Report on Task Force on Coating Fingerprinting (Phase 3: 2018 – 2020)

Co-chairpersons

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The local paint users endure high cost of repainting structures when paint coating fails prematurely. One of the attributing factors for the failure of the coating may be due to the formulation of the polymeric paint, which may not be appropriate for the job sites. This implies that the quality of supplied polymeric paint may deviate from the required specifications.

Over the years, the industry was told, there was no simple way to verify or re-test the polymeric paint to confirm its actual chemical nature or origin. One has to put the product through numerous complicated and rigorous testing in a chemical laboratory to verify the product formulation.

An industry-academia collaboration was initiated in 2013 by the Institute of Materials, Malaysia (IMM) where the academic Council Members of IMM from various Malaysian universities in collaboration with oil companies, paint manufacturers, Fourier-Transform Infra Red (FTIR) instrument vendors and Coating Consultants came together to solve an industrial challenge on fingerprinting of polymeric coatings.

A significant break-through to provide a "Mill Certificate" for polymeric paint was showed case here, which it is termed as "Coating Fingerprint Certificate". This certificate is one of the effective QA & QC tools for the enhancement of the overall painting coating quality assurance. This can avoid consumers from applying the wrong paint as the Coating Fingerprint Certificate can ensure the right paint specification is applied for the job. Thus, even the practice of reformulation of paint can lead to the non-compliance of the test specifications as required to be presented in the Coating Fingerprint Certificate. This is the first-of-its-kind fingerprint exercise in the world!

The **objectives** of this Task Force shall include but not limited to the followings:-

(1) To conduct mock-execution on the study of FTIR analysis on more coating products such as Inorganic Zinc Coating, Epoxy-Zinc Coating, High Solids Epoxy Coating, Polyurethane Coating, Glass Flake Polyester Coating and Silicone-Aluminum Coating plus comparison of aged (1-2 years old) products.
(2) To propose the implementation mechanism of the coating fingerprinting and the standards for the execution.

To recapitulate, Phase 1 (2013-2014) initiated the application of FTIR Spectroscopy as a simple and reliable tool for the study of reproducibility (*i.e.* to fingerprint) of the epoxy coatings (Resin and Hardener). The fingerprinting regions of FTIR for epoxy resin and hardener were identified and the **confidence level of acceptance** for QA & QC control was proposed at **≥ 0.900.**

Phase 2 (2015-2016) involved the appreciation of the root causes of coating failures throughout the world and the adoption of the Coating Fingerprinting initiative by the Malaysian Oil & Gas Operators as one useful QA/QC tool for ensuring coating quality. It also led to the establishment of the 1-day Foundation Course on Coating Fingerprinting and the 2-day Certification Course for Coating Fingerprint Quality Controller.

List of committee members of the Task Force on Coating Fingerprinting Phase 3 (2018—2020)

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