NovaTech *Additive Manufacturing Services*


Design


Material


Technology


Production

AM Overview

Additive Manufacturing (AM) is more than just 3D printing. NovaTech provides a comprehensive approach to AM, gained through practical experience across multiple industries, that is designed to realize all the potential that AM promises in innovation and performance.

<u>Design Optimization</u>
- Collaborative requirements process
- Iterative design process
- Advanced design tools

<u>Material Selection</u>
- Material performance analysis
- Printing characteristics
- Broad range of materials

<u>Print Technology</u>
- Product design and application
- Material compatibility
- Quantities and cost

<u>Production Printing</u>
- Supply chain and resources
- QC, testing, and certification
- Budget, schedule, and cost control

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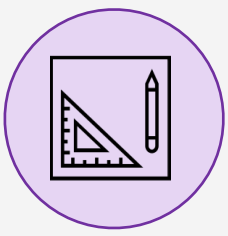
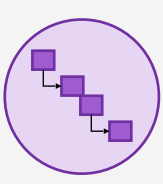


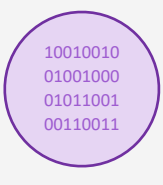
Design Optimization

Optimizing your product's design to take advantage of what additive manufacturing has to offer, i.e. better performance, lower cost, higher reliability, better maintainability, fewer parts, and lower weight.

Specifications and Requirements
- Collaborative process with customer
- Valuation
- Cost benefit analysis



Design Process
- Form Fit Function evaluation
- Finite Element Analysis
- Prototyping/Testing



Data Integrity
- Configuration Management
- Data security
- ISO 9001, ASME NQA-1 compliant

Software Tools
- SolidWorks™
- Ansys™
- Materialise Magics™

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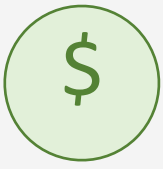
Material Selection

Selecting the right additive manufacturing material for your product is critical and involves a multitude of factors not only concerning material performance, but printing characteristics as well.

Material Performance Requirements
- Mechanical/Thermal
- Chemical
- Electromechanical

Printing Characteristics
- Layer Thickness
- Surface Finish
- Material Properties



Cost
- Material amount/weight
- Maximizing parts per build
- Rapid prototyping

Materials
- Plastics: Nylon, PETG, etc.
- Metals: Inconel 718, Stainless Steel, etc.
- Composites: Nylon/Carbon Fiber, etc.

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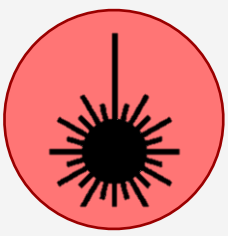


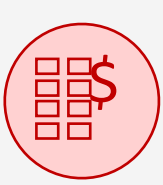
Print Technology

Determining the best print technology is based on many factors: form, function, materials, and printing environment. Not employing the right printing technology can make a significant difference in product outcome.

Design Considerations
- Size
- Feature resolution/finish
- Tolerances

Material Considerations
- Type (metal, plastic, etc.)
- Product operating environment
- Color

Technology
- Machine budget
- In-house vs. outsourced
- Technology maturity level



Quantities and Costs
- Build time
- Support removal
- Post processing/heat treatment

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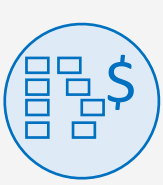
Production Printing

Although Additive Manufacturing (AM) is usually thought of as being employed in prototyping, a considerable amount of production is now being done by AM. NovaTech has the experience to effectively manage design changes, material supply, and production demand.

Supply Chain and Resources
- Best resource for material
- Consider lead time, quality, cost, etc.
- Supply chain resilience

Quality Control and Testing
- Tensile testing with Instron
- Access to SEM
- Inspection with CMM

Product Certification
- In-situ monitoring
- Data validation and verification
- AM specific QA plan



Budget, Schedule, and Costs
- Cost control and variance
- Critical path Gantt/PERT
- Continuous Customer Updating