight was reduced.

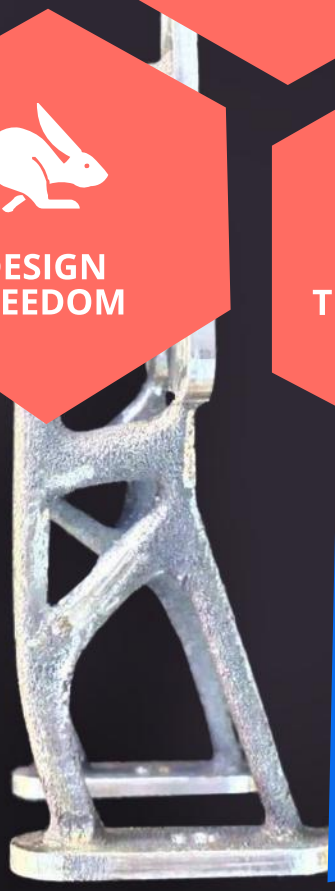
IMPROVED PERFORMANCE

WEIGHT REDUCTION

DESIGN FREEDOM

TIME-TO-REALIZE

With the process package established, the customer now has the ability to make efficient design alterations to improve the functional performance, with very short "Redesign-to-realize" cycle time.



The complete redesign to realize lifecycle for the 'Bracket' was done in less than 2 weeks.

About Wipro 3D

Wipro 3D is an AS9100 Certified metal AM solutions and services provider, serving Aerospace, Space, Defense, Industrial, Heavy Engineering, Automotive, Energy, Nuclear & Healthcare sectors. Our solutions include AM Consulting, Additive Engineering & Design Offerings, Manufacturing Services, Research & Development based solutions right unto Design - Deployment and Operation of captive metal AM centers.

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