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DEFENCE

Component

STFE Starting Nozzle

Material

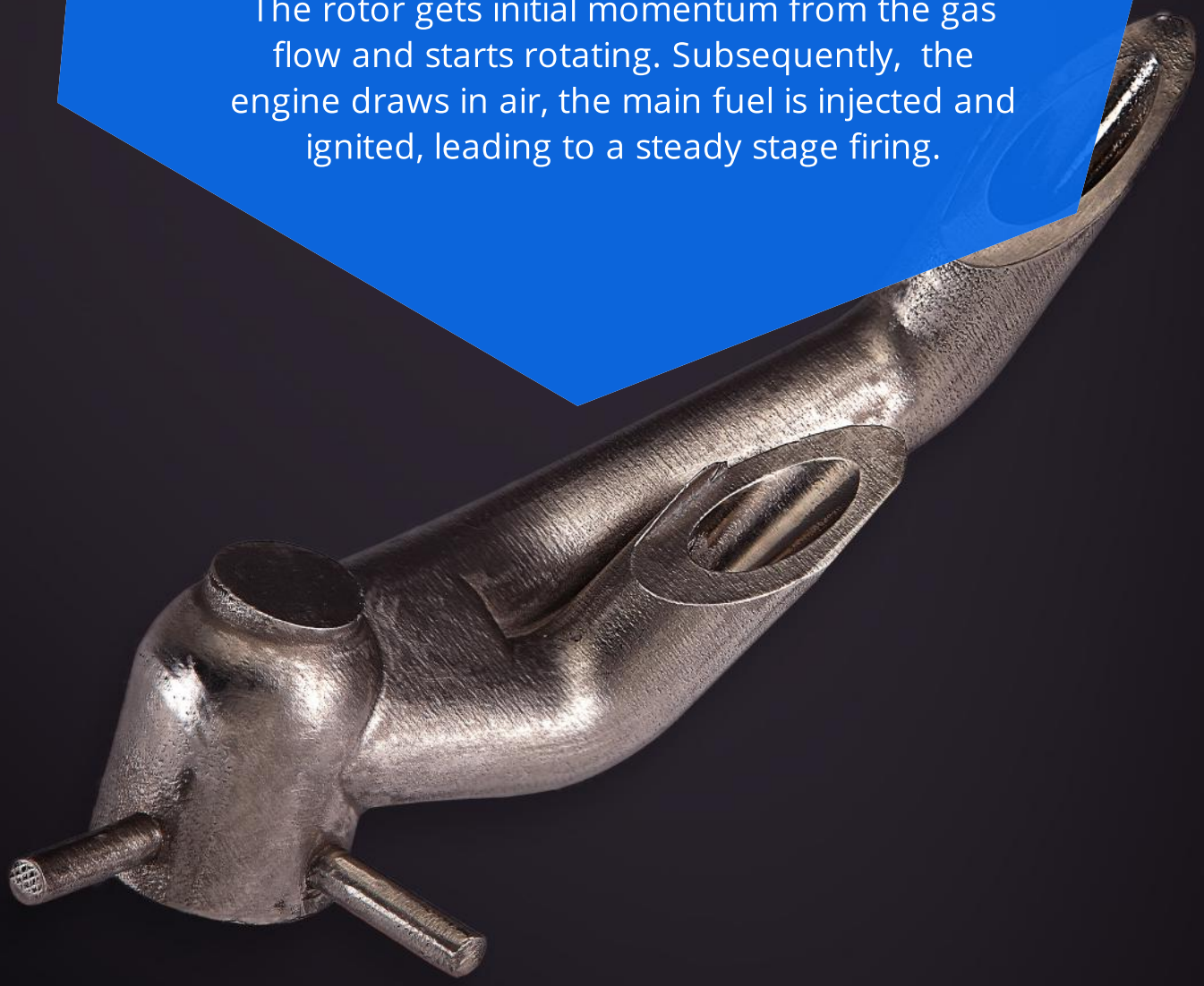
IN718

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.

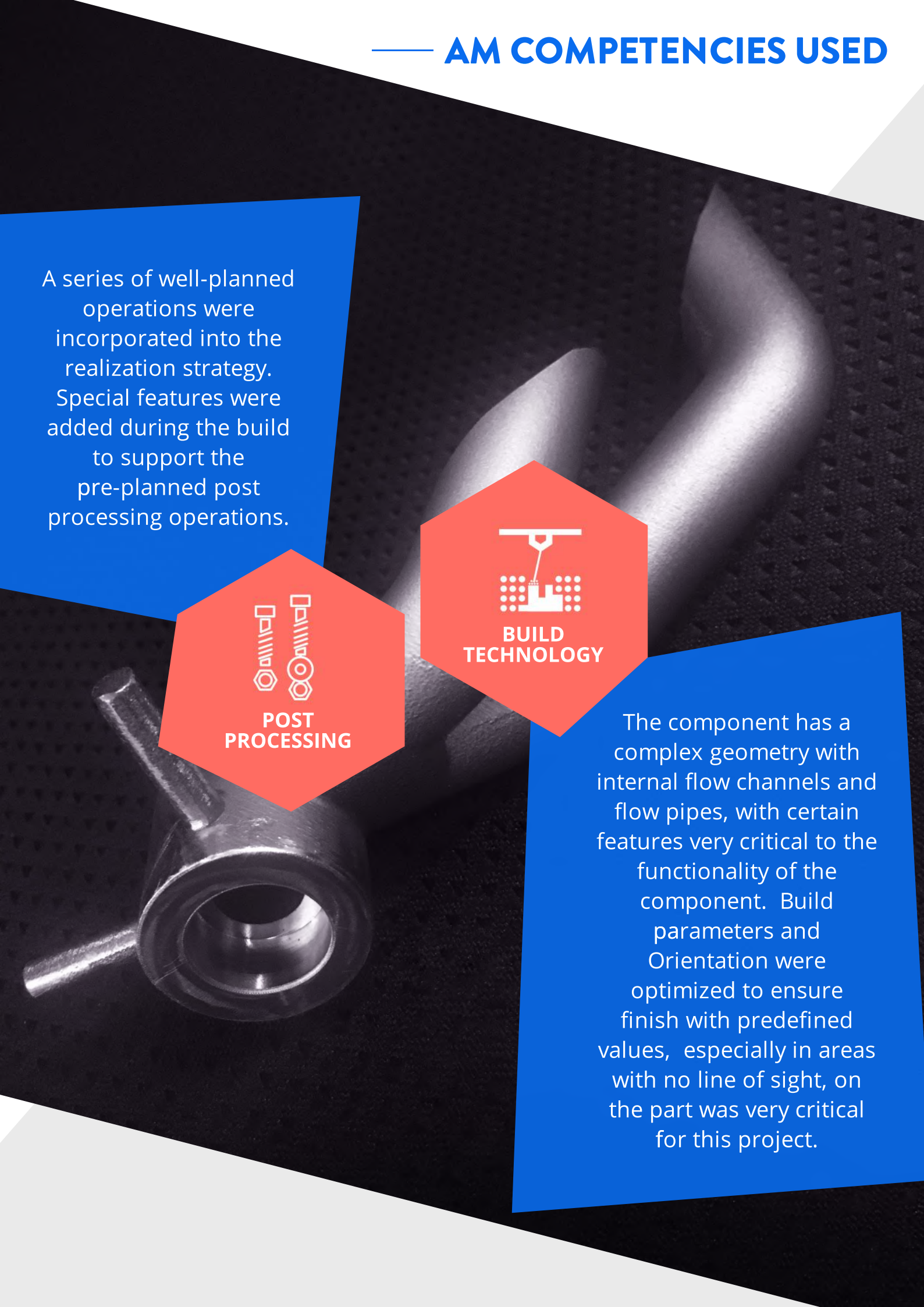
ABOUT THE PROJECT

The Starting Nozzle is a critical component of Turbo Fan Engine . The engine has wide ranging applications and is one of the initial set of Additively Manufactured components that is being integrated into the overall manufacturing plan of the Turbo Fan engine.

The Starting Nozzle directs pressurized gas produced by the pyro device into the engine shaft for a few seconds, when the STFE is started. The rotor gets initial momentum from the gas flow and starts rotating. Subsequently, the engine draws in air, the main fuel is injected and ignited, leading to a steady stage firing.



AM COMPETENCIES USED



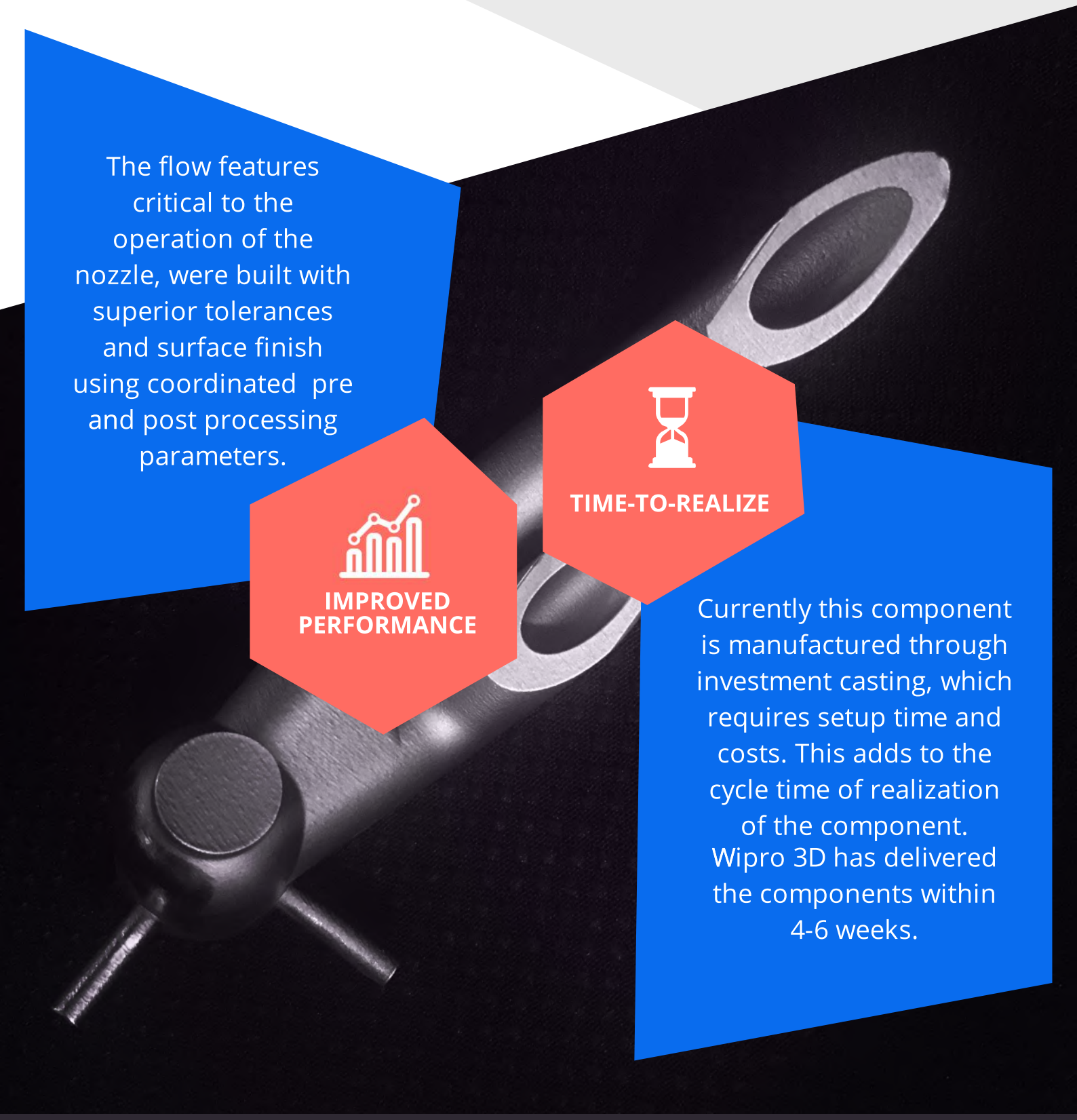
A series of well-planned operations were incorporated into the realization strategy. Special features were added during the build to support the pre-planned post processing operations.

POST PROCESSING

BUILD TECHNOLOGY

The component has a complex geometry with internal flow channels and flow pipes, with certain features very critical to the functionality of the component. Build parameters and Orientation were optimized to ensure finish with predefined values, especially in areas with no line of sight, on the part was very critical for this project.

AM VALUE ADDITION



The flow features critical to the operation of the nozzle, were built with superior tolerances and surface finish using coordinated pre and post processing parameters.

IMPROVED PERFORMANCE

TIME-TO-REALIZE

Currently this component is manufactured through investment casting, which requires setup time and costs. This adds to the cycle time of realization of the component. Wipro 3D has delivered the components within 4-6 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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