



A quarterly magazine

For Members Only
Issue 9

MATERIALS IND

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Institute of Materials, Malaysia



HIGHLIGHTS

- Ms. Losini of MMU, won 3rd place in Young Persons' World Lecture Competition (YPWLC2014) in California, USA
- IMM nominated as Secretariat of AWF for 2 years

IMM COURSES

COATINGS COURSES	DURATION (DAYS)
▪ Blasting & Painting Training Course	5
▪ Protective Coatings Technician Certification Scheme	1
▪ Blasting & Painting Supervisor	2
▪ Corrosion Control by Protective Paint	2
▪ Coating Inspection Certification Scheme Level 1	4
▪ Coating Inspection Certification Scheme Level 2	1
▪ Thermal Spray Coatings Applicator	4
▪ Thermal Spray Inspector Level 3	4
WELDING COURSES	
▪ IMM Welding Inspection Scheme	5
▪ Associate Welding Engineer (JWES)*	6
▪ Welding Engineer (JWES)*	6
▪ Senior Welding Engineer (JWES)*	6
▪ Welding and Joining Technology for Non Welding Personnel	1
▪ Calculation of Strength of Welded Members	1
▪ Cost & Estimation of Welding Projects	1
▪ Interpretation of Weld Quality by Welding Codes	1
▪ Interpretation of Weld Quality by Radiographic Method	1
CORROSION COURSES	
▪ Corrosion Technician	4
▪ Corrosion Control by Cathodic Protection	2
▪ Cathodic Protection Technologist	4
VIBRATION SPECIALISTS	
▪ The Importance of Vibration	1
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▪ Vibration Specialist Level 2	4
▪ Vibration Specialist Level 3	4
▪ Vibration Specialist Level 4	4
COURSES AVAILABLE UPON REQUEST	
▪ Welding – SMAW, GMAW, GTAW (1G - 6G)	5
▪ API-570 Piping Inspector	5
▪ API-510 Pressure Vessel Inspector	5
▪ API-653 Above Storage Tank Inspector	5
▪ Diploma of Applied Science (Coatings Technology)	10

* Registration and full payment of course must be made at least 2 months prior to the course.

* Registration to be made through MOS (www.primos.com.my)

* Disclaimer : All dates are subject to change without notice. Please contact Materials Technology Education Sdn Bhd for the latest schedule and information.

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The Winners of the YPWLC2014 finals. On the left: 2nd place Winner, David Bishop (Ireland), in the middle: Raphael Smith (South Africa), the 1st place Winner and on the right: Losini Amarasan (Malaysia), the 3rd place Winner (23 Oct 2014)

Ms. Losini Amarasan from Multimedia University has made Malaysia proud in winning the third place in the YPWLC2014 finals in California, USA. She beat the finalists from Brazil, USA and UK. Losini was the winner of IMM-Materials Lecture Competition 2014 (MLC2014) and represented Malaysia in the YPWLC2014 finals. Her trip to the USA was fully sponsored by Institute of Materials, Minerals and Mining (IOM3), UK.

The Young Persons' World Lecture Competition (YPWLC) has been held annually since 2005 and organized by IOM3 which is based in the UK. The aim of the YPWLC is to provide a platform for young scientists and engineers (age 28 or under during the year of the competition) to present their materials-related topics to a diversified audience. It is a friendly competition participated by finalists from all over the World.

The YPWLC 2014 final was held at the University of California, Riverside, USA on the 23rd October 2014. There were 10 finalists, however due to unforeseen circumstances, two finalists from Singapore and Hong Kong were not able to participate in the competition. The 10 finalist were as follows;

1. Anna Song (Michigan State University, USA).
Topic: Preparation of poly(lactic acid)/polystyrene bioblend hollow microparticles embedded with nanoparticles via a one-step emulsion-diffusion method.
2. David Bishop (University of Ulster, Ireland)
Topic: Addressing an unmet need in von Willebrand disease: A biosurface solution
3. Duncan Johnstone (University of Oxford, UK)
Topic: Layered inorganic nanomaterials going beyond graphene
4. Daniel Francioli (Federal University of Rio de Janeiro, Brazil)
Topic: Characterising surface fragmentation for comminution modelling
5. Losini Amarasan (Multimedia University, Malaysia)
Topic: Silica fibre: The next material for thermoluminescence dosimeter (TLD)
6. Calvin Davis III (University of Florida, US (East Coast))
Topic: Microwave processing for improved ionic conductivity in $\text{LiO}_2\text{-Al}_2\text{O}_3\text{-TiO}_2\text{-P}_2\text{O}_5$ glass ceramics
7. Zeng Xiao Mei (Singapore)
Topic: Superelasticity in small volume zirconia ceramics
8. Raphael Smith (South Africa)
Topic: The design, construction and testing of a hermetically sealed breast platform for dual-modality mammography
9. Qiu Guangyu (City University of Hong Kong, Hong Kong)
Topic: Evanescently excited localized surface plasmon resonance biosensor based on self-assembly gold nanoislands
10. Corey Hardin (University California Riverside, US (West Coast))
Topic: CAPAD processing of rare earth doped zirconia for high temperature light emission applications

The winners of the YPWLC2014 finals received certificates, cash and other prizes were;

YOUNG PERSONS' WORLD LECTURE COMPETITION 2014 (YPWLC 2014)



By: Prof. Dr Esah Hamzah Chairperson, Materials Lecturer Competition



The YPWLC2014 finalists in a mini bus for a Los Angeles city tour (19 Oct 2014)



The YPWLC2014 finalists and organisers at the Santa Monica Pier, Los Angeles (19 Oct 2014)



The YPWLC2014 finalists and organisers at Hollywood Hills, Los Angeles (19 Oct 2014)

First Place: Raphael Smith, South Africa
Second Place: David Bishop, University of Ulster, Ireland
Third Place : Losini Amarasan, Multimedia University, Malaysia

The judging panel were from the academia and industries namely, Dr Philip Bischler, Vice President of IOM3, Professor Dr Jon Binner, the President of IOM3, Dr Michael Clinch from Luxfer Gas Cylinders and Professor Dr Reza Abbaschian, the Dean of Bourns College of Engineering, University of California, Riverside, USA.

The YPWLC 2014 finalists stayed a week (18-24 October 2014) at the Mission Inn Hotel and Spa, Riverside, California, USA and went for Los Angeles city tour, industrial visits to University of California Research Laboratories, Croquip and Luxfer Gas Cylinders Companies. Apart from the visits, the finalists were also treated to dinners and lunches at the luxurious hotel and restaurant. The events were sponsored by CBMM Brazil, Luxfer Group and Rolls Royce.

The following are a brief account of the activities prior to the YPWLC2014 final competition as narrated by the Malaysia Finalist (Winner of the IMM-MLC 2014) and 3rd place Winner of the YPWLC2014, Ms. Losini Amarasan;

18th October 2014 (Saturday)

The overseas YPWLC2014 finalists arrived at the Los Angeles International Airport, USA and spent the night at the LA Hilton Hotel together with the finalists from the USA. They met, had friendly chat and welcoming dinner with the organisers and sponsors of YPWLC2014 at the hotel.

19th October 2014 (Sunday)

The finalists were treated to a one-day city tour of Los Angeles in a mini bus accompanied by a tour guide. They visited the city centre, Santa Monica Pier Beach, the Hollywood Hills and the Beverly Hills.

20th October 2014 (Monday)

The finalists departed from Los Angeles and travelled to Riverside, California to check in at the Mission Inn Hotel & Spa where they stayed for the rest of the week. In the afternoon, they visited the University of California Research Laboratories, Centre for Environment Research and Technology & CERT & Bourns Inc where they were given a briefing on how the electronic components were manufactured. Later they went for a tour of the University campus and at the same time were given an overview of the researches, faculties and facilities of the University.

21st October 2014 (Tuesday)

Each finalist made an individual presentation of his/her topic of the YPWLC2014 in front of a camera in a recording room. The presentation (prior to the competition) was filmed and will be uploaded in the IOM3 website after the competition is over. Later they had a tour to the Luxfer Gas Cylinders Company. It is the World's largest manufacturer of high-pressure aluminium and composite cylinders.

22nd October 2014 (Wednesday)

The finalists visited the Cyroquip Company which is the World's leading fabricator of cryogenic vaporizer and industrial gas equipment manufacturer. Later they went for a short visit to the Temecula Valley Wine Country and had different types of wine tasting.

23rd October 2014 (Thursday)

The day of the YPWLC2014 final competition which was held at the Bourns College of Engineering, University of California, Riverside (UCR) which started at 2.00 pm and ended at around 5.00pm. Ms.

Losini Amarasan won third place and received a Macbook, USD\$1000 cash and a certificate.

24th October 2014 (Friday)

Flight home from Los Angeles International Airport.

References: IOM3 website and YPWLC2014 Finals Booklet

*Prepared by:
 Prof. Dr. Esah Hmazah
 Chairperson, Materials Lecture Competition
 29 December 2014*



The YPWLC2014 finalists and organisers at the Cyroquip Company, California (22 Oct 2014)



Ms. Losini Amarasan (Malaysia Finalist) the 3rd place Winner of YPWLC2014 finals received a prize from Dr. Michael Clinch. In the middle is Prof. Dr. Reza Abbaschian from University of California, Riverside. Both were the judges of the YPWLC2014 finals (23 Oct 2014)



Losini Amarasan (Malaysia Finalist) the 3rd place Winner of YPWLC2014 finals holding her winning certificate with Prof. Dr. Jon Binner, the President of IOM3 (23 Oct 2014)

MATERIALS LECTURE COMPETITION

Putrajaya
14 MAY
2015

INTRODUCTION

The Materials Lecture Competition is intended to enhance awareness among young Material Scientists and Engineers in Malaysia, on the importance of Materials Engineering, Innovations in Materials and sustainability in the advancement of Technology and humankind.

AIM OF COMPETITION

The objective of the MLC is to select a competitor from Malaysian universities who can demonstrate excellent presentation & communication skills with the unique ability to express and explain his or her materials research work to an audience of academics as well as industrialists who may or may not have any educational background in Materials Science & Engineering. This competitor shall pit his or her skills against other international competitors from USA, UK, Brazil, Singapore, Hong Kong, etc. The command of English is of utmost importance in this competition.

SUBMISSION PROCEDURE

To take part in the MLC2015 competition, please send an e-mail with your name, a copy of IC (Malaysian Student) or Passport (International Student), phone number and e-mail details as well as an abstract of a maximum of 150 words, to your university's representative.

Name of University Representative:

Email Address :

H/P Number :

Each university will organise their own internal competition to select a winner who will represent the university in MLC2015 semi-final. The top five winners of the semi-final will compete in the MLC2015 finals. Cash prizes of RM 3000, RM 2000 and RM 1000 will be awarded to the first, second and third winners of the MLC2015 final competition (National Level). Additionally, the 4th and 5th finalists will receive cash prizes of RM 500 each. Lastly, the first prize winner of the MLC2015 (National Level) will represent Malaysia at the IOM3-UK Annual Young Persons Lecture Competition (YPLC) in Dublin in October 2015.

IMPORTANT DATES

- **15 DECEMBER 2014**
Submission of names to participate in MLC 2015 (University level)
- **19 MARCH 2015**
MLC 2015 Semi-final (UKM, Bangi)
- **28 FEBRUARY 2015**
Submission of the name of the University winner to MLC 2015 committee
- **14 MAY 2015**
MLC 2015 Final (Putrajaya)

JUDGING CRITERIA

Presentation will be judged against the following criteria:

- Structure of the presentation and clarity of explanation and argument
- Standard of presentation
- Personal enthusiasm for the subject
- Ability to deliver presentation spontaneously
- Technical content of the presentation
- Clarity and relevance of any visual aids used
- Ability to deliver a concise and meaningful summary at the end of presentation
- Ability to present within the specified time allocated
- Ability to handle judges questions

The decision of the judges is final, and is not subject to negotiation or appeal.

If you require additional information, please contact the MLC 2015 committee:

1. Assoc. Prof. Dr. Mariyam Jameelah Ghazali mariyam@eng.ukm.my
2. Professor Dr. Esah Hamzah : esah@fkm.utm.my
3. Ir. Max Ong : maxong54@gmail.com

For enquiries kindly contact the:

INSTITUTE OF MATERIALS, MALAYSIA

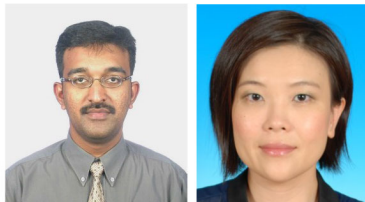
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Compiled by:
Engr. Dr. David, N.V. and Dr. Tan Winie, Universiti Teknologi MARA, Shah Alam

International Journal of the Institute of Materials Malaysia
ISSN: 1511-8487
www.ijimm.org

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The International Journal of the Institute of Materials Malaysia (IJIMM) is an initiative by the Institute of Materials, Malaysia (IMM) to provide a publication platform for sharing and disseminating of primary research findings in Materials Science and Engineering. The Editorial Board of IJIMM comprises international members who are recognized experts in the subject areas. Published twice a year, IJIMM comprises research papers that report primary or original scientific work that has not been published elsewhere.

Aims and Scope

IJIMM aims to provide a publication platform for new research findings in Materials Science and Engineering, and its extended application in major areas such as Energy, Sports, Biomedical Engineering and Built Environment including interdisciplinary research performed at the interface of these areas. This includes analysis of properties, processing, characterisation, behaviour and operating environment of engineering materials.

Manuscript Submission

The editorial solicits theoretical, analytical, experimental and/or computational articles that contribute to scientific knowledge base or expand existing knowledge into industrial applications for review. Please visit <http://www.ijimm.org> for more information on manuscript preparation and online submission.



International Journal of The Institute of Materials Malaysia

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IMTCE2016

10th International Materials Technology
Conference & Exhibition

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16 - 19 May 2016

**Putra World Trade Centre (PWTC),
Kuala Lumpur, Malaysia**

Organised by:



Institute of Materials, Malaysia

Synergising Industry & Academia
Design, Research & Inventions

10th International Materials Technology Conference and Exhibition (IMTCE2016)

INVITATION

The 10th International Materials Technology Conference & Exhibition (IMTCE2016) is scheduled to be held from 16 – 19 May 2016 at the Putra World Trade Centre (PWTC), Kuala Lumpur. IMTCE2016 will provide a platform to academicians and industrialists to showcase their knowledge and expertise in the area of "Design, Research & Inventions" in the following progressions of technology:-

Current Technologies - performance of materials, facilities & assets

New Technologies - trials & tribulations encountered

Future Evolution - research & inventions for the future

The collaboration of industrial practitioners and academic researchers have led to the development of new sustainable innovative products and services in the oil & gas, marine, power, petrochemical, chemical, water resources, transportation, construction, automotive, equipment manufacturing, electrical & electronics, agriculture, food & beverage processing, and furniture industries. IMTCE2016 covers both economic issues and technical aspects on materials science, engineering and technology, ultimately affecting all industries globally. It intends to highlight the requirements, challenges, and uncertainties in 2016 and beyond for the sustainability of facilities, equipment, and assets through design, research and inventions of better materials, better products and better services.

Papers are cordially invited from industry and academia. **Ample time is provided for free discussion between industry and academia during the conference.**

CONFERENCE OBJECTIVES

- To provide a platform for the exchange of knowledge and expertise among industrial practitioners, industry's professionals and higher learning institutions.
- To provide a forum or discussion and exchange of views on the opportunities that arises in the challenging material processing and applications through collaborations between industry and academia.

3 Technical Symposiums

- **ISAPM2016:** International Symposium on Advanced Polymeric Materials
- **ISMAI2016:** International Symposium on Materials & Asset Integrity
- **ISCC2016:** International Symposium on Coatings & Corrosion

All conference presenters are encouraged to submit full papers to identified **peer-reviewed, ISI or Scopus-indexed journals and book.**

Please visit **www.imtce2016.org** for more details.
enquiries@imtce2016.org

Co-Organisers :



IMTCE2016 Main Program Schedule

15th May 2016 (Sun)	IMTCE2016 Friendly Golf Game
16th May 2016 (Mon)	Registration and conference
17th May 2016 (Tue)	Conference, CCA2016 Exhibition, cocktail and banquet dinner
18th May 2016 (Wed)	Conference, CCA2016 Exhibition and closing ceremony
19th May 2016 (Thu)	Masterclasses, CCA2016 Exhibition, plant visits and local tours

Coat and Corrosion Asia Exhibition 2016 will be held from 17 – 19 May 2016 in conjunction with IMTCE2016. This first-of-its-kind 3-day exhibition will be showcasing the latest coating and corrosion technologies for the region's environmental, manufacturing, oil & gas, petrochemical & power, marine and industrial needs, ranging from raw materials for paints, coatings, printing inks, adhesives, corrosion inhibitors, cathodic protection products & services, exotic materials (stainless steels, nickel alloys, titanium, etc), polymers & composite materials, ceramics, nanomaterials, insulation materials, welding materials, welding equipment, blasting & painting equipment, laboratory and production equipment, and the latest technologies for quality control, inspection, test and measurement.

Some 800 speakers, presenters, exhibitors and delegates are expected to participate in IMTCE2016. We welcome you to IMTCE2016!

Sponsorship Packages

IMTCE2016 offers various advertising and sponsorship opportunities which would be outstanding for companies to raise their brand awareness & promotion reaching 800 conference delegates & over 10,000 exhibition visitors. Attendees come to this event to discover new research findings, products, equipment & technologies & there is simply no better platform for you to promote awareness of your brand to your targeted audience.

For further information, please contact:
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Email: mte5475@gmail.com or
Ms. Karen Cheng: Mobile tel: 012-2952668
Email: karen@mte.com.my

REGISTER NOW

Important Dates and Deadlines **

Submission of Abstract	1 st Jan 2015 – 30 th Aug 2015
Notification of Acceptance	1 month after submission
Submission of Presentation (pdf or ppt) for pen-drive	1 st Jan 2016 – 29 th Feb 2016
Full Paper Submission for Journal	16 th – 31 st May 2016
Registration of Masterclass	14 th Feb 2016
Registration of local tours	*
Registration of plant visits	14 th Feb 2016
Registration of IMM friendly golf	14 th Feb 2016

*For local tour registration, please refer to conference website.

** Subject to change without notification. Please always refer to the conference website for latest update.

Registration fees

(A) IMTCE2016 Technical Sessions (inclusive of 6% GST)

Category	Early Bird ^{*1}	Regular	On-site ^{*2}	Banquet Dinner
IMM Member (Fee include Banquet Dinner)	MYR 2000 / USD 740	MYR 2300 / USD 850	MYR 2760 / USD 1020	
Non Members (Fee include Banquet Dinner)	MYR 2200 / USD 850	MYR 2500 / USD 930	MYR 3000 / USD 1150	
Students (Fee Exclude Banquet Dinner)	MYR 1500 / USD 560	MYR 1700 / USD 630	MYR 2040 / USD 760	MYR 200 / USD 75

*¹ Early Bird – Registration & full payment received on or before 1st Dec 2015.

*² On-site payment in cash must be in exact amount in only Malaysian Ringgit or US Dollars.

(B) Other IMTCE2016 Activities

Activity	Fee (inclusive of 6% GST)
IMTCE2016 Friendly Golf Game (15 th May 2016 - Sunday) Return Transportation Seri Pacific Hotel-Golf Club (Optional)	MYR 300 / USD 120 MYR 100 / USD 40
Plant Visit I [*] (19 th May 2016 - Thursday) (Venue: TBA)	MYR 100 / USD 40
Plant Visit II [*] (19 th May 2016 - Thursday) (Venue: TBA)	MYR 100 / USD 40
Masterclass (19 th May 2016 - Thursday)	MYR 1300 / USD 485

Mode of Payment

Full payment must be made online at <http://www.imtce2016.org> or by other modes of payment on or before 15th April 2016. The organisers reserve the right to prohibit presenters who fail to do so, from presenting at the Conference. The information on other modes of payments is available at www.imtce2016.org

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January 2015 Issue 9

Plenary speakers of IMTCE2016

Confirmed : **Prof. Dr. Stuart Lyon**
(School of Materials, The University of Manchester, UK)
Title : Exploring Coating Failure Mechanisms Using Advanced Analytical Tools
- More to Come -



IMTCE2016 Conference Advisory Panel

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International Symposium on Advanced Polymeric Materials (ISAPM2016)

Theme: Functional Polymeric Materials for Industrial Applications

Aims of Symposium:

1. Disseminate and showcase advances in the understanding of polymeric material innovation technology and application in industry.
2. Gather stakeholders from academia and industry for sharing of innovative and sustainable ideas, collaboration and networking opportunities.

1. Polymer composites and nanocomposites
2. Advanced functional polymeric materials
3. Advances in polymer synthesis and processing
4. Application of polymer composites in industry
5. Biological, biomedical and environmental-friendly polymers
6. Polymeric materials for clean and sustainable energy
7. Multi-techniques of polymer characterisation
9. Durability and performance

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Please visit www.imtce2016.org for more details.
enquiries@imtce2016.org

January 2015 Issue 9

International Symposium on Coatings & Corrosion (ISCC2016)

Theme: Sustaining Technical Integrity through Improved Coating Industry and Corrosion Protection Technologies.

Aims of Symposium:

1. Disseminate and showcase advances in the research, development and application of the new and/or greener technologies for paints & protective coatings
2. Disseminate and showcase advances in the understanding of corrosion and corrosion protection techniques.
3. Gather researchers from academia and industry for the exchange of ideas, collaborations and networking opportunities.

Scopes and Topics

- | | |
|---|--|
| 1. Smart and nano coatings | 17. Health concerns in coatings |
| 2. High temperature coatings | 18. New regulatory/standards and trends affecting the coating industry |
| 3. Biocoatings | 19. Asset integrity in coatings |
| 4. Biobased composites | 20. Material selection |
| 5. Nanocomposite coatings | 21. Corrosion research |
| 6. Coating QA and QC standards | 22. Accelerated corrosion testing |
| 7. Coating inspection and maintenance program | 23. Corrosion of steel reinforced concrete |
| 8. Coating equipment | 24. Corrosion inhibitors |
| 9. Green coatings | 25. Cathodic protection |
| 10. Rheology of coatings/Complex fluid | 26. Corrosion monitoring |
| 11. Surface engineering | 27. Eternal corrosion direct assessment |
| 12. Organic coatings and Inhibitors for corrosion control | 28. Corrosion modeling |
| 13. Polymer coatings | 29. Microbiological induced corrosion |
| 14. Thin film coatings for electronic packaging | 30. Pipeline corrosion |
| 15. Coating processes and techniques | 31. Marine corrosion |
| 16. Coating performance | 32. Stray current & interference |

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International Symposium on Materials & Asset Integrity (ISMAI2016)

Theme: Advancements and Innovations in Materials & Asset Integrity Analysis and Management

Aims of Symposium:

1. Disseminate and showcase findings in materials & asset integrity analysis and management in the areas of (but not limited to) energy, power generation, oil and gas, built environment and other engineering industries.
2. Provide academic-industry collaborative opportunities.

Scopes and Topics:

1. Materials for clean and sustainable energy devices
2. Materials characterization
3. Materials failure analysis
4. Structural characterization of materials
5. High strain rate behavior of materials
6. Advanced materialological fundamental understanding
7. Monitoring and inspection
8. Durability and performance
9. Corrosion management
10. Asset integrity analysis
11. Asset life-cycle analysis
12. Integrity and reliability management
13. Infrastructure protective technologies
14. Structures under extreme loadings and environments



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Interesting activities :



Friendly golf

15th May 2016 (Sunday)
7.00 am – 3.00 pm
Glenmarie Golf &
Country Club,
Shah Alam



Plant visit

To be confirmed



Local tour

To be confirmed

Masterclasses

Masterclasses are a collection of scientific and technical classes/lectures of multi-disciplinary subjects, designed to cater the industrials needs. Tentative list of 1-full day masterclasses:

1. Introduction to Corrosion and Corrosion Protection by Organic Coatings
2. FTIR application for coatings fingerprinting
3. Welding appreciation for Non-Welding Personnel
4. Failure analysis



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January 2015 Issue 9

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(Multiple sponsors)

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RM10,000

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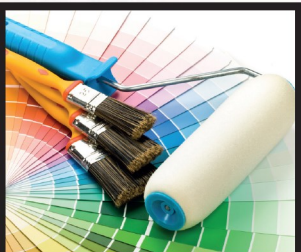
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Golf Shield

2014

Reported by: Nor Azrie Abu Samah, Materials Technology Education Sdn Bhd
 Edited by: Karen Cheng, Materials Technology Education Sdn Bhd

In a surprise draw, 3 very fortunate players won a BMW travel bag each sponsored by Wheelcorp Premium.

IMM is grateful to the following sponsors (in alphabetical order) for their support: Asas Gruppen Sdn Bhd, Boustead Penang Shipyard Sdn Bhd, Corrtrol Synergy Sdn Bhd, Deleum Services Sdn Bhd, Dialog Group Bhd, DNV GL Germanischer Lloyd GLM Sdn Bhd, Golden Ecosystem Sdn Bhd, Hawks Technologies (M) Sdn Bhd, Husky Enviro Services Sdn Bhd, Kansai PLC Sdn Bhd, KNM Group Bhd, Malaysian Offshore Contractors Association (MOCA), McConnell Dowell (M) Sdn Bhd, MECIP Global Engineers Sdn Bhd, Menta Construction Sdn Bhd, MIE Industries Sdn Bhd, MSPL Engineering, Multi-Engineering & Management Sdn Bhd, OMPI Resources Sdn Bhd, PPG Performance Coatings (M) Sdn Bhd, Rekayasa Industri (M) Sdn Bhd, Serba Dinamik Group Bhd, Technip Geoproduction (M) Sdn Bhd, Transwater API Sdn Bhd, Turcomp Engineering Services Sdn Bhd, UBF Maintenance Sdn Bhd, Ultradex Engineering Supply Sdn Bhd, Velosi Sdn Bhd and Woodgroup Group Kenny.



Saturday—11th October 2014

Before the dawn of day breaks, 120 enthusiastic and excited golfers began to stream into the Sungai Long Golf and Country Club in Kajang. The full house of players were gathering to compete at the IMM Golf Shield 2014.

After a hearty breakfast, some back-patting and handshakes amongst good friends and associates, they were ready to begin. The weather was pleasant and the dew began to evaporate when the sun rose to greet the day. The players, together with the caddies, hopped onto the buggies which took them to the respective holes for the Shot-Gun start. Play soon started when the siren sounded.

The third hole of the course was a long and challenging one. More so, when it is the one that could win the lucky player a brand new and shining BMW320i Sedan at the Hole-in-One sponsored by Serba Dinamik Group Bhd.

Soon the golfers were returning to the clubhouse for a refreshing shower and a well spread lunch. After tucking in, excitement rose again when the results of the winners were being announced. All were eager to find out who the winners are, especially the Beemer. There were many winners on the day – 6 Novelty (Nearest-to-Pin, Nearest-to-Line & Longest Drive) prizes, 7 lucky golfers randomly picked to win a box of Titleist Pro-V1x Golf Balls each, a special prize of a Nike 'Method' Putter for an eagle score, with the 4th – 10th placings winning shopping vouchers each.

The 3rd prize winner won a Sony Xperia M2 handphone whilst the 2nd prize winner won a Apple Ipad Mini. The winner of the tournament walked away with a handful of prizes comprising the IMM Golf Shield 2014, a replica shield for keep's sake, a Nike 'Method' Putter, a box of Titleist Pro-V1X golf balls and the latest Samsung Galaxy S5 handphone.

To ensure that all present are happy during the event organised by Institute of Materials, Malaysia (IMM), everyone went home with a home appliance. That should make the spouse happy too. IMM would like to take this opportunity to thank the Golf Committee members for their hard work, commitment and undivided support in making IMM Golf Shield 2014 a successful and exciting endeavour.

Hole In One:

Platinum:

Sponsor:

IMM Golf Shield 2014 Tournament Competition Winners:-

- Champion* : Ahmad Sharul Anuar (Score: 38, Handicap: 6)
2nd Place : Halim Ghani (Score: 38, Handicap: 8)
3rd Place : Fariz Nazrul (Score: 38, Handicap: 12)
4th Place : Larry Goh (Score: 38, Handicap: 15)
5th Place : Shamsul Hilal (Score: 38, Handicap: 17)
6th Place : Soo Shaiw Yee (Score: 37, Handicap: 9)
7th Place : Chew Choon Chong (Score: 37, Handicap: 9)
8th Place : Abdul Latif Jamin (Score: 37, Handicap: 14)
9th Place : Steward Siran (Score: 37, Handicap: 17)
10th Place : Dato Capt. Rahim (Score: 37, Handicap: 19)

Novelty Winners

Nearest-to-Pin

- 1. M. Iskandar Bakeri (Distance: 6’7”, Handicap: 24)
- 2. Chew Choon Chong (Distance: 4’3”, Handicap: 9)

Nearest-to-Line

- 1. Dato’ Capt Rahim (Distance: 2’4”, Handicap: 19)
- 2. YTM Tunku Dato Norazman (Distance: 1”, Handicap: 21)

Longest Drive

- 1. Halim Ghani (Distance: 259 yards, Handicap: 8)
- 2. Shaun Mooney (Distance: 256 yards, Handicap: 11)

Eagle Score Winner

Shamsul Hilal (Handicap: 17)



Hole-In-One sponsored by Serba Dinamik Group Bhd



Shields for the Champion of IMM Golf Shield 2014



From R-L: Mr. Suhaimi Manaf, Mr. Mohd. Azmi Mohd. Noor, Mr. Chan Yew Kai & Ir. Lai Kah Chiung



The Champion Winner: Mr. Ahmad Sharul Anuar



2nd Place Winner: Mr. Halim Ghani



3rd Place Winner: Mr. Fariz Nazrul



From R-L: Prof. Dr. Mohamad Kamal Harun, Mr. Raza Amin, Mr. Tarmizi Munir, Mr. Chan Yew Kai, Dr. Zulkarnain Kedah & Mr. Mohd. Azmi Mohd. Noor



‘I have a great golf swing’ by Mr. Mohd. Azmi Mohd. Noor



MTE Sdn Bhd sponsored the Novelty Prize – Longest Drive



‘No one will think it’s mysterious, I got a hole in one, right?’



‘Where is the golf ball’



“Golf is an expensive way of playing marbles.”

IMM

ADVISOR MEET-UP

With Council-Members & Committees



Reported by: Ms. Karen Cheng – Materials Technology Education Sdn Bhd

A lunch meeting with the IMM Advisor, Datuk. Ir. (Dr) Abdul Rahim Hj. Hashim and Council & Committee members was held on 21st October 2014 at Seligi Chinese Restaurant, Malaysian Petroleum Club, KLCC. Among the participants were Prof. Dr Mohd Kamal Harun, Mr. Mohd Azmi Mohd Noor, Ir. Max Ong, Ir. Mohd Suradi Yasin, Assoc. Prof. Dr. Melissa Chan Chin Han, Ms. Nurul Asni Mohamed, Ir. Maimunah Ismail, Mr. Justin Nga, Mr. Kirk Keng Chuan & Ms. Karen Cheng.



From L-R: Assoc. Prof. Dr. Melissa Chan, Ms. Karen Cheng, Ms. Nurul Asni Mohamed, Mr Kirk Keng Chuan, Prof. Dr. Mohamad Kamal Harun, Datuk. Ir. Dr. Abdul Rahim Hj. Hashim, Ir. Mohd Suradi Yasin, Mr. Mohd Azmi Mohd Noor, Ir. Max Ong, Ir. Maimunah Ismail and Mr. Justin Nga

The IMM president, Prof. Dr. Mohd Kamal Harun, updated Datuk Rahim on the institute's key achievements, current status, latest development & activities. Mohd Azmi Mohd Noor, Chairman of Materials & Asset Integrity Committee, then provided an update on the progress achieved at the Materials Integrity & Quality Assurance Forum held on 11th September 2014. It was proposed at the forum that a Task Force be formed to identify the current situation pertaining to the various issues affecting weld quality, promote and activate the **Common Welder Certification Scheme (CWCS)**, an initiative by the **Asian Welding Federation (AWF)**, which is supported by the Manpower Optimization Software (MOS).

The **IMTCE2016** Committee Chairman, Assoc. Prof. Dr. Melissa Chan, reported that the 10th IMTCE to be held on 16-19 May 2016 at PWTC, KL is targeting 600 Oral Presenters. She also introduced the **"Coat & Corrosion Asia Exhibition"** which will be held in conjunction with the conference. The exhibition, contracted to ECMI, is expected to draw more than 100 exhibitors. Ms. Nurul Asni Mohamed, Task Force Chairman of Coatings Fingerprint shared the latest development of the research on Coatings Fingerprint. PETRONAS-GTS is leading the development work for the next Phase as an IMM-PETRONAS-UiTM Research & Development Project funded by PETRONAS. She feels the involvement of UTP in this project will be beneficial. Datuk Rahim was also briefed on the next **Materials Lecture Competition (MLC) 2015** scheduled in March 2015 when a Malaysian representative will be selected to the Grand Finals of the Institute of Materials, Minerals and Mining, (IOM3) UK, **Young Persons World Lecture Competition (YPWLC)** scheduled in London in April 2015. PETRONAS had sponsored MLC in 2013 & 2014, and is seeking support from them again for the 2015 competition. In addition, IMM plans to be the Malaysian Affiliate of IOM3-UK.

The IMM Council & Committee members are grateful to Datuk. Ir. (Dr) Abdul Rahim Hj. Hashim, who took the time off to attend this meeting and provided valuable input. His presence and support has encouraged the members to do better.

Congratulations!



The IMM congratulates our advisor, Y. Bhg. Datuk Ir. (Dr.) Abdul Rahim Hj Hashim, on his election as Fellow of the Academy of Sciences Malaysia (ASM) - Engineering & Computer Sciences, at the Academy's 19th Annual General Meeting.

ASM is a statutory body of Ministry of Science, Technology & Innovation (MOSTI) with a mission to pursue, encourage and enhance excellence in Science, Engineering and Technology in support of the advancement of the nation and for the benefit of mankind. The Academy, as a "Think Tank" has contributed strategic guidance on the development and policies in Science, Technology and Innovation initiatives to support nation building. The Fellows of the Academy are drawn from eminent Malaysian scientists, engineers and technologists in many fields. A Fellow is appointed based on his/her achievements which are considered to be of extraordinary value.

IMPORTANT DATES

15 DEC 2014
Submission of UKM participants

20 JAN 2015
UKM MLC 2015 @ Meeting Room FKAB

28 FEBRUARY 2015
Submission of the name of the University winner to MLC 2015 committee

19 MARCH 2015
Semi Finals @ Bilik Seminar
Pusat Siswazah UKM

14 MAY 2015
Finals @ Pullman / Everly PutraJaya

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Website: www.iomm.org.my
Email: admin@iomm.org.my



IMM

Elected to be Secretariat of AWF

REPORT ON AWF MEETINGS IN XI'AN, CHINA (22ND – 26TH OCTOBER 2014)

Venue: Xi'an Jiao Tong University
Academic Exchange Center,
Nanyang Hotel, Xian, China

Malaysian Delegates: Ir. Dr. Edwin Nyon Tchan Jong,
Mr. Bernard Maxmillan Sim
(IMM Welding Committee)
Ms. Ainil Fidrah Mohd Ghazali
(MTE)



Reported by: Ainil Fidrah Mohd Ghazali, Materials Technology Education (MTE) Sdn Bhd

Edited by: Ir. Dr. Edwin Nyon Tchan Jong, Chairman of IMM Welding Committee

Following the periodic AWF Governing Council (GC) Meeting held in Tokyo, from 21st to 24th April 2014, the AWF Council Members from the Asian Country Members met again for the second time this year in Xi'an, China. This meeting was attended by over 49 country delegates from China, Indonesia, Japan, Korea, Malaysia, Mongolia, Myanmar, Philippines, Singapore and Thailand, a total of 10 country members being participated. The AWF GC and Task Force Meetings this time were hosted by the Beijing Welding Society in conjunction with "The 4th East Asia Symposium on Technology of Welding & Joining (4th EAST-WJ).



The AWF GC and Task Force Meetings were held continuously for three consecutive days to discuss on the progress of the implementation of Asian Welding Federation – Common Welder Certification Scheme (AWF CWCS) and further to endorse on the two draft operations procedures (i.e. OP 22 & 23). Meetings of task force groups were held back to back from the 22nd to 24th October 2014. Among the task force present to further discuss and share progress and way forward of their committee were; Technical Expert Panel (TEP) Committee, Organization Structure Review Committee, Documentation Committee, Training & Education Committee, Audit Committee and Standardization Committee. The discussion results and recommendations of these task force meetings were finally presented to the 22nd Governing Council Meeting which was held on the evening of 24th October 2014 for further consideration and approval. At the Council Meeting, **Malaysia was nominated and elected as the Secretariat for AWF for a period of 2 years from 1st January 2015. This is an honour and indeed the benchmark as a historical moment for IMM to represent Malaysia, being entrusted an important position in AWF.**



Among some of the important subject matters that were discussed during the meeting were; review and revision of AWF Organisation Structure and AWF Charter to be AWF Constitution for registration of AWF as legal entity in Singapore, Roles and responsibilities of members in committees, the Implementation Plan for iManpower Optimisation System (iMOS) at each country member and the needs to set up a new working group to encourage more Asian countries participation for ISO TC-44 committee. With the progressive, constructive and affirmative outputs reported by each of the committee, the implementation of AWF CWCS would surely become a reality before long within all the Asian country members.

Delegates from Malaysia at Governing Council Meeting



Teracotta Warriors in Ancient City in Xi'an

After the challenging and constructive task force and GC meetings for two days, the organisers had prepared dinners for both nights, one being hosted at a hotel and the other at an Opera House where all delegates and spouses were entertained with spectacular art performance by a famous Chinese Theatre Group in Xi'an. It was back to business on the fourth day where the organisers had conducted an ACB auditor workshop followed by a written examination for certification of ACB Auditor and Examiner. And, on the final day of the meeting, the organiser had also arranged a social and cultural tour to the ancient Capital of Shaanxi Province and a few other famous tourist spots around Xi'an. The meeting was concluded with positive remarks from all country members and the AWF Meeting shall convene again in Bali, Indonesia from 21 – 23 October 2015



AWF Organisation Structure Taskforce Meeting



MOS Workshop

Group photo taken at the 21st AWF Governing Council Meeting, 24 October 2014 – Xi'an China



1st Row (from left):

Mr. Nives Klaphayong (Thailand), Ms. Ainil Fidrah Mohd Ghazali (Malaysia), Mr. Ohn Myint (Myanmar), Ir. Dr. Edwin Nyon Tchan Jong (Malaysia), Prof. Dr. Li Xiaoyan (China), Mr. Suchin Katavut (Thailand), Dr. Takashi Miyata (Japan), Prof. Dr. Suck-Joo Na (Korea), Mr. Ang Chee Pheng (Singapore), Mr. Achdiat Atmawinata (Indonesia), Mr. Slamet Subagyo (Indonesia), Mr. Eric Montes (Philippines), Mr. Rolando R Ortanez (Philippines), Mr. Toru Ijima (Japan)

2nd Row (from left):

Ms. Zhang Li (China), Ms. Carol Lau (Singapore), Mr. Reynaldo L Dela Cruz Jr (Philippines), Dr. Liu Zhenying (China), Mr. Sesanandi C Ablencia (Philippines), Mr. Sze Thiam Siong (Singapore), Dr. Budi Setyo Utomo (Indonesia), Mr. Eddie Ko (Singapore), Mr. Wataru Mizunuma (Japan), Mr. Suzuki Naoki (Japan), Mr. Shoichi Nomura (Japan), Mr. Hideaki Harasawa (Japan), Mr. Gerald S Gallardo (Philippines), Mr. Ernesto B Policarpio (Philippines), Mr. Yuzuru Kaneko (Japan), Dr. Hirosada Irie (Japan)

3rd Row (from left):

Mr. Rachan Rothapol (Thailand), Mr. Mochammad Moenir (Indonesia), Mr. Isidro D Millo (Philippines), Mr. Minoru Otsu (Japan), Mr. Zulfayar Bold (Mongolia), Mr. Ding Fubao (China), Mr. Bernard Maxmillan Sim (Malaysia), Mr. Supot Thongdee (Thailand), Dr. Sun Zhenguo (China), Mr. Ackadech Lersvanichkool (Thailand)

Plant Visit to Jotun Paints (Malaysia) Sdn Bhd



Reported by Zalilawati Hasan, Materials Technology Education
Edited by Ms. Ainil Fidrah Mohd Ghazali, Manager of MTE

Date: 24th October 2014, Friday

Time: 9.30 am to 1 pm

Venue: Jotun Paints (M) Sdn Bhd, Lot 9143, PN 38500,
Kawasan Perindustrian Nilai, 71800 Nilai, Negeri
Sembilan, Malaysia

Members of the Polymer Committee and Task Force on Coatings Fingerprinting of Institute of Materials, Malaysia (IMM) visited Jotun Paint (M) Sdn Bhd located in Nilai, Negeri Sembilan on 24th October 2014. One of the prime objectives of this plant visit is to expose the IMM members of the Polymer Committee and Task Force on Coatings Fingerprinting on the paint manufacturing process as well as the in-house quality control and quality assurance (QA & QC) processes for protective coatings.

Mr. Vincent YS Tan, General Manager of Jotun Paint Malaysia, welcomed all the guests during the plant visit. This was followed by a briefing from Mr. Low K Teong (Senior Factory Manager) and Mr. Jason Kok Boon Foo (Deputy Specification Manager, Protective Coatings) on Jotun plant operations and Jotun business activities.

Jotun (Malaysia) Sdn Bhd is a joint venture company between Malaysia and Norway which started operation since 1983. Its head office is located at Gimle, Sandefjord, Norway.

Odd Gleditsch Sr. is the founder of Jotun Paint in 1926 and now their presence are around the globe with 38 factories located on all continents. Jotun Nilai Factory started operation in 2010 and their first batch of production was on 24th June 2011. Jotun is the market leader in oil & gas, infrastructure, marine, energy and petrochemical industries.

Jotun Paint is classified in four segments which are; Decorative Paints, Marine Coatings, Protective Coatings and Powder Coatings. IMM members were briefed with an overview of the manufacturing plant, manufacturing processes, research & development for protective coatings; and lastly on QA & QC processes. The tour began with visit to their in-house laboratory where Jotun shared with the visiting members various matters related to QA and QC. Then, members were guided to the storage compartments of the raw materials and the intermediate materials of paints and later followed by a visit to their state-of-art mixing tanks of the intermediate materials of paints.

At the end of the plant visit, IMM Polymer Committee members and the staffs of Jotun (Malaysia) mutually agreed that Fourier-transform infrared (FTIR) structural analysis of epoxy paints on steel structures for **Coating Fingerprinting Certificate** is practical to be carried out at the in-house laboratory of the company. Besides, both parties are looking forward to strengthening the co-operation on Coatings Fingerprinting towards the implementation of **Coating Fingerprint Certificate** for protective coatings in near future.

IMM thanked Jotun (M) Sdn Bhd for hosting this plant visit.



Figure 1 Coatings Fingerprinting Task Force was briefed by Mr Vincent Tan on the company's profile and Jotun products.



Figure 2 Mr. Low K Teong briefed on Jotun products.



Figure 3 Front row from left to right: Mr. Low K Teong (Jotun), Ms. Rohana Jaafar (PETRONAS GTS), Ms. Zalilawati Hasan (MTE), Ms. Karen Cheng (MTE), Ms. Fatin Harun (UiTM), Dr. Tan Winie (UiTM), Pn. Nurul Asni (PETRONAS GTS), Assoc. Prof. Dr. Melissa Chan Chin Han (UiTM), Mr. Vincent YS Tan (Jotun), En. Farish Irfal Saaid (UiTM), Mr. Lim Chuan Gee (SIRIM).

Second row from left to right: Ir. Mohd Suradi Yasin (IMM), Assoc. Prof. Dr. Chia Chin Hua (UKM), En. Muhammad Hawari Hassan (PETRONAS GTS), Mr. Kirk Keng Chuan (IMM), Dr. David V. Natarajan (UiTM), En. Abdul Aziz Haron (SIRIM), Ir. Max Ong Chung Hup (Norimax Sdn Bhd), En. Hafiz Hidir (UiTM) (last)

AUN/SEED-NET Regional Conference 2014 On Materials Engineering

In Conjunction with the 3rd UM-JWRI International Seminar 2014



Reported by: Dr. Ching Yern Chee (Universiti Malaya, Malaysia)

Edited by: Assoc. Prof. Melissa Chan Chin Han, Editor of Materials Mind



**AUN/SEED-Net Regional
Conference 2014 on Materials
Engineering in conjunction with
3rd UM-JWRI
International Seminar 2014
11– 12 November 2014 at
Sunway Putra Hotel,
Kuala Lumpur**

2014 AUN/SEED-Net Regional Conference on Materials Engineering was the regional conference supported by Mechanical Engineering, Faculty of Engineering, University of Malaya (UM), Malaysia, Joining and Welding Research Institute (JWRI) and JICA Project for AUN/Seed-Net. The AUN/SEED-NET Regional Conference on Materials Engineering is a platform to share the most updated technology and research of regional common issues from the Member Institutions and Japanese Supporting Universities. This regional conference involves participants from the industries and other professional organizations. This conference allows opportunities for participants to discuss future collaborations and activities related to material engineering field. University of Malaya and Joining and Welding Research Institute (UM-JWRI) International Seminar aimed to be a collaborative platform for sharing the latest research developments and knowledge in joining and welding. Moreover, it also aimed at maximizing the outreach of the AUN/SEED-Net network for stronger impacts by involving external participants, including representatives from the government, industry, community, and other professional organizations.

The **AUN/SEED-Net Regional Conference 2014 on Materials Engineering** in conjunction with **3rd UM-JWRI International Seminar 2014** was held on 11 – 12 November 2014 at Sunway Putra Hotel, Kuala Lumpur (formerly known as The Legend Hotel & Apartments, Kuala Lumpur) in Peninsular Malaysia. The conference was again hosted by the Center of Advanced Materials (CAM) and the Center of Advanced Manufacturing and Material Processing (AMMP), Department of Mechanical Engineering, University of Malaya, and **Institute Materials Malaysia (IMM)** as one of the co-sponsors. **Ir. Kang Kim Ang (IMM Student Chapter Committee member)** was invited as one of the plenary speakers for this

event. The title of his talk is “Indirect Assessment of Buried Pipeline External Corrosion”. Ir. Kang shared his depth knowledge about the latest techniques used in the study of the corrosion protection status, external coating defects and the corrosively of soil/water in contact with pipeline surface.

The mission of the conference was to provide a forum at which the latest research on the following fields were presented:

Advanced Metals and Alloys	Environmentally Sustainable Materials
Ceramics	Mechanical Behaviour of Materials
Polymers and Soft Materials	Materials Degradation (Corrosion, Wear)
Composites	Failure Analysis
Electronic, Magnetic and Optical Materials	Coating and Surface Engineering
Biomaterials	Nanomaterials and Nanotechnology
Materials for Energy Storage, Conversion and Renewable Energy	Modelling and Simulation in Materials Engineering
Materials Processing	Joining and welding of advanced materials



Ir. Kang Kim Ang (IMM Student Chapter Committee member) was the invited plenary speaker from industry to share his technical knowledge and skills on corrosion protection.

Analysing Organic Coatings

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Abstract

Apart from routine mechanical testing of organic coatings, analytical methods such as FTIR, differential scanning calorimetry (DSC) and instrumented indentation test can be used to provide useful, complementary information about a coating's final properties, which are determined by how well it has been cured. These methods are relatively simple, and yet practical for application in the coatings industry.

Introduction

The properties of a thermosetting coating system is significantly determined by how well it has been cured (crosslinked). A coating that has been properly cured will be able to achieve its targeted properties, as well as the performance it has been engineered for. The reverse is true if the coating has been undercured or overcured. The curing process is therefore a very important step in any coating application, and as such it requires relevant testing methods to ascertain whether this step has been done properly. In the industry, mechanical tests are widely used, such as pencil hardness, bending, cupping deformation, impact resistance, as well as solvent resistance tests.

While the mechanical testing of coatings are necessarily the norm and are cost-effective ways to ensure that the expected qualities are achieved, the use of analytical testing methods are arguably still relatively lacking in the Malaysian coatings industry particularly among the smaller manufacturers. This may be largely due to the higher cost of investing in the analytical instruments, as well as the cost to properly operate and maintain them.

It goes without saying that the industry cannot dispense with the mechanical tests. However, the adoption of analytical techniques should be given due consideration as they are in fact very useful and they complement the usual tests very well. There are of course many analytical techniques available and it is neither practical nor sensible to employ a host of these in routine applications. It is more reasonable to select a few that suit the needs of both the manufacturer and the end user. This article will briefly highlight some of the more useful and practical methods in the analysis of coatings, particularly in relation to the study of the relative degree of curing.

Results and discussion

Fourier Transform Infra-Red Spectrometry (FTIR)

FTIR, or more specifically the Attenuated Total Reflection (ATR)-FTIR method, is one of the most useful and accessible of all analytical methods for coatings. In fact the uses of FTIR and ATR-FTIR in the fingerprinting of wet paint have been described recently in the context of the Malaysian oil and gas industry [1-4]. The same method can be similarly adapted for cured coatings.

Among many others, one of the uses of ATR-FTIR analysis on coatings is the determination of the relative degree of curing. Figure 1 shows an example of this application in practice for a polyester-melamine coil coating system. The spectra show the changes on the band at about 910 cm^{-1} attributed to the methoxy groups of the melamine crosslinker present in the polyester coating cured at different peak metal temperatures (PMT). The 910 cm^{-1} band gets increasingly smaller with higher PMT as the crosslinking reaction between the melamine and the hydroxyl groups of the polyester resin results in the removal of increasing numbers of methoxy groups as methanol. The relative degree of curing can

therefore be inferred from the comparison of the height or the areas under the band, where in this case the smaller areas would indicate a higher degree of crosslinking. This study can therefore provide useful information about how well a coating has been cured and should also be one of the first techniques used when troubleshooting a defective coating.

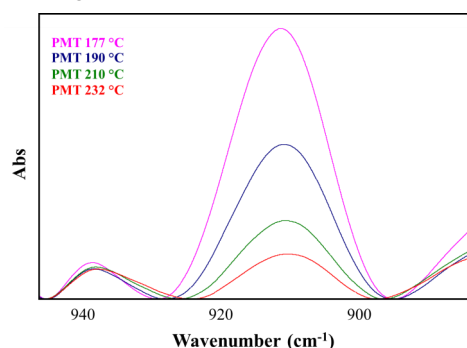


Figure 1 ATR-FTIR spectra of a polyester-melamine coating cured at different peak metal temperatures (PMT)

In order to apply this method for other coating systems, it is necessary to know whether the crosslinking reaction results in the increase or decrease in absorbance of any particular band when compared against an uncured coating. Provided that this band is not interfered with by other bands in the same region, i.e. these latter bands do not themselves change in absorbance at different extents of crosslinking, the selected band can therefore be used to observe the relative degree of curing of the coating. As a complement to the fingerprinting of a finished coating, the analysis of the selected band can be a useful tool to further ensure that the coating has been cured to within specifications.

Differential scanning calorimetry (DSC)

DSC is a thermal analysis technique commonly used to determine parameters such as glass transition temperatures (T_g), melting points and heat capacities of materials [5-8]. For coatings, the measurement of T_g is one of the most useful and essential techniques available. T_g is the temperature at which an amorphous material will transition from being in a glassy, brittle state into a soft, rubbery state. In other words, above the T_g , the material will behave very differently compared to its state when below the T_g .

Figure 2 shows the increase in the T_g of a polyester-melamine coating as its curing PMT increases. For this system, the coating appears to have approached an adequate degree of curing at a PMT of about 199-210°C where the T_g no longer appears to be increasing significantly. Knowing the T_g that a coating should achieve when properly cured is useful because this is the T_g at which the coating should achieve its specified properties and should therefore perform as expected.

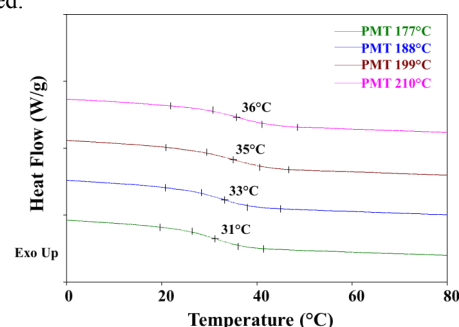


Figure 2 Stacked DSC thermograms showing the T_g (midpoint) of a polyester-melamine coating cured at different PMT

If the measured T_g of a coating is lower than expected, then it is usually undercured due to inadequate crosslinking and the coating will be relatively softer with a corresponding poorer performance in areas such as chemical resistance and dirt pickup resistance. An improved flexibility is usually observed but while this is normally desired due to a lower tendency for cracking, the overall poorer properties will result in the premature failure of the coating. Conversely, an overcured coating with excessive crosslinking will show a higher T_g than expected. The result is a coating which is more brittle and therefore more susceptible to cracking upon deformation or impact which can also lead to premature failure.

Instrumented indentation test

Instrumented indentation test, or microhardness, is a relatively lesser known technique in the analysis of organic coatings; the standards available today have only been around for the last decade or so [9-10]. It is different from the usual mechanical tests for hardness (such as pencil hardness) in the sense that this a non-destructive technique which is able to give information about the visco-elastic properties of a coating without the influence of the substrate, provided that the coating has adequate thickness.

The method uses a conventional Vickers indenter head to apply an ultra-low load on the coating. As shown in Figure 3, the test load is first increased gradually while the corresponding indentation depth of the measuring head is obtained. A holding cycle where the indentation is allowed to continue (creep) at a constant maximum load can be incorporated. The load is then gradually released to zero, while the coating relaxation displacement is measured. The hardness (Martens, HM or Universal, HU) is then calculated as the quotient of the applied load over the surface area of the resulting indentation. The indentation surface area is itself derived from the measurement of the indentation depth displacement and the well-defined geometry of the Vickers indenter.

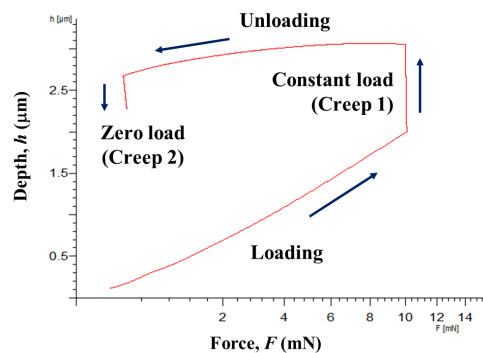


Figure 3 An instrumented indentation test profile showing the steps of increasing load, constant load, decreasing load, and zero load

The instrumented indentation test is usually carried out for a few times on the same sample and an average is obtained as the result. As the properties of organic coatings are also affected by temperature and humidity, it is also necessary to carry out the test under reasonably controlled conditions in order to have reliable comparative data.

Two of the more commonly used data that can be obtained from the instrumented indentation test include Martens hardness (HM) and indentation creep (C_{IT}). Table 1 shows the data for the same polyester-melamine coating cured under different PMT. HM can be seen to increase with PMT while at the same time C_{IT} decreases. This can be interpreted as an increase in the relative degree of crosslinking as PMT increases, which results in the increase in hardness and in a corresponding decrease in indentation creep. The properties at PMT 199°C and 210°C are not widely different, and they suggest that the coating has probably approached an adequate level of crosslinking at these temperatures, supporting the findings from the T_g analysis. As

the results are obtained from the average of several measurements, a statistical comparison can of course be performed between the samples if so desired.

Table 1 Changes in Martens hardness and indentation creep with PMT as measured in an instrumented indentation test. Results are averaged from 9 measurements

PMT °C	HM (σ) N/mm ²	C_{IT} (σ) %
177	101 (13)	44 (5)
188	140 (9)	32 (2)
199	187 (19)	22 (2)
210	204 (19)	19 (1)

Conclusion

All the three techniques discussed in this article can be used to analyse the relative degree of curing of a coating, complementing the standard mechanical tests carried out routinely. Results from these analyses can be compared against data from tests such as pencil hardness, cupping deformation, impact resistance and even solvent resistance tests. While not shown here, good correlation can be observed between the analyses and the standard tests, for instance a coating with a relatively higher degree of curing will show better solvent resistance or scratch resistance, in correspondence with higher T_g . Having some analytical evidence on hand to explain the observations from standard tests can therefore be helpful. These techniques become even more indispensable when there is coating failure and the causes need to be understood. When used together, all three methods complement each other very well and are an especially strong combination in the curing study of a coating.

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Half Day Seminar on “Innovative Zinc Coatings”



*Reported by: Mr. Chew Boon Kheng, UE Zinga Malaysia Sdn Bhd and
Ir. Max Ong Chong Hup, Chief Editor of Materials Mind.*



29th October 2014, Malaysian Petroleum Club, Kuala Lumpur

The Institute of Materials, Malaysia (IMM) Corrosion Committee organised a half day seminar titled Innovative Zinc Coatings. This seminar was sponsored by Ue Zinga Malaysia Sdn Bhd / GPT Resources Sdn Bhd. It was held at the Malaysian Petroleum Club, KLCC on 29th October 2014 and attended by 64 participants from oil & gas industries, electricity utility, coating manufacturers, infrastructure consultants, researchers, blasting companies and applicators.

Questions from Dr. Mahboob Elahi Rana - Petronas Group Technical Solution



The President of Institute of Materials, Malaysia, Prof. Dr. Mohamad Kamal Harun, officiated the event and introduced the two speakers Mr. Christian Verbrugghi from Belgium and local popular Speaker Mr. Kang Kim Ang.

Mr. Christian Verbrugghi, an expert on Zinga, film galvanizing system, talked about the innovative zinc coating that provides active cathodic protection as well as traditional passive protection. Zinga is easy and simple to apply and was certified to comply with ISO 12944. He illustrated with numerous examples where it has been in use for over 50 years all over the world in various industries including the marine, infrastructure as well as oil and gas industries.

Mr. Kang Kim Ang talked about zinc wrapping systems where zinc tapes are used instead of conventional zinc coating in the form of paint or metallized spraying. Wrapping tapes are easy to use on tubes and pipes.

Question and Answer session was lively with active participations from the audience. Dr. Mahboob Elahi from PETRONAS fielded questions on “**coating fingerprinting**” which generated considerable discussions among the audience and the speakers. It was clear that coating fingerprinting has not been introduced by both the Zinga zinc coating product and the Zinc tape product. Both Speakers informed that they will look into the **coating fingerprinting certification**. Ir. Max Ong commented on the many great qualities of Zinga and was humbly replied by Mr. Christian who pointed out some limitations of Zinga while Mr. Vincent Huang from Galvanizing Engineering Service Sdn Bhd, speaking from his experience, found that Zinga actually complement and not compete with hot dip galvanizing. Members from blasting companies as well as traditional paint manufacturers also keenly participated in the ensuing discussions which covered issues such as costs of both products versus traditional inorganic and organic zinc coatings, “cathodic protection throwing power” of 15 mm distance claimed by Zinga, and possible areas of applications for both products. Others were keen to find out more about the innovative ways of providing protections for structures where corruptions eat up billions of dollars each year. Both speakers took up the questions raised and answered as best they could in the short available time. The interesting discussions continued for an hour more after the event was officially ended.



Snippet of The Seminar



Questions from Mr. Vincent Huang - Galvanizing Engineering Service Sdn Bhd

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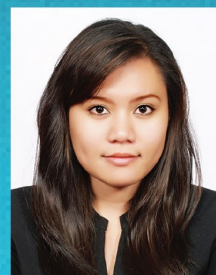
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Introducing the Crew at MTE

UMS-IMM

Technical cum Career Talk



Reported by: Ms. Karen Cheng, Materials Technology Education Sdn Bhd

Kota Kinabalu, 11th November 2014

The Institute of Materials, Malaysia (IMM) marked another milestone by successfully co-organising the half-day UMS-IMM Technical cum Career Talk on 11th November 2014 with the Faculty of Engineering, University Malaysia Sabah (UMS). The half day event was held at the Main Lobby of Faculty Engineering Building, UMS, with more than 150 students and lecturers in attendance.



IMM team: (L-R) Eur. Ing. Nigel, Ir. Abd Razak, Mr. Kirk, Mr. David & Mr. Kang

The talk began with the official welcome remarks by Prof. Ir. Dr. Rasalam Sarbatly, Dean of Faculty of Engineering. He stressed that “it is important that UMS collaborates with industry players for the benefit of the students”. He encouraged students to join societies of the status of IMM for lifelong learning with continual improvement. This was followed by the exchange of mementos with the IMM Honorary Secretary Ir. Abd Razak Abu Hurairah, in the presence of Prof. Dr. Yeo Kiam Beng @ Abdul Noor – Head of Materials & Minerals Research Unit (MMRU) of UMS.

In conjunction to the talk, Eur. Ing. Nigel Brewitt, Chairman of IMM Student Chapter, took this opportunity to facilitate the connection between industry and universities. IMM aims to set up Student Chapters in universities and to provide students with the information and experience in the exciting world of materials.



From left: Eur. Ing. Nigel, Mr. Kang, Mr. David, Prof. Dr. Yeo, Prof. Ir. Dr. Rosalam, Ir. Abd Razak, Assoc. Prof. Dr. Sivakumar & Dr. Sazmal



Interest in the talk where 4 speakers presented was high.

Assoc. Prof. Dr. Sivakumar Kumaresan (from MMRU) who specializes in Herbal Processing & Process Control, Personal Development Trainer presented a paper on ‘*Handling Gen X HR Managers: A Guide for Gen Y*’. He established the differences between Generations X, Y, and Z, advised the students of the global trends of employment, how such trends apply to finding a career, and the various elements for success for those who possess the desired aspects. A professional who is keen in human development, Asso. Prof. Dr. Sivakumar, captivated the audience.

Mr. David Lim, IMM Council Member & Chairman of the Coatings Committee, shared a paper on ‘*Protective Coatings*’. His presentation covered the fundamentals, role, applications and importance of Protective Coatings not only in marine environment operation facilities, but also in industries such as oil and gas, chemical processing, power generation, pulp & paper, mining & metals and the building and infrastructure. He added “The impact of coatings has been tremendous where the worldwide consumption of anticorrosion coatings was estimated to be 1.1 million metric tons, with a value of USD \$5 Billion in 2001”.

After a short break, the talk continued with a paper by Ir. Abd Razak Abu Hurairah, Honorary Secretary of IMM. Ir. Abd Razak, who was in Oil & Gas Industry Project Management in Operation & Maintenance, provided an insight to the ‘*Career Opportunities in the Oil & Gas Industry*’. He covered the various phases in the development of oil & gas facility where there are career and specialization opportunities in each of the phase such as Engineering Design, Onshore and Offshore Construction, Operation and Maintenance.

Rousing the engineering students by affirming of being proud to be an engineer, Mr. Kang Kim Ang, then took the stage. The Secretary of IMM Corrosion & Materials Degradation Committee who is a specialist in Corrosion & Material Engineering delivered the ‘*Importance of Corrosion Technology in the Oil and Gas Industry in Malaysia*’, and showed the students the great importance of corrosion in shipbuilding, pipelines, construction and infrastructure, air and sea ports, more so in the Oil & Gas industry. He showed them pictures on how lack of control of corrosion caused huge disasters, heavy losses, injuries and fatalities, even the harming the environment. He concluded that there are many positions in corrosion engineering available to the prepared engineer.

In closing, Ir. Abd Razak Abu Hurairah encouraged the audience to join IMM which is a society of non-profit society of professionals whose aims are to promote honourable practice and professional ethics and encourage education in materials science, engineering and technology.



Eager beavers: Students from Faculty of Engineering, University Malaysia Sabah

STUDENT CHAPTERS



By: Eur. Ing. Nigel Brewitt, Chairperson of IMM Student Chapters & Norimax Sdn Bhd



Eur. Ing. Nigel Brewitt giving his talk to students.

Ever thought that giving talks to students as an industrialist is a waste of time? That they won't listen or would rather play with their iPad. Well you would be wrong. Since I came to Malaysia almost six years ago, I have had many very rewarding experiences talking to students in formal seminars (ran by the students), and involving myself in the student chapters. I have really learnt a lot; the need to take your mind back to first principles in order to explain something, the need to appreciate the modern vernacular without becoming a born-again student yourself.

The establishment of IMM Student Chapters in universities and polytechnics is a great idea. To give the students some freedom to add to their learning that which is often lacking in academia i.e. an industrial perspective. This is an opportunity for them to take control and organise events such as site visits and seminars. These are opportunities that can be taken advantage of as a group whereas they would be denied as an individual. My meeting with the Student Chapter of UTAR in late November certainly showed me a thing or two. I was met with an enthusiastic barrage of ideas (as well as a few demands) but all focussed on how they could promote THEIR institute – The Institute of Materials Malaysia. None of the ideas were silly and all were put forward in a professional manner. In fact, the IMM was so impressed that we executed, or put into motion, practically all of the ideas.

The University College of Tunku Abdul Raman recently held their annual dinner and performance to welcome their student colleagues back from Sheffield Hallam University in the UK. The last four years they have kindly invited me to this event and every year I have thoroughly enjoyed myself. This year they asked me to speak (see figure). I talked on some of my experiences in Rolls-Royce and tried to express how large companies think regarding research and development. Afterwards, the students and staff showed considerable interest in the formation of an IMM Student Chapter and we hope that the new year will bring further talks.

A career talk given to students of The University of Malaya Sabah (UMS) by volunteers of the IMM was met with enthusiastic applause. I talked to students over typical Malaysian snacks and discovered that the need to embrace industrial concepts runs deep. Their thirst for education outside the classroom is simply impressive. We shouldn't be letting them down and we hope to establish a Student Chapter at UMS within 2015.

IMM hope to establish Student Chapters in all educational establishments throughout Malaysia. This is going to be quite a challenge but one which we embrace enthusiastically. To make sure that this is a success, we need experienced engineers and materials professionals to step back into the world of academia to ensure an industrial perspective is ever present in the curriculum. If you are willing to give a talk to students please contact me at nigel@mtis-malaysia.com.

Materials Mind Photography Competition



Prepared by Dr. Huang Nay Ming, Managing Editor of Materials Mind

Materials Mind magazine under the Institute of Materials, Malaysia (IMM) is organizing a "Materials Mind Photography Competition". Share with us your best photo and you could win an attractive prize. All you have to do is to capture an interesting, creative and amazing photo of "materials" and send it in. The best photo will win away RM 500, a certificate and one year FREE IMM membership (excluding the processing fee); and the photo will be published in the Materials Mind magazine. As the magazine is published quarterly, we accept four submissions per year. The deadline of photo submission is one month before the publication of the magazine issue. Details of the Materials Mind Photography Competition announcement can be accessed through the magazine webpage under IMM website at <http://www.iomm.org.my>.

Submission dates of photo to Materials Mind in 2015

No.	Issue	Submission date
10	Jan - Mar 2015	1 st Feb – 28 th Feb 2015
11	Apr - Jun 2015	1 st May – 31 st May 2015
12	Jul - Sep 2015	1 st Aug – 31 st Aug 2015
13	Oct - Dec 2015	1 st Nov – 30 th Nov 2014

HOW TO ENTER

EMAIL your photo as an attachment to Dr. Huang Nay Ming, the Managing Editor of Materials Mind (huangnayming@um.edu.my) and c.c. to the Co-Chief Editors, Ir. Max Ong Chong Hup (maxong54@gmail.com) and Assoc. Prof. Dr. Melissa Chan Chin Han (cchan_25@yahoo.com.sg). Entries must include photo title, brief description of the photo (< 100 words), date it was taken, your name, address and phone number. The **submission form** can be downloaded through the magazine webpage under IMM website at <http://www.iomm.org.my>.

Materials Mind Photography Competition Rules

1. Anyone who is interested in photography on materials is eligible.
2. An image that has won other competition is not eligible to enter this contest.
3. Photo can be taken using a device of choice.
4. Photo must be submitted electronically through email to the Managing Editor of Materials Mind, Dr. Huang Nay Ming at huangnayming@um.edu.my and c.c. to the Co-Chief Editors, Ir. Max Ong Chong Hup (maxong54@gmail.com) and Assoc. Prof. Dr. Melissa Chan Chin Han (cchan_25@yahoo.com.sg) with the heading of "Materials Mind Photography Competition". The Managing Editor will reply the email to acknowledge the acceptance of photo submission.
5. Maximum file size is 20 MB, and it is recommended that the file size be no smaller than 3 MB although smaller file sizes will not be disqualified. Files must be in .jpeg or .tiff.
6. Entries must include photo title, brief description of the photo (< 100 words), date it was taken, your name, address and phone number.
7. Each participant may submit up to three photos for judging for every quarter.
8. Entries will be judged based on creativity, originality, quality and visual impact.
9. Entries must be received one month before the publication of the magazine issue to be eligible for prizes. Please send all correspondence to huangnayming@um.edu.my and c.c. to maxong54@gmail.com and cchan_25@yahoo.com.sg.
10. Winners will be notified three weeks after the closing date and the decision of the Materials Mind's judges is final.
11. Failure to comply with all of the above-mentioned rules disqualifies the entry.



Compiled by Mr. Justin Nga, IMM MIQA Workgroup

Rapporteurs' Report of IMM FORUM on MATERIALS INTEGRITY & QUALITY ASSURANCE

Date	: 11 th September 2014
Time	: 2:00 pm - 6.00 pm
Venue	: IMPIANA KLCC HOTEL, Impiana Banquet Hall 2
Jointly organised by	: IMM Materials & Asset Integrity Committee IMM Welding Committee IMM Polymer Committee
Co-organiser	: Faculty of Applied Sciences, Universiti Teknologi MARA
Participants	: More than 100 representatives from: Aecom Perunding Sdn. Bhd. Agensi Nuklear Malaysia Aker Solution Bureau Veritas Carigali – PTTEPI Operating Company Sdn Bhd Corrodynamic Sdn. Bhd. Corroserv (M) Sdn. Bhd. DNVGL Envimech Sdn. Bhd. Jurutera Perunding Akal Lloyd's Register of Shipping (M) Bhd. MRA International Sdn. Bhd. Muhibbah Steel Industries Sdn. Bhd. Norimax Sdn. Bhd. Oilfield Technical Inspection Petrofac ECOM, Asia Pasific PETRONAS Petronas Carigali Sdn. Bhd. PETRONAS GTS Research Instruments Sdn Bhd RIA Solution (M) Sdn. Bhd. ROSEN Sapura Kencana Shell SIRIM Bhd. Technip Malaysia Tunku Abdul Rahman University College Ue Zinga Malaysia Sdn. Bhd. Universiti Islam Antarabangsa Malaysia Universiti Kebangsaan Malaysia Universiti Teknologi MARA University Kuala Lumpur University National Malaysia University Science Malaysia University Technology MARA Velosi Woodgroup Intertech

Introduction:

The Oil & Gas, Power & Marine industries are plagued with *Materials Integrity issues*.

Very often we hear of catastrophes such as a gas pipeline rupture & explosion or collapse of a key structural component and many near misses. Sometimes, these events lead to *fatalities*. The objective of the inaugural MIQA Forum was to discuss the possible root causes and possible solutions to reduce such occurrences or even prevent them from ever occurring. The Forum focused on Inspection, Coatings, and Welding with emphasis on Quality Assurance & Quality Control in the Oil & Gas &

Petrochemical industries. Highlighted were the much-needed Review of Inspection Techniques and Inspection Personnel Performance, the revolutionary Coatings Fingerprinting Initiative, and the drive to implement the Common Welder Certification Scheme introduced by the Asian Welding Federation (AWF).

Summary of the presentation sessions:-

Speaker 1	: Mr. Mohd Azmi Mohd Noor (Head of Asset Integrity, Upstream HSE)
Topic	: Overview of Integrity Issue in the Oil & Gas Industry



Mr. Azmi began with statistical evidence on global trends in integrity management for offshore assets. The issues pertaining to Integrity are Upstream driven. His analysis zoomed into a local context where it is estimated 50% of Malaysia's facilities are more than 25 years old.

Mr. Azmi further presented that the overall concept of Integrity is closely linked to Quality. Quality Management stretches across the board; whilst ageing assets will naturally see a focus on quality, there is also a strong emphasis on "getting it right the first time" on new builds – this shall now become the mantra for all future CAPEX projects as Malaysia and indeed Petronas strives to elevate its global status.

He posed key questions to the audience:

- "How do you assure quality?"
- "How do we control quality?"

The presentation ended with Mr. Azmi prompting the learned audience on initiatives moving forward, including kick starting industry led task forces – this will provide the platform to ensure tighter control on growing areas of inspection, welding (procedures and welders themselves), blasting, and painting.

Speaker 2	: Ms. Nurul Asni Mohamed (Principal Engineer - Corrosion, PETRONAS GTS)
Topic	: Coatings Fingerprinting Initiative-Phase 1 Success



The Coatings Fingerprinting Initiative celebrated the successful completion of its first year in 2014.

Ms. Nurul presented the salient points of the initiative and the key points of its success.

The headlining statement focused on a key driver for the initiative: the cost of corrosion. The estimated cost of corrosion across all industries in Malaysia is RM10billion per year; in O&G the estimated cost of corrosion in Malaysia is RM3billion per year of which the Coatings Industry contributed a quarter of this figure.

The key issue of premature coating failures still persist. There are

industry-known practices to address long-known causes of coatings failures i.e. the surface preparation quality & applicator skills and paint inspection personnel capabilities. Yet, despite introduction of many skills training and certification programs for blasters & painters and paint inspectors, the costs contributed by coatings failures in the oil & gas industries continue to increase and posing risks to structural integrity and dangers to personnel. Thus, the additional focus on the paint materials quality assurance to establish a mechanism to produce a “mill certificate” for the manufactured paint products. The question remained then is it possible to fingerprint polymer coatings.

Through the Coatings Fingerprinting Task Force officialised in April 2013, this has been proved possible. The Task Force consists of O&G companies, Academicians, Coatings Advisors, Testing Laboratories, FTIR Equipment Suppliers and Coating Manufacturers.

Ms. Nurul shared the Task Force Objectives:

- To review the available standards and specifications requiring Fingerprinting of Polymeric Coatings in the O&G industry.
- To review quality control and quality assurance techniques practised by the paint manufacturers during manufacture and storage.
- To review QA and QC techniques practised by the blasters and painters in regards to the paints prior to application and during application.
- To review fingerprinting testing methods available in regards to the reliability, speed of testing and costs.
- To establish a Fingerprinting Document Template acceptable to all parties involved in the manufacture, application and usage of Polymeric Coatings in the Oil and Gas industry.

Key challenges include ensuring manufacturer’s proprietary coating formulation will be secured and establishing an Acceptance Criteria in Matching % values. Both these challenges have been successfully addressed by the Task Force.

The presentation ended with Ms. Nurul introducing the next step in the initiative, the way forward proposed is Phase 2 development, pilot implementation and the creation of an IMM Best Practice Document.

Speaker 3 : **Mr. Ang Chee Pheng**
(Sec. Gen - AWF; VP - IIW)

Topic : **Common Welder Certification Scheme**



It is important to assure quality in welding. However there are still quality concerns even though we have specific standards for welding. The O&G industry acknowledges that Human Factor will be a continuous issue – are there gaps to address for improvement?

These are areas that through Mr. Ang’s detailed presentation, the Asian Welding Federation (AWF) Common Welder Certification Scheme and the Manpower Optimisation System (MOS) will hope to address practically and effectively to suit Malaysia’s and Asia’s potential demand for well-rounded welders in the next 5 to 10 years. Mr. Ang highlighted that despite all the various welding standards available in the industry such as the ISO, API, AWS, EN, JIS, DIN etc, the quality of welding continue to pose potential risks and dangers to structural integrity and materials integrity. Numerous structures and materials associated with many facilities, pipelines, process equipment and production equipment have encountered major as well as catastrophic failures over recent years throughout Asia.

A key value proposition of the Common Welding Certification Scheme is the objective of achieving rejection rates of <1%.

The details of how AWF CWCS works were presented and discussed.

Structurally, the AWF individual country members will undertake the following:

- Each member country sets up an Authorized Certification Body (ACB) to meet the AWF CWCS Requirements. In Malaysia, IMM has been appointed the Malaysian ACB by the AWF.
- ACB applies for approval by AWF GC for its Quality Management System for AWF CWCS
- Approved ACB in turn approves Test Centers, Test Personnel & Training Centers
- Approved Test Personnel conducts welder qualification tests in accordance to the Rules set



How To Implement AWF CWCS & MOS

ROLES AND RESPONSIBILITIES			
ACB	Facility Owner	Test Center	Service Provider
• Prepare and apply for authorization as ACB by AWF GC • Manages & Administer the AWF CWCS & MOS: • Organize training and approval of auditors for auditing Testing Center & Training Body • Organize audit and approval of Testing Center, Test Personnel & Training Body • Register approved Test Center, Test personnel & Training Body in MOS • Ensure compliance through spot checks on welder qualification test and bi-yearly audit • Assign Test Centers to perform welder qualification tests	• Register in MOS as Facility Owner • Vet and approve assigned welder for work at the facility • Monitor welder on the job performance and document RT results in MOS	• Prepare and apply for approval as ATC • Perform welder qualification test in accordance to the Rules of the AWF CWCS • Document results of welder qualification test in MOS • Perform on the job assessment & document RT results in MOS	• Register as MOS Subscriber • Register welders in MOS • Assign new welders for welder qualification test in MOS • Assign qualified welders to work at the respective job site

Q&A Session

Q1: Mr. Ramakrishnan Meenakshi Sundaram – TPG Oil & Gas Sdn Bhd

The issue of lack of quality on new projects is acknowledged. However there are times when management pressure dictates that the project schedule will have to be adhered or improved. In such instances, the individuals responsible for quality will be unable to enforce effective controls which may potentially lead to quality issues – corner cutting due to chasing of timelines.

What is the experience from the Operator’s side?

A1: The issue is long standing. However, with a significant amount of CAPEX to be spent over the next 5 years, it is important to highlight that the area of Quality needs to be emphasised and driven in the entire project life cycle with the support of the industry. As the O&G industry in Malaysia is upstream driven, it is important to note and understand the potential impact on project quality as assets get operated in harsher environments which naturally call for the use of exotic materials to address higher % of material degradation. This opens the door to new innovations and technologies to speed up work schedule. Companies and universities are encouraged to introduced new research & development technologies and products/services which can speed up the construction and fabrication schedules to meet the challenges of the new age. At the same time, professional societies such as the IMM need to offer sustainable quality assurance programs to ensure the industry comply to quality standards.



Q2: Mr. Mohamed Siraj Abdul Razack – Petrofac E & C Sdn Bhd

This is to take a view of the human capital side of Quality and Integrity. Has leadership training been given enough thought? This cascades down to the level of welder supervisory staff - soft skills approach?

A2: Well noted on this issue. Petronas has already taken active steps to promote collaborations with industries. A good example of this is the Asian Welding Federation Common Welder Certification Scheme (AWF-CWCS). It is a bottoms-up approach where the main objective is to standardize welder qualification & certification as well as to monitor welders' performance – this ensures that supervisory staffs of welders are consistent in their approach to supervision once there is a stable platform.



Q3: Mr. Ang Chee Pheng – Asian Welding Federation

What are the factors contributing to the success of Phase 1 of Coatings Fingerprinting Initiative?

A3: All parties involved in the manufacture, supply, application, testing, and usage of paints in the oil & gas industry had to agree on the objective. All parties also had to agree that prior initiatives to tackle the paint quality problems by focussing on the surface preparation (Blasters), application (Painters) and inspection (Paint Inspectors) had not solved the problem. All parties also had to agree that existing Industry Practices and existing International Standards have not sufficiently addressed the quality problems faced by the painting industry. Once everyone agreed that an additional focus was required i.e. the missing link of paint materials quality assurance, the work to establish a “mill certificate” to assure paint supplied is as per specifications proceeded with full co-operation from everyone. No tables will be left unturned. Academicians and industry experts will work together to re-look at the existing practices, existing Standards, where these practices and Standards are lacking, and then identify new initiatives to be introduced by the Task Force to address the issues contributing towards the problems.

Q4: Mr. Mohd Shahrizal PKM Seeni Mohd – Petronas GTS

Are there key causes that contribute to the coatings degrade action? Would it be possible to have a correlation of matches?

A4: Coatings degradation can be caused by many factors due to the paint quality itself, surface preparation, paint application, paint inspection QA/QC, design of the coating system, environmental factors, fabrication techniques, etc. Key causes may be related to inadequate thickness during application, whilst at the same time we cannot ignore that mechanical damage is very common to contributing to the failure mode. Correlation between paint fingerprinting matching criteria against the paint performance under various conditions will be part of the Task Force's plans under its Phase 2 program.



Q5: Mr. Nigel Brewitt – IMM

How to resource all-rounded welders in a short time?

A5: Welder certification needs to be monitored every 6 months. (No re-test). Malaysian oil and gas industry needs ~20,000 welders. This is not only about the training and producing new welders. It is also about quality maintenance of existing welders.

The MOS system monitors the quality of welders – the MOS support the CWCS so that the right resources get deployed in the most effective manner.

Training is to be viewed separately from certification – it is important for the individual welder to go through the required formal training. However the concept of CWCS is to provide common certification for 6 months. For example, if welder has gone through WQT at Operator A, it would be possible for him/her to utilize this certification for the next worksite 2 months later without going through another round of qualifying/ certifying. So, by not having to re-test qualified welders every 6 months (which will save the Oil & Gas companies millions of Ringgit), the resources to train and test new welders can be put to good use to generate more welders.

Q6: Mr. Abdul Ghani Jaralla – Technip Malaysia

Is there a link between industry and education?

A6: There is nothing specific in education that provides an individual a direct route into a career in Quality. Being a Quality expert means having a technical background with the opportunity to participate in the “Quality Chain”. This includes having a clear appreciation of consequences due to lack of quality. The education industry can prepare individuals by linking with industry experts and tapping into live examples of successes and misses related to quality.

The link is currently very weak but with bodies like IMM and MOGSC playing a part in linking industry and education providers via dedicated discipline workgroups, this link will be enhanced.

(Q)7: Mr. Ahmad Husni - Shell

Below is an experience sharing and not a question.

He believes that the future of welding is towards automation. There are competency issues still evident, but this may be related to the individual who vets the boarding process of welders. As an example, a piping welder compared to a structural welder will be of different competency level. Whilst the CWCS is aimed at creating an advantage in terms of answering the call of resourcing quicker, having more regular WQT/year for welder will only ensure that it delivers a positive (perceived) impact to the quality of welding.



Q8: Mr. Nigel Brewitt – IMM

Is there any emphasis given on design issues?

A8: There is no current regulation in Malaysia for verification of designs. There are verification societies who perform this on a global scale and we have seen more Oil Operators employing this on their projects. The scrutiny on detailed design may not be detailed enough in terms of weldability but the verification process of a project will ensure that assets are built right the first time.

Q9: Are we monitoring performance?

A9: A proposed suggestion is to start a welding task force.

It is equally important that all facets of the industry work together to achieve the objective of delivering quality: Client to EPC to Contractor to Sub-contractor.

The IMM will lead the best practice however training organizations are still expected to enforce the minimum requirements.

The IMM President at this stage emphasised that the Task Force must prioritize its goals, aiming for realistic achievable goals in the short term and building upwards thereafter.

It was then agreed that the IMM Welding Integrity Improvement Task Force will convene in a month's time.



Rapporteurs:

Mr. Justin Nga, DNVGL Oil & Gas
Dr. Mahesh Kumar Talari, Universiti Teknologi MARA
Dr. Andrew Spowage, WoodGroup Intetech Malaysia



Signing Ceremony **AWF SECRETARIAT**

&



FRIDAY 27th March 2015

**Impiana Banquet Hall 2, Impiana Hotel,
KLCC, Kuala Lumpur**

- 9.30 am** *Registration & arrival of guests (Tea/Coffee served)*
- 10.00 am** *Welcoming Speech by Prof. Dr. Mohamad Kamal Harun,
President, Institute of Materials, Malaysia*
- 10.15 am** *Speech by the President, Asian Welding Federation (AWF)
& show of the AWF Montage*
- 10.30 am** *Speech by the Deputy Minister of Science, Technology & Innovation
(MOSTI), YB. Datuk Dr. Abu Bakar bin Mohamad Diah*
- 11.00 am** *Signing of the Appointment of the IMM as the Secretariat of the Asian
Welding Federation (AWF) for 2015 & 2016*
- 11.15 am** *Launching of International Materials Technology Conference & Exhibition
(IMTCE2016)*
- 11.30 am** *Lunch*
- 12.30 pm** *END.*



HRDF CLAIMABLE

5th REGIONAL MATERIALS TECHNOLOGY CONFERENCE

THEME : MATERIALS TECHNOLOGIES FOR GLOBAL QUALITY AND SAFETY STANDARDS

DATE : 8th MAY 2015

VENUE : MERITZ HOTEL, JALAN MERBAU, 98000 MIRI, SARAWAK

CALL FOR PAPERS

Deadlines for submission:

31st March 2015 - Abstract (email to karen@mte.com.my)

15th April 2015 - Full Paper (online at www.ijimm.org)

Selected papers will be reviewed for possible publication in the International Journal of the Institute of Materials Malaysia (IJIMM), an open-access journal.

Please visit www.ijimm.org for writing guideline.

Many Oil & Gas operators in the country have onshore refineries and offshore platform facilities that have been in service for several years and operated continually beyond their original design life. Operators may be required to continue operating these aging assets contractually for another 30 years or beyond.

This becomes a challenging task as long overdue degradation issues vary in different types of components (i.e. pressurized, non-pressurized and structural facilities), arising from in-service fatigue, corrosion/erosion, stress corrosion cracking and even direct exposure to tropical marine environment and UV radiation attacks.

In response to this challenge, IMM Miri Regional Chapter is organising the 5th Regional Materials Technology Conference (5thRMTC) in Miri as a platform for the sharing of experience and knowledge relating to issues in materials & corrosion, welding technology, inspection and asset integrity in the effort to sustain these aging facilities and to enable safe production environment for our future generations.

Keynote Speaker 1 : Mr. Mohd Azmi Mohd Noor- Head of Asset Integrity, HSE PETRONAS

Keynote Speaker 2 : Prof. Dr. Michael Cloke- Dean of School of Engineering & Science, Curtin University, Sarawak

Organised by IMM Miri Chapter

Fee per participant: RM250.00 (Subject to GST)

For further information, please contact :

1)Ms. Karen Cheng: karen@mte.com.my

2)Ms. Yusleyda: yusleyda@mte.com.my

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IMM TRAINING CALENDAR 2015

Course / Training	Duration (Days)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
COATINGS COURSES													
Blasting & Painting Training Course	5	5-9				25-29	Weekly	Weekly	10-14	Weekly	Weekly	Weekly	Weekly
Protective Coatings Technician Certification Scheme	1	Weekly 15-16	Weekly	Weekly	Weekly		4-5	Weekly		10-11			
Blasting & Painting Supervisor	2		10-11				9-10					17-18	
Corrosion Control by Protective Paint	2												
Coatings Inspection Certification Scheme Level 1	4			16-19		18-21			3-6		5-8	2-5	
Coatings Inspection Certification Scheme Level 2	1			20		22			7		9	6	
Thermal Spray Coatings Applicator	4				20-23		16-19			1-4			
Thermal Spray Coatings Inspector Level 3	4												7-10
WELDING COURSES													
IMM Welding Inspection Scheme	5					11-15					19-23		
Associate Welding Engineer (JWES)	6	19-26							17-24				
Welding Engineer (JWES)													
Senior Welding Engineer (JWES)								2					
Welding and Joining Technology for Non Welding Personnel			5					27				2	
Calculation of Strength of Welded Projects	1				6								
Cost & Estimation of Welding Projects	1				7			28				3	
Interpretation of Weld Quality by Welding Codes	1				8			29				4	
Interpretation of Weld Quality by Radiographic Method	1				9			30				5	
CORROSION COURSES													
Corrosion Technician	4	20-23			7-10					28/9 - 1/10			
Corrosion Control By Cathodic Protection	2			9-10				1-2					2-3
Cathodic Protection Technologist	4		6-9									2-5	
VIBRATION COURSES													
The Importance of Vibration	1			3						11			
Vibration Specialist Level 1	4			17-20									
Vibration Specialist Level 2	4						1-4						
Vibration Specialist Level 3	4									7-10			
Vibration Specialist Level 4	4												14-17
OTHER COURSES (Upon request)													
Welding SMAW, GMAW, GTAW (1G - 6G)	5												
API-570 Piping Inspector	5												
API-510 Pressure Vessel Inspector	5												
API-653 Above Storage Tank Inspector	5												
Diploma of Applied Science (Coatings Technology)	10												

Please call (03) 5882 3574 or email karen@mte.com.my / azrie@mte.com.my for more details

SEMINAR ON RUBBER/METAL COMPOSITES APPLICATIONS IN OIL & GAS INDUSTRY

Tuesday, 10th March 2015 | 2:00pm— 5:15pm
Arcade 3 & 4 (Lower Ground, East Wing), Renaissance Kuala Lumpur Hotel

The use of rubber/metal composites in areas such as construction, automotive and industrial application are becoming widely used. However, at vast atmospheric conditions such as those in marine, the composites are known to have failed. The failure is mainly induced by corrosion reaction that initiates de-adhesion between the rubber/metal composites. This seminar focuses on experiences by the industries in dealing with these failures and the approaches deployed in mitigating the issues arise.

Program

- 2:00 pm Registration (Welcome Coffee & Tea served)
- 2:30 pm Opening Remarks & Introduction
- Ms. Halimah Pit (Chairman, IMM Corrosion Committee)
- 2:35 pm **Longevity of Nature Rubber Structural Bearings**
- Mr. Hamid Ahmadi (Tun Abdul Razak Research Centre, Hertford London [TARRC])
- 2:55 pm Q & A
- 3:05 pm **Rubber Components for the Oil and Gas Industries**
- Dato' Dr. Ong Eng Long (Malaysian Rubber Products Manufacturers' Association)
- 3:25 pm Q & A
- 3:35 pm Tea Break
- 4:00 pm **Epoxidized Natural Rubber [ENR]-Polyaniline based Coating for Corrosion Inhibiting of Carbon Steel**
- Dr. Yong Kok Chong (Malaysian Rubber Board)
- 4:20 pm Q & A
- 4:30 pm **Failure of Industrial 205 Primer in Commercial Rubber/Metal Composites**
- Ms. Ismaliza Ismail (Malaysia Rubber Board) and Prof. Dr. Mohd. Kamal Bin Harun (University Malaysia Kelantan)
- 4:50 pm Q & A
- 5:00 pm Closing Remarks
- Prof. Dr. Mohd. Kamal Bin Harun (President, IMM)
- 5:15 pm Adjourn

Prior Registration required

Free-of-Charge for IMM
Members and their Guests

Non Members : RM40.00

Walk-in Participants : RM60.00

Organiser



IMM Corrosion Committee

Co-Organisers



Kluster Industri dan Inovasi



**For more information/
registration, please contact:**

Institute of Materials, Malaysia

Tel: 03-5882 3574/84

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COATINGS CONSULTANTS

MATERIALS INTEGRITY ENGINEERING & SERVICES

CORROSION MANAGEMENT



SACRIFICIAL ANODES



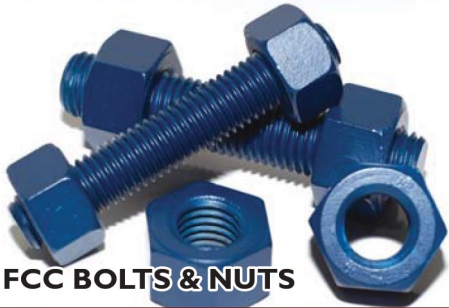
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THERMAL SPRAY COATINGS



Why Materials Fail?

PASSIVE FIRE PROTECTION



MATERIALS TESTING



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- > WELL INTEGRITY

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The Institute of Materials, Malaysia (IMM) is a non profit society of professionals whose aims are to promote honourable practice and professional ethics and encourage education in materials science, engineering and technology.



MIQA Forum II



MATERIALS INTEGRITY & QUALITY ASSURANCE FORUM II

Organised by:

- IMM Materials & Asset Integrity committee
- IMM Polymer Committee
- IMM Welding Committee

Objective of the Forum II:-

Following the successful MIQA Forum I held on 11th September 2014 which highlighted the Quality Assurance issues faced by the industry, the IMM initiated a task force to address welding QA/QC issues. The IMM Coating Fingerprinting Task Force has successfully completed its Phase 1 program to establish a "Coating Fingerprinting Certificate" to address the issues of coatings quality assurance deficiencies in the oil & gas, power, marine & infrastructure industries in Malaysia and has commenced on Phase 2. This MIQA Forum II will bring together academics and industry practitioners to identify gaps, flaws, weaknesses and opportunities to improve the performance of activities such as fabrication, welding, corrosion control, coatings, corrosion inhibitors, QA/QC inspection, selection of materials, materials testing, non-destructive testing, failure analysis, materials design, materials specifications, research & development, and implementation of new technologies.

Limited seats available (First-Come-First-Served Basis)
Participation by registration only!

Date: Friday, 27th March 2015
Time: 2.30 pm — 5.30 pm
Venue: Cedar on 15, Level 15
Impiana KLCC Hotel, Kuala Lumpur



For details, please contact Fazlan (admin@iommm.org.my) or Karen (karen@mte.com.my) or IMM Secretariat at (03) 5882 3574

MIQA Forum II

MATERIALS INTEGRITY & QUALITY ASSURANCE FORUM II



PROGRAM:

- 2:30pm: Registration (Coffee/Tea served)
- 3:00pm: Opening Remarks
- 3:20pm: **Review of Deficiencies in Current QA/QC Inspection Practices**
- Mohd Azmi Mohd Noor (Head of Asset Integrity, Upstream HSE, PETRONAS)
- 3:35pm: Open Dialogue & Discussion
- 3:50pm: **Welding Integrity Improvement Task Force Initiatives**
- Ang Chee Pheng (Secretary General - Asian Welding Federation;
Vice President - International Institute of Welding)
- 4:05pm: Open Dialogue & Discussion
- 4:20pm: Tea Break
- 4:40pm: **Coating Fingerprinting Task Force Phase II Initiatives**
- Nurul Asni Mohamed (Principal Engineer - Corrosion, PETRONAS GTS)
- 4:55pm: Open Dialogue & Discussion
- 5:10pm: Panel Discussion
- 5:25pm: Closing Remarks
- 5:30pm: Adjourn
- 6:00pm: 25th Annual General Meeting of Institute of Materials, Malaysia.
- 7:00pm: Close



Institute of Materials, Malaysia

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Prior Registration Required

Free-of-Charge for IMM Members and their Guests

- Non Members : RM40.00
- Walk-in Participants : RM60.00

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