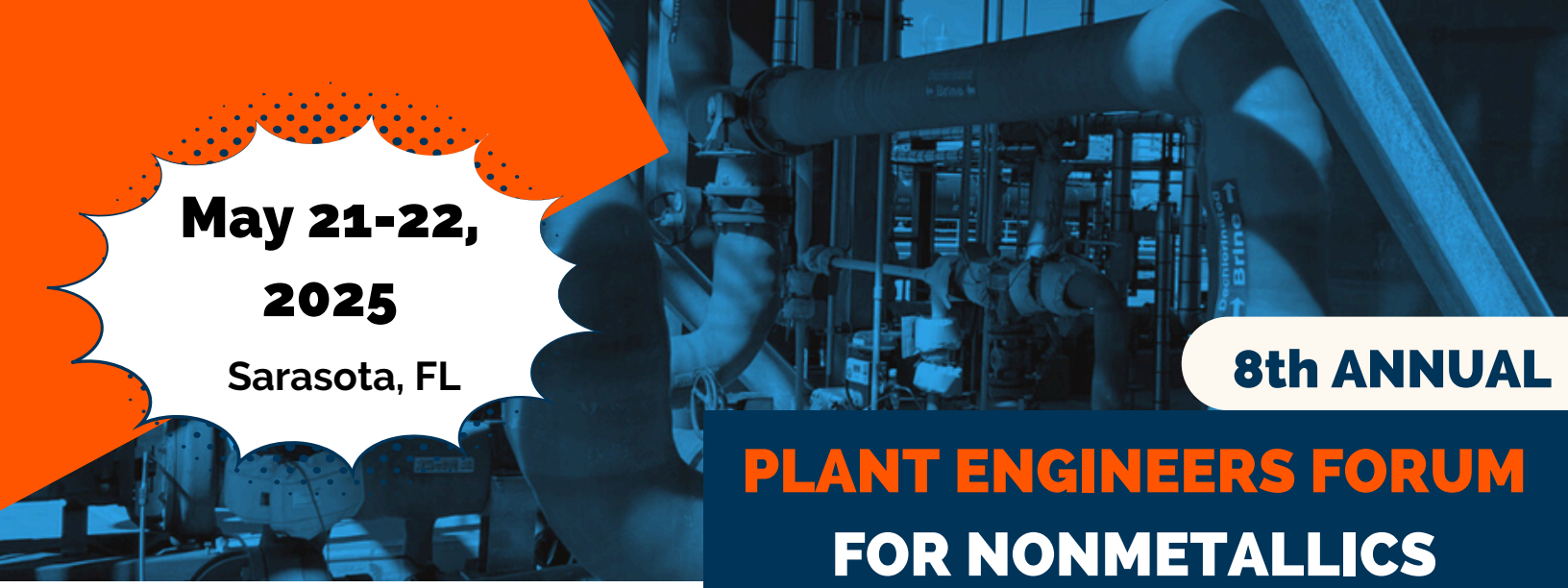

May 21-22, 2025

Sarasota, FL

8th ANNUAL

PLANT ENGINEERS FORUM FOR NONMETALLICS

2025 Technical Program

Maverick Applied Science presents the official Technical Program for the 8th Annual Plant Engineers Forum for Nonmetallics, brought to you by our sponsors.

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2025 Technical Program

DAY 1: WEDNESDAY, MAY 21st

7:30 AM- 8:00 AM

Forum Registration Check-In

8:00 AM- 8:10 AM

Greetings & Introductions

Jeffrey Eisenman, P.E.
Maverick Applied Science, Inc.

8:10 AM- 8:50 AM

FRP 201: Tank Construction and Fabrication Methods

A variety of fabrication methods can be implemented to manufacture FRP tanks, whether straight FRP or dual laminate FRP. We will discuss the various fabrication methods for a multitude of components associated with FRP Tanks as well as discuss and compare advantages and priorities to ensure quality and performance.

James Pierce,
Maverick Applied Science, Inc.

8:50 AM- 9:30 AM

Composite Repairs – Importance of Adhesion and ASME PCC-2/ISO 24817 High Level Review

MTI has completed two projects relating to composite repairs. One is adhesion to the metallic substrate; the other compares requirements of the two primary standards governing the design and qualification of composite repairs. This discussion will provide an overview of the results of these efforts and help you achieve a good reliable composite repair. To achieve a good adhesion, the surface of the substrate must be properly prepared. If this cannot be done the repair will not perform well. MTI project 382 evaluated various surface preparations for adhesion. The two standards, ASME PCC-2 and ISO 24817, provide requirements for design and qualification of both composite repairs and personnel. MTI project 394 compares the requirements of these two standards.

Dale Keeler,
Materials Technology Institute

9:30 AM- 10:10 AM

How to Control Expansion and Contraction in Thermoplastic Pipes

The presentation will cover the characteristics of plastic pipes exposed to varying ambient and fluid temperatures. The primary focus will be on polyolefins and fluoropolymers. Expansion rates will be discussed, and a review of the mechanisms that can be used to guide, support and anchor the piping to provide the most optimal installation for given field conditions. We'll look at the forces generated by expansion and contraction, and how they affect the hardware and logistics of anchoring plastic pipes in a way that does not risk damaging the piping. The discussion will cover both single wall and double contained piping, and the particular challenges double contained systems may pose, and ways to accommodate relative movement in double contained systems.

Robert Marsiglia
Asahi/America

10:10 AM- 10:30 AM

MORNING BREAK

10:30 AM- 11:10 AM

Maintenance of In-service FRP Equipment – Part 1: How to Know if an FRP Asset is Fit for Service?

Owner's Process Safety Management procedures often require Fitness-for-Service or RAGAGEP compliance, but what does that actually mean for FRP? Are there standards explaining how to do this? In this Part 1 presentation on maintenance and reliability of in-service FRP equipment, we'll discuss various ways to inspect FRP assets, both with non-destructive and destructive methods, to ensure safe and reliable performance.

Darryl Mikulec, P.E.
Maverick Applied Science, Inc.

11:10 AM- 11:50 PM

An Engineer's Guide to Implementation of ASME NM.2

The state-of-the art FRP piping standard, ASME NM.2, Fiber-Reinforced Thermosetting-Resin Piping Systems has been in use for 5 years now and is current in its 3rd publication. This is the first comprehensive standard for FRP piping that ASME has developed for industry. Focused on FRP piping, the depth of guidance and direction in the standard follows the scope and details of the principal piping codes. In the presentation, we be will diving into the standard, it's intent, and contents. Additionally, we will offer insights and guidance to the full and best implementation of the standard for best system or project performance. This standard has raised the expectations for proof of design and construction. We will discuss an approach for most efficient implementation for reliable system performance.

Jeffrey Eisenman, P.E,
Maverick Applied Science

11:50 AM- 12:30 PM

Thermoplastic Piping Systems within Industrial Applications

We will explore several different thermoplastic piping materials available on the market and address their benefits and limitations within the chemical process industry. We will also discuss common misconceptions and concerns around thermoplastic piping in industrial applications such as support, impact, chemical resistance, failed joints and testing.

Steven Dolejsi
IPEX USA LLC

12:30 PM- 1:30 PM

LUNCH (Provided for all attendees)

1:30 PM- 2:10 PM

Proper Procedures and Management of FRP and Dual Laminate Piping Project from Conception to Field Installation

This presentation will cover the details and flow of a piping project from sales, engineering and design, supports, fabrication, QA/QC and field installation. This will benefit all necessary requirements to complete a piping project from both an end-user, fabricator, and installer. This will cover the high points required to perform a FRP and dual laminate pipe project.

Miles Mohnkern,
Thorpe Plant Services, Inc.

2:10 PM- 2:50 PM

Bolted Flanged Connections (BFCs) in Industrial Piping Systems: Challenges and Best Practices

Bolted flanged connections (BFCs) are critical components in industrial piping systems, ensuring the safe containment of chemicals under dynamic operating conditions. The reliability of the system depends on many factors, making its design, installation, and maintenance complex. We will explore key challenges associated with BFCs, including gasket selection, the impact of bolt preload, and the effect of temperature and pressure on reliability. We will address issues such as leaks, connection relaxation, and gasket degradation, and best practices to mitigate these risks. By adopting proper assembly procedures, incorporating function-specific training, and utilizing advanced sealing materials, engineers and supervisors can enhance the long-term reliability and performance of BFCs.

Jeff Wilson
VSP Technologies

2:50 PM- 3:10PM

AFTERNOON BREAK

3:10 PM- 4:10 PM

Breakout Session: Material Selection, Project Execution, Plant Maintenance, and Reliability

Attendees will break into two groups led by subject matter experts and discuss topics focusing on either capital projects and execution or plant maintenance and reliability. This session gives attendees an opportunity to communicate and share ideas with the subject matter experts and fellow professionals in their field.

All Speakers

4:10 PM- 5:00 PM

Regroup Panel Discussion

Attendees will reflect on the discussions had in the breakout sessions, offering fresh perspectives and ideas to consider to fellow attendees. We will share comments and conclusions from breakout session for group interaction.

All Speakers

DAY 2: THURSDAY, MAY 22nd

8:00 AM- 8:40 AM

Understanding FRP Material Selection, Corrosion Performance to Extend Service Life of Industrial Equipment

Corrosion performance of FRP based equipment is not readily understood by many engineers upon graduation from college. Many engineering curriculums are highly focused on use of metals for industrial process equipment such as pipes, tanks, scrubbers, and reaction vessels. Material suppliers and companies that specialize in FRP equipment fabrication house much of the know-how, corrosion data, and case histories for use and performance of FRP in industrial applications such as chemical process, chlor-alkali, mineral processing, pulp and paper and pollution control. Transfer of this knowledge to a wider audience, specifically teams that select, design and build process loops and plants, is a challenge that talks seek to address.

When making investments in new plant expansion or existing plant repair, decision makers need a clear understanding of the risk and benefits of selecting one material over another. FRP material suppliers and fabricators have the needed tools to help them with their decision making.

Lisa Adkins,
INEOS Composites

8:40 AM- 9:20 AM

Best Practices for Execution of an FRP Piping Project

FRP has many applications in chemical processing, across many material constructions and services. This presentation will discuss a project execution plan for FRP piping. We will discuss considerations in materials selection that impact reliability and longevity of a system. In chemical processing, detailed engineering and proper stress analysis are essential for predicting and ensuring dependable system performance. To get started on the right foot, vendor selection and bid evaluation is important. We will present key elements in this process. Fabrication and construction are where the rubber meets the road. In this presentation, we will discuss expectations in fabrication and installation and key check points to ensure a successful project.

Jeffrey Eisenman, P.E,
Maverick Applied Science Inc.

9:20 AM- 10:00 AM

Analysis of FRP Piping Design Standards: Methods, Requirements, and Best Practices

There are various national and international standards, each specifying different methods for design, testing, and quality control of FRP piping systems. This presentation provides a comparative analysis of key FRP piping standards. The discussion covers standard design methodologies for FRP pipes and fittings, highlighting the key differences. Additionally, the presentation explores...

...testing requirements, quality control measures, and compliance considerations, providing insights into selecting the appropriate standard based on application-specific needs. By understanding the similarities and differences between these standards, engineers and industry professionals can make informed decisions to ensure value, reliability, safety, and regulatory compliance in FRP piping systems.

Shahin Shadlou, P.E.,
RPS Composites

10:00 AM- 10:20 AM

MORNING BREAK

10:20 AM- 11:00 AM

Standards vs. Specifications: Importance of Comprehensive FRP Equipment Specifications

FRP standards provide necessary general guidelines and minimum requirements for standard FRP equipment; however, general guidelines and minimum requirements may not be sufficient for non-standard FRP equipment or, as an owner, may not meet the expectations and quality set at your facility. This is where a comprehensive FRP equipment specification bridges the gap to ensure, as the owner, you are getting the FRP equipment you expect and that is safe and reliable for your specific service. The goal of this presentation is to discuss some of the non-standard FRP equipment as well as compare aspects of the FRP standards that are generally left more ambiguous or self-governing, to what could be stated in an FRP specification as a requirement.

James Pierce
Maverick Applied Science, Inc.

11:00 AM- 11:40 AM

Expansion Joint Reliability in Plants

Due to the relatively lower modulus of elasticity of FRP piping and equipment, FRP is much more flexible than other traditional piping materials. This behavior requires different choices in expansion joint materials and stiffness. To complicate the challenge further, traditional elastomeric expansion joints are not suitable for many severe chemical services. Fluoropolymer expansion joints are needed for these most demanding services. In this presentation we will discuss selecting the right fluoropolymer expansion joints and the purpose of expansion joints, how to size them appropriately, the importance of how they are designed and manufactured, and how physical inspections and site audits should be conducted for safe and reliable operation of equipment.

Colleen Reeves,
Andronaco Industries

11:40 AM- 12:20 PM

Maintenance of In-service FRP Equipment Part 2: How to Repair FRP Assets that aren't Fit for Service

In this Part 2 presentation on maintenance and reliability of in-service FRP equipment, we'll discuss the process for rehabilitating and repairing FRP equipment that's nearing the end of its useful service life or has been deemed unfit for service. If done wrong, the results could be disastrous and costly. However, there are proven and reliable ways to repair or reline FRP, but there are critical steps that need to be taken to do it right.

Darryl Mikulec, P.E.
Maverick Applied Science, Inc.

12:20 PM- 1:20 PM

LUNCH (Provided for all attendees)

1:20 PM- 2:00 PM

Nonmetallic Material Selection for a Mineral Processing Project

There are many elements of mineral processing that are common to chemical processing, particularly where solvent extraction is part of the process to separate essential minerals from raw rock and ore. That said, conversely, there are other factors that are unique to mineral processing, which require additional considerations in material selection for these services. Because many services can be slurries with suspended solids in the flow stream, abrasion resistance is a notable consideration. Depending on the fluid and design conditions, there are a number of piping materials that may be suitable for these services, such as FRP, HDPE, PEX, and CPVC. We will discuss factors to consider in the evaluation of these materials for specific service conditions and offer thoughts and guidance in material selection for optimal performance of these piping materials.

Jeffrey Eisenman, P.E.,
Maverick Applied Science, Inc.

2:00 PM- 2:40 PM

Evaluating the Benefits and Challenges of Lined Steel for Process Equipment in Aggressive Environments

This presentation evaluates the benefits of lined steel for process equipment by examining various case studies from the chemical process industry. Lined steel, often used for corrosion resistance, chemical compatibility, and enhanced durability, is a critical material choice for equipment exposed to aggressive environments. This presentation will highlight strengths of these solutions as well as share some potential weaknesses to aid the end user in the proper selection and use.

Michael Krauss,
Knight Material Technologies
Co-sponsorship with AGRU America, Inc.

2:40 PM- 3:30 PM

Panel Discussion

We will have an open panel discussion. The panel of presenters will further discuss questions related to material selection, approaches to reliability, project strategy for nonmetallic equipment and considerations for a successful project.

All Speakers

END OF FORUM, 3:30PM