



ADDITIVE MANUFACTURING FOR THE MARINE AND OFFSHORE INDUSTRIES

ADDITIVE MANUFACTURING TECHNOLOGY

Additive manufacturing (AM), also known as 3-D printing, refers to multiple manufacturing processes that build parts by adding material layer-by-layer, whereby replacing or augmenting more traditional manufacturing processes such as casting and forging. AM can shrink the supply chain and lead times for specialized and complex parts, introducing new efficiencies driven by design innovation, reduced manufacturing time and improvements in part availability.

The two most common methods for producing metallic parts using AM are powder bed fusion and directed energy deposition.

Metallic AM parts are currently used in the aerospace and medical industries for reducing weight, simplifying assemblies, increasing design functionality and creating specialized parts. These parts are small to medium sizes, such as fuel injectors and implants. Advances in AM technologies will enable the manufacturing of larger structural and machinery parts applicable to the marine and offshore markets.

In addition to rapid production, AM's capacity to fabricate complex and unique parts allows for improvements in design. One example is producing

parts with features such as internal cooling channels that lead to cost and efficiency savings over the life of the part.

With these benefits, why are AM technologies not used more frequently? AM processes can have many quality-affecting variables acting simultaneously, which can cause uncertainty and variability in the final part properties and lead to unnecessary risk. Certification requires an understanding of the relationship among the part design, material properties, and processing parameters for each AM part and process.

Process definition is key to repeatability and confidence in AM parts.

Benefits of Additive Manufacturing

- Shortens supply chain lead time
- Provides flexibility in design of end-use parts
- Allows for the production of parts in small batch quantities
- Augments traditional manufacturing processes

ABS SUPPORT AND GUIDANCE

The *ABS Guide for Additive Manufacturing* defines a procedure



for qualifying additive manufactured parts, as well as the processes and systems used to create them, including powder bed fusion and directed energy deposition.

The Guide defines the ABS approval and certification process for AM facilities and parts by providing standards for AM design, feedstock material, building processes, inspection and testing.

Central to the Guide is a methodology that helps part design owners and manufacturers improve overall process definition, thereby driving repeatable and reliable results. In developing the Guide, ABS recognized the importance of flexibility in additive manufacturing, and outlined a process that allows for swift changes and alterations without affecting the ultimate quality.

Contact us today at AdditiveManufacturing@eagle.org to learn how ABS can help.



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