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DEFENCE

Component

Receiver & Transmitter Antennae

Material

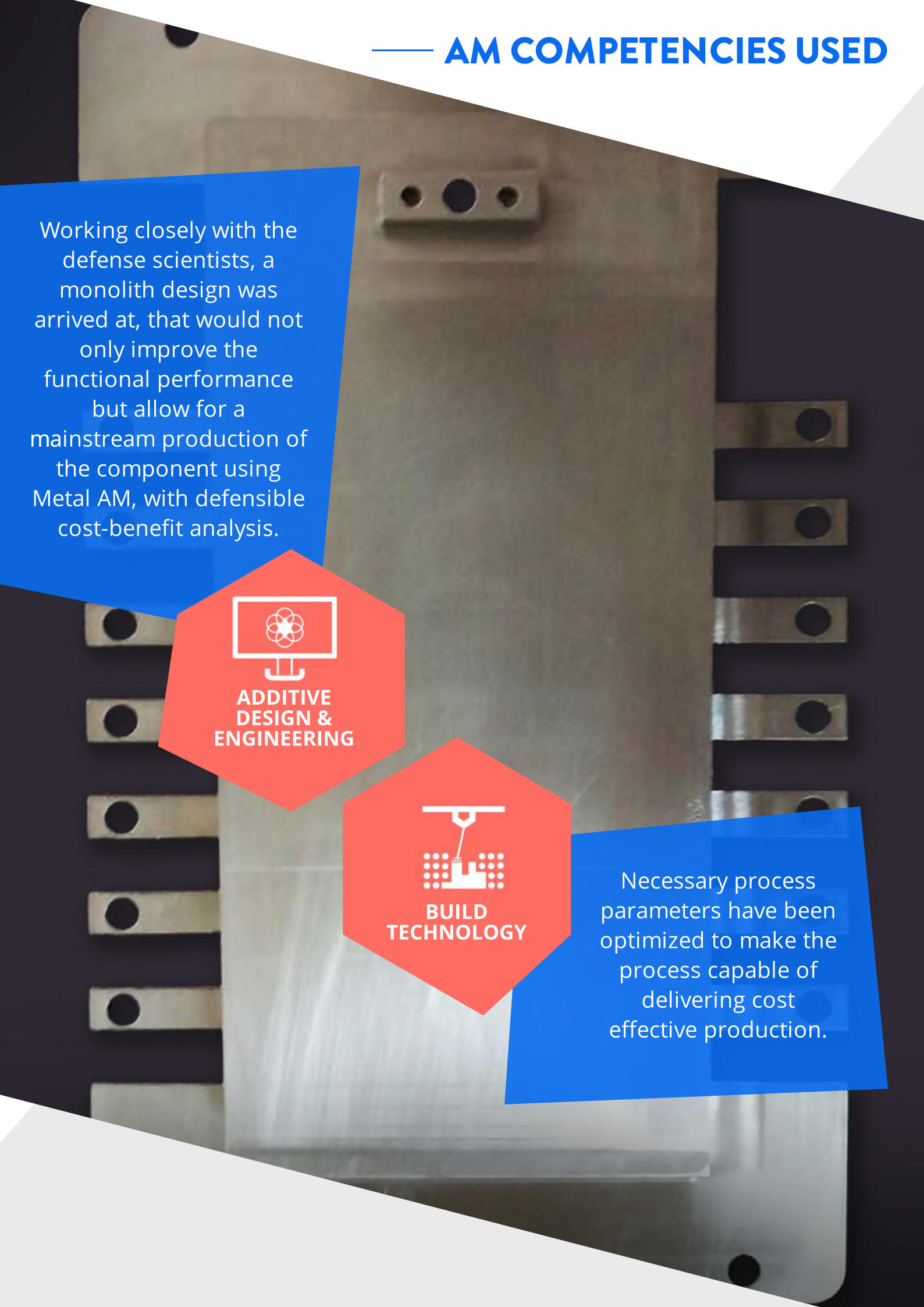
AlSi10Mg

The defense industry is among the earliest adopters of Additive Manufacturing along with the Aerospace industry, in a myriad of applications State run defense agencies and private defense organizations are using AM in highly critical projects for missiles, fighter jets, customized equipment, handheld weapons, drones, respiratory gear, and much more. The defense logistics and product acquisition processes are already in the process of transformation with the help of relatively small and tactical AM centers deployed in army, naval and air force establishments. Perhaps the most impactful application of AM could be portable in-field AM centers deployed near conflict zones.

ABOUT THE PROJECT

The Receiver & Transmitter Antennae' are new products to be deployed on strategic weapons platforms and are used to transmit mission critical signals for defense directives. The antennae have 8 slots or arrays to transmit the RF wave within the chamber. AlSi10Mg was chosen due to its light weight and conductive properties to substitute a legacy material. The antennae are currently in the prove-out stage. The project involves developing a process package for short series runs that will be implemented post the prove out stage.

AM COMPETENCIES USED



Working closely with the defense scientists, a monolith design was arrived at, that would not only improve the functional performance but allow for a mainstream production of the component using Metal AM, with defensible cost-benefit analysis.

ADDITIVE DESIGN & ENGINEERING

BUILD TECHNOLOGY

Necessary process parameters have been optimized to make the process capable of delivering cost effective production.

AM VALUE ADDITION

The antennae were being made in multiple parts and then welded together. The welds were causing signal distortion and were rupturing during vibration tests. These issues have been eliminated due to the monolith design proposed by Wipro 3D.

IMPROVED PERFORMANCE

RAPID ITERATIONS

Two iterations were completed in quick succession to check critical sections of the part. Wipro 3D shall soon be moving into short series run for the component.

TIME-TO-REALIZE

The Antennae were Additively Manufactured, duly post processed and delivered in under a week.

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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