A Materials Technology Institute Publication

MTI CONNECT

2022, ISSUE 3

GLOBAL CHALLENGES / TRUSTED SOLUTIONS

MTI Processing Industry Projects Deliver Value

Total MTI Project Funding Eclipses $1.5 Million in 2022

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CONNECT

Inside This Issue

ABOUT THIS PUBLICATION:

MTI CONNECT is published by the Materials Technology Institute, Inc. (MTI). 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.

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CALENDAR OF EVENTS:

AmeriTAC 140
February 20-22, 2023
Ft. Lauderdale, FL

AsiaTAC Spring Meeting
April 2022
Da Nang, Vietnam

EuroTAC Spring Meeting
May 2022
Berlin, Germany

MTI HONORS THE MEMORY OF ROBERT SINKO

FELLOW AND LONG-TIME MEMBER

One of the Materials Technology Institute's most active contributors and faithful supporters, Robert Sinko, 67, passed away on October 2, 2022, after a sudden cardiac arrest on September 24.

MTI paid tribute to his memory during the AmeriTAC 139 meeting, October 25, 2022, in Houston, with a moment of silence and later opened the floor for Robert's "MTI Family" to share their memories.

Robert was a long-time MTI participant with member company Eastman and more recently with Becht. He was such a big believer in MTI that he frequently displayed the organization's logo on his head. From pictures in newsletters and on the website to live AmeriTAC Meetings, Robert was often seen sporting a beige ballcap with the recognizable blue brand just above the bill. In 2020, MTI presented him with the prestigious Fellow Award, an award and role he was most honored to receive. Robert began participating in MTI in 1995. He was passionate about MTI and always, figuratively speaking, "put on his MTI hat" when serving as Board Chair, Board member, TAC Chair, project champion and voting on projects. He frequently engaged in the MTI Forum discussions as both a member and Fellow with more than 600 activities documented from his discussion contributions.

MTI will miss Robert's knowledge, leadership and friendship. Our deepest condolences go out to his wife Linda, their family and all who mourn Robert. ▪

MTI pays tribute to Robert Sinko during AmeriTAC 139 in Houston.

MTI ELECTS 2022-23 BOARD OF DIRECTORS

BY BYRON KEELIN, MTI

NEW LEADERSHIP FOCUSES ON STRATEGIC PLAN

MTI members elected new leaders for the 2022-23 year during the Annual Member's Meeting this past October in Houston. Debra McCauley (Chemours); David Barber (Dow); Maria Jose Oestergaard (Topsoe); Curtis Huddle (Eastman); Nina Young (Chevron Phillips Chemical Company); Meghan Oaks (BASF); Maurice Wadley (DuPont); Srini Kesavan (FMC); Dale Heffner (Knight Materials); Chuck Young (Tricor Metals); and Bill Bieber (Webco Industries) were elected as the 2023 MTI Board of Directors.

Members also voted on the Technical Advisory Council (TAC) leadership teams. AmeriTAC will have a new Chair, Andrew Rentsch (Huntsman), and Vice Chair, David Cole (Eastman). EuroTAC and AsiaTAC both saw reappointments of their leaders. Anette Hansson (Topsoe) and Lars Rose (DuPont) were re-elected as the EuroTAC Chair and Vice Chair, and TP Cheng (ITRI), Alex Chen (Dow), and Jan Li (Outokompu) will continue to serve as AsiaTAC Chair and Vice Chairs.

Serving as the new MTI Board Chair is Debra McCauley with Vice Chair Andrew Rentsch. McCauley held the Vice Chair position from 2019 – 2022 and takes over as MTI has fully emerged from the throws of the pandemic.

Incoming Board Chair, Debra McCauley (Chemours)

Incoming Board Vice Chair & AmeriTAC Chair, Andrew Rentsch (Huntsman)

"I would like to acknowledge the excellent work that David Barber provided these past three years," McCauley shares. "David successfully led and maintained the health of MTI during the toughest of times with COVID. I know I have big boots to fill, he has been an outstanding mentor and friend."

McCauley has been involved in MTI for 15 years. She serves as the Designated Representative for Chemours and is a subject matter expert in non-metallics. Her expertise has helped make MTI the industry leader in FRP and Dual Laminates.

"My goal for MTI, as Chair, is to continue to grow and work on solving problems for our member companies and evaluate new materials and technologies that affect process industry-related applications," she says.

And she'll have plenty of help to make that happen as Rentsch joins McCauley on the executive leadership team. He served as the AmeriTAC Vice Chair for the past two years and is the Chair of the MTI Website Committee, so he's no stranger to challenges. During the pandemic, Rentsch helped lead the

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Ed Naylor (far right) is presented the MTI Fellow Award by David Barber, former Board Chair, and Heather Allain, MTI Executive Director, while his wife Jennifer (far left) looks on.

ED NAYLOR NAMED 19TH MTI FELLOW

HONORED AT 2022 MTI AWARDS BANQUET

How about a drum roll, please?" The request from MTI Executive Director Heather Allain rang through the microphone at the start of the 2022 Annual Awards Banquet on October 26 in Houston. Everyone in the room joined in the fun as they waited with suspense for the name to drop, but no one was enthusiastically tapping away at the table with fingers for drumsticks like Ed Naylor (Nouryon). As the opening slide transitioned to reveal the recipient, Allain delivered his name. The room erupted with applause. Naylor sat there in a state of shock while his wife Jennifer snuck in behind him and the crowd moved to a standing ovation. It was the ultimate surprise that only a "family" like MTI could have orchestrated.

"Indeed, I was shocked!" Naylor confesses. "My mind raced through the previous 18 MTI Fellows as I tried to wrap my head around being permanently affiliated with such an esteemed group of people."

The shock lingered as he turned to see his wife, embraced her and then made their way to the podium where Allain and David Barber (former MTI Chair) noted his dedication and involvement in MTI for the past 25 years. Barber presented him with the award and a lapel pin that only the elite group of individuals possess.

"To me, there's no greater professional reward than being recognized by your peers. Combine that with the recognition coming from MTI, for which I have such respect and admiration, and it's doubly humbling," he remarks.

Nouryon, AkzoNobel at the time, joined MTI in 1997. Naylor's predecessor was close with the "First Five"—the guys at the bar in Toronto that came up with the MTI idea, so he made sure to introduce them. That's where his history with MTI began. He says he was instantly struck by the friendliness and openness of the attendees to genuinely want to help one another.

"It wasn't about who makes the best product but rather how could we all do better. Sure, we all have our intellectual property, but there's a whole lot of areas where we all struggle and can help one another. That hasn't changed," he shares. "If anything, I'm even more impressed with how younger engineers begin participating in teams and meetings. Meeting by meeting, you can just watch their confidence grow—very fun to witness."

Along with the generational change happening at MTI, Naylor notes three big changes he influenced: PDCs, regional TACs and the MTI website.

"When I first became involved, Project Develop Committees were

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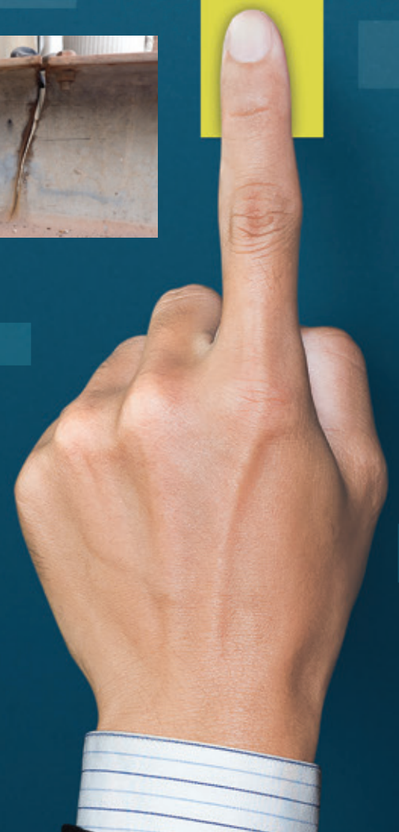


MTI PROCESSING INDUSTRY PROJECTS DELIVER VALUE

MTI's expert technical community provides member companies with opportunities to combine resources and network to solve critical industry challenges. From potential to funded to completed stages, these member-driven projects are a key benefit of membership. The collaborative approach generates results and deliverables of the highest technical quality.

NEW PROJECTS

Total MTI Project Funding Eclipses $1.5 Million in 2022

The Board of Directors approved $90,000 in funding for Project #351 – PTFE Bellows Expansion Joints Integrity, championed by Maurice Wadley (DuPont), during their meeting on October 27, 2022. The project was first presented for funding during the AmeriTAC meeting on October 26 and TAC approved the technical merit of the project.

The project scope is to create a "best practices" document for the correct use of properly manufactured and designed bellows, together with guidelines for qualifying fabricators/suppliers of bellows. These best practices will increase plant safety and reliability of this critical and necessary, but often vulnerable, component of process operations.

In addition, the Board approved supplemental funding for Project 357 – Corrosion in Bio-Oils during a conference call in November. The project was originally approved for funding at the AmeriTAC 137 meeting in February 2022. The additional funding of $42,800 will be added to Phase I of the project to perform four additional flow-through tests, modify the autoclave to include baffles and vortex breakers to maximize flow severity, and generate a final summary report.

This brings the total number of projects funded this year to nine and the total amount of funding to $1,547,505. Throughout MTI's 45-year history, this is the largest amount approved for projects in one year. The magnitude of new technical research projects and MTI's investment demonstrates the ability to collaborate and work quickly to address members' processing industry challenges.

Here is a quick recap of the new projects approved earlier this year:

#335 – Atlas of Microstructures for Alloy 625
Champions: Gary Whittaker (Nickel Institute), Alvaro Corbato Prieto (Topsoe)
Amount Funded: $133,750
Additional Funding: $11,600

#357 – Corrosion in Bio-Oils
Champions: Nate Sutton (E_2G), Maricela Johnson (Chevron)
Amount Funded: $132,355

#369 – Business Cases for Knowledge Management Continuous Improvement
Champions: Chuck Young (Tricor Metals), Jay Schickling (Chemours)
Amount Funded: $99,500

#375 – Remaining Life Evaluation of Aged Alloy 20CrNi1Nb Components
Champions: Jeremy Nelson (Koch Industries), Jose Ramirez (Air Products)
Amount Funded: $339,000

#379 – PSA Vessel Structural Integrity and Fatigue Testing
Champion: Jader Furtado (Air Liquide)
Amount Funded: $318,000

#382 – Composite Repair Surface Preparation Study
Champions: Dale Heffner (Knight Material Technologies), Enxhi Marika (Chemours)
Amount Funded: $93,000

#390 – HTHA Atlas of NDE Images and Corresponding Microstructures
Champion: Nina Young (Chevron Phillips Chemical Company)
Amount Funded: $253,000

#391 – Duplex Stainless Steel Welds at Elevated Temperatures
Champions: Anette Hansson (Topsoe), John Houben (ExxonMobil), Jennifer Larimore (Chemours)
Amount Funded: $34,500

For additional information or to join these projects, visit www.mti-global.org/communities/funded-projects.

TAC Representatives vote on technical projects at AmeriTAC 139, in Houston, TX., to approve sending to the Board for funding.

PROJECT UPDATE

Funded Project Update #375 – Remaining Life Evaluation of Aged Alloy 20Cr32Ni Components

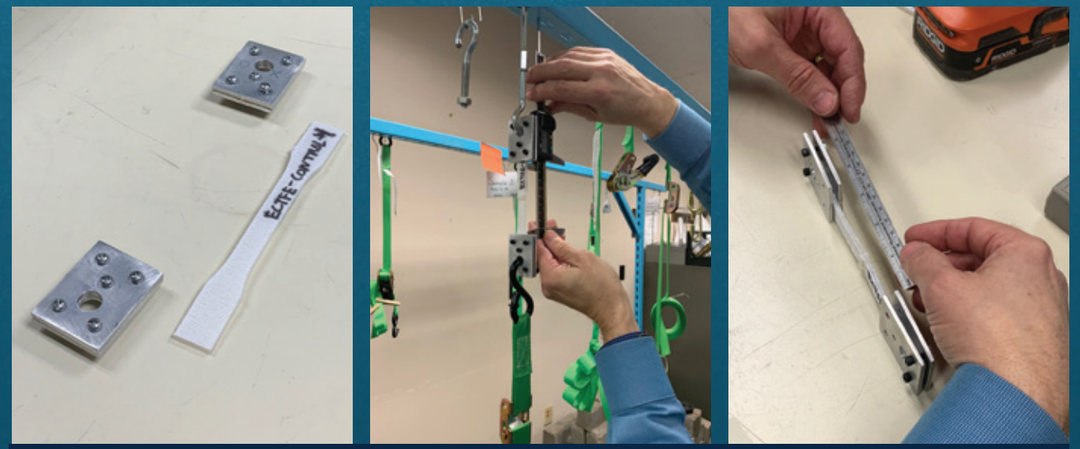
MTI Project #375 – Remaining Life Evaluation of Aged Alloy 20Cr32Ni Components has obtained an ex-service reformer outlet manifold. This donated manifold includes two repair welds made after 15 years in service and operated for a year after the repairs were made. Therefore, it contains both initial fabrication welds (Alloy 21/33) and repair welds (Alloy 617), which have experienced aging. MTI's lab contractor has completed metallography on weld and base metal specimens from the manifold. Interestingly, some g-phase ($Ni_{16}Nb_6Si_7$) has been identified in the samples, which is uncommon for this alloy family.

Currently the project is performing mechanical property testing to study the effect of the microstructural aging in service on the manifold's fracture toughness, creep life, and creep crack growth rates. As part of the scope, a guideline has also been developed for performing an example API 579/ASME FFS-1 Fitness For Service assessment on this component, using the data gathered from the testing. The test results from Project #375 will help industry to better understand the relationship between this concentration of g-phase, along with other in-service degradation features, and the component's flaw tolerance. Practically speaking, an owner-user could apply this guideline to evaluate whether a repair is required on a reformer manifold or similar asset in their plant.

COMPLETED PROJECTS

MTI Completes Three More Projects to Conclude the Year

Completed Project #267 – Polymer Cap Strip Welding



MTI Project 267 contractor conducts sample testing for the Polymer Cap Strip Welding project.
Photos courtesy of Associated Polymer Labs – Hudson Falls, NY.

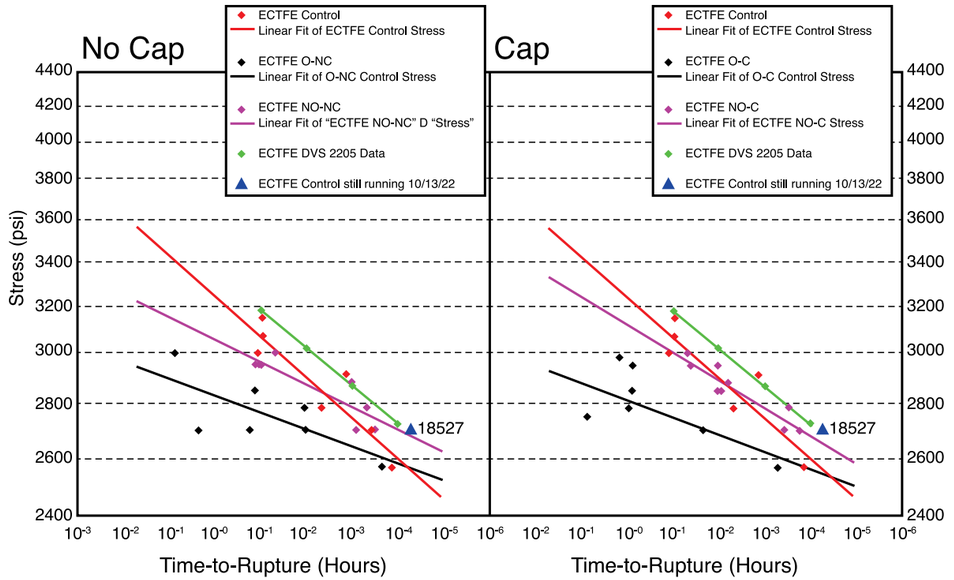
The MTI #267 Project Team is excited to announce that the final report on the Polymer Cap Strip Welding project findings will be released to members near the end of year. Marc Cook (Dow), Project Champion, presented a project completion report at the AmeriTAC 139 meeting in Houston of what was found.

The project looked at welding between polymer sheets. They investigated the effect of cap strips and offset between the sheets when welding. The results included looking at three different materials: PFA 451, ECTFE 901, and PVDF 2850. The offset between sheets used was 20 percent, which is the maximum allowed by RTP-1 Appendix M-12 for Dual Laminate Linings.

The team found that the offset was insignificant for PFA 451 and PVDF 2850, but there was a 7-8 percent drop in creep rupture strengths with 20 percent offset for ECTFE 901. Regarding the effect of cap strips, they found there was no effect for PVDF 2850 and ECTFE 901, but with PFA 451 there may be an effect—it was inconclusive in terms of statistical significance. However, the team considers there might be future work to look at that.

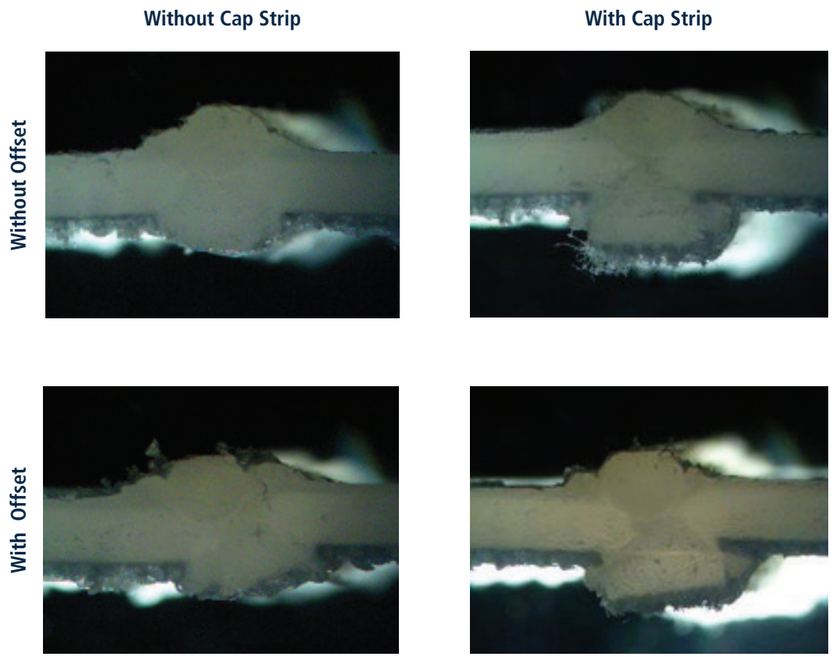
The other benefit of the project was that it developed creep rupture curves for some materials that didn't previously exist—PFA 451 and PVDF 2850. According to Cook, these creep rupture curves at room temperature can be useful for design. The ECTFE 901 curves already existed, and there was good correlation between the data in the MTI project and the existing data.

Be sure to watch the MTI website for the final report!



Logarithmic Time-to-Rupture (Stress Rupture) Curve - ASTM D2990 (Fig.5) - Updated 10/13/2022 (ECTFE)

Blue Point related to one ECTFE Control sample loaded at 2700 psi is still running as of 10/13/2022 at 18.527 hours



COMPLETED PROJECTS

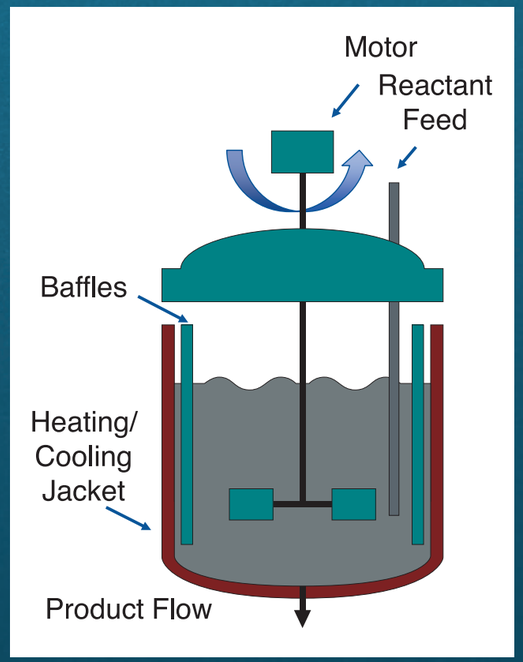
Completed Project #336 – CPI Equipment, Materials, and Corrosion Learning Modules

BY BOB FREED, MTI

Have you ever had the responsibility or assignment to train a new, entry level employee, like a process engineer, plant operator, lab technician, equipment salesperson or materials engineer, who are new to the equipment, materials, corrosion issues, and processes used in the chemical process industry? This can be a tough, time-consuming task depending on the previous experience of the new employee, their educational background, and the educational materials available to conduct the training. Suitable, high quality training materials tailored for this industry have not been readily available from any public source. Generally, the trainer must prepare the training materials themselves or, if lucky, use documents prepared previously by colleagues.

This type of situation, experienced by many MTI members, inspired Bob Hurst (Becht) and Jennifer Larimore (Chemours) to propose and champion the CPI Equipment, Materials, and Corrosion Learning Modules (336) project, which MTI recently completed. The purpose of this project was to develop course materials that facilitate training of entry level engineers and technicians, with a focus on corrosion and inspection fundamentals common to chemical process equipment. The course incorporates a basic introduction to vessels, heat exchangers, columns, reactors, piping, and other common process equipment. Commonly used metallic and non-metallic materials of construction are reviewed, and the various modes of corrosion/damage specific to different types of plant equipment, including the inspection of equipment and possible remedies, are addressed. However, the information is not meant to be a "self-teaching" course; the intent is that the information will supplement on-the-job training led by an experienced instructor.

The training materials consist of 21 PowerPoint modules, which are designed to be delivered by a knowledgeable technical person to the target audience. All the modules are editable to allow the trainer to tailor the information for company or organizational needs.



The CPI Learning Modules are available to members for download. After signing-in to the MTI website, members can access all 21 modules from the "Quick Link" menu on the home page.

This project would not have been possible without the significant contributions of many experts who served as the module reviewers. MTI would like to extend a special thanks to the following individuals: Emory Ford, Jim Fritz, Mark Hilton, Srini Kesavan, Ken Kirkham, Gene Liening, Jay Schickling, Steve Springer, Paul Whitcraft, Jennifer Larimore, Bob Hurst, and Bob Freed. The reviewers contributed a large amount of time to not only review but edit the modules to optimize and improve them for the benefit of all MTI members. Thank you!

Completed Project #275 – Asset Integrity Program for Plant Structures

The integrity of plant infrastructure is a vital component of maintaining safe and reliable operations. As of 2014, the average age of equipment and manufacturing assets in the United States was 20 years. During the life of these facilities, infrastructure has been subjected to environmental and process-related elements through the years. However, capital expenditure is typically focused on assets related to increasing or maintaining production rates. Plant structures supporting the miles of piping, process vessels, platforms, and ladders routinely used in daily operations often can be given less priority than production equipment. Having a robust inspection and repair program for plant infrastructure is an important component of a site's integrity management program.

Having safe and reliable operations is a goal of all manufacturing facilities. Proactively managing risks due to aging civil structural assets plays an important role in ensuring silent running and in minimizing health, safety, and environmental incidents and business interruption.

If most of a plant's civil structures ("structures") are the same age and the plant begins a structural inspection and repair program in response to a structural failure, it may require significant investment to restore the plant to an acceptable condition. Annual preventive maintenance plans and repair strategies are less costly over a plant's life cycle than large projects for infrastructure renewal. A risk-based approach to inspection, repair, and preventive maintenance further optimizes spending allocation over time and ensures integrity is restored or maintained in the most critical areas.

Structures do not have an infinite design life and may pose certain risks as they degrade over time. For sites that have not actively maintained plant structures, significant resources may be needed for structural repairs to keep plants running safely and reliably. Through the development of a risk-based structural inspection program, structural repairs can be planned and prioritized in a systematic way to promote safe and reliable operations.

This book provides a framework for establishing a risk-based inspection (RBI) and repair program for plant structures. This methodology was developed and deployed at a large manufacturing facility in the United States. It was then incorporated into a sustainable inspection and risk assessment program. The creation of inspection templates, the selection and training for inspection contractors, and a means of determining structural risks were essential components of the program. This program provided a quantitative means of demonstrating a reduction in plant structural risks. The RBI and repair program helped the company focus efforts on the most critical repairs and improved its structural repair strategy. Companies can model this RBI and repair program to help promote the integrity and safety of plant structures and other supporting infrastructure at their facilities. This book will discuss this approach and considerations for implementing a similar program at other manufacturing facilities.

Members are encouraged to login to the MTI Website and visit the Technical Resource Library to download a PDF copy or purchase a print copy for $69 in the member bookstore. This publication is exclusive to MTI members until March 2024. ▪

STAINLESS STEEL'S

SUSTAINABLE ADVANTAGE IN THE CPI

BY CLAES TIGERSTRAND, OUTOKUMPU

Understanding the Whole CO_2 Footprint

Sustainability is a hot topic impacting the process industry. Thus, the carbon dioxide (CO_2) footprint is becoming an increasingly important factor to consider. When talking about the CO_2 impact of steel products, it is of utmost importance to consider the full picture of the total CO_2 footprint, i.e., scope 1 (direct emissions from own production), scope 2 (emissions from electricity use) and scope 3 (all indirect emissions from supply chain including raw materials).

There are big regional differences when it comes to the sourcing of energy, electricity and virgin alloying elements. In addition, the amount of scrap utilized as raw material strongly influences the footprint of a stainless steel plant. Outokumpu has advantages with its own ferrochrome mine, high recycled content of over 90%, and the use of low carbon electricity which are the key factors of having a CO_2 footprint that is 70% lower than the global industry average. Climate compensation is not used in the calculation of Outokumpu's emissions.

Stainless Steel versus Carbon Steel

In stainless steel production, electric arc furnaces (EAF) have been used for decades—a technology that the carbon steel industry only partly started to use. An EAF process is much less energy-intensive and uses scrap instead of virgin iron ore for melting. This has a positive impact on the emissions level of the melt shop. Especially for high alloyed stainless steels, the use of scrap is of high importance as virgin alloying elements such as chromium and nickel have very high impact.

In general, stainless steel is sustainable, durable, and designed to last forever. Selecting the right grade, no coating process is required, which saves process time, costs, and CO_2. Moreover, without any coating, the material does not require any pretreatment to get 100% recycled.

Finally, you can gain further profit from high strength stainless steel. High strength materials enable lightweight designs, which means less material and therewith CO_2 emission savings.

Carbon Footprint on a Grade Level

To calculate the complete CO_2 emissions (scope 1-3) across the supply chain, it is essential to know the CO_2 impact of the pre-material. Therefore, the product carbon footprint (PCF) is important. Outokumpu developed a tool that calculates a grade-specific PCF (scope 1-3, cradle-to-gate) which can then be printed on material certificate issued by the mills. The process for calculating is based on ISO 14067 standard and third-party verification.

When it comes to Forta DX 2205 (EN 1.4462, UNS S32205), Outokumpu's PCF is 1.8 kg CO_2–equivalent per 1 kg steel (twelve-month-rolling average to September 2022). The current cradle-to-gate emission level declared for carbon steel is on par or higher in the range 1.73 - 2.71 kg CO_2–eq. per 1 kg steel depending on identified suppliers' specific production process*. Note, the emission data for carbon steel is not grade specific, it is based on a typical composition.

Life Cycle Assessment of Duplex Stainless Steel in Storage Tank

Life Cycle Assessment (LCA) is a systematic process to quantify the total CO_2 emissions generated by a product or application over its life cycle, from extraction of resources, through production, use, disposal, and if applicable, recycling. ISO 14040, 14044 and 21930 provide a framework for how to perform an

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STAINLESS STEEL'S SUSTAINABLE ADVANTAGE IN THE CPI

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LCA study. These standards were originally developed by the buildings and civil engineering sector but can equally be applied to other industry sectors such as chemical process industry and its typical applications, e.g., storage tanks and process vessels.

To give an example, the CO_2 footprint of a 20 m tall and 20 m wide cylindrical tank shell is shown in Figure 1 comparing a carbon steel A516-70 with Duplex 2205 (S32205). For the carbon steel, a 2 mm corrosion allowance and coating application (blast cleaning and epoxy paint) of both inside and outside are considered in the study*. The material consumption is reduced by 30% using the higher strength duplex grade in accordance with API 650. A complete coating replacement of the carbon steel shell is expected once over the life cycle.

The CO_2 emissions for carbon steel (e.g., A516-70) are in a range as presented in the previous section, where the upper and lower bounds are used here, denoted as 'high' and 'low' in Figure 2." (The lower bound reflects the benefit of using more scrap based than conventional iron ore based steelmaking.) The LCA results depicted in Figure 2, cradle-to-grave (excluding end-of-life impacts), indicate a potential reduction of up to 64% using Duplex 2205. Note, this is a simplified analysis but gives a hint that the duplex tank offers greater potential to reduce the total CO_2 footprint in a Life Cycle Assessment study compared to a coated carbon steel tank. ▪

* Emission data for the carbon steel is taken from EPDs provided by SSAB, ArcelorMittal, Hyundai Steel and AISC. Emission data for water based epoxy paint refers to EPD published by Jotun A/S.

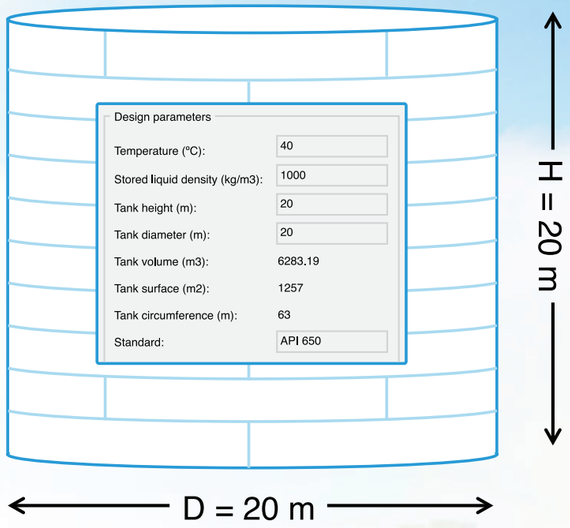

Figure 1. Tank shell design parameters used to estimate the required shell course thicknesses using the 1-foot method in accordance with API 650.

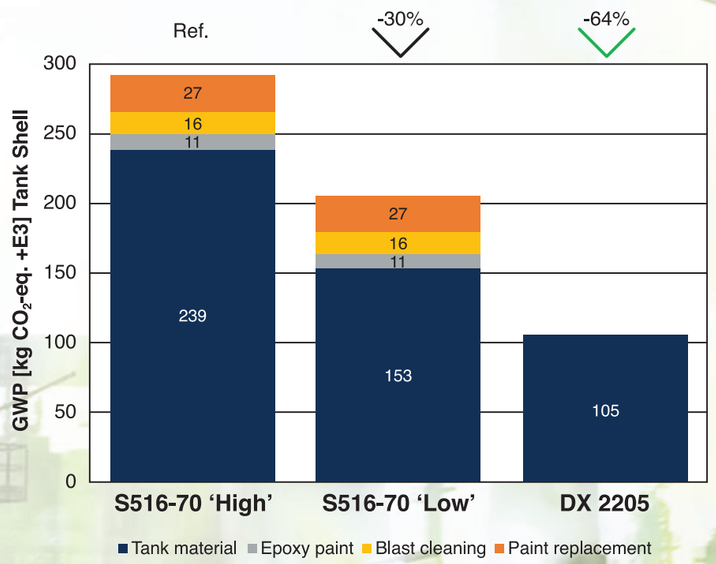

Figure 2. Estimated global warming potential (GWP), CO_2–eq. of storage tank shell by LCA study, cradle-to-grave, (excluding end-of-life impacts), comparing carbon steel S516-70, 'High' and 'Low' emissions versus Duplex 2205.

FRP & DUAL LAMINATE TRAINING AND EUROTAC FALL 2022 MEETING A SUCCESS IN AMSTERDAM

PARTICIPATION AND COLLABORATION CONTINUE TO THRIVE

BY DANIEL RASMUSSEN, MTI

Dale Keeler (MTI), Hardin Wells (Albemarle), Brian Linneman (RL Industries) and Deb McCauley (Chemours) traveled to Amsterdam to present a three-day FRP & Dual Laminate Training session in November. Inset: EuroTAC attendees engaged in an MTI report on the multi-phase project for HTHA damages.

Through the hard work of the EuroTAC leadership team, the Fall 2022 meeting was one of the most successful in the region yet. The reappointed EuroTAC Chair, Anette Hansson (Topsoe) and Vice Chair Lars Rose (DuPont) developed an excellent agenda and opportunity for training with support from Rolf Kirchheiner, MTI's new European Associate Director (AD), and Bob Freed, MTI AD. Despite the difficulties with travel over the last few years, the meeting was in high demand with 65 combined meeting and training attendees.

The EuroTAC 2022 Fall Meeting began on November 14 in Amsterdam with a three-day in-person FRP and Dual Laminate Training. The 48 attendees were guided by four expert trainers – Hardin Wells (Albemarle), Brian Linneman (RL Industries), Debra McCauley (Chemours) and Dale Keeler (MTI), with more than 120 years of combined experience on a wide range of projects relevant to the presented topics.

"To my knowledge, this was the first time a training on inspection of FRP and Dual Laminates was offered in the EU," remarks Keeler. "The training provided a good basis for inspection personnel to develop their skills and understanding FRP and Dual Laminate Equipment."

The instructors covered 19 modules on FRP and Dual Laminate, including Thermoplastic Linings, FRP and Dual Laminate PCE, Testing Techniques and Tools, Evaluation of In-Service Equipment, and Case Histories. The modules provided hands-on demonstrations to keep the training interactive and serve as a way for participants to learn through firsthand experience. After soaking up three days' worth of knowledge, the training concluded with an evaluation on the information covered. Participants received a course completion certificate via mail in the weeks following the training.

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ASIATAC HOLDS 2022 FALL MEETING AND TRAINING PROGRAM IN PERSON

ATTENDANCE IMPROVING POST-PANDEMIC

AsiaTAC attendees are happy to meet face-to-face during the Fall 2022 meeting in Suzhou, China.

MTI held its 2022 AsiaTAC Fall Meeting on September 19 at the Hyatt Regency in Suzhou—a city 100 miles west of Shanghai—followed by a half-day virtual training via Zoom on September 20.

There were 36 attendees for the AsiaTAC face-to-face meeting with nine online attendees from overseas. The half-day training session on "Reactive and Refractory Metals" involved 37 virtual attendees. In total,13 Member Companies were represented along with three potential members.

China has one of the toughest COVID-19 control policies and all participants had to go through strict testing procedures to attend the face-to-face meeting. This included securing a health certificate, 24-hour negative PCR test to travel into Suzhou city and an additional PCR test upon arrival.

"We were very happy to see the turn out under such circumstances," concludes Paul Liu, MTI AsiaTAC Associate Director. "Overall, the meeting received very positive feedback and there was active participation between the presenters and audience."

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Future Meetings

The AsiaTAC leadership team has outlined a tentative plan for 2023:

AsiaTAC 2023 Spring Meeting

- Date: Mid-April (one-day TAC meeting plus one-day Training)
- Format: face-to-face meeting with virtual accessibility for international presenters and invited guests
- Location: Da Nang, Vietnam
- Local co-sponsor: Vietnam Institute of Materials

AsiaTAC 2023 Fall Meeting

- Date: Mid-September (three-day program)
- Format: face-to-face
- Location: Shanghai, China

THREE MTI MEMBER COMPANIES UNDERGO TRANSITIONS

MEMBERSHIP CONTINUES UNDER NEW NAMES

KNIGHT MATERIAL TECHNOLOGIES

SUNCOR + Syncrude
Stronger Together

Alleima

Knight Material Technologies Acquires Electro Chemical

Electro Chemical Engineering and Manufacturing Co., a 23-year MTI member, has been acquired by Knight Material Technologies (KMT). Electro Chemical will continue membership as Knight Material Technologies with Dale Heffner—longtime MTI participant and Designated Representative (DR) for Electro Chemical—serving as the DR.

KMT designs, manufactures, installs and services corrosion-resistant material solutions, and Electro Chemical is a leader in high-performance fluoropolymer-lined vessels. The combination of the two companies' solutions creates a larger, complementary product offering and expanded reach. The Gulf Coast region has not previously had a local manufacturer for the sales, project management and manufacturing of fluoropolymer-lined vessels. Electro Chemical intends to expand into the region to assist local customers with a broader range of both products and services using KMT's Houston office, and fabrication facilities in Baytown, Texas. In addition to Electro Chemical's various fluoropolymer vessel liners, including PVDF, ECTFE, ETFE, FEP, PFA, PTFE, and more, it also has proprietary adhesive systems for sheet lining and plastic welding technology.

Syncrude Canada Ltd. Integrates with Suncor

Syncrude Canada Ltd. has been a corporate member of the Materials Technology Institute (MTI) since 2006, with Mike Anderson, Senior Technical Advisor-Materials, as the Designated Representative (DR). Syncrude is a Joint Venture (JV) among Suncor Energy Inc., Imperial Oil Resources, Sinopec Oil Sands Partnership and CNOOC Oil Sands Canada. In October 2021, Suncor became operator of the Syncrude Project. With the change in operatorship, the MTI membership will be under Suncor as of January 2023. Syncrude joins the other Suncor facilities (oil sands mining and upgrading at its Base Plant and Fort Hills sites; in situ operations at Firebag and MacKay River; refineries in Edmonton, Montreal, Sarnia and Commerce City; along with offshore production at Terra Nova). This means that the MTI benefits and value will now accrue to a much larger technical audience in the entire Suncor enterprise. Mike has named Haixia Guo, Specialist, Materials Engineer, as the vice-DR while Mike retains the DR responsibilities. Mike and Haixia, along with the entire Suncor materials community, look forward to ongoing interaction with MTI and all its member companies.

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MTI 2022 AWARDS BANQUET HIGHLIGHTS MEMBER ACCOMPLISHMENTS

Recognizes Members with Value, Service and Anniversary Awards

MTI was thrilled to reinstate its Annual Awards Banquet on October 26 in Houston, Texas, after a hiatus from the pandemic. The MTI Fellow Award (see article on page 5), Membership Anniversaries, Distinguished Service Award, Chair Leadership Award, and Value Awards were among the honors being celebrated.

Membership Anniversaries

Two member companies celebrated milestone anniversaries in 2022. VDM Metals was recognized for five years of membership and ITRI for 10 years of membership. Representatives from both companies were unable to attend the banquet, but the certificates were presented at the EuroTAC and AsiaTAC meetings.

VDM Metals

工業技術研究院
Industrial Technology Research Institute

Value Awards

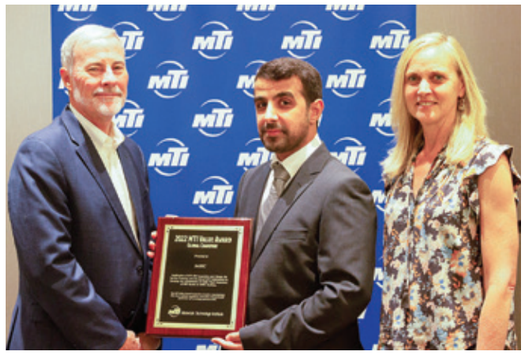
Five members submitted applications in 2022 for a total of two joint and one single. The Value Award recognizes members that have realized quantifiable value from successful application of knowledge gained through their MTI membership. The Global Value Award is the top achievement for applying MTI resources to gain quantifiable value.

A Joint Value Award was presented to Eastman and Webco Industries for demonstrating a cooperative effort to meet a critical delivery requirement. Eastman was completing an emergency tube bundle build for a large U-tube exchanger (1800 tubes). The relationship between Webco and Eastman facilitated a rapid delivery of the tubes for the tube bundle. Webco produced and shipped the required material 4-5 days earlier than promised on the already expedited order. The early arrival of the tube material allowed Eastman to complete their project even earlier than anticipated. Collaboration between Eastman and Webco resulted in a minimization of lost production.

Corteva Agriscience and Haynes International, in collaboration with one non-member AT&F, also received a joint award for the application of Hastelloy Hybrid-BC1 Alloy to corrosive solutions. Thanks to the networking opportunities provided at MTI, this project was initiated as an informal discussion of a Corteva Agriscience representative with a Haynes International representative at an AmeriTAC meeting. Haynes International has published many manuscripts on HYBRID-BC1 alloy leveraged for the project, including a presentation at EUROTAC 2019, that assisted in including HYBRID-BC1 alloy as a candidate material of construction for testing purposes. This is the first time a Heat Exchanger was made of a HYBRID-BC1 alloy (a relatively new alloy); therefore, it involved close collaboration with the alloy's manufacturer as well as the fabricator.

Finally, the 2022 Global Value Award winner was SABIC for implementing a company-wide FRP Integrity Improvement Program. SABIC applied MTI membership benefits to develop the competency of SABIC plant inspectors and engineers and internal inspection practices to ensure plant integrity and reliability. More than 150 engineers and inspectors attended the MTI training sessions and used available resources, such as MTI publications for the Guide for the Repair and Alteration of FRP Equipment and Guidelines for Large Diameter FRP Tanks, among others, for the effective management of FRP assets at SABIC sites.

SABIC coordinated with the MTI team to conduct several training sessions and roundtables to build the required technical competency for SABIC engineers and inspectors. Access to MTI practical guidelines also enabled more effective and reliable management of FRP assets at SABIC sites, where inspection and repair guidelines are now frequently used at SABIC sites.



Top left: Will Hoskins (Eastman) and Tony Schwart (Webco Industries) accept value award plaques on behalf of their companies from MTI Chair David Barber.

Right: Heather Allain, MTI Executive Director, congratulates John Doyle and Rachel Lanczynski (Corteva) and Javier Esquivel Guerrero and Vinay Deodeshmukh (Haynes International) for their value award achievement.

Bottom: David Barber, MTI Chair, and Heather Allain, Executive Director, present the 2022 Global Value Award to SABIC accepted by the company's DR Abdulmohsin Alsahli.

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Chair's Leadership Award

MTI recognized Nate Sutton (E_2G) with the Chair's Leadership Award. This award acknowledges individuals who have significantly advanced MTI's mission through extraordinary accomplishment, example, and vision. The Chair's Leadership Award signifies the promise of continued success of MTI made possible through the inspiration and positive contributions of new volunteers. Sutton is the Project Champion for the Corrosion in Bio-Oils Project #357 and most recently was the project champion for the MTI Renewable Diesel Roundtable conducted at the June AmeriTAC meeting in Kansas City. This roundtable provided members and prospective members an introduction to the industry and has helped MTI identify future potential projects addressing the challenges in the bioprocessing sector. He also stepped up in October 2021 to take over as chair of the Metals PDC.

Nate Sutton (E_2G) proudly displays his Chair's Leadership Award presented during the 2022 banquet by David Barber (MTI Chair) and Heather Allain (MTI ED).

Distinguished Service Award

MTI recognized Chuck Young (Tricor Metals) with the Distinguished Service Award. This award acknowledges individuals whose accomplishments have made a significant impact on the organization and delivered value to the members.

MTI Executive Director Heather Allain congratulates Chuck Young (Tricor Metals) upon presenting him the 2022 Distinguished Service Award.

Chuck attended his first MTI Meeting in 2010 (as a guest) and has been one of MTI's most active members since Tricor Metals joined in February 2011. In his 10-plus years, Young served as Champion of the Technical Awareness Bulletins Committee from 2015-2020 and led the team to publish eight new bulletins in that timeframe. He's been the Co-Champion of two Global Solution Symposiums (Projects 342 and 366). Under Chuck's co-leadership, working with the Executive Director and staff, the inaugural 2020 Symposium met or exceeded all pre-established KPIs and helped achieve a successful meeting in 2022 coming out of the pandemic. He has volunteered to co-Champion the 2024 Symposium. He is Co-Champion of Business Cases for Knowledge Management Continuous Improvement, and he's been an active contributor on more than seven other projects.

In addition to his project team participation, Young has been a member of the MTI Board since October 2017. He served as chair of the Products Committee, served on the Nominating Committee, and has been a very active participant in the Membership Committee where he leads the Sales and Marketing Subcommittee.

Thank you all for your membership and participation at MTI, and congratulations on your achievements! ▪

EUROTAC ASSOCIATE DIRECTOR PATRICE HOULLE RETIRES

SHARES HIGHLIGHTS FROM HIS TENURE AND FUTURE PLANS

Saying 'good-bye' is never easy, especially after working for an organization for eight years. But at the 2022 Spring EuroTAC meeting in Germany, Dr. Patrice Houlle, MTI European Associate Director, bid farewell to the EuroTAC members. He was recognized for his service at this meeting but continued working until September to help the incoming Associate Director, Rolf Kirchheiner, transition to the role.

"Making the retirement decision was not easy, because I know that I will miss all the contacts that I made," Houlle explains. "But I leave it in the good hands of Rolf with this guidance: 'The most important is to consider that the European AD must be a facilitator providing the best conditions for the MTI members to work together with pleasure and efficiency.'"

This is wisdom he not only gained from his experience at MTI over the years, but the roots extend deeper from his participation with MTI member Haynes International (Previously CABOT).

"I joined CABOT in 1978 as a corrosion engineer in France, and it was the beginning of a long cooperation with Galen Hodge (MTI Fellow)," Houlle recalls. "I spent one year in 1991 in Kokomo under Galen's supervision, and I discovered MTI activities during that time. When he became Marketing and Sales Vice President, we made some customer visits together in Europe, and I remember that he was always introducing the MTI organization during these meetings."

This left an important impression on Houlle, which he later found valuable in his years working with

Patrice Houlle

MTI. When his "MTI mentor" retired and became MTI Associate Director in 2010, Houlle began getting more involved at the MTI EuroTAC meetings and was a regular participant until he retired from Haynes International in 2012. Hodge asked Houlle if he was interested in working for MTI as the European Associate Director and finally, in August 2014, Houlle began his work for MTI in Europe.

"I really enjoyed this collaboration during the following eight years," he explains. "Since the very beginning of my contacts with MTI, I realized that one of the most important features of the MTI organization was the social aspect. And so, my main target has always been to create the conditions to strengthen it."

He worked with member companies to hold meetings at their facilities, which was another opportunity to develop relationships with members. He led the effort to organize European Roundtables—one on High Temperature Hydrogen Attack (HTHA) in Paris and another focused on Life Sciences in Basel, Switzerland. EuroTAC also started meeting twice per year beginning in 2014, which not only aided him in maintaining contacts, but also allowed the group to become more involved in project development. This was an essential piece, according to Houlle, that allowed MTI to create the successful EuroTAC that has grown and expanded.

"Before 2014, no MTI projects had been initiated in Europe. Since then, seven projects were introduced by the European teams," Houlle shares. "But I must mention especially those on the Detection of High Temperature Hydrogen Attack Damage at the Early Stage (Projects 305/355 and 362) initiated by Air Liquide. The cooperation between the project teams, the different champions and the Contractor (Institut de Soudure) and subcontractor (Extende) was extremely fruitful. Frequent discussions were necessary."

However, it hasn't all been smooth sailing. The global pandemic was a massive challenge for Houlle to overcome, but he did it again through collaboration, which he attributes to the very efficient MTI staff and project team members.

"To find a positive outcome, we learned how to set up video meetings to at least keep contact between members and participated in virtual global TAC meetings as a whole organization," describes Houlle. "The project teams were initially exclusively European, but joined by more and more members based globally, only demonstrating

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Q&A

WITH ANETTE HANSSON & JOHN HOUBEN

PROJECT CHAMPIONS

MTI is at the forefront of providing global leadership in materials technology to improve safety, reliability, sustainability, and profitability. Technical research projects play a vital part in the success of the MTI mission. While the goal and outcome of each project varies, the overarching commonality is member leadership to develop and nurture each project from inception to completion. These member leaders, dubbed MTI Project Champions, have the unique opportunity to grow leadership skills, network and create tangible solutions alongside other industry professionals.

In this issue, CONNECT spoke with co-champions Anette Hansson and John Houben to learn about their leadership experience of project 391 – Duplex Stainless Steel Welds at Elevated Temperatures.

Q: ***Please describe your roles at your companies.***

A: **Houben:** My current Role from April 2022: Principal Engineer Welding and Surface Modification. From 1987, I have spent 35 years with ExxonMobil, always in materials engineering, welding, materials selection, and duplex applications. From 1993, I was involved with global engineering function mix of base plant support, failure examinations, new facilities materials selection and construction support.

Hansson: I have been with Topsoe since 2013 and employed as Principal Specialist working with material selection, writing guidelines, conducting training (internal and external), failure investigations, corrosion testing in specific environment, and supporting my colleagues whenever they have a material related question.

Q: ***How long have you been a member of MTI? How have you benefited from your involvement?***

A: **Houben:** I began to attend MTI meetings in 1998. From 2005 I have been more involved in projects and special focus areas such as CUI prevention (TSA applications), heat exchanger reliability, metal dusting, relaxation cracking, low toughness CS, duplex stainless steel applications. MTI enables networking with peers working in the same field, often with the same issues and questions. It is a good network to benchmark, test strategies to solve problems, improve reliability, or find new lower cost solutions.

Hansson: Topsoe has been an MTI member for more than 20 years. I've participated in MTI meetings and projects since 2015. I frequently use some of the MTI publications in my work. I also value the networking opportunities that you get from attending the MTI meetings and project work; I've learned a lot on specific topics by being active in MTI projects.

Q: ***How have your fellow MTI members helped you grow in your career and/or in your involvement with MTI?***

A: **Houben:** Many MTI members are working in the same field. You can discuss and exchange ideas and long-term visions. It is good to calibrate your strategies with resources, both suppliers and service providers, before roll-out in company. During the EuroTAC Meeting at Dechema in 2012, I had an off-line discussion with MTI members on issues experienced regarding low toughness carbon steel flanges, cast valves and pipe. We had similar problems and MTI members supported drafting project proposal for project 217, adding supplementary requirements for impact testing and grain-size to ASTM A105. Although not successful in ASTM, end-users and suppliers picked-up the mitigation strategy for critical services. For ASTM, more data was needed, and this is now proposed in Project 318.

Q: ***How did you become a champion of this project? Please tell us how you came to take on this role and what skills and/or experience you hold that helps the project and team to succeed.***

A: **Houben and Hansson:** Typical for 2205 DSS the design temperature maximum is 250/280°C (Europe) and 316°C/600°F (ASME). But there are a dozen applications where the normal operating temperature is below 316°C, but the design temperature is higher, between 300 and 425°C, because special, short-term start-up / shutdown, or failure contingencies need to be included in the design. In ExxonMobil, we tested in a couple applications the use of 2205 and 2003 duplex heat exchanger tubing in heat exchangers with normal operating below 316°C but design above this temperature limits. Duplex tubing is a third of the cost of nickel alloy tubing used in the past for this application. I [John] made a presentation in 2016 on this topic at a duplex conference showing a dozen successful applications where we use 2205 and 2003 DSS tubing, improving reliability and generating significant cost savings, even with the additional engineering work to get approval by pressure vessel authorities. There was support to investigate what the short-term temperature limits of 2205 duplex are. This was with other interested MTI members proposed in MTI projects, because there is little operating data published on this topic.

Q: ***How was the project idea developed? Is the current state of the project the same as the original idea?***

A: **Houben:** The initial idea was structured by MTI project team in 1) Project 307 literature study 2) Project 364 testing of 2205 base metal. This project was very successful showing that after short term exposures, 2205 DSS still meets the ASTM mechanical requirements. Corrosion properties were likely reduced, but still sufficient for most targeted applications, replacing carbon steel or 304/316SS 3) Project 391 testing of Duplex Weldments was proposed to also cover applications where duplex welded constructions can be used.

Hansson: No, the current state of the project is not the same as the original idea. The project initially included a rather large test matrix, including multiple grades, multiple heat treatments, and multiple tests. The result was a very expensive project. Thus, the project was rethought, and three smaller projects as described by John have been and are being conducted. This has reduced the text matrix and cost significantly.

Q: ***Tell us about Project 391 Duplex Stainless Steels in Elevated Temperatures.***

A: **Houben:** In project 391, we have had quite some discussions on the scope. The heat treatment tests were kept similar as in Project 364. With the addition of welds, scope can grow if too many variables, filler metals, welding processes, test scope, etc. are included. We reduced the scope from the initial wider scope and limited this to 2205DSS and a few welding processes. The results can be used by duplex suppliers, fabricators, EPC's and end-users around the globe. This is typical for new designs but also for upgrades of heat exchanger bundles or vessel internals to duplex, or risk assessments for equipment that has been exposed short term to temperatures slightly above the original design temperature, of 316°C.

Q: ***Please explain what you have learned from your previous experiences on a project team and how it has helped you champion this project.***

A: **Houben:** It is easy to add too many parameters and variables to a project resulting in a too big scope. A project is better to have a narrow but focused scope and objective at first. This can, when good results are seen, help expand to new projects.

Hansson: Working in projects across companies grow you as a person. You learn about other cultures and other companies' perspective and way of doing.

CONNECT thanks Anette and John. Members interested in the 391 project can learn more at www.mti-global.org. ▪

ED NAYLOR NAMED 19TH MTI FELLOW

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called Resource Advisory Groups. I don't know about you, but I like the sound of PDCs more than RAGs, which I use to clean up in the garage," he jokes. "The change came about while I was AmeriTAC Chair, and the Board (Sandy Sharp – Chair) decided to pursue US Department of Energy funding by creating what was known then as a Roadmap. Long story short, MTI realigned itself to match the categories of the roadmap; that's what created the PDCs and their focus areas such as Integrity & Condition Assessment, Predicting Materials Degradation, etc. It's evolved a little since then, and that's good. The MTI structure should always be flexible and attentive to member needs."

The other two big changes came during his tenure as Board Chair when EuroTAC and AsiaTAC were implemented, and the MTI website was created. He explains that a large portion of MTI members were headquartered outside the United States. MTI's flexibility to meet member needs was essential. The Board formed the two additional regional TACs and, most importantly, empowered them to operate just like AmeriTAC and put forth projects directly to the Board for approval.

"We had to overcome the sense that MTI was 'an American organization,'" Naylor recalls. "I think that's been successful. While each TAC seems to have its distinct identity, what hasn't changed is the collegial nature of the meetings and participants' interest in helping one another. I encourage MTI member representatives to attend other global TAC meetings; there are both similarities and differences. Both are good."

Naylor also oversaw the creation of the website and Website Committee—a monumental change. An avid user and advocate of the MTI Technical Forum, the website forever changed the tenor and style of that resource to maintain organizational relevancy.

"Believe it or not, before the website, nobody knew the forum questions until the MTI Staff mailed out the meeting packet about three weeks prior," he remembers. "Member representatives would furiously cut, tape and fax questions to people in their organization they thought might have good input. All those comments would be brought to the meeting, and every forum question would be answered from scratch. If memory serves, I think the record was 81 forum questions in a single meeting. Of course, at that time, TAC meetings lasted 2½ days! Now Forum questions receive responses within minutes or hours, and that improves the speed and efficiency of problem solving."

He holds many memories of MTI through the years – some good, some a result of adversity. As a leader on the Board through the 2008 economic downturn, the concern was substantial, but MTI made it through. Many of his fondest memories consist of the Thursday night post-Board meeting dinners. He reckons the best was at Truffles in St. Louis in the early 2000s but suggests that story is best told over a casual beverage (by Enerfab's Kelly Wyrough).

"It's those kinds of experiences and memories while achieving the technical business, project advancement and learning generated at every TAC meeting anywhere in the world that produces the collegial relationships that make MTI such a close-knit community willing to support each other," Naylor observes. "I always thought the best compliment of MTI's success was when I attended another organization's meeting and inevitably, fellow MTI member representatives would gravitate to one another, and a 'Mini MTI Meeting' would break out."

Now that he's enshrined in MTI, Naylor says he looks forward to making more memories and to begin participating with the Fellows, who meet on occasion via conference call.

"My first such conference call will probably have happened before this interview is published, but it will be thrilling to catch up with a few of my MTI friends. No burning issues, but I'd like to hear how the others approach MTI involvement and whether there's an opportunity to fulfill a need of the organization or create a new mission for Fellows," he explains.

In closing he offers a bit of advice to his fellow members, particularly the younger participants just beginning to get involved at MTI: "Stay involved. I always found it helpful to learn how other subject matter experts and their companies addressed materials challenges, industry regulations and changing global dynamics. There's tremendous value in active MTI membership by participating in project teams that advance your company's interests. Sounds like MTI's founding principle! So, get involved; get your co-workers involved. That's how you learn. MTI does it better than any other organization."

He concludes with one final thought to share of the late Robert Sinko (MTI Fellow 2020) – a friend, mentor and someone who truly embodied MTI.

"I'd like to again express my deepest sympathy to Linda and the entire Sinko family after Robert's recent passing. He embodied all that is good and true about MTI. May we all aspire to his standard. Long live MTI!" ▪

MTI ELECTS 2022-23 BOARD OF DIRECTORS

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effort and planning of the Global Virtual TAC Meetings in place of the usual face-to-face events. He's also been instrumental in improving the design, content and Search Engine Optimization of the MTI website—a task that never ends with evolving software updates and user experience best practices. Now he's ready to support McCauley and face new and different challenges head-on.

"I look forward to working with Debra in growing MTI membership and continuing to deliver value to members," he notes.

One of the first areas the duo is addressing is updating MTI's strategic vision. The BOD last updated the strategic plan under former Chair Oestergaard in 2018. In early 2022, Barber initiated the effort to begin another strategy planning session with a brief discussion and direction for the BOD to review the current plan. In June he assigned subcommittees of the BOD to begin working on updating or revising the strategic goals under the three pillars MTI operates: Identity, Value and Impact. The effort is ongoing, but McCauley and Rentsch are resolved to see that process through.

"The pandemic has changed some of the ways MTI delivers value to its members, and we must make sure MTI is able to effectively meet these challenges," McCauley concludes.

Rentsch adds, "MTI is a great organization and provides an opportunity for materials engineers to share technical expertise to make our operations more sustainable, efficient, and profitable. Our goal as leaders of MTI is to work with members to continue building an organization that increases member participation in our research projects and solves materials processing challenges for our member companies." ▪

Jeremy Nelson (Koch Industries) was recognized at the MTI Annual Meeting in Houston for his service as AmeriTAC Chair and Ex Officio Board Member.

EUROTAC ASSOCIATE DIRECTOR PATRICE HOULLE RETIRES

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MTI's international reach and cooperation."

None of this, he says, could have been done without a core team he could rely on. As Associate Director, he worked with the EuroTAC chair and vice chair, key project managers and key members.

"I would like to thank the people who were always ready to participate, to exchange, and to work to make things happen, especially members from Topsoe, DuPont, Air Liquide, Total, BASF, Shell, Fluor, Nickel Institute and NobelClad," Houlle mentions. "I must add that I had the chance to work with a wonderful 'assistant' in the person of Heather Allain [former MTI AD, now Executive Director] who supported EuroTAC and helped to create the international MTI aspect."

Now he looks forward to his second retirement and he considers it a "new life" with plenty of time to spend with family, traveling and seeking to fulfill dreams from long ago.

"My family and especially my granddaughters will be my focus. I traveled a lot in my different careers, but I realized that there are many wonderful places in France I neglected that I will visit with my wife. I am also going to take some airplane pilot lessons. This is an old dream but I was always on a commercial plane during the weeks, so it was impossible to consider doing that during the weekends!! Now it is time and not too late to make it happen," he concludes.

Au Revoir, Patrice! Thank you for your dedication to EuroTAC to make MTI stronger. ▪

FRP & DUAL LAMINATE TRAINING AND EUROTAC FALL 2022 MEETING A SUCCESS IN AMSTERDAM

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Attendees participated in the immersive FRP and Dual Laminate Training program consisting of 15 learning modules and a comprehension test.

Attendees then gathered for a group dinner to relax, network, and reconnect with fellow industry professionals. Thank you to all our presenters and attendees for another successful MTI training session!

Following the FRP and Dual Laminate Training, MTI members and guests participated in the EuroTAC Meeting November 16-18. The transition of leadership to MTI's new European Associate Director, Rolf Kirchheiner, was quickly apparent with new ideas and strategies implemented at the meeting. Day one opened with an update on projects #379 PSA Vessels Structural Integrity and Fatigue, #372 Small Sample Testing Techniques, #391 Duplex Welds at Elevated Temperatures and #378 Stress Relaxation Cracking Heat Treatment Alternatives, followed by the collaborative sessions MTI EuroTAC meetings are well known for. Members generated and discussed new project ideas during the Project Development Committee (PDC) sessions, which are intended to become fully funded projects to improve processes for members and the rest of the Process Industries.

One example of a collaborative project, conceived in the EuroTAC PDC, is Project #355/362, Enrichment of the HTHA Damages Simulation Model to Take into Account Inclusions of Affected Welded Areas. This effort was spotlighted during a hybrid session at the meeting, "as a way to provide membership with value by sharing projects incepted at EuroTAC that they may otherwise not be involved with," explains Kirchheiner.

The meeting ended with knowledge shared through seven technical presentations:

- Detection of Corrosion under Insulation – Fiber Optic Monitoring: A Revolution for CUI Prevention
- Specific Challenges for Global Engineering Groups
- Materials Challenges for the Conversion of Natural Gas Transport Pipelines to Hydrogen Transport Pipelines
- Probabilistic Assessment of Crack-Like Flaws in Cyclic Operations
- The Use of Carbon Steels for $C0_2$ Transmission Pipelines, Compressor Stations, and Above-Ground Storage
- Material Selection for Carbon Capture and Storage CCS Wells
- Nickel and Nickel-Alloys in Recent Developments for Clean Energies

Attendees appreciated the opportunity to learn from the presenters during each technical session and to collaborate with one another during the Project Team meetings and Project Development Committee sessions. The EuroTAC leadership team hopes to see even more participation at the EuroTAC Spring 2023 meeting to continue the collaboration! ▪

ASIATAC HOLDS 2022 FALL MEETING AND TRAINING PROGRAM IN-PERSON

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The first day of the program included two special subject talks. The first topic was "Geothermal Energy Production – Materials Selection" with Phillip Song (Nickel Institute) and the second was "Non-metal Internal Liner for Corrosion Prevention" by Debra McCauley (Chemours). There were also three Panel Discussion Sessions, including Material Application and Selection (five technical presentations); Failure Analysis (three technical presentations); Inspection and Corrosion Prevention (two technical presentations and live drone demonstration).

The half-day training session on "Reactive and Refractory Metals" covered four subjects by three instructors:

- Clad Metal for CPI Applications – John Banker, Clad Metal Consulting
- Introduction of Titanium, Rick Sutherlin, PE
- Introduction of Zirconium, Rick Sutherlin, PE
- Niobium: Corrosion Properties and Applications – Steve Sparkowich, Niobium Research LLC

Attendees participate in a technical learning presentation at the AsiaTAC Fall 2022 meeting.

Presentations available from the TAC meeting and training are located in the MTI Technical Resource Library. ▪

THREE MTI MEMBER COMPANIES UNDERGO TRANSITIONS

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Alleima – a New Name with a Strong History

Alleima, formerly Sandvik Materials Technology (SMT), was listed for trading on Nasdaq Stockholm, August 31, 2022. At the same time the company changed its name from SMT to Alleima. The new name combines two core strengths of the company—alloys and materials—with 'alei', an old version of the word alloy, as the foundation.

While everything is new, it's very much 'business as usual'. Its assets, capabilities, global offering and footprint remain the same; Alleima has manufacturing plants and sales offices in all regions and local presence in approximately 90 countries. Its total control over its fully integrated production, from R&D to melt to the final product remains a key strength for Alleima. It drives customer confidence in its technology, quality, sustainability, delivery certainty, and circularity. Alleima remains committed to advancing its customers' operations, enabling new technologies, and driving sustainability. Its development and manufacturing of advanced stainless steels and special alloys continue to be at the core of its business expertise. It's what the company has been doing for 160 years and the continued development of advanced materials is what the company is committed to do from now on and into the future.

Alleima is the same supplier and retains the same ways of working as before, including the same products, services, and expertise.

Alleima President Göran Björkman said: "Alleima is fiercely devoted to giving our customers the absolute best in materials technology. We relentlessly push products and processes to be more efficient, more profitable, and more sustainable. We work hand-in-hand with customers to move industries, innovation, and society ever forward.

"Our materials make the difference. Our expertise makes it work. We're exceptionally proud of our rich history and where we've come from. But we're even more excited about where we can take you next."

For more visit www.alleima.com. ▪

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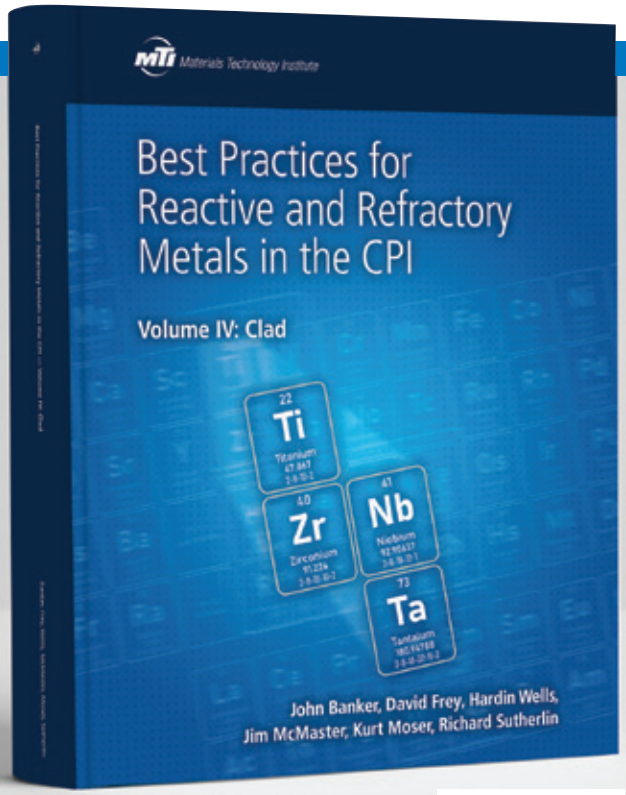
BEST PRACTICES FOR REACTIVE AND REFRACTORY METALS AVAILABLE TO PUBLIC



MTI is pleased to announce the Reactive and Refractory Metals in the CPI publication is now available to the industry and can be found in the MTI bookstore! The books can be purchased for $250 per volume or the entire set for $825.

The set includes:

- **Volume I: Titanium**
- **Volume II: Zirconium**
- **Volume III: Tantalum and Niobium**
- **Volume IV: Clad**
- **Volume V: Appendices (Safety, Welding, Castings and Project Management)**

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