Tentative Coating Fingerprint Certificate for 2-component intermediate materials of polymeric coatings

(Rev. 2.4 on 2nd January 2016)

Jointly drafted by:

Company name:	*e.g.* Company ABC	**Country:**	*e.g.* Malaysia
Certificate number:	*e.g.* epoxy/001/02Jan2016	**Date:**	*e.g.* 2 Jan 2016
Number pages:	*e.g.* 05		

Section 1: General information

Product name:	*e.g.* EPOXY123	**Product type:**	*e.g.* epoxy, polyurethane, polyester, inorganic zinc, epoxy zinc, *etc*

Date of issue:	**Base material** (*e.g.* epoxy / epoxy zinc / polyacrylate / polyester / inorganic zinc)	**Curing agent / hardener** (*e.g.* amine / isocyanate / peroxide / ethyl-silicate)
Specify base material & curing agent	*e.g.* epoxy	*e.g.* amine
Trade name	*e.g.* Epikote123	*e.g.* Amine123
Generic	*e.g.* Epoxy	*e.g.* Hardener
Factory location	*e.g.* Shah Alam, Selongor	*e.g.* Shah Alam, Selongor
Batch number	*e.g.* 1234567A	*e.g.* 1234567B
Production date	*e.g.* 02 Jan 2016	*e.g.* 02 Jan 2016
Product technical data sheet number	*e.g.* TDS123A	*e.g.* TDS123B
Material safety data sheet number	*e.g.* MSDS123A	*e.g.* MSDS123B
Shelf life	*e.g.* 24 months	*e.g.* 24 months

Section 2: Test methods and results

Physical analyses

Parameters	**Method**	**Base material**		**Curing agent / hardener**	
		Specification with tolerance	**Test result**	**Specification with tolerance**	**Test result**
Viscosity	*e.g.* ASTM D4287 ASTM D5125 ASTM D562 ISO 2431 ISO 2884-1	*e.g.*…..± 0.05 P	*e.g* 3.24.± 0.02 P	*e.g.*…..± 0.05 P	*e.g* 2.78.± 0.03 P
Density	*e.g.* ISO 2811-4	*e.g.*…..± 0.05 g cm^{-3}	*e.g.* 1.48 ± 0.03 g cm^{-3}	*e.g.*…..± 0.05 g cm^{-3}	*e.g.* 0.943 ± 0.02 g cm^{-3}
Color code	*e.g.* BS 4800 RAL Color Standards	*e.g.* colour difference (dE) < 1	*e.g.* Light grey	*e.g.* colour difference (dE) < 1	*e.g.* clear
Non-volatile matter (by mass)	*e.g.* ISO 3251	*e.g.*…..± 2 %	*e.g* 78.± 2 %	*e.g.*…..± 2 %	*e.g* 99.± 2 %
Weight Solid: Zn metal/Total Zn Note: submit certificate of % purity by manufacturer **Note:** applicable to organic and inorganic zinc only	*e.g* ISO14680-2 ISO3549	*e.g.*…..± 1 %	*e.g.* N/A for epoxy system	*e.g.*…..± 1 %	*e.g.* N/A for epoxy system

Structural analysis					
Infrared spectra	**Wet sample as supplied in can. Degree of similarity (r) ≥ 0.900*** (tentative tolerance = ± 0.002 or range of r = 1.000 – 0.898)				
	Method	**Base material**		**Curing agent / hardener**	
Base material: **epoxy** Curing agent: **amine**	ASTM D7588	600-4000 cm^{-1}	0.988	600-4000 cm^{-1}	0.970
		1000-1300 cm^{-1}	0.995	1000-1400 cm^{-1}	0.957
		700-900 cm^{-1}	0.996	N/A	N/A
Base material: **polyacrylate / polyester** Curing agent: **isocyanate**	ASTM D7588	600-4000 cm^{-1}		600-4000 cm^{-1}	
		1600-1800 cm^{-1}		2000-2500 cm^{-1}	
		3000-3800 cm^{-1}		3000-3800 cm^{-1}	
Base material: **polyester** Curing agent: **peroxide**	ASTM D7588	600-4000 cm^{-1}		600-4000 cm^{-1}	
		1600-1800 cm^{-1}		900-1200 cm^{-1}	
		2700-3100 cm^{-1}		N/A	N/A
Base material: **epoxy zinc** Curing agent: **amine**	ASTM D7588	600-4000 cm^{-1}		600-4000 cm^{-1}	
		1000-1300 cm^{-1}		1000-1400 cm^{-1}	
		700-900 cm^{-1}		N/A	N/A
Base material: **inorganic zinc** Curing agent: **ethyl-silicate**	ASTM D7588	600-4000 cm^{-1}		600-4000 cm^{-1}	
		N/A	N/A	2700-3200 cm^{-1}	
		N/A	N/A	1000-1500 cm^{-1}	

*average results of triplicate analyses

Section 3: FTIR test details (as per ASTM D7588)				
Analyst & company name	*e.g.* Name & Company ABC Sdn Bhd			
Brand & model of FTIR	*e.g.* FTIR Brand XYZ & model: 2016			
Type of FTIR spectrophotometer	*e.g.* benchtop / mobile / handheld			
Benchtop: ATR crystal material	*e.g.* diamond, zinc selenide (ZnSe), germanium			
Spectral correction (circle) **Note:** correction is NOT recommended.	YES / (NO) [**Note**: if **YES**, please state the correction(s) made] *e.g.* automatic baseline correction			
Spectral range (cm^{-1})	*e.g.* 600 - 4000 cm^{-1}			
No. of sample scans (min 32)	*e.g.* 32 scans			
No. of background scans (min 32)	*e.g.* 32 scans			
Resolution (min 4 cm^{-1})	*e.g.* 4 cm^{-1}			
High sensitivity of correlation compare algorithm for matching ratio in absorbance mode	**Note:** Correlation compare algorithm of the FTIR software should depend on both ***x***- (wavenumber) and ***y***- (absorbance) vectors. High sensitivity compare algorithm, which analyzes the variations *via* summation of the squared differences of each variation from the overall mean OR equivalent, should be used.			
	Dependence on BOTH ***x***- and ***y***- vectors (circle)	(YES) / NO	High sensitivity compare algorithm (circle)	(YES) / NO
Trade name and batch number of reference spectrum for base material	*e.g.* Epikote123 & 1234567A-Reference			
Trade name and batch number of reference spectrum for curing agent / hardener	*e.g.* Amine123 & 1234567B-Reference			

Notes:

1. Full range of FTIR spectra for both base and curing agent without automatic baseline correction and in absorbance mode are to be attached with this report (raw data).
2. Compliance to matching criteria values do not exclude meeting the requirements of other QA/QC checks *e.g.* drying time, gloss, hiding power *etc*.
3. Methods used shall reference latest published document.
4. This certificate is applicable to 1-pack or 2-pack systems.
5. This certificate can be submitted in CD or other digital formats.

Authorized QA/QC Executive:-	**Validated by**:-
e.g. **NAME** **Company ABC Sdn Bhd** (123456-X) QC Department	*e.g.* COATING IMM Yoga Sugama Salim FP002 FINGERPRINT QC
Signature: *e.g.* *Name*	**Signature**: *e.g.* *Yoga Salim*
Date: *e.g.* 2 Jan 2016	**Date**: *e.g.* 2 Jan 2016
IMM membership member: (optional to be IMM member)	**IMM membership member**: *e.g.* O-1234

Section 4: Compulsory appendices (to be submitted in CD or other digital formats)	
Appendix 1	Overlay reference and sample FTIR spectra for base materials (**Note**: In addition, raw data of reference and sample FTIR spectra must be provided in two raw data files)
Appendix 2	Overlay reference and sample FTIR spectra for curing agent / hardener (**Note**: In addition, raw data of reference and sample FTIR spectra must be provided in two raw data files)
Appendix 3	Certificate of analyses which are relevant to the in-house standard testings
Appendix 4	Certificate of % purity of zinc by metal manufacturer for organic zinc and inorganic zinc

END OF REPORT

Received & checked:

Date: *e.g.* 15 Jan 2016

COATING IMM CHAN CHIN HAN FP001 FP QC

Melissa Chan

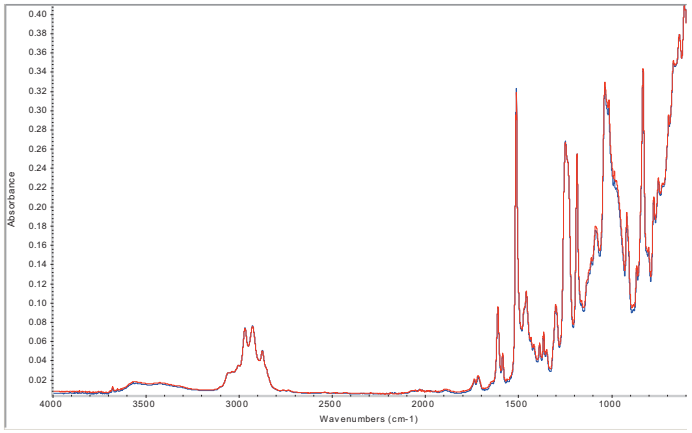
IMM membership member:

e.g. F-1234

Appendix 1 Overlay reference and sample FTIR spectra for base materials

Reference spectrum – red (generated by averaging the FTIR spectra from **T**op, **M**iddle and **B**ottom of the mixing tank for the sample sent for qualification for painting systems and products for offshore application)

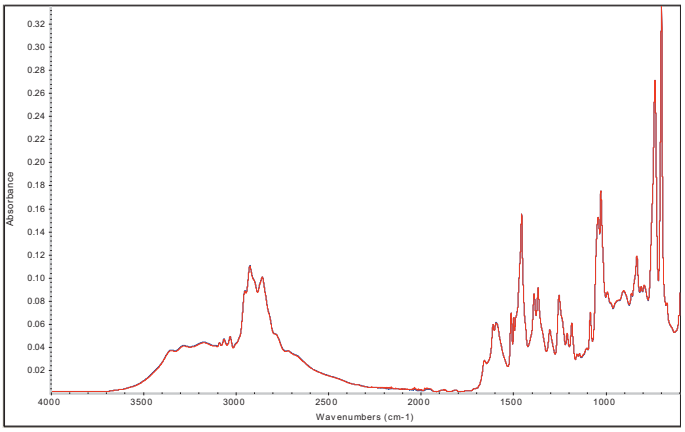
Sample spectrum – blue (for each batch of production, sample at the location of **B**ottom of the mixing tank)



Appendix 2 Overlay reference and sample FTIR spectra for curing agent / hardener

Reference spectrum – red (generated by averaging the FTIR spectra from **T**op, **M**iddle and **B**ottom of the mixing tank for the sample sent for qualification for painting systems and products for offshore application)

Sample spectrum – blue (for each batch of production, sample at the location of **B**ottom of the mixing tank)



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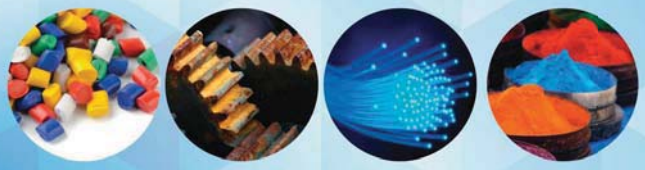

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HIGHLIGHTS

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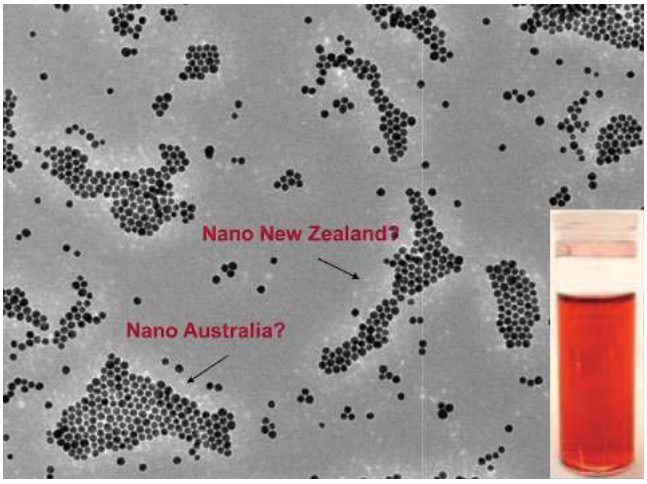

Congratulations to Dr. Lim Teck Hock from Faculty of Applied Sciences and Computing, Tunku Abdul Rahman University College, Setapak. He won RM 500 and an award certificate.

Title : NanoGold: A whole new world

Photography description:
A bright-field high resolution transmission electron microscopy (HRTEM) image of monodispersed gold nanoparticles taken at the start of an in-situ study of coalescence at nanoscale. The particles self-assembled into shapes resembling that of New Zealand and Australia - a purely serendipitous and delightful encounter.