PIFM PROPOSAL ON THE IMPLEMENTATION OF MS 832 AND MS 1017 UNDER AKTA 520

PART 1 – CLAUSE 5.1

ARCHITECTURAL ANODISING

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REVISION	DATE	VENUE	ATTENDANCE	
REV. 1	15/09/2020	WISMA MUTIARA, LEVEL 6 MEETING ROOM	PIFM MEMBERS MS. IVY PHUA MR. DESMOND CHONG MS. JULIAN MR. BERNARD LEE MR. ERIC PIFM SUB COMMITTEE FOR CIDB CHAIRMAN: MR. KONG KOK LEONG MR. KHIK LAP FUN MR PETER YANG PIFM COMMITTEE MEMBER PRESIDENT: MR. LEE HAN KOON	 JOTUN PAINTS (M) SDN. BHD. BECKER INDUSTRIAL COATING (M) SDN. BHD. AXALTA POWDER COATING SYSTEM (M) SDN. BHD. AL COATING SDN. BHD. ALCOPLA PUSPAJAYA ALUMINIUM SDN. BHD. LB ALUMINIUM BERHAD TUV-SUD (M) SDN. BHD. HKL METALS WORKS SDN. BHD.
REV. 2	20/09/2020	ZOOM MEETING	PIFM TECHNICAL ADVISOR DATO DR. ROBERT SEE PIFM COMMITTEE MEMBER PRESIDENT: MR. LEE HAN KOON VICE PRESIDENT: MR. FONG KOK LEONG SECRETARY: MR. WONG POH KIN TREASURER: MR. TEH TIANG HOONG COMMITTEE MEMBER: MR. LIM HUAI EN MR. CHEAH KEE HOONG AUDITORS: MR. KONG KOK MENG MR. YONG CHUAN CHIN	 PINTAR JAYA (M) SDN. BHD. HKL METALS WORKS SDN. BHD. PUSPAJAYA ALUMINIUM SDN. BHD. HITTI ALUMINIUM SDN. BHD. ARCHI CASAKA DESIGN SDN. BHD. ANGKASA JASA SDN. BHD. LUCKSOON METAL WORKS SDN. BHD. MIS SDN. BHD. SIGNATURE FAÇADE TREATMENT SDN. BHD.
REV. 3	27/09/2020	ZOOM MEETING	PIFM TECHNICAL ADVISOR DATO DR. ROBERT SEE PIFM COMMITTEE MEMBER PRESIDENT: MR. LEE HAN KOON VICE PRESIDENT: MR. FONG KOK LEONG SECRETARY: MR. WONG POH KIN TREASURER: MR. TEH TIANG HOONG COMMITTEE MEMBER: MR. LIM HUAI EN MR. CHEAH KEE HOONG AUDITORS: MR. KONG KOK MENG MR. YONG CHUAN CHIN	 PINTAR JAYA (M) SDN. BHD. HKL METALS WORKS SDN. BHD. PUSPAJAYA ALUMINIUM SDN. BHD. HITTI ALUMINIUM SDN. BHD. ARCHI CASAKA DESIGN SDN. BHD. ANGKASA JASA SDN. BHD. LUCKSOON METAL WORKS SDN. BHD. MIS SDN. BHD. SIGNATURE FAÇADE TREATMENT SDN. BHD.
REV. 4	29/09/2020	WISMA MUTIARA, LEVEL 6 MEETING ROOM	PIFM TECHNICAL ADVISOR DATO DR. ROBERT SEE PIFM COMMITTEE MEMBER PRESIDENT: MR. LEE HAN KOON VICE PRESIDENT: MR. FONG KOK LEONG SECRETARY: MR. WONG POH KIN ASST SECRETARY: MR. LAM WYE HOE TREASURER: MR. TEH TIANG HOONG	 PINTAR JAYA (M) SDN. BHD. HKL METALS WORKS SDN. BHD. PUSPAJAYA ALUMINIUM SDN. BHD. HITTI ALUMINIUM SDN. BHD. CENTRAL GLASS FAÇADE WORKS ARCHI CASAKA DESIGN SDN. BHD.

			COMMITTEE MEMBER: MR. CHEAH KEE HOONG	LUCKSOON METAL WORKS SDN. BHD.
REV. 5	4/10/2020	ZOOM MEETING	<u>PIFM TECHNICAL ADVISOR</u> DATO DR. ROBERT SEE MR. MATHIEU MEUR <u>PIFM COMMITTEE MEMBER</u> PRESIDENT: MR. LEE HAN KOON VICE PRESIDENT: MR. FONG KOK LEONG SECRETARY: MR. WONG POH KIN ASST SECRETARY: MR. LAM WYE HOE TREASURER: MR. TEH TIANG HOONG COMMITTEE MEMBER: MR. LIM HUAI EN MR. CHEAH KEE HOONG AUDITORS: MR. KONG KOK MENG	PINTAR JAYA (M) SDN. BHD. DP FAÇADE PTE LTD HKL METALS WORKS SDN. BHD. PUSPAJAYA ALUMINIUM SDN. BHD. HITTI ALUMINIUM SDN. BHD. CENTRAL GLASS FAÇADE WORKS ARCHI CASAKA DESIGN SDN. BHD. ANGKASA JASA SDN. BHD. LUCKSOON METAL WORKS SDN. BHD. MIS SDN. BHD.

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1. What is architectural anodizing?

   ANODIZING IS AN ELECTROCHEMICAL PROCESS THAT CONVERTS THE METAL SURFACE INTO A DECORATIVE, DURABLE, CORROSION-RESISTANT, ANODIC OXIDE FINISH.

2. What is the function of architectural anodizing?

   FOR ANODISING ARCHITECTURAL USAGE, MARINE AND STRUCTURAL, THIS DOCUMENT ONLY RELATE TO ANODISING FOR ARCHITECTURAL APPLICATION.

   ANODIZING CAN BE MADE BETWEEN 10 AND 25 MICRONS THICK. ANODIZING THICKNESS INCREASES WEAR RESISTANCE, CORROSION RESISTANCE, ABILITY TO RETAIN LUBRICANTS.

3. What are the current codes and standards governing the use of architectural anodising?

   BS EN 12373-1, SUPERSEDED BY BS EN ISO 7599:2018

4. What are the standard thicknesses of architectural anodising available?

   10 TO 25 MICRONS THICK

5. What are the advantages and disadvantages of 10, 15, 20 and 25 microns architectural anodising?

   ADVANTAGES:
   I. THE THICKER IT IS, THE MORE RESISTANT TO WEATHER, CORROSION RESISTANT, ABILITY TO RETAIN LUBRICANT

   DISADVANTAGES:
   I. COSTLIER

6. What are the cost differences between these architectural anodising thicknesses?

   - NA 10 MICRONS – MOST ECONOMICAL
   - NA 15 MICRONS – APPROX 1.4 TIMES HIGHER THAN 10 MICRONS
   - NA 20 MICRONS – APPROX 1.4 TIMES HIGHER THAN 15 MICRONS
   - NA 25 MICRONS – APPROX1.4 TIMES HIGHER THAN 20 MICRONS

7. What was the trend for the last 10 years regarding architectural anodising thickness?

   - INDOOR (NOT EXPOSED TO WEATHER) – 10 MICRONS
   - OUTDOOR (EXPOSED TO WEATHER) – 10-25 MICRONS (SUBJECT TO EXPOSURE TO TYPE OF ENVIRONMENT)

8. What is Standard Malaysia's current recommendation on the architectural anodising thickness?

   AVERAGE 15 MICRONS WITH 12 MICRONS MINIMUM AT ANY LOCATIONS

9. What is the main basis and objective for Standard Malaysia to recommend the current architectural anodising thickness?

   TO MAINTAIN QUALITY PRODUCTS

10. The industry view on item 8 and PIFM's recommendation for architectural anodising?

    TEST REQUIREMENT FROM BS EN ISO 7599:2018 (REFER TO ITEM 12)

    - INDOOR (NOT EXPOSED TO WEATHER)- 10 MICRONS
    - OUTDOOR (EXPOSED TO WEATHER)- 15, 20 OR 25 MICRONS (SUBJECT TO EXPOSURE TO TYPE OF ENVIRONMENT)

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11. What is the impact of PIFM's recommendation of architectural anodising thickness to the industry?

I. IMPACT TO SUPPLIERS
   - ALL KNOWN PIFM SUPPLIERS CAN COMPLY WITH BS EN ISO 7599:2018

II. IMPACT TO END USERS
   - VARIETY OF CHOICES, SUITABILITY TO DIFFERENT ENVIRONMENT

III. COST IMPACT TO THE SUPPLIERS
   - THICKER MICRON COST MORE

IV. COST IMPACT TO THE FAÇADE INDUSTRY
   - THICKER MICRON COST MORE

V. COST IMPACT TO THE CONSTRUCTION INDUSTRY
   - THICKER MICRON COST MORE

VI. AUTHORITY IMPLEMENTATION IMPACT
   - UNIFORM QUALITY AND COMPLIANCE TO BS EN ISO 7599:2018 STANDARD

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12. Test requirement for BS EN ISO 7599:2018 consist of 16 parts. To select the relevant test.

	Codes	Test methods	Test for	Test Applicable to what factor	Equipment	Done in house	Test to apply	Remarks
1	ISO 1463	Metallic and oxide coatings - Measurement of coating thickness - Microscopical method	Anodic thickness	A2, A3, A4	Microscope		To check further	Involves hazardous materials, operation, and equipment & an industrial microscope.
2	ISO 2085	Anodising of aluminium and its alloys - Check for continuity of thin anodic oxidation coatings - Copper sulfate test		A2, A3, A4	Copper Sulfate		Not Required	Limited to anodic coatings of <5µ or deformed coatings
3	ISO 2106	Anodizing of aluminium and its alloys - Determination of mass per unit area (surface density) of anodic oxidation coatings - Gravimetric method.	Surface Density	A2, A3, A4	Electrolysis Device		Required	
4	ISO 2128	Anodizing of aluminium and its alloy - Determination of thickness of anodic oxidation coatings - Non-destructive measurement by split beam microscope	Anodic thickness	A2, A3, A4	Microscope		To check further	1. Already using eddy current – ref item 6 2. Will need to check availability of an industrial microscope
5	ISO 2143	Anodising of aluminium and its alloys - Estimation of loss of absorptive power of anodic oxidation coatings after sealing - Dye-spot test with prior acid treatment	Sealing	A2, A3, A4	Acid	Yes	Required	
6	ISO 2360	Non-conductive coatings on non-magnetic electrically conductive basis materials - Measurement of coating thickness - Amplitude sensitive eddy current method	Anodic thickness	A2, A3, A4	Micro Measuring Device	Yes	Required	
7	ISO 2376	Anodizing of aluminium and its alloys - Determination of electric breakdown potential	Electric breakdown	A4	Electrical Device		Not Required	Not applicable to architectural use
8	ISO 2931	Anodizing of aluminium and its alloys - Assessment of quality of sealed anodic oxidation coatings by measurement of admittance	Sealing	A2, A3, A4	Electrical Device		To check further	Already done by item 9
9	ISO 3210	Anodizing of aluminium and its alloys - Assessment of quality of sealed anodic oxidation coatings by measurement of the loss of mass after immersion in acid solution(s)	Sealing	A4	Phosphoric Acid based Solution	Yes	Required	
10	ISO 3211	Anodizing of aluminium and its alloys - Assessment of resistance of anodic oxidation coatings - Assessment of resistance of anodic oxidation coatings to cracking by deformation	Cracking	A4	Bending Device		Not Required	Applicable to sheet material with anodic thickness <5µ
11	ISO 7583	Anodizing of aluminium and its alloys - Vocabulary	NA	NA	NA		NA	
12	ISO 8251	Anodizing of aluminium and its alloys - Measurement of abrasion resistance of anodic oxidation coatings	Abrasion	A2, A4			Required	

13	ISO 8993	Anodizing of aluminium and its alloys - Rating system for the evaluation of pitting corrosion - Chart method	NA	NA	NA		NA	
14	ISO 8994	Anodizing of aluminium and its alloys - Rating system for the evaluation of pitting corrosion -Grid method	NA	NA	NA		NA	
15	ISO 9220	Metallic coatings - Measurement of coating thickness - Scanning electron microscope method	Anodic thickness	A2, A3, A4	Electron Microscope		To check further	Availability of electron microscope
16	ISO 9227	Corrosion test in artificial atmospheres - Salt spray tests	Corrosion	A2	Salt Spray Booth	Sub-contracted	Required	To be done by CAB

NOTES:

Annex A – GENERAL GUIDANCE BASED ON END USE OF ALUMINIUM

A-2: ARCHITECTURAL AND DECORATIVE QUALITY
A-3: BRIGHT ANODISED QUALITY
A-4: GENERAL ENGINEERING QUALITY

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