

## Thorpe Plant Services— FRP and Dual Laminate Specialists

Non-metallic materials such as fiberglass reinforced plastics (FRP) and dual laminates have been successfully used for over 50 years for storage of many corrosive compounds at elevated temperatures. These include various acids, acid chlorides, caustics and other chemicals. Many non-metallic composites have proven their reliability when used in harsh environments for tanks, scrubbers, vessels, piping, and ducts in various industries such as petrochemical, power generation, wastewater treatment, chlorine production, pulp and paper, etc.

When viewing composites as an engineering material, FRP remains superior in corrosive environments. In addition to its resistance to corrosion attack, FRP also has excellent strength to weight ratio. For example, a FRP laminate can be 1/6th to 1/3rd the weight of steel while providing up to a 32,000 psi ultimate tensile strength in contact molded laminates and up to 60,000 psi ultimate hoop tensile strength in filament-wound applications. In addition, FRP material is naturally non-conductive and does not require cathodic protection or corrosion inhibitors like many other materials.

FRP and dual laminates can significantly reduce maintenance costs when compared to other materials. Non-metallic materials will not rust, which provides excellent protection from exterior elements. With proper inspection and preventive maintenance, along with the proper operational controls, non-metallic equipment will far exceed the lifespan of many other materials and systems.

### Choosing a Manufacturer

Choosing a manufacturer can be a daunting task for the inexperienced buyer or engineer, as not all manufacturers are created equal. We recommend a single source, turnkey contract as the best way to assure a successful project and long-term reliability. The most important step is to ensure the manufacturer you choose has experience in your application. The important criteria include:

1. Technical and engineering capabilities
2. Manufacturing quality
3. Field erection/installation capability

Manufacturers should be evaluated on their technical knowledge and capabilities. Outsourcing key technical and engineering components and functions often leads to a poor design due to miscommunications and involvement of others who are not as close to the needs of the application. Manufacturing quality standards should be closely scrutinized as well. ASME offers accreditations to shops that can properly execute their high standards and maintain that environment on a day-to-day basis. ASME RTP-1 is considered by many to be the best available control technology for FRP design, fabrication, and testing. This covers designs for tanks and process vessels from +/-15 psig design pressure. When vessels require higher design pressure, ASME offers Section X Class II authorizations to cover vessels from full vacuum to +250 psig design pressure. Failures commonly occur at field joints and tie-ins due to unqualified installers erecting and maintaining equipment, materials, and processes they are not familiar with.

Thorpe Plant Services, Inc. performs all three key components with complete turnkey capability. We work closely with the major material suppliers for the proper material selection and perform all engineering calculations internally. A recent merger has brought to Thorpe the former STRAND® Composites and Engineering Company. The STRAND® logo stands for "Excellence in Composite Manufacturing" with dual accreditations to ASME RTP-1 and ASME Section X, Class II, assuring we maintain a vigorous quality control program that is unparalleled in the industry. STRAND® brings Thorpe to over 400,000 ft<sup>2</sup> of manufacturing space across the U.S. Thorpe provides shop manufactured vessels and equipment up to 57 ft in diameter using our patented (1978) ring-oblation process, with almost endless possibilities on height. Our field services offices are spread across North America and provide experienced crews familiar in non-metallic corrosion-resistant materials and equipment to assure the best quality installation.

### Winning Together

The Thorpe Plant Services team remains committed to helping your company find the right solution, while providing you with the safest, most cost-effective and maintenance-free equipment possible.

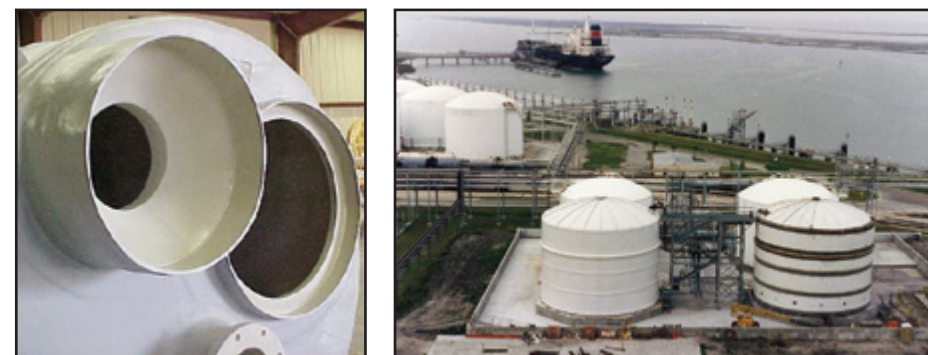


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# FRP & Dual Laminate Tank Specialists



Thorpe Plant Services, Inc. is proud to present STRAND® fiberglass reinforced plastic and dual laminate tanks and products. The world's leading manufacturer of custom FRP/Dual Laminate tanks and products with over 400,000sf of manufacturing space across the USA. Thorpe utilizes state-of-the-art engineering software, materials, equipment, and design principals, as well as industry leading QA/QC procedures, to meet growing process and environmental demands from both public and private industrial clients for the most corrosive environments.

### Why FRP/Dual Laminate Tanks?

- Economical benefits compared to field install alloy tanks  
– Less labor & freight, smaller crane needs, faster to erect/install
- Safer to assemble than steel tanks – minimal elevated work
- Corrosion resistant throughout the FRP structure
- Exterior paint not required – no "UV" derogation
- Easy to repair if damaged
- Good insulator on temperature and static electricity

### Thorpe Service and Product Offerings

- Turnkey FRP & Dual Laminate Specialists  
– Engineering and Design  
– Manufacture  
– Field erect/install
- Developer of oblation technology (Patented 1978)
- Dually accredited  
– ASME RTP-1  
– ASME Section X, Class II
- Custom designs
- Tanks, pressure vessels, scrubbers, piping, ducts and structural components
- Shop and field erected FRP vessels, piping, ducts and equipment
- Full line of U.S. made FRP flanges, fittings and accessories
- Manufactured with premium grade resins: vinyl ester, furan and phenolics
- Thermoplastic and fluoropolymer liners for more severe corrosive environments