Design and Analysis of Composite Structures

Damage Modeling

Topology Optimization for Additive Manufacturing

Material Characterization and Structural Testing

Prototype Manufacturing

Compression Molding

Injection Molding

Specialty Textile Engineering and Production

Non-Destructive Evaluation, Quality Assurance and Metrology

CERTIFIED ISO 9001:2015 COMPANY

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msc® Materials Sciences Corporation

COMPANY CAPABILITIES

Engineering the Future of Materials

45+ years serving major corporate and government clients

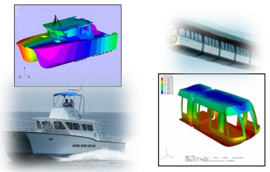
www.materials-sciences.com

COMPANY PROFILE

Materials Sciences Corporation (MSC) is a small business headquartered in southeastern Pennsylvania that has provided engineering services to the composites industry since 1970. A recognized leader in the design, analysis and testing of composite materials and structures, MSC is committed to excellence in all stages of the engineering development cycle: research, design, analysis, prototype manufacturing and testing. MSC's capabilities include composite material development and product design, analytical modeling and simulation, prototype manufacturing and testing. MSC also operates a textile and composite manufacturing facility in Greenville, South Carolina and engineering offices in Huntsville, Alabama.

PRODUCT DEVELOPMENT AREAS

MSC has led design, analysis, manufacturing and testing of advanced composite materials and structures for a broad range of product applications for both government and corporate clients. These have included marine and transportation systems, ground vehicles, aviation and missile systems, unmanned systems and high performance sporting goods.



Marine and Transportation Systems

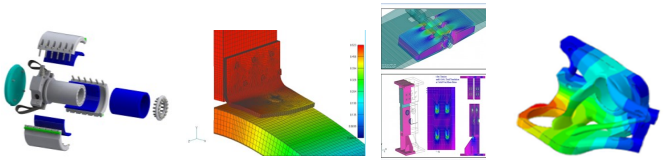
Aviation and Missile Systems

Commercial Products

Specialty Textiles Production

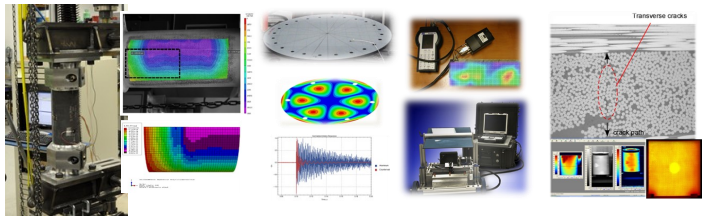
DESIGN AND ANALYSIS

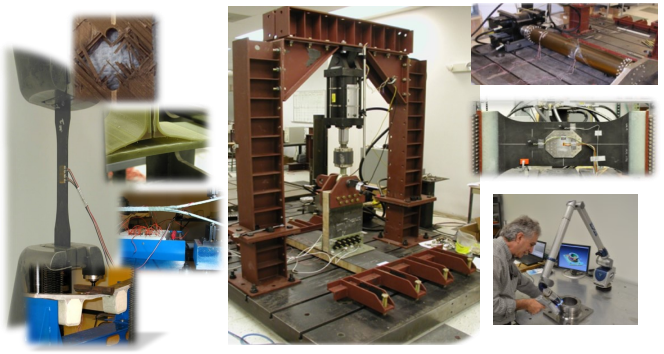
- State of the art workstations
- Computer aided design and solid modeling software (Autocad, SolidWorks)
- Commercial and in-house finite element programs (ABAQUS, LS-DYNA, ANSYS, FEMAP)
- Proprietary materials analysis and design software
- Topology optimization for additive manufacturing



MATERIAL CHARACTERIZATION AND STRUCTURAL TESTING

- Test planning, specimen design, data reduction and analysis, material qualification
- Standard coupon (e.g., ASTM, SACMA) and large-scale specialty element/component testing
- Static and Fatigue Testing -Servohydraulic and electro-mechanical
- Dynamic– modal analysis, DMA, creep, random vibration, shock, system identification
- Environmental conditioning –moisture, temperature, UV, etc.
- Dimensional analysis/3D inspection
- Non-destructive Testing (Ultrasonic Transmission, Thermography, Acoustic Emission)



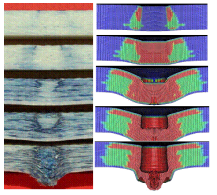


PROTOTYPE MANUFACTURING AND PRODUCTION

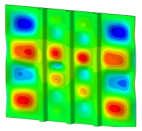
- Fabrication of fiber reinforced (continuous and dis-continuous) thermoset and thermoplastic composite parts
- Out-of-Autoclave (OoA) manufacturing via resin transfer molding (RTM), resin film infusion (RFI)
- Compression molding
- Injection molding
- Textile production

MODELS FOR EVOLVING MATERIAL RESPONSES

- **MAT 161/162**- Progressive failure model for LS-DYNA and ANSYS



- **NDBILIN**—Stress based failure modeling for ABAQUS



- **DDSHM**—Fracture-based failure modeling for ABAQUS