



COMMUNICATIONS

MATERIALS TECHNOLOGY INSTITUTE OF THE CHEMICAL PROCESS INDUSTRIES, INC.

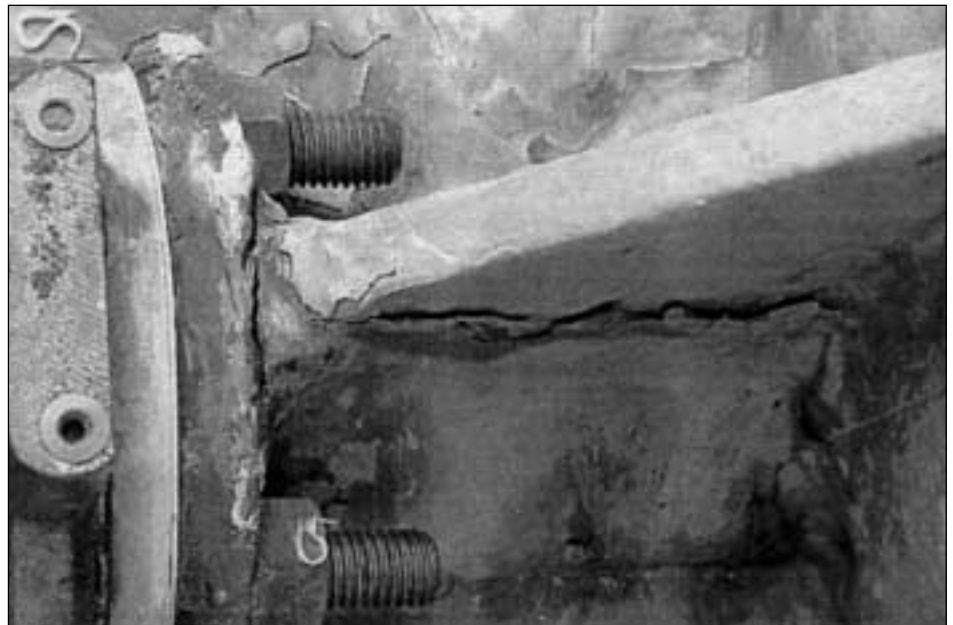
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Project 129-99 Self-help Guide for In-service Inspection of FRP Equipment and Piping

The Polymer Resource Advisory Group initiated this project in 1999. The project contract was initially awarded to the late Dr. John Niese, who played a major role in obtaining supporting documentation and writing the first draft of the document. Dr. Hira Ahluwalia completed the project by technical editing and formatting the document.

The mechanical integrity program initiated by many companies requires inspection of process equipment. Although various inspection guidelines exist for metallic equipment, no such document is readily available for Fiberglass Reinforced Plastic Equipment (FRP). This document presents the first comprehensive field guide to the inspection of FRP equipment. The guide is aimed at assisting plant inspectors and maintenance personnel in performing inspections of FRP equipment and piping, even though the inspector may not be familiar with FRP technology. It is hoped that this project will be the genesis of a more comprehensive fitness for service document.

The guide is divided into several different chapters. The first three chapters provide a background of FRP technology and inspection methodology. The next four sections are the heart of the guide, and illustrate pictorial views of various forms



PHOTOGRAPH SHOWING A GUSSET CONNECTION ALMOST CRACKED OFF AT THE NOZZLE. THIS CRACK WAS THE RESULT OF SEVERE BENDING STRESS CAUSING FAILURE OF THE SECONDARY JOINT BETWEEN THE GUSSET AND THE NOZZLE.

of damage that occur with FRP. Photographs of actual failures illustrate degradation caused by mechanical, chemical, environmental reasons and those due to fabrication errors. The final chapter is a compilation of various miscellaneous failures.

This guide is meant to be evergreen. More detailed case histories are needed, and should be submitted to the St. Louis office. The entire guide is available to MTI members on the members' only web page.

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Materials Technology Institute of the Chemical Process Industries, Inc. (MTI) is a unique, cooperative research and development organization representing private industry. Its objective is to conduct generic, non-proprietary studies of a practical nature on the selection, design, fabrication, testing, inspection, and performance of materials and equipment used in the process industries.



MTI Approves and Funds Three New Projects

GUIDELINES FOR TROUBLESHOOTING WATER COOLED HEAT EXCHANGERS

A guideline manual will be produced for reviewing cooling water circuit performance and identifying critical heat exchangers that utilize phosphate treated water in open recirculating cooling towers. The manual will be a useful tool in training plant maintenance and operations, as well as designers and engineering personnel in issues concerning cooling water. Technical professionals will be equipped with practical guidelines for troubleshooting the waterside of a heat exchanger.

Heat exchanger performance in the process industries impacts the sale, delivery and stocking of materials and products produced by all member companies. This project will aid in improving heat exchanger reliability and subsequently process uptime while reducing maintenance costs and profit losses.

The Board of Directors approved \$100,000. The successful contractor is Arthur Freedman Associates, Inc. Total project timing should not exceed 1-1/2 years. Project champion is Brian Fitzgerald, ExxonMobil.

FIELD TRIALS OF MICROWAVE NDE

The objective of this project is to confirm microwave resonator sensor sensitivity in the detection of known blister defects from field test measurements on FRP tanks that have been in HCl service. Emphasis here is on known and/or suspect defects that involve localized search patterns. This is a continuation of a previous project that determined the application of microwaves.

This technique will provide an economic and efficient means of non-intrusively inspecting FRP storage tanks and piping.

The Board of Directors approved \$58,000. Project timing is dependent upon tankage availability as a function of plant turnarounds and validity of data received. The project is estimated to be complete in one year. KDC Technology Corporation is the successful contractor. Pradip Khaladkar, DuPont is the project champion.

FLANGE MAKE-UP TRAINING PROGRAM

This project will provide MTI members with guidelines for training mechanics in the proper and safe make-up of flanged joints using gaskets. The benefits include not only improved process safety, but reduced flange leakage will lessen the need for on-stream repair, reduce fugitive emissions, lower operating costs, and reduce property damage.

The program will address three crucial areas: Procedures, Qualifications and Awareness Training. This program applies to bolted/gasketed joints mainly associated with ANSI/ASME standard pipe sizes and to some degree, heat exchangers and equipment body closure flanged joints.

An amount of \$46,000 has been authorized by the Board of Directors for the project to be completed by the contractor(s) within one year. Contact Bob Sherwood, Air Products and Chemicals Inc., project champion (sherworj@apci.com) or the St. Louis office (314-576-7712) for further details on how you might participate. The greatest impact on a project comes at the very beginning. Now is the time to put forth your ideas in this significant problem.



Bert Krisher Retires



Bert Krisher "officially" retired from MTI in February 2001. A founding member of MTI, Bert retired from Monsanto Corporation after a 34-year career as a materials engineer. He came on board MTI in 1985 as a Technical Director and in 1988 took on the position of Executive Director. He served as Executive Director for seven years and "retired" to the position of Associate Director. After an additional six years as an associate director in February of this year, Bert relinquished his primary role with MTI formally retiring (for the fourth time).

Bert has been instrumental in the formation and the development of the organization. He is considered the historian of the organization amongst many other things. He will continue a presence in MTI as a consulting director making his knowledge and wisdom always available to the members and the staff.



International Scene

SUMMARY REPORT

On November 15-16, 2000 MTI and NiDI held a joint process industries discussion at the Novotel Hotel, Brussels, Belgium. Eighteen member companies of MTI were present.

Highlights:

- The Coris system developed by Bayer and Dechema was discussed by Gervens and Schweier of Bayer. It is a very large database (about 80,000 cases), with extensive details on each, using neural network to interpolate.
- Metal Dusting was discussed in considerable detail.
 - Korkhaus of BASF discussed failure analyses. He collaborated with van Wortel of TNO. van Wortel reported on sponsored studies at TNO. His associates are in contact with the MTI/DOE study. van Wortel observed that metal dusting and relaxation cracking occur in overlapping temperature areas, so both may occur on the same equipment.
 - Recent increase in interest in metal dusting incidence is attributed to the following: 1) many systems now involve catalysts which are poisoned by sulfur compounds, 2) the steam ratio in reformers has decreased, moving reformers into the metal dusting regime, and 3) with energy conservation, there are more interchangers operating in the damaging 400° to 700°C temperature range.
- Ethylene Pyrolysis
 - Frans Terwijn of Shell reported on anticoking treatment for ethylene pyrolysis tubes. This treatment, called "PPW," involves weld overlay (about 2 mm thickness of 50-50 Cr/Ni) on the inside tube surface to retard coking. The surface exposed to the process is Cr rich, in contrast to the Fe rich base metal. Furnace run times and tube life have been extended by factors of 2 or 3 times.
- Bjornstedt of Avesta described a new proposal to harmonize European and American standards by modifying the Cr minimum for 304. Earlier (about 1991) a reduction from the ASTM limit of 18% to 17% was proposed. The new proposal is for Cr minimum of 17.5. This was discussed at MTI during TAC 46, October 1991, under the title "Potential Change in Type 304 Stainless Standards."
- Peter Cutler described a very thorough guide to SS being developed as software by NiDI. It is expected to be finished in a couple of months. It will be available on the NiDI web site.
- MTI presented material on three subjects, as listed below:
 - H. Lee Craig – MTI initiatives in the High Temperature Area
 - Pradip Khaladkar – Non-metallic activities at MTI
 - Bert Krisher – Studies of computerized corrosion prediction tools at MTI. Gert Boulliard of METALogic discussed the AUSCOR program in more detail.



Networking—A Value Plus of MTI Membership

Whenever veteran representatives discuss the benefits of MTI membership, networking always gets high marks. Recently a member told of an occasion he had to call a friend he had met through attendance at MTI, to seek his opinion on a certain engineering standard. This capability satisfied his immediate need for information about this topic. Yet this is only one of many examples of networking that goes on both during and in between the more formal meetings that make up the three days of MTI - TAC, RG and Structured Forums. Listening to the many discussions of questions and presentations soon provides a new member with familiarity – just who it is that has the answers to his problems. The informal nature of the get-together in the early evening hours (as shown in the accompanying photo) allows a friendly approach to someone that you want to make a new friend. The value of questions in promoting new thought patterns and ways of solving problems is well known. Most engineers welcome the give-and-take that surrounds points that are sometimes debatable. This is done with a feeling of goodwill, in a common effort to reach a consensus of those who know the subject.

As alluded to by the example cited above, this degree of cooperation and willingness to help one another carries over long after the meeting is finished. The advent of e-mail to supplement the more conventional phone call allows a broader degree of response. Time is available to look up a certain point when answering by Internet, compared with the sometimes-awkward uncertainty that occurs during a phone call.



SRINI KESAVAN, ASHOK RAKHE, BOB WOLF AND BOB GILL NETWORKING AT A RECENT MTI MEETING

If you haven't tried networking before – do give it a try. You will almost assuredly like it, both for the information you get plus the good feelings provided by working constructively with others.



Champion in the Spotlight

MTI recognizes the contributions of members who volunteer their time, effort and energy as project champions to guide and direct projects to their fulfillment.



ROBERT (BOB) SHERWOOD
ENGINEERING ASSOCIATE
AIR PRODUCTS & CHEMICALS,
INC.

As a project champion, Bob has been exposed to new contacts and challenged to interface with group members in order to evaluate the input and

the needs of a group. He is currently responsible for the Flange make-up training program. This program addresses critical issues for the installation of flanges and assurance of joint tightness. The integrity of joints is fundamental in reducing emissions and small

leaks that have the potential to lead to environmental, safety issues and corrosion problems.

Bob became a project champion because of personal and professional interests in the project and was fueled by the challenge to make it a success. "I have been involved with MTI for many years with Ken Baumert as our representative. I have been fortunate to regularly attend the meetings for the last three years."

His involvement in MTI has been very satisfying and rewarding from the standpoint of making new contacts and establishing a network of resources.



New Members of the Board of Directors

Recent vacancies on the Board brought about the election of two new members.



BRIAN FITZGERALD

Brian has effectively represented ExxonMobil in the Technical Advisory Council (TAC) for eight years, since 1993. When asked why he wanted to serve on the Board, he said "As a Board member, I can help MTI adjust to the present industry changes in order to

remain a vital and productive industry contributor. MTI is unique among technical organizations in their approach to materials and engineering needs. Changes in the industry will challenge MTI to keep pace. MTI has made valuable contributions to the industry as well as my company."



KELLY WYROUGH

Kelly has been actively representing Roben Manufacturing in the TAC for 3 years, since 1998. Kelly said she wanted to serve on the Board because "As a representative from the supplier membership, my position on the Board will bring new views to an ever-changing

organization while keeping the mission of MTI in focus. My role will be to provide balance and diversity to promote the growth and advancement of the organization."



Product News...

MTI HAS UPDATED ITS PRODUCTS CATALOG!
E-mail mtiadmin@mti-link.org to request your copy today!



Permeation Through Polymers, by R. P. Campion
is available \$62.50, members, \$125, for non-members.
Call 304-522-0086 or order on-line at www.mti-link.org.



Welcome New Members...

MILLENNIUM INORGANIC CHEMICALS

Millennium Inorganic Chemicals is a subsidiary of Millennium Chemicals Inc., a large U.S. based chemical company. Millennium's global strength is in the production of Titanium dioxide - TiO₂ - a bright-white powder with the power to pigment virtually everything. It is a crucial ingredient in the best coatings, paints, plastics, papers, rubber, and ceramics. Manufacturers value TiO₂ for the brightness, opacity, and durability it adds to many high-quality products.

Millennium Inorganic Chemicals produces TiO₂ on four continents, United States, the United Kingdom, Western Australia, France and Brazil. Modern plants, operating around the clock, assure Millennium's ranking as the second largest TiO₂ producer in the world.

In the United States, Millennium is the

largest supplier of titanium tetrachloride (TiCl₄), which is used to manufacture titanium metal for the aerospace industry. Titanium tetrachloride is part of our Performance Chemicals business with production in the United States, France and Australia.

Knowledgeable employees provide personal, local service anywhere in the world.

Larry Duke, Manager, Global Materials & Equipment Reliability, is Millennium's TAC representative.

METALTEK INTERNATIONAL

In 1999, the parent company of Wisconsin Centrifugal which is located in Waukesha, WI; Carondelet Corporation in Pevely, MO; Wisconsin Investcast in Watertown, WI; Southern Centrifugal and Beryum Metals located in Chattanooga, TN created a new identity, MetalTek International.

The MetalTek International companies are major producers of centrifugal cast, static (sand) cast, investment cast, continuous cast components and fabricated equipment. Together they bring the expertise afforded by over 200 years in the manufacture of engineered alloy solutions for quality and value. Employment exceeds 800 employees.

At MetalTek International, this wide product offering is delivered through three business units; Engineered Products, Petrochemical Products, and Turbine Products. Each of these special units is structured to provide easy access to custom alloys across numerous metalworking technologies and afford single source responsibility.

Jerry Gapinski, Senior Development Engineer, is MetalTek's TAC Representative.



New Year, New Staff

MTI has brought aboard two new staff members in 2001. Emory Ford joined the staff in January and Galen Hodge came on in February. They bring a wealth of experience and knowledge to MTI. Bert Krisher retired as of February 28, 2001, but remains active in MTI as a Consulting Director. Tom Gibbs officially retired January 2001.



EMORY FORD

has more than 30 years experience in the petrochemical industry retiring from Equistar Chemical Company as Chief Scientist in January of 2000. His experience includes process development, fundamental research and materials selection for new plants and processes. He holds a BA in Physics and Chemistry from Hartwick

College and a PhD in Chemistry from Syracuse University. He was adjunct professor of Chemistry and Chair of the Industrial Advisory Board for the Department of Material Science at the University of Cincinnati. He has authored several technical publications and holds several US patents. Emory and his wife Susan recently moved to Northampton, Massachusetts. They have two daughters, one in Boston and one in graduate school at the University of Chicago.



GALEN HODGE

has over 36 years of experience in the steel, nickel alloy and nuclear industries, much of which was related to the chemical process industry. He most recently held positions in Research,

Marketing and International sales. He retired from Haynes International, Inc. in March 2001. Galen has a Ph.D. in Metallurgical Engineering from Rensselaer Polytechnic Institute. He and his wife, Hazel, have two daughters and seven grandchildren and live in Kokomo, Indiana.



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Calendar of Events

<u>MEETING</u>	<u>DATES</u>	<u>LOCATION</u>
MTI R.G. Meetings	JUN 4	Memphis Marriott
MTI TAC	JUN 5 & 6	Downtown
MTI BOD	JUN 6	Memphis, TN
MTI R.G. Meetings	OCT 22	Embassy Suites
MTI TAC	OCT 23 & 24	Phoenix North
MTI ANN	OCT 24	Phoenix, AZ
MTI BOD	OCT 24	
MTI R.G. Meetings	FEB 25	Sheraton Sand Key Hotel
MTI TAC	FEB 26 & 27	Clearwater Beach, FL
MTI BOD	FEB 27	