



INSTITUTE OF MATERIALS, MALAYSIA

**PROTECTIVE COATINGS TECHNICIAN**

**(BLASTING & COATINGS)**

**COMPETENCY CERTIFICATION SCHEME**

**Fifth Revision**  
With effect from 1<sup>st</sup> January 2009

## **PROTECTIVE COATINGS TECHNICIAN TRAINING/ASSESSMENT & CERTIFICATION INTRODUCTION**

This brochure serves as a guide on how to go about obtaining the Institute of Materials, Malaysia (IMM) protective coating technician assessment and certification. It is designed to satisfy the need of the Malaysian Oil & Gas Exploration & Production (EP) industry for formally assessed and certified blasters and coaters as per requirement in the Standard Malaysian EP Oil & Gas industry blasting and coating Specification no: PETRONAS Technical Standard PTS 30.48.00.31P Protective Coatings and Lining.

The PTS Blaster and Coater Training/Assessment & Certification Scheme was established in response to the EP industry, which has identified a need to enhance the skills of blasters and coaters in the industry. The scheme is aimed at improving the quality of workmanship thereby reducing overall costs. In the Malaysian EP industry, the total cost from rework, in service repair and total recoating is estimated at a staggering RM45m annually. The lesson learnt by all asset operators/owners is premature failures not matching the system's lifespan capability are often encountered. Root cause analysis by manufacturers and industry research attributed up to 70% of it to surface preparation and application weakness.

The local industry mindset needs to change and recognise the importance of coating. By default, the term "coating", is often associated with cosmetic and not the protective function that it provides. Hence the often lower priority provided. Recognise that in most cases, the typically 0.325mm to 1.0mm resultant paint "skin" is the only barrier protecting against expensive environmental corrosion. Blasting and coating deserves to be recognised as a skilled task to effectively deliver this "high tech" protection.

Traditionally, blasters and coaters acquire their trade through on the job trial and error experience. Unlike their more "glamorous" welder colleagues, there is very limited training or do they undergo any assessment/certification. Hence, quality of the final protection coating may not be as optimal as it could be; sometimes requiring costly recoating works at short cycle times.

The objective of this project is to help the industry design, setup and facilitate implementation of a training/assessment & certification scheme for blasters and coaters. The target result is that the industry can look forward with better confidence to higher quality coatings and lower overall cost. This aspect is in line with ISO9001 process control and also reduces micro inspection. A cross industry project team was charged with this task. A comprehensive yet fit-for purpose programme was formulated and a suitable implementation vehicle sought.

The first avenue opened is via the IMM, a non-profit Malaysian professional organisation. In line with its' charter to advance this industry, IMM accepted the challenge of coordinating and administering this scheme. All EP and work site blasting and coating service providers are requested to contact the nearest IMM branch or call the Secretariat in Kuala Lumpur at telephone no.: (03) 5882 3574; fax no.: (03) 5882 3524 to upgrade their workforce.

## THE SCHEME (HOW IT WORKS)

Graduates of the programme will be issued with a Certificate and Identification Card and be graded as "IMM Certified Protective Coatings Technician Level 1 (Blaster)" or "IMM Certified Protective Coatings Technician Level 1 (Coater)" or "IMM Certified Protective Coatings Technician Level 2 (Multi-skill)".

The programme consists of a half day classroom theory lesson followed by another half day of assessment test. The assessment test comprises 2 parts. The first part is a multiple - choice theory test. The second part is a practical test whereby the candidates are assessed on their skills in blasting and coating on a mild steel test panel. Candidates have a choice to sit for only the Blaster or Coater examinations or both. The competency certification programme will be coordinated by the IMM who will register the candidates and issue the certificates. The theory lessons and practical tests will be conducted by IMM certified trainers at the respective "Training Facilities" throughout Malaysia. The candidates will have to register with the IMM and a schedule of the one day lecture plus assessment dates and the Training Facility location will be advised by the IMM.

Graduate Blasters who have acquired coating skills and wish to sit for the Coater Assessment must submit a record prior to the examination showing proof of their experience over a 12month period. The same procedure applies to Graduate Coaters who wish to sit for the Blaster Assessment. All Graduates must keep a record of their work and kept in the database of the Manpower Optimization System (PRIMOS) as their certification is valid for five years only. Proof of continuous working experience without a lapse of more than 18 months will entitle the Graduates to automatic recertification for another five years.

## TYPICAL TEST PIECE (MILD STEEL) FOR PRACTICAL ASSESSMENT

Round pipe / I-Beam / Angled Plates; preferably with welded sections/attachments

Abrasive blast to SA 2.5 and coat with 2 pack coating.

## TRADE ASSESSMENT

After the completion of the theoretical section, the candidate will be assessed through two parts:-

Part 1:

A theory assessment consisting of:

(i) True/False & Objective Questions (for Blaster) = 100 %

(iii) True/False & Objective Questions (for Coater) = 100 %

Part 2:

A practical assessment consisting of:

(ii) Blasting skills = 100 %

(iv) Coating skill = 100 %

Adding the percentage values from Part 1 & Part 2 and averaging them, the grading of candidates will be as follows:-

70% - 100%	= Certified Protective Coatings Technician Level 1 (Blaster) for Part 1 (i) & Part 2 (ii) Level 1 (Coater) for Part 1 (iii) & Part 2 (iv) Level 2 (Multi-Skill) for Part 1 (i) + (iii) & Part 2 (ii) + (iv)
Below 70%	FAIL

## **ASSESSMENT RECORD**

Graduate Blasters who have acquired coating skills and wish to sit for the Coater Assessment must submit a record prior to the examination showing proof of their experience over a 12 month period. The same procedure applies to Graduate Coaters who wish to sit for the Blaster assessment.

## **JOB DEVELOPMENT RECORD BOOK**

All Graduates will be registered (subject to the current fee paid) and added to the Manpower Optimisation Scheme (PRIMOS) which will be used for re-certification purposes. Should a candidate's record shows that there has been a lapse of more than 18 months without working as a blaster or Coater, the candidate will have to re-sit the one day assessment for recertification. Candidates who have continuous relevant experience will be automatically recertified after 5 years.

**VALIDITY OF CERTIFICATION:** 5 YEARS; Graduates must register as an IMM member for the certification period of 5 years. Membership fees for the 5 years shall be accordance to their membership grade.

## **LOCATIONS OF TRAINING**

At selected "Training Facility" throughout Malaysia. ("Training Facility" shall be defined to include lecture room, lecture notes, audiovisual aid, test pieces for practical assessment, blasting & coating equipment, paint materials, abrasives and consumables, plus tea/refreshments and lunch for the candidates and trainers/assessors/invigilators. The IMM will provide one master set of the lecture notes in soft copy for the "Training Facility" Provider to make sufficient copies for the candidates.)

## **PROGRAMME**

8:00 a.m.	-	10:30 a.m.	Theory lectures
10:30 a.m.	-	10:45 a.m.	Tea/Coffee
10:45 a.m.	-	11:30 a.m.	Theory lectures
11:30 a.m.	-	12:30 p.m.	Theory Assessment Test
12:30 p.m.	-	1:30 p.m.	Lunch-break
1:30 p.m.	-	3:30 p.m.	Practical Assessment
3:30 p.m.	-	3:45 p.m.	Tea/Coffee
3:45 p.m.	-	6:00 p.m.	Practical Assessment

## **TRAINING SCHEDULE**

The lectures and practical will be conducted at the selected "Training Facility" throughout Malaysia. Each session will be limited to 20 candidates. Upon receipt of registrations and payment of fees of the candidates, the IMM will inform the candidates of the trainers' names, training date and venue. All candidates are required to equip themselves with their work uniform and safety gears for the assessment.

## **CANDIDATE ELIGIBILITY**

Candidates should have 2 years of blasting and/or coating experience. Candidates with less than 2 years experience must submit a testimonial from employer or client to demonstrate their eligibility. The decision to accept candidates will be made by the IMM. All decisions by the IMM is final.

## **LANGUAGE**

The lectures and assessments will be conducted in English or Bahasa Malaysia. Where a candidate cannot read or write, the examiners shall conduct the assessment orally and record the results. Candidates must advise their preferred choice of language at the time of registration.

## **COURSE SYLLABUS**

The course will cover all aspects of the work of the Blaster & Coater.

### **1. HOW TO READ PRODUCT TECHNICAL DATA**

The prime importance before coating is to know the nature of paint. All necessary information can be easily gathered from the product technical data. The following should be covered: generic type of product, volume solid, surface preparation required, recommended spray equipment, drying time, mixing ratio, type of thinner etc.

### **2. SURFACE PREPARATION**

Mechanisms which determine the bonding / adhesion of protective coating to substrate. Only methods (STANDARD) being specified in coating specification to be discussed in term of the equipment, abrasive and achievable surface quality. In addition, site protection and setting up of wind breaker are important. How to handle sharp edges and weld seam? How to clean oil or grease contaminant?

### **3. PAINT DRYING MECHANISM**

Candidate to be exposed to three major paint drying mechanism: OXIDATION, PHYSICAL and CHEMICAL REACTION. The common defects related to the nature of drying mechanism.

### **4. USE OF VOLUME SOLID**

Definition of volume solid. Candidate should be exposed to the calculation of wet film thickness required for a particular Dry Film Thickness and the theoretical and practical coverage per litre of paint.

### **5. WHAT IS MIXING RATIO**

Definition of mixing ratio. The importance of correct measured ratio in small mixing.

### **6. FUNCTION OF THINNER**

Definition of Thinner. The function of thinner.

### **7. WHAT AFFECT DRYING TIME**

Factors affecting the drying time in term of product nature, substrate and external environment.

### **8. POT LIFE AND SHELF LIFE**

Definition and what is the difference between the two. How it affect the coating process and coating performance. Proper storage conditions and handling of paint stocks.

### **9. APPLICATION METHODS**

Technique used to prepare and mix paint for application to the substrate. Methods of paint application and equipment set up.

### **10. HOW TO GET CORRECT WET FILM THICKNESS??**

How to get even WFT by various application methods? Stripe coating.

### **11. WASTAGE? HOW TO MINIMIZE**

This issue is to look into from five angles:

- i) Substrate dimension
- ii) Mixing of paint
- iii) Application methods
- iv) Equipment used
- v) External condition

### **12. COMMON SITE DEFECTS AND REMEDY**

The following common site defects to be discussed: sagging, dry spray, low thickness, orange peel, wavy, not dry, pinpoint rust, delamination, mud cracking etc.

### **13. QUALITY CHECK AND INSPECTION TOOLS**

The condition check before blasting and coating which include Relative Humidity, Steel Temperature, Dew point, substrate surface quality etc. QC check on paint work including visual appearance and Dry Film Thickness.

### **14. SAFETY PRECAUTION**

Personal protection equipment (PPE) for surface preparation, during paint mixing, coating. Safety in confined spaces. Emergency procedure.

## REGISTRATION OF CANDIDATES

	<b>Blaster Training &amp; Assessment Fee</b>	<b>Coater Training &amp; Assessment Fee</b>	<b>Blaster &amp; Coater Training &amp; Assessment Fee</b>
IMM Member	RM 950.00	RM 950.00	RM 1030.00
IMM Membership *	RM 220.00	RM 220.00	RM 220.00
Primos <sup>#</sup>	RM 60.00	RM 60.00	RM 60.00

Note: 1. \* Registration and Membership Fee for 5 (five) years  
2. # Membership fee for 1 (one) year

## RESIT OF EXAMINATIONS

A candidate who failed in one or all examinations can apply to re-sit for the certification. The candidate must again attend the complete training and practical in order to be eligible to sit for the examination. The candidate must pay for the Registration Fee plus the appropriate examination fee. However, the candidate will have to wait until the next available training schedule. The IMM will notify the candidate of the next available date and location (if different from original location).

## RECERTIFICATION

All graduates of the IMM Protective Coatings Technician (Blaster & Coater) Certification Scheme shall maintain a 5-year record of their work experience. The work experience may be recorded in a log-book prepared by the certificate holder or his employer, and verified by an IMM Coatings Inspector or a Client Representative, or in the form of testimonials from the various project managers/client representatives.

Within six (6) months prior to expiry of the certification, the certificate holder shall submit an application to IMM for re-certification for another five (5) years. Upon lapse of 6 months from expiry date, the certificate holder must re-sit for Blaster & Coater scheme to qualify for re-certification.

The certificate holder must submit the work experience record plus payment of the re-certification fee and IMM membership fee. The re-certification fee shall be RM50.00 for another 5 years. The IMM membership fees for another 5 years shall be in accordance to the membership grade of the certificate holder.

Upon receipt of the full payment of RM50.00 plus the 5-years IMM membership fee, the work experience record will be reviewed by the IMM Coatings Committee and IMM Examination, Certification, & Accreditation Panel (ECAP) for approval. Once approved, the certificate holder will be issued a new certificate and I.D. card.





**BLASTER/COATER PERSONAL & QUALIFICATION RECORD**  
(Photocopy extra copies for each candidate)

1. Name: \_\_\_\_\_

2. I.C./ Passport No: \_\_\_\_\_

3. Academic Qualification (if any): \_\_\_\_\_

4. Nationality: \_\_\_\_\_ Race: \_\_\_\_\_

5. Sex: Male/ Female \*      Date of Birth: \_\_\_\_\_ Age: \_\_\_\_\_

6. Current Personal Skill: BLASTER / COATER \* (**IMPORTANT**)

7. No. of years of experience: \_\_\_\_\_ Language: \_\_\_\_\_

8. Location of Work: \_\_\_\_\_

9. Familiar with Paint System such as (Pls specify): \_\_\_\_\_

10. Knowledge on Paint applications \* :  
Airless Spray: Yes / No  
Conventional Spray: Yes / No  
Paint Brush: Yes / No  
Other Special Application Mode: \_\_\_\_\_

11. Familiar with Surface Preparation \* :  
Manual Cleaning: Yes / No  
Dry Blasting: Yes / No  
Garnet / Slag: Yes / No

12. Employer's name: \_\_\_\_\_

13. Proposing Training Date: \_\_\_\_\_ Venue: \_\_\_\_\_

Certified by: \_\_\_\_\_ Date: \_\_\_\_\_  
QA/QC Dept.

Name: \_\_\_\_\_

Designation: \_\_\_\_\_

\* Delete whichever not applicable.

<b><u>FOR OFFICIAL USE</u></b>	
Verify by:	Verify by:
_____	_____
(Examiner)	(IMM Observer)