



Final Forum on “Towards Fingerprinting of Polymeric Coatings” III

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Date	:	20 th June 2014 (Friday)
Time	:	2.30 pm – 6.00 pm
Venue	:	Glenmarie Golf and Country Club, Shah Alam, Selangor
Jointly organized	:	1) IMM Polymer Committee 2) IMM Coatings Committee 3) Universiti Teknologi MARA, Faculty of Applied Sciences, Shah Alam, Malaysia
Co-chairs of forum	:	1) Assoc. Prof. Dr. Chia Chin Hua, Universiti Kebangsaan Malaysia 2) Mr. David Lim Chee Cheong, IMM
Co-sponsor	:	1) Research Instrument Sdn. Bhd. 2) Agilent Technologies Sales (M) Sdn Bhd 3) Perkin Elemer (M) Sdn. Bhd. 4) PPG Sigma Sdn. Bhd.

The IMM Polymer Committee, IMM Coatings Committee and Universiti Teknologi MARA, Malaysia (UiTM) jointly organized the Final Forum on “Towards Fingerprinting of Polymeric Coatings” III at Glenmarie Golf and Country Club, Shah Alam. The forum served as a follow-up to the highly publicized first (Mac 2013) and second (Oct 2013) Fingerprinting Forums that took place in the year of 2013.

This event on Friday, 20th June 2014 was sponsored by Research Instrument Sdn. Bhd., Agilent Technologies Sales (M) Sdn. Bhd., Perkin Elemer (M) Sdn. Bhd. and PPG Sigma Sdn. Bhd. The consecutive series of Fingerprinting Forums serve as a mean for the academicians and industry practitioners to discuss the innovative procedures of “fingerprinting” polymeric coatings, which were not possible in the past as the QA and QC tool for the paint manufacturing plant.

Through the effective platform from IMM, university researchers managed to pick-up this relevant industrial problem (i.e. **Can we fingerprint polymeric coatings??**), which were unsolved for the last 30 years through the collaborative works with oil & gas users, paint manufacturers, instrument suppliers, laboratory testing bodies etc. After 1 ½ years, this final forum was sending out a clear message that **fingerprinting of polymeric coatings is possible and practical** by using Fourier-transform infrared (FTIR). Fingerprinting regions of FTIR for epoxy resin and hardener are proposed and the confidence level of acceptance for QA &

QC control is proposed at $\geq 90.0\%$. The updates for fingerprinting findings on epoxy coatings were presented, but there are lots more other types of coatings, finished goods, coatings with aging effects and so on will have to be addressed to near future.

The Final Fingerprinting Forum drew a considerable number of participants, with more than 120 in attendance from the paint industries, oil & gas companies as well as the academicians (c.f. Table 1). The forum comprised of a total of 4 presentations by Mr. Muhammad Hawari Hassan from PETRONAS Malaysia, Ms. Michelle Lee Jia Yin from Research Instruments Sdn. Bhd., Ms Chow Mee Ling from Agilent Technologies Sales (M) Sdn Bhd, and Ms. Nurul Asni Mohamad, the chairperson of IMM Fingerprinting Task Force from PETRONAS Group Technical Solutions, Malaysia.

The forum started with the welcoming address by IMM Deputy President, Mr. Muhamad Azmi bin Mohd Noor from PETRONAS Carigali Sdn Bhd. Mr. Azmi spoke on IMM’s plans, directions & activities towards enhancing awareness, and technological progress in materials science & engineering. This was followed by the opening remarks by Prof. Dr. Khudzir Ismail, the Dean of Faculty of Applied Science, UiTM. He highlighted that the faculty and university are looking forward to establishing more sustainable industry-academia linkages in materials technology.

The first speaker, Mr. Muhammad Hawari Hassan, spoke on “Qualification for New Maintenance Painting System and Products for Offshore Application”. Mr. Hawari’s presentation touched on how the corrosive external environment at offshore facilities poses a great deal of challenges for the operators to sustain high integrity and reliability of equipment and piping. He included the visual inspection results and proposed ways to improve the coatings performance. Among the points discussed embraced surface preparations, simulation of real conditions during applications, testing protocol, challenges and opportunities.

Ms. Michelle Lee Jia Yin discussed the “FTIR Spectroscopic Method for Laboratory Analysis of Polymeric Coatings” and highlighted the many tests conducted on various epoxy coatings used in the oil & gas industry. In her presentation, she discussed the sampling procedures and FTIR analysis procedures for epoxy resins and hardeners. The interpretation of the FTIR results was assisted by Assoc. Prof. Dr. Melissa Chan Chin Han from UiTM. She concluded that FTIR is a simple and reliable tool for the study of reproducibility of the epoxies and hardeners as well as to differentiate different types of epoxies and hardeners without any intrusion of paint formulations. **Batch-to-batch reproducibility of the epoxies and hardeners** is magnificently high.

“Advanced Technology for Polymeric Coatings” was the subject of presentation by Ms. Chow Mee Ling. The working principle of FTIR Spectroscopy was briefly discussed by Ms. Chow Mee Ling. In her presentation, she shared the advanced

technology of FTIR handheld analyzer which captured the attention and rekindled interest of the audiences.

The forum continued with live demonstrations on the FTIR analyses, both bench-top and handheld. A number of paint samples were used during the demonstrations and the forum participants garnered a chance to witness the simplicity in operating the FTIR spectrometer (both hardware and software) as well as the QA and QC tools of the software for the reproducibility analyses.

The last speaker, Ms. Nurul Asni, stressed on “Coating Fingerprint Certificate for Every Batch of Paint Manufactured”. Ms. Nurul gave a summary of the task force activities since it was first set-up in April 2013. Ms. Nurul also gave her review on the available standards and specifications requiring fingerprinting of polymeric coatings in the oil & gas industry. Finally, she presented the tentative version of Coating Fingerprint Certificate for epoxy coatings.

The presentations were followed by an open discussion. Many important points were brought up by the audiences and addressed by the speakers and the committee members, resulting in a stimulating and productive exchange between speakers and participants.

The session chair of the Fingerprinting Forum cum the Chairperson of the Polymer Committee, Assoc. Prof. Dr. Melissa Chan Chin Han of UiTM provided a summary of the task force activities and hoped that the implementation of coating fingerprint Certificate would proceed as scheduled. She expressed her heartfelt appreciation for the efforts of the joint- and co-organizers, as well as the speakers, sponsors, forum secretariat and participants for making this event a smooth-sailing and fruitful affair.

This final forum had succeeded in create awareness for the practicality of the fingerprinting of the polymeric coatings. The well acceptance from the Malaysia oil & gas users for the Coating Fingerprint Certificate as one of the effective approaches for QA & QC tools for the enhancement of the overall painting coating quality assurance was noted.



Table 1 Summary of participation in Final Forum on “Towards Fingerprinting of Polymeric Coatings” III

No	Organization/University	Number of Participants
1	Agilent Technologies Sales (M) Sdn Bhd	1
2	Asia Pacific University, Malaysia	1
3	Beckers Group, Malaysia	3
4	CTRM Aero Composites Sdn Bhd, Malaysia	2
5	DuTech Instrument Sdn Bhd, Malaysia	1
6	Dyna Segmen Sdn Bhd, Malaysia	2
7	ECMI ITE Asia Sdn Bhd	2
8	Institute of Materials, Malaysia	3
9	International Paint Sdn Bhd, Malaysia	1
10	Jotun (M) Sdn Bhd, Malaysia	3
11	Kansai Coatings Malaysia Sdn Bhd	5
12	KCC Coating Sdn Bhd, Malaysia	3
13	Malaysia Marine and Heavy Engineering Holdings Berhad, Malaysia	2
14	Materials Technology Education Sdn Bhd, Malaysia	6
15	Nippon Paint (M) Sdn Bhd, Malaysia	2
16	Norimax Sdn Bhd, Malaysia	5
17	Perkin Elmer Sdn Bhd, Malaysia	7
18	PETRONAS, Malaysia	20
19	PPG Coatings (M) Sdn Bhd, Malaysia	5
20	QES (Asia-Pacific) Sdn Bhd	1
21	Research Instruments Sdn Bhd, Malaysia	6
22	Shell, Malaysia	4
23	Sirim QAS International Sdn Bhd, Malaysia	5
24	Tunku Abdul Rahman University College, Malaysia	1
25	Technip, Malaysia	2
26	TNB Research Sdn Bhd, Malaysia	1
27	Universiti Teknologi MARA, Malaysia	18
28	Universiti Kebangsaan Malaysia, Malaysia	3
29	Universiti Malaysia Perlis, Malaysia	1
30	Universiti Putra Malaysia, Malaysia	6
31	Universiti Sains Malaysia, Malaysia	1
32	Universiti Teknologi PETRONAS, Malaysia	1
	Total	124





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HIGHLIGHTS



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