

SESSION 13

***Composites—Leading the Offensive in
Corrosion-Resistant Duty for Large Industrial Vessels***

NOTE: No formal papers were submitted for this session.

Large Diameter FRP Applications in FGD Systems

JOHN C. MCKENNA AND A. HERBERT

Presentation will consist of a general discussion of large diameter chimney liners, slurry tanks and scrubber systems. Detailed historical information from recent stack liner survey will be demonstrated showing positive results in the use of composites for FGD applications. The field winding process and other considerations will be discussed including the examination of the material handling concerns for large structures.

John C. McKenna and A. Herbert, Ershigs, Inc., P.O. Box 1707, Bellingham, WA 98227

The Suitability of Isopolyester FRP for Water Treatment and Sewer Applications

H. R. DAN EDWARDS AND BEN BOGNER

For more than three decades, unsaturated polyesters based on isophthalic acid have been the workhorse matrix resin for fiber reinforced polymer (FRP) pipe, tanks and structures used in the transmission and treatment of water. Applications extend far beyond sewer pipe, the best known and largest use, to include reservoir pipe, power plant outfalls, municipal sewer pipe relining, and tanks for the storage of water treatment chemicals to name a few. In this paper many of these applications will be profiled and the technical reasons justifying the choice of isopolyesters will be reviewed.

While good field experience with isophthalate polyesters is most compelling, laboratory testing is convenient for isolating the resistance to specific chemicals. Total immersion of relatively thin laminates and elevated temperature are effective means to accelerate permeation as long as the test temperature is below the glass transition temperature of cured matrix resin. Increasing chemical concentrations beyond that seen in actual service can produce misleading results. New techniques to estimate actual service life expectancies from laboratory test results will be discussed.

Case Histories of ASME RTP-1 Stamped Vessels Designed by Subpart A and Subpart B

ALFRED L. NEWBERRY

In some cases RTP-1 stamped FRP vessels may be designed with the rules of formulas found in Subpart A. The stress analysis method found in Subpart B may be used for any vessel but must be used for vessels not covered by Subpart A rules.

The first case history is a vessel which was designed by Subpart A rules. The second case history is a vessel which could not be designed by Subpart A rules and had to be designed by Subpart B stress analysis. In this case, as in most cases, this analysis was performed using Finite Element Analysis. Both vessels were fabricated and stamped by Tankinetics Inc., Harrison, AR.

The differences in the design methods will be discussed. Special attention will be given to the methods and details involved in performing a Subpart 3B design.

The 0° and 90° Laminate—An Advanced Fabrication Method for FRP Corrosion Resistant Vessels and Equipment

JOE LASSANDRO

The intent of the paper is to present a method of laminating Fiberglass Reinforced Plastic cylinders for corrosive service which offers high strength in both the hoop and axial directions and excellent corrosion resistance. The intent is to provide an understanding of the technique, its capabilities and its advantages over present methods.

Dual Laminate Piping

GARY ALAN GLEIN

Many alternatives are available for piping in chemical or high purity applications. Dual Laminate is constructed with an inner thermoplastic liner which is bonded to fiber reinforced plastic for mechanical strength.

This presentation will overview the design, construction, and use of dual laminate piping

Topics covered will include the description of products available, typical chemical and high purity applications, methods of design and construction and a cost/benefits analysis compared to fiberglass and metallic alternatives.

Information will be developed from reviews of past literature as well as interviews of users, fabricators and material suppliers.