

Advancing Innovation with Additive Manufacturing



Executive Summary

Fairbanks Morse Defense (FMD) is revolutionizing the maritime defense industry by integrating cutting-edge additive manufacturing (3D printing) into its production processes. This case study highlights how FMD's innovative approach has transformed the production of critical components, such as valves, for the U.S. Navy.

The Challenge

Traditional manufacturing methods, such as sand casting, often result in high material waste, longer lead times, and quality inconsistencies. For components like copper-nickel valve assemblies, these challenges are amplified due to the material's porosity and high fallout rates.

The Solution: Additive Manufacturing

FMD, in collaboration with Lincoln Electric, adopted additive manufacturing to produce a 70-pound copper-nickel valve assembly for U.S. Navy submarines. This process involves building components layer by layer, enabling the creation of complex geometries and reducing material waste.

Key Achievements

- **First-of-its-Kind Innovation:** FMD delivered the first 3D-printed valve assembly for U.S. Navy submarines, setting a new industry benchmark.
- **Enhanced Efficiency:** The additive manufacturing process reduced production time by two-thirds compared to traditional methods.

Key Achievements

- **Superior Quality:** The 3D-printed valve bodies achieved higher first-time yields, eliminating the need for additional production time to account for fallout rates.
- **Sustainability:** By minimizing material waste, FMD demonstrated its commitment to environmentally responsible practices.

Benefits to the U.S. Navy

- **Improved Fleet Readiness:** Faster production and delivery of critical components ensure operational readiness.
- **Cost Efficiency:** Reduced material waste and production time lower overall costs without compromising quality.
- **Supply Chain Resilience:** Scaling additive manufacturing reduces reliance on global supply chains, supporting the Navy's strategic goal of a 300+ fleet.

Conclusion

Fairbanks Morse Defense's pioneering use of additive manufacturing exemplifies its commitment to innovation and excellence. By embracing this transformative technology, FMD is not only enhancing the performance and reliability of its products but also contributing to the U.S. Navy's mission readiness and sustainability goals.