

KNOWLEDGE

FSE is dedicated to the **application of knowledge** in the industrial use of FRP composite technologies. A complete FRP specialty engineering and inspection firm, FSE has developed a singular approach to the design and evaluation of FRP equipment based on sound theoretical methods, years of testing, and extensive jobsite and shop experience. Designing, engineering, testing, quality assurance and maintenance inspection are completely integrated in this full service organization. FSE has held this unique position since 1976.

QUALITY

FSE provides unsurpassed **assurance of quality** in the design of industrial composite materials (FRP). Well positioned to evaluate the client's project requirements, FSE assists in the selection of appropriate technologies, assuring that solutions are appropriately suited to meet project objectives. The result is a higher level of quality that translates into greater product reliability, increased safety conditions, lower operating costs and longer service life.

INDEPENDENCE

FSE brings the **advantage of independence** to industrial FRP projects. Providing an unbiased and clear perspective when considering potential solutions for FRP projects, FSE becomes an independent member of the project team, making decisions only in the best interest of the client's objectives. Our unique approach to independent design and specification allows FRP work to be accomplished by a variety of vendors at multiple jobsites while maintaining consistent quality and assuring meaningful, competitive bidding.

CLIENT
CONFIDENCE

the benefits of

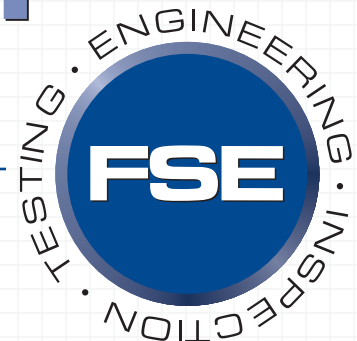
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Fiberglass Structural Engineering, Inc.

Consulting Engineers / Specialists in Composite Materials Application

316 East McLeod Road, Bellingham, WA 98226

Tel: 360-734-7040 • Fax: 360-733-7905



Design & Engineering Services

Feasibility Studies
Project Scope Development
Materials Selection
Engineering Analysis
Finite Element Analysis
Project Specifications
Construction Details and Drawings
Vendor Qualification
Bid Evaluation
Submittal Review

Preventive Maintenance and Evaluation

Review Existing Documentation
Review Operation and Maintenance History
Inspection Planning and Equipment Prioritization
Visual Inspection
Data Collection
Non-Destructive Testing
Engineering Evaluation
Reparability Assessment
Inspection and Maintenance Programs
Repair Specifications and Recommendations

Process Safety Management

Preventive Maintenance and Evaluation (as above)
Verify and Document Extent of Code Compliance
Recommendations to Establish Code Compliance
Evaluation of Process Changes
Evaluation of Mechanical Integrity
Design of Equipment Replacement or Modification
Pre-Startup Safety Review
Supplement Owner's Process Hazard Analysis Team
Training and Qualification of Inspection Personnel
Assist with Emergency Action Plan
Develop Procedures to Maintain Mechanical Integrity

Failure Investigation

Site Inspection and Sampling
Document Review
Engineering Analysis
Review of Design and Maintenance History
Sample Testing and NDT
Expert Testimony

Quality Assurance Services

Specification Review
Vendor Qualification
Design Verification
Vendor Submittal Review
Shop Fabrication Inspection and Testing
Installation Inspection
Product Testing and NDT
Training

Non-Destructive Testing and Evaluation

Acoustic Emission Monitoring
X-Ray
Infrared Thermography
Ultrasonics
Magnetic Thickness Gauging
Visual Inspection
Control Area and Photographic Records
Strain Gage Application and Monitoring
Engineering Evaluation of Data

Corporate Guidelines and Specifications

Evaluation of Applications
Materials Evaluation and Testing
Design Optimization
Feasibility and Cost Analysis
Application of Codes and Standards
Specification of Fabrication Requirements
Specification of Design Requirements
Quality Control Programs
Vendor Qualification

Technical Instruction and Training

Preventive Maintenance Inspection
Quality Assurance Inspection
Field Joining and Repair Procedures
Design and Procurement Approaches

Product Testing and Evaluation

Full Scale and Sample Testing
Acoustic Emission Monitoring and NDT
Design Evaluation
Materials Evaluation for Intended Services
Finite Element Analysis



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