

Composites in Construction

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FRP: Current Status

- Six decades of experience and three decades in infrastructures
- Primary use: repair and rehabilitation
- Exceptions: bars for reinforcement and work at WVU
- Restricted use in applications where fire is an issue

Goals

- Create a field applicable, economical and durable hybrid MATRIX Systems
- Attributes needed: fire resistance, abrasion resistance, UV resistance
- New markets: in-place pipe repair.....
- Green engineering: extending the life of existing structures; provide a ceramic coating for concrete and steel structural surfaces

Goals

- Create a ceramic coating for concrete.
Masonry...
- Graffiti resistant
- Self cleaning
- De-polluting: conversion of NO_x

Self-Cleaning De-polluting Coatings

- Use of sun's energy for self cleaning and de-pollution (converting NO_x)
- Use transportation structures for de-pollution
- Noise barriers
- New Jersey barriers

Protective Coatings

- Piers
- Retaining walls
- Sea water
- Glowing-safety
- Weathering steel beams
- Earthquake retrofit
- Fire resistance and compatibility

Goals

- True renewable material: Timber
- Structural timber: wood+ carbon and glass fibers + fire resistant matrix+ fire resistant coating
- Use of existing manufacturing techniques
- Saw dust, low grade timber
- Export

Goals

- Terror resistant structural components
- High temperature
- Blast loading
- Resistance to cutting
- Typical applications: cables, connections,...

Goals

- Integrated research between the two institutions (four decades experience with composites and two decades with in organic polymers)
- Longstanding research contributions to DOT and industries
- Collaboration within the industries and with the researchers
- Reduce the time needed for implementation
- Innovation and advancement of the state of the art in research and application

Background of Industry

- Material and system manufacturers: fibers, matrix, nano materials
- Structural engineers, designers..
- Industries involved in construction
- Architects
- Instrumentation for monitoring and self-healing....
- Owners: DOT, Port authorities
- National laboratories: USDA, FAA, ...Existing centers

Education

- Students
- Practicing engineers
- Construction professionals

New areas

- Energy
- Naval structures
- Offshore structures

**THANK
YOU!**

