



# COMMUNICATIONS

MATERIALS TECHNOLOGY INSTITUTE OF THE CHEMICAL PROCESS INDUSTRIES, INC.

1215 Fern Ridge Parkway • Suite 116 • St. Louis, MO 63141-4405 • Telephone: 314/576-7712 • Fax: 314/576-6078 • E-mail: mtiadmin@mti-link.org

## MTI & DOE Launch Project Partnerships

The enormous opportunity for energy conservation in the chemical process industry led to a cooperative effort beginning in 1996 between the Department of Energy (DOE) and the industry to produce a Vision 2020 document forecasting the technology needs and priorities through the year 2020. This effort revealed that a substantial opportunity for energy conservation depends on technology advances in materials of construction for new manufacturing equipment and maintenance of existing equipment. In 1998, with DOE support, MTI developed a Technology Roadmap for new technology needs in materials of construction (available on the MTI web site <http://www.mti-link.org>).

MTI polled the membership for project ideas and champions resulting in more than a dozen proposals. Five of these were developed into project proposals submitted to DOE in response to their solicitation. All five projects were accepted for funding by the DOE over three years beginning Spring 2000. The total cost will be \$14.3 million of which DOE will provide nearly \$6 million; MTI cost will be about \$275,000; the balance will be in-kind support or funds from the other partnerships.

**Corrosion Monitoring System** is a partnership between DOE, Honeywell International, Oak Ridge National Laboratory (ORNL), Eastman Chemical,

and MTI. The objective is to develop a corrosion monitoring system that would ultimately reside in a control room and perform sensing, diagnostics, and prognostics for operation equipment in service. The champion is Gary Whittaker, Eastman Chemical, and the MTI staff person is Tom Gibbs. The total cost of Project 135-00 over 3 years is \$2.0 million, which includes \$970,000 from the DOE.

**Prediction of Corrosion in Mixed Solvents** is a partnership between DOE, OLI Systems, Oak Ridge National Laboratory (ORNL), and MTI. They intend to build on existing computer models that predict corrosion rates of simple metals and develop a model to identify species and predict corrosion behavior of alloys in mixed solvents. The champion is Sandy Sharp, Westvaco, and the MTI staff person is Jim Macki. The total cost of Project 136-00 over 3 years is \$2.4 million, which includes \$930,000 from the DOE.

**Enhancement & Commercialization of the Alloy Selection System for Elevated Temperatures** (ASSET) is a partnership between DOE, Shell Oil, and Oak Ridge National Laboratory (ORNL). The objective is to expand the database of the ASSET software program to predict corrosion rates and mechanisms in high temperature environments using existing and new data developed from a testing program at ORNL. The champion is Randy John, Shell, and the MTI staff person is Lee

Craig. The total cost of Project 130-00 over 3 years is \$2.9 million, which includes \$1.4 million from the DOE.

**Advanced Intermetallics & Alloy for Ethylene Crackers** is a partnership between DOE, ExxonMobil Chemical, and Oak Ridge National Laboratory (ORNL), and MTI. They intend to fabricate and test the suitability of aluminide intermetallics for improved ethylene reactors, components for operation at higher temperatures and longer life than currently available materials. The champion is Brian Fitzgerald, ExxonMobil, and the MTI staff person is Lee Craig. The total cost of Project 137-00 over 3 years is \$4.5 million, which includes \$1.4 million from the DOE.

continued on page 5

### In This Issue

MTI Products .....	Page 2
MTI International .....	Page 2
MTI BOD .....	Page 3
MTI Project Champion .....	Page 4
MTI in Education .....	Page 4
Member Company News .....	Page 5
MTI Events .....	Page 6

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 Products

### UNUSUAL CORROSION PROBLEMS IN THE CHEMICAL INDUSTRY

*P. Dillon*

Prediction of materials performance in a known environment is possible today given the wealth of information and data available. However, atypical behavior and deviation from the normal does occur in everyday operating practice. These deviations can result in material failures of a potentially catastrophic nature. This publication calls on the vast experience of Paul Dillon whose knowledge base and experience in the

area of materials of construction for the chemical process industry spans in excess of 50 years.

Typical environments such as acids (sulfuric, hydrochloric, acetic, nitric) and others are discussed and 160 actual case histories are presented.

### PERMEATION THROUGH POLYMERS FOR PROCESS INDUSTRY APPLICATIONS

*R.P. Campion*

The publication addresses both the theory and the practice of permeation

through polymers. Testing methodology was developed to quantify the permeation characteristics of a wide range of fluids used in the chemical process industry. A series of guidelines was subsequently developed.

### ANNOUNCING...

MTI has updated its Products Catalog! E-mail [mtiadmin@mti-link.org](mailto:mtiadmin@mti-link.org) to request your copy today!

## On the MTI International Scene...

### JAPAN WELCOMES MTI

MTI was invited by the Plant Materials Engineering Committee (PMEC) of the Society for Chemical Engineering Japan (SCEJ) to participate in their meetings in Tokyo during March 2000. Dr. Masao Nakahara of Asahi Chemical Industry Company Limited (an MTI member) organized the meetings. The purpose of the meetings was to familiarize Japanese chemical companies with MTI operations and benefits. Dr. Nakahara is leading an effort to address the need for a cooperative materials technology organization for the chemical process industries in Japan.

Ken Baumert, Air Products, presented a paper on metal dusting (co-authored by Dick Jones). Jim Macki, Executive Director of MTI, provided an overview of MTI. He also presented a paper on software for corrosion prediction, authored by Sandy Sharp and Bert Krisher (who were unable to attend). Bert Krisher organized and arranged the details of these meetings for MTI.

During the meetings several mutually beneficial actions were identified. These included translating some Japanese documents into English for use by MTI members, translating selected MTI documents into Japanese for current and prospective Japanese members of MTI, and planning a future MTI meeting in Japan.

### 7TH EUROPEAN MEETING SCHEDULED

MTI and Nickel Development Institute (NiDI) will jointly sponsor a technical interchange meeting in Brussels, Belgium, 15 & 16 November 2000. The planning is not yet complete, but the meeting will be held in a downtown hotel, readily accessible by rail or air transport.

These meetings provide an opportunity for European based employees of MTI member companies to discuss technical questions of general interest and to learn more about MTI programs.

Detailed information will be distributed during the late spring or summer.

# MTI Board of Directors

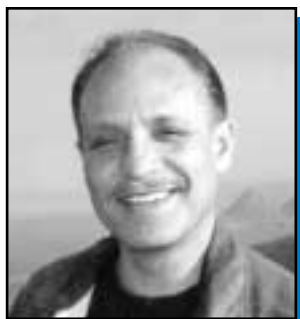
Dr. F. Galen Hodge, Haynes International has retired from the MTI Board of Directors, ending a long (18 years) and distinguished period of service in this capacity. His contributions to the effective management of MTI affairs have been numerous and important. He served as chairman of the Board of Directors in 1994, 1995 and 1996.

Two new members were elected to the Board. Ed Naylor, Akzo Nobel and Bert Moniz, DuPont.



ED NAYLOR

Ed Naylor has effectively represented Akzo Nobel on the TAC for four years since 1996. He becomes an ex-officio member of the BOD by virtue of his election as Vice Chairman of the TAC. When asked why he accepted this position, he responded, "I agreed to stand for election as TAC Vice Chairman because I can contribute to both the future of the TAC and the challenges facing the BOD at this critical time in MTI's continuing development. Electronic information transfer and expanding membership are having a dramatic effect on the TAC Open Forum, Resource Group participation and meeting attendance. The birthplace of MTI projects is becoming RAGs instead of Open Forum discussions. Maintaining project excellence and managing the leveraging of resources afforded by joint MTI/DOE projects are also crucial issues facing the organization."



BERT MONIZ

Bert Moniz has also been active and effective representing DuPont in the TAC for four years, since 1996. When asked why he wanted to serve on the BOD, Bert responded, "I wanted to serve on the Board of Directors to represent the interests of all members. The organization is going through important changes and these must be fuelled by consensus built on diversity of opinion." He firmly believes that active participation in resource groups and teams pays big dividends and will encourage all members to do so.

With these changes the 2000 BOD is: W. C. Fort, III (Shell),



W. C. FORT, III

Chairman, T. Nemzer (FMC), Vice Chairman, K. L. Baumert (Air Products), TAC Chairman, B. N. Greene (BASF), D. F. Jensen (Eli Lilly), E. L. Liening (Dow), A. H. Rahke (Celanese), W. B. A. Sharp (Westvaco), R. E. Smallwood (Cytec), R. R. Valbuena (DNV), G. S. Whittaker (Eastman), R. A. McTamoney (Carter, Ledyard & Milburn), Legal Counsel.

## ADMINISTRATIVE MANAGER RETIRES

After 15 years of loyal service to MTI, Lu Humphrey retired on March 31, 2000. Lu started working with MTI in April of 1985 as a part-time secretary and advanced to Administrative Manager in 1995.

A Roast & Toast was held in her honor in February at the TAC meeting in Clearwater Beach, Florida. When asked what she will do with all of her spare time Lu said, "I will spend time with my grandchildren, travel, and of course, fish."

MTI salutes her tireless efforts over the years and wishes her well in her new phase of life.



LU HUMPHREY AT HER ROAST & TOAST WHICH WAS HELD AT THE TAC MEETING LAST FEBRUARY. PICTURED ABOVE (L-R) ARE DEBBY EHRET, JULIE FULTON, LU HUMPHREY AND LORI ELGIN



## Project Champion



**W. B. A. "SANDY" SHARP —**  
SENIOR RESEARCH ASSOCIATE, WESTVACO CORPORATION

Sandy has been active in MTI for 15 years. He has chaired the TAC and the BOD, served on numerous Resource Groups and championed several, including the Leveraged Technology Programs Resource Advisory Group that led to the 5 projects recently funded by DOE.

Sandy has degrees in Metallurgy, Corrosion and Chemistry, and leads a central corrosion group that serves Westvaco's pulp and paper mills and chemical plants. When asked about the benefits of working with MTI, Sandy responded: "MTI provides us opportunities for competitive advantage by enabling us to find out about and implement materials technologies that have been successful in other industries but are unfamiliar in the paper industry or the wood chemicals industry. MTI is particularly effective in offering us access to information quickly, when we need it, which is more valuable than the passive transfer of information offered by other technical organizations. Participating in MTI activities has also improved my personal skills by showing me how the 'best in the business' approach technical problems."

Sandy says he volunteered to be champion of the Leveraged Technology Program Resource Advisory Group "to develop a process for obtaining major financial support from the Department of Energy for pre-competitive projects that could

help MTI member companies. The potential benefits were so great that I was ready to provide the leadership and administrative work required to try to achieve them, as project champion."

Sandy's previous involvement with DOE pulp and paper industry projects had prompted him to suggest that DOE use MTI to define materials research needs for the chemical process industries. He added, "I knew the excellent capabilities of the national laboratories, and I knew that my own company would support in-kind contributions to projects matched by external or government funding. Although MTI had been moving away from projects that required substantial involvement of member personnel, I thought that the potential rewards from the projects that could be completed in partnership with DOE would make them attractive to other MTI member companies also. Initially, negative experiences of other MTI companies with previous government-aided research presented a barrier to MTI's involvement with DOE. Fortunately, with help from Homi Bedhwar and Tom Gibbs, I was able to persuade MTI to push ahead."

In further comments on the value of being a project champion, he said, "I was very pleased that we were able to develop an alternative process for funding projects of interest to Westvaco and other MTI companies. So, although the activities involved in being a project champion did not generally involve much technical interchange, the outcome more than justified the work involved."

## University Professor Uses MTI Materials in Course Work

MTI believes in actively assisting Professors who teach courses relevant to materials and corrosion. One program, the Corrosion Education Program, jointly sponsored by MTI and the Nickel Development Institute (NiDI) provides selected MTI materials to these professors for use in course work.

In a recent interview, Professor Carl Locke, Dean of Engineering,

University of Kansas reported on his use of the MTI Corrosion and Materials Awareness Videos. These are short (10 to 20 minutes) videos intended to increase awareness of non-specialists about corrosion and materials issues.

Dr. Locke reported that in his course "Corrosion Engineering I," he has used the "Recognizing Corrosion" video, and plans to use two others

"Nondestructive Testing" and "Stainless Steels" later in the course. Feedback from the students has been very positive. They considered the video did a good job of illustrating how corrosion damage will appear. It helped them understand how corrosion theory taught in the course relates to the real world.



## Welcome New Members...

### RATH MANUFACTURING COMPANY, INC.

Rath Manufacturing Co., Inc., located in Janesville, Wisconsin, is a major producer of welded tubing and pipe in austenitic stainless 300 series, duplex and super duplex stainless and nickel alloys. Rath's size range is .500 through 4.000" outside diameters. The company began as a small dairy equipment company in 1952 and has been producing tubular products since 1975.

Rath has 16 tube and pipe mills, 14 operating with TIG and 2 with laser welding equipment. The 1999 sales were approximately \$75 million and employment level 140-150 people.

In 1999 Rath acquired Gibson Tube located in North Branch, N.J. Gibson manufactures welded tubing and pipe in straight lengths and coils with an outside diameter range of .062" - 1.500". The materials

base is very much the same as Rath Manufacturing.

Dallas Moore, Consultant & Management Resource, is Rath Manufacturing's TAC Representative.

### ELECTRO CHEMICAL ENGINEERING & MANUFACTURING COMPANY

Electro Chemical Engineering & Manufacturing Company is a key player in America's chemical process industry. For over 50 years Electro Chemical Engineering has been a leader in the war on corrosion. They pioneered the first fluoropolymer systems for internal protection of steel equipment in the 1960's and currently offer a complete line of time-tested, non-metallic lining, coating and chemical resistant masonry systems. The linings are constructed to withstand extreme temperatures and highly corrosive conditions. In

addition to their installation capabilities, Electro Chemical is also active in testing of materials for chemical resistance at various temperatures in immersion service and development of test methods and procedures to analyze and assure the consistency and reliability of installed systems. These systems are used in many industries including chemical, semiconductor, pharmaceutical, steel, mining, and pulp and paper.

The company is located in Emmaus, Pennsylvania with a second location in Baton Rouge, Louisiana. Electro Chemical Engineering & Manufacturing Company employs approximately 50 people and is active on both National and International work.

Dale K. Heffner, Vice President, is Electro Chemical Engineering's TAC Representative.

## MTI & DOE

(continued from page 1)

**Study of Metal Dusting Phenomenon & Development of Materials Resistant to Metal Dusting** is a partnership between DOE, Argonne National Laboratory, and MTI. They will study the mechanisms of metal dusting and develop materials resistant to the degradation through analysis, laboratory and field tests in various commercial processes such as hydrogen production,

methanol and ammonia, and syngas production. At least nine MTI companies will participate. The champion is Ken Baumert, Air Products, and the MTI staff person is Lee Craig. The total cost of Project 138-00 over 3 years is \$2.5 million, which includes \$1.2 million from the DOE.

## Share the News!

If you've finished reading this copy of MTI Communications, please share it with a friend or co-worker.

If you would like to be added to MTI Communications mailing list, contact Lori Elgin at 1-314-576-7712 (telephone), 1-314-576-6078 (fax), or [mtiadmin@mti-link.org](mailto:mtiadmin@mti-link.org) (e-mail).



Materials Technology Institute  
of the Chemical Process Industries, Inc.  
1215 Fern Ridge Parkway, Suite 116  
St. Louis, MO 63141-4405  
www.mti-link.org

BULK RATE  
U.S. POSTAGE  
PAID  
ST. LOUIS, MO  
PERMIT NO. 3252

*Address corrections or list deletions should be sent to the address above.*

## Contact:

Submit all correspondence regarding  
MTI Communications to:

Materials Technology Institute of the Chemical  
Process Industries, Inc.  
Attn: MTI Communications  
1215 Fern Ridge Parkway  
Suite 116  
St. Louis, MO 63141-4405

1-314-576-7712 (telephone)  
1-314-576-6078 (fax)  
mtiadmin@mti-link.org

## Subscriptions:

For a free subscription, write to MTI or  
contact mtiadmin@mti-link.org

# Calendar of Events

<u>MEETING</u>	<u>DATES</u>	<u>LOCATION</u>
MTI R.G. Meetings MTI TAC MTI BOD	JUN 5, 2000 JUN 6 & 7 JUN 7	Airport Marriott Hotel St. Louis, MO
MTI R.G. Meetings MTI TAC MTI ANN MTI BOD	OCT 23 OCT 24 & 25 OCT 25 OCT 26	Embassy Suites Hotel Charlotte, NC
MTI European Meeting	NOV 15 & 16	Brussels, Belgium
MTI R.G. Meetings MTI TAC MTI BOD	FEB 26 FEB 27 & 28 FEB 28	Sheraton Sand Key Hotel Clearwater Beach, FL