INSTITUTE OF MATERIALS MALAYSIA

# THE MATERIALS BULLETIN

VOL 2. (1) 1998 JAN 1998

A BIENNIAL PUBLICATION OF THE INSTITUTE OF MATERIALS MALAYSIA
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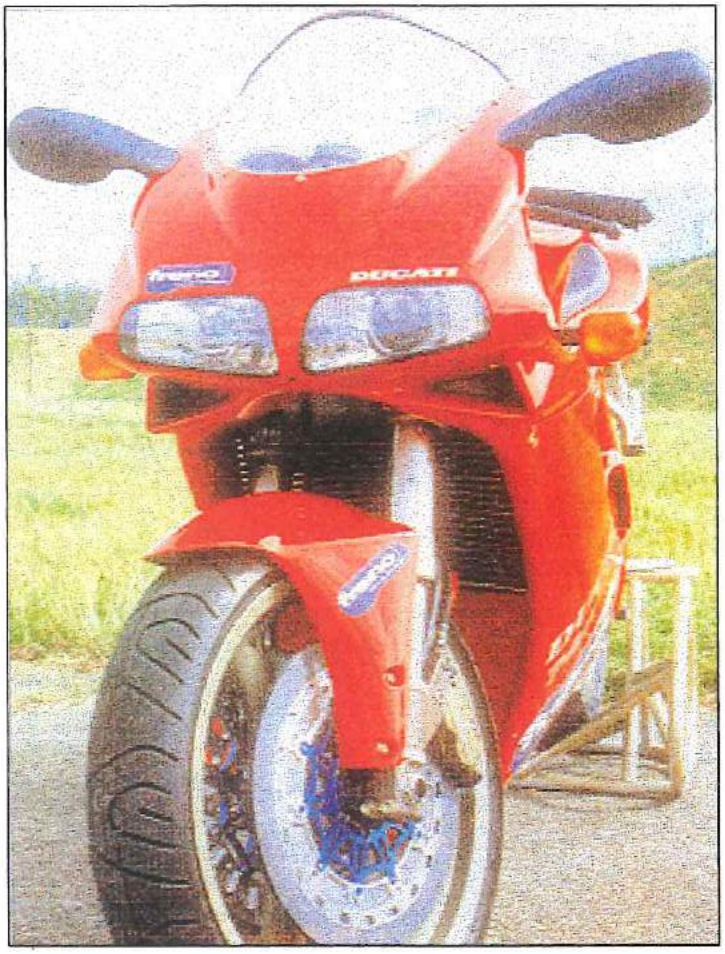

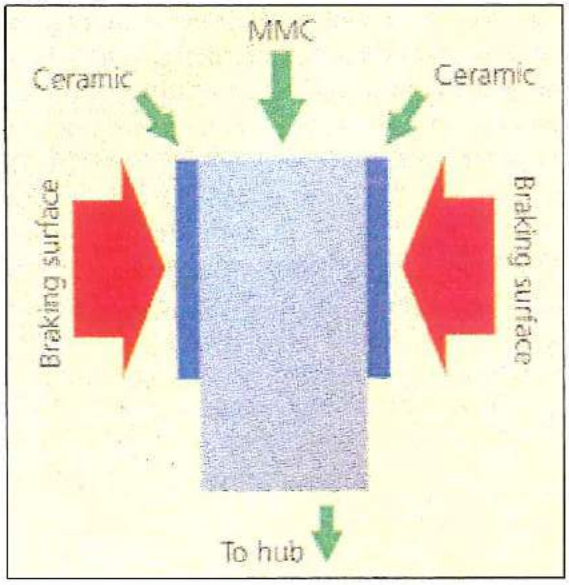


Inset picture shows the schematics of the brake arrangement

Main picture shows a Ducati 748 racing bike fitted with Freno MMC brakes

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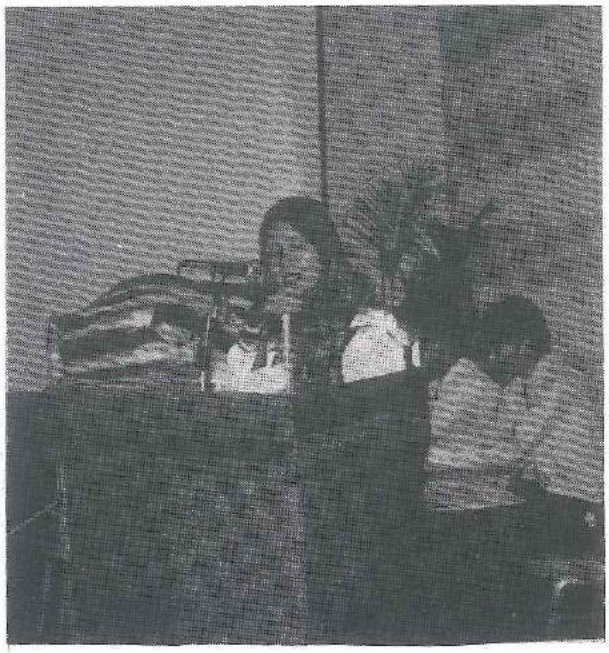
* Membership to the respective committee are by invitation of the Committee Chairperson and on a voluntary basis.

## THE EDITOR'S INKWELL

The start of a new year gives one the liberty of merrily wishing people 'A Happy New Year" because it's the done thing to do so. 1997 has been a wonderful year for IMM, with a quite full calendar, scholarly events, courses, conferences and a blitzkrieg opening with plenty of razzmatazz. There was a persistent effort for a membership drive, the carrot being a distinguished looking tie-pin which looks at home on his or her tie, his or her coat lapel and definitely on *her* tudung. I wear mine on my tudung and people consider me some sort of a crusader for transforming that little tie-pin into a hot 1998 fashion accessory. 1998 again starts fresh with hope, what with the inaugration of our learned publication, Journal of the Institute of Materials , Malaysia or JIMM. I will be saying more about this journal later. I am still hoping for letters, articles, comments from readers on how to improve our bulletin. Till the next issue, felicitations from me.

Che Husna Azhari
Executive Editor



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## CONTENTS OF THIS JAN 1998 ISSUE NO 1 VOL 2

## THE ECONOMY AND YOU : HOW HAS IT AFFECTED THE MATERIALS INDUSTRY IN MALAYSIA?

Malaysia has lately been a centre of world attention, not merely due to the Commonwealth Games but a far more aggressive Games, that is of the economy. Within a space of a few months the national, regional and world economic headlines has been that of Asia-Pacific spiralling economies and IMF bailouts. Only last week, Mr. Camdessus, the managing director of IMF visited the Asean region, talking to Heads of State as part of the front line monitoring of the regionally affected economies, particularly the implementation of the policies in the wake of the IMF bailouts in countries like South Korea, Thailand and Indonesia. Thankfully, we have resisted IMF bailout to stem our shrinking ringgit, but our measures to stem ringgit depreciation, the famous capital flight, borrowing IMF-lingo, has been felt by all, both by the public and the private sectors. Bulletin has spoke to several people in the materials industry to get a brief overview of the situation. Here are some of the views.

In general,in the short term, everybody is affected, very few positively because very few industries are completeley home grown and export oriented.The most glaring example is in fluctuating raw ,materials cost. The raw material not only fluctuates, wildly, due to the fluctuating fortunes of our ringgit, but most have to be paid in US dollars. The dollar is suddenly king! Apart from that the raw materials must be carefully monitored and turnover control is tighter.

Raw materials bought even from neighbouring countries like Thailand have to be paid in US dollars. Asian economies are all hard hit and in order to prop up their own currencies, all purchases have to be made in USD. That is why, the prime ministers' suggestion in using South East Asian currencies, starting perhaps with the Singapore dollar has far reaching implications. It can, in our opnion only have good implications. The only negative implication is that this will not please the foreign fund be managers. Asian countries tend to be more selective and have probably slowed down intra regional trading in lieu of their spiralling and fluctuating currencies.

Generally the climate is less conducive and a lassez faire attitude of yore drastically curtailed. Manufacturers have to be lock-tight about their customers, especially their financial backgrounds.

Since December, the only country which has seen social unrest due to the ecnomic downturn has been Indonesia. We saw a resurging in the value in the ringgit, hopefully resuscitating the manufacturing industry, but we certainly have not seen consumer prices improved, in fact it has dramatically increased, despite government price controls.

We would be pleased if more companies would like to comment on the state of the economy.

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## MATERIALS FORAY: BIOMATERIALS PART TWO.

Another interesting class of biomaterials are the biopolyesters. The usual polyesters are polymers formed by the condensation of polyhydric,alcohols such as glycol or polypropylene glycol and polybasic aacids such as maleic or terephthalic acids. Biopolyseters on the other hand, are polyesters derived from bacterial sources and are exclusively based on hydroxyalkanoic acids. Usually these are the β-hydroxyalkanoic acids, but examples of γ-hydroxyalkanoic acids have been known to be used. The discovery of biopolyesters leads to the conclusion that a new class of non-biodegradable and environmentally friendly plastic has been found. These are the poly(hydroxyalkanoates) the main material produced through fermentation technology being poly-β-hydroxybutyrate.

PHB was discovered as a spin-off from the ICI technology to produce single cell protein as animal feed. Pruteen, the single cell feed was successfully produced but not commercialised due to the high costs of large scale commercialisation. ICI combined expertise from the Agricultural Divison as well as the Plastics Division and consequently developed PHB which was given the trade name Biopol. However the mechanical properties of pure PHB allowed no particular advantage over polypropylene, due to excessive brittleness. The

costs of producing PHB has remained keen and therefore has not been developed as a high tonnage plastic as yet. Closer to home we read in the news last year that a team of researchers from Universiti Putra Malaysia has utilised the same process but used a different substrate to produce a sister Biopol. I am unaware of the detailed properties of the Malaysian Biopol, and I invite the researchers to write and inform us on the latest developments of this biopolymer to the Bulletin.

For comparison I have taken the liberty to enclose a schematic diagram for the isolation and purification of poly-β-hydroxyalkanoates using selective enzymolysis.

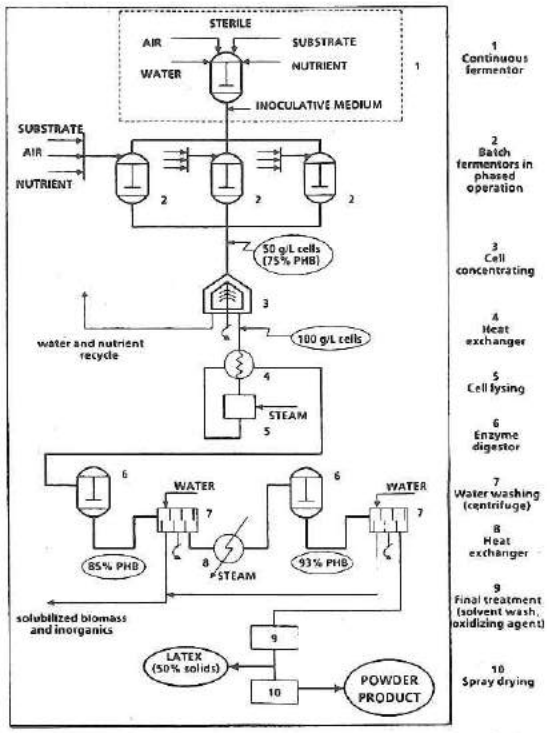


Fig 1.0 Schematic diagram for the isolation and purification of poly-β-hydroxyalkanoate using selective enzymolysis.

Another biomaterial which has been around for a long time is silk. Silk fibre is a continous protein filament secreted by various insects, especially the larvae off Lepidoptera, specifically the Bombyx mori, in forming cocoons. These cocoons yield filaments with a reelable length of 600 to 900 metres. The cocoons are sorted and then sent for silk reeling. The raw silk thread is then converted to yarns ready for manufacturing into textiles. The silk filament consists of minute filaments called fibrils. The moisture content varies between 9-12%. Silk has a tensile strength of 4g/dernier, this is the usual quotation for textiles. There is only a small elastic region followed by a yield region with a 20% elongation before break. It is quite a strong textile. Silk has been used as an electrical insulator because its poor electrical conductivity. I used to think there only reason silk existed was for the benefit for the rich fashion houses.

Silk fibroin consists off extended protein chains of various molecular weights of amino acids, with glycine (44%) and alanine (30%). There is an interesting story on silk and Nylon. Apparently the first research on Nylons were made by Japanese researchers looking for ways to make silk without resorting to caterpillars. And that is why nylons are the analogues to the silks in chemical structure. It is a true story, and you may have to look up such names as Izumi (1959) and Akabori (1956) to verify my story. Apparently the company which developed the process to produce Nylon-6 was Toray of Japan. The company was quite a leader in producing synthetic textiles. May I digress yet again to confirm my favourite theory that war is the master of innovation by stating that Nylon- 6 was first produced in Germany during the war years(the Third Reich) when incidentally the Beetle, the Volkswagen Beetle that is, was also manufactured.

This story about silks is to gently introduce yet another relatively unknown biomaterial to the IMM reading public, and that is the spider silk. Although silk is produced by some insects, centipedes and millipedes and a similar substance is produced by some crustaceans, such as ostracods and amphiphods, mites and pseudoscorpions, only the spiders (not Spiderman!) are true silk specialists. Spider silk is a protein called fibroin, which has chemical characteristics similar to those of insect silk. These threads of spider silk have very high tensile strength (I mentioned them in the last issue) and great elasticity. These silks have yet to find some engineering applications, but engineers are still trying to fathom their

structure, and how to replicate that in steels. We would then hope to see steel cables used in suspension bridges as cute little gossamer threads and not the hefty cables that they are now.

Another biomaterial which has been stirred some interest are the gelatinised starch products. In principle their existence had been known for the last 25 years or so, but their existence is fraught with patents that they have yet to find wide commercial application. A recent addition to this family is shown in the figure below.

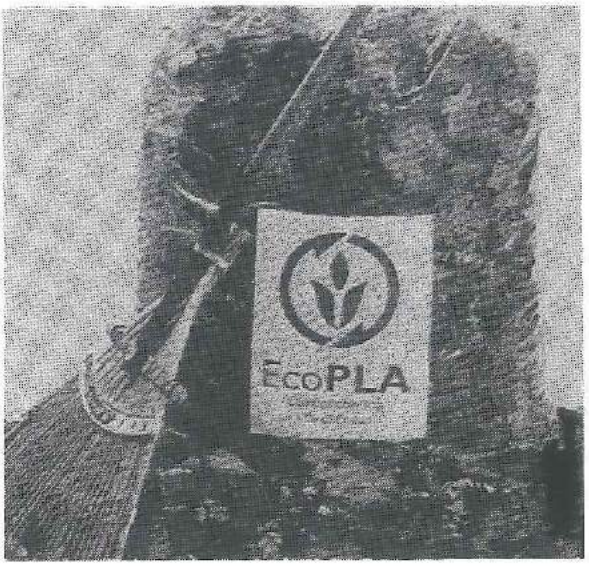


Fig 2.0 An example of a biodegradable polymer film made in the US ( courtesy of Plastics Engineering, journal of the Society of Plastics Engineers)

Natural starch is a high molecular weight polymer. Starch is the product of an industry based almost entirely on agricultural raw materials. It has a spherulitic crystalline particle form. Its industrial applications is as a thickening or binding agent and is mostly consumed by the paper, food, oilwell drilling, textiles as well as conversion into sugars. Starch has been used as a filler for thermoplastic by Coloroll which used the polyolefins as degradable carrier bags. There has been claims that high shear mixing of formulations of starches with synthetic polymers usually with twin screw extruders produced novel states akin to interpenetrating works of starch gel and synthetic polymer at the near molecular levels . The processing requirements of these polymers have made these degradable polymers three times the cost of the conventional polymers.

These are some of the biomaterials which will be discussed under our regular materials foray. I hope readers will take up my invitation to write us articles on the materials of their choice, the articles need not be long, it could just be 'notes'. I would urge researchers in the universities and research institutes write to us on the latest developments in their materials research, and it need not be the scholarly detailed version.

---

## MATERIALS IN OFFSHORE STRUCTURES

For want of a definition one would suppose 'offshore' would mean not inland and certainly very far from the shore. However in petroleum-terms it has come to mean activities connected with the business of prospecting, producing and transporting of oil from the deep sea to the shore. It is a very hazardous and exacting business demanding of people, materials , design , strategy as well as clement conditions. One would then presuppose that 'structures' would mean the fabrication of structures needed to carry out these activities. A typical offshore structure would be the oil rig shown in Fig 3.0

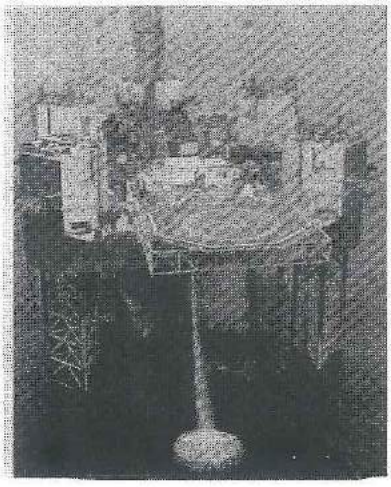

Fig 3.0 A typical offshore structure

The selection of materials for offshore structures is governed by requirements for high tensile and fatigue strengths, fracture toughness as well as weldability.

A large range of materials are available, traditionally metals to meet these requirements. These materials range from the low-strength normalised carbon-manganese steels to higher strength TMCP steels. They have been successfully used in applications such as fixed platforms as well as mobile structures. A current practice is to limit the minimum yield strength to 420Mpa for TMCP and 450 for QT steels.

The direction in material usage is to use more steels with lower carbon content to improve the weldability and the fracture toughness at lower temperatures. But this has resulted in lower strengths which has been compensated by the addition of microalloying elements such Cu and Ni. The addition of nickel in particular has been found to enhance fracture strengths when used in applications such as the North Sea.

Weldable structural steels can be classified as as-rolled , normalised, quenched, and tempered or TMCP with minimum yield strengths ranging from 200 to 690 MPa . the supply condition affects the weldability and toughness of the steel as well as the tensile strengths. The steels are supplied to BS,API,ASTM, Euronorm and other international standards. All standards specify either a maximum or a range for carbon, manganese, silicon, and other alloying elements. This can imply that two plates supplied under the same material standard but manufactured from two different charges of steel may show differences.

Despite advances in so called 'corrosionless' steels, it is impossible to wipe out corrosion , only perhaps minimise and retard the process. Corrosion of offshore platforms is usually treated by using surface coatings, the science of which has reached a very advanced stage. It can also be minimised by substituting the steels used with non-ferrous components and composite materials. Cathodic Protection and the use of Corrosion Inhibitor Chemicals are also alternative means of corrosion protection for offshore structures.

## NEWS ROUND-UP

### IMM SEMINAR FOR NON-MATERIALS ENGINEERS.

The IMM started the calendar with the above one-day seminar. It was a rather confusing title, engineers thought it wasn't for them, but the civil and mechanical people turned up, getting the language right, that it was indeed meant for anyone who was not a materials engineer. It was held at this sophisticated tower in PJ and was well attended. There were about 25 constant attendees at any one time. The organising chairperson, Dr.Esah Hamzah from UTM did a wonderful job of getting the whole thing organised and must be commended. The first paper was presented by our president and it was entitled 'The Materials Engineering Profession",the paper appears as one of our feature articles. Prof Radakrishna of Institut Pengajian Tinggi, UM gave the next paper, on Materials Selection. This highlights one of the most important aspect of materials engineering, materials selection and its importance to the application and hence design. Next was a highly informative paper on wood, the wonder engineering material. We thought it was a wonderful time for the material to make its debut then. I then followed after lunch with a brief introduction into materials processing techniques, a near impossible task as you can imagine, since I took a whole semester just to teach polymer processing techniques at university. Mr.Kang, the 'uncorroded' man gave his presentation on his life long passion of fighting corrosion. It was highly informative and hands-on. I guess his presentation must get the prize for showing the most graphics. Last but not least we heard the story behind the sinking of the 'Titanic". No, it was not the movie, but Dr.Teh from UM, on his favourite topic of how materials fail under different circumstances. I must tell him and the producers of the movie that this "Titanic' problem is also my favourite exam question. The participants kept the sessions lively with their questions and most of the time it was more of discussions rather than 'questioning' the paper presenters. They suggested the IMM organise workshops for specific materials the next time. We will certainly think about this suggestion.

## THE FOURTH MALAYSIAN CONFERENCE ON OIL AND GAS FABRICATION TECHNOLOGIES

Apparently the offshore fabricators have been left unscathed by the all pervading economic recession (I am risking a torn limb by making this statement) and this event was the jewel in the IMM crown this year, not forgetting all the money-spinning courses of course. The above conference was jointly organised by IMM of OSFAM, the Offshore Structure Fabricators Association of Malaysia. It took place at the Pan Pacific on the 11th and 12th of December. There was a strong presence of members from both organisations, since their past president is our current president. The conference was opened by Datuk Mohamed Nazri Tan Sri Dato' Abdul Aziz, the Deputy Minister in the Prime Ministers Department.

The organising committee line-up reads thus: Chairman, Dr. A. Rahim Mohd.Nor, The Co-Chairman, En. Mohd Shaharuddin Mohd Hassan. I must point out the politically correct, ungender-biased term now is chairperson, without the *man* in the chair. The secretary was En.Omar Ali, the Treasurer, En.Richard Wee, the committee members being En. Ong Chong Hup, En.Mohd Suradi Yassin., En. Adnan Haron, En. Tommy Lim. En.Shaharuddin Mohd Nor, En. Abdullah Sabri, En. Ahmad Yazid Mohd Mukhayat and En.Hairul Shamse Said.


Fig 4.0 The OSFAM-IMM Organisational line-up at the OSFAM-IMM Conference. The backdrop spells out all the relevant details. Left to right, OSFAM President En. Arshad Ahmad, IMM President Dr.Samad Solbai, Datuk Nazri, Organising Chairman Dr. Rahim and En. Mohd Shaharuddin, Organising Co-Chairperson.

There was an exhibition outside the Conference avenue which was put up by companies involved in the offshore construction business and being in front of the coffee/tea area they commandeered a strategic position. The Technical Programme took two days, being very well attended right up to the end, even though the last day was Friday.

Paper presenters took 30 minutes, normally this would be a long time but they generally sparked a lot of interest. The sessions didn't appear to have any particular order or theme for each session, but if this appear erroneous, the organising committee may feel to correct me.

I understand the launching of the IMM took place on the first day, and I also understand I missed a great multi-media show ( I missed the launching) Now that we are started on such an auspicious note, we hope that IMM would take on an auspicious year.

### THE YEAR"S EVENTS

The year's events have been summarised into a calender as below;

26/4/97 7th AGM at Sime Darby Tyre Tech Centre, Petaling Jaya.

15/7/97 Seminar on Corrosion and Welding at PWTC by the Corrosion and Welding Committee

Fig 5.0 One of the paper presenters at the above seminar

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*Affix photo here*

# MEMBERSHIP APPLICATION FORM

*(Confidential)*

APPLICATION FOR COMPANY MEMBER/ORDINARY MEMBER/FELLOW(FIMM)/ MEMBER(MIMM)/ASSOCIATE MEMBER(AMIMM)/STUDENT MEMBER *

**(I) PERSONAL PARTICULARS** (photocopy of I.C./Passport to be submitted)

NAME IN FULL (MR/MS/DR):_____
(BLOCKS LETTERS)

RESIDENCE/POSTAL ADDRESS:_____

TELEPHONE NO.: HOUSE:_____ DATE OF BIRTH: _____

PLACE OF BIRTH:_____

NATIONALITY: _____PASSPORT/I.C. NO._____

---

**(II) NAME OF EMPLOYER/COMPANY**

_____

TITLE OR POSITION: _____

ADDRESS:_____

_____

TELEPHONE NO:_____FAX NO:_____

BASIC QUALIFICATIONS, TECHNOLOGICAL EDUCATION, HONOURS, DECORATIONS AND AWARDS; MEMBERSHIP OF OTHER ENGINEERING AND SCIENTIFIC BODIES.

(One photocopy of document to be submitted)

---

**(III) FOR STUDENT MEMBERSHIP ONLY**

COURSE OF STUDY:_____ YEAR OF STUDY:_____

NAME OF UNIVERSITY/COLLEGE:_____

ADDRESS:_____

_____

TELEPHONE NO:_____ FAX NO:_____

The above student is allowed to join the Institute.

Signed:_____
Name:_____
Designation:_____
_____
Date:_____

University/College Chop

---

**(IV) COMPANY PARTICULARS (FOR COMPANY MEMBERSHIPS)**

COMPANY NAME:_____

ADDRESS:_____

_____

TELEPHONE NO:_____ TELEX NO:_____ FAX NO:_____

PRINCIPAL REPRESENTATIVE
(MR/MS/DR) _____ POSITION:_____

ALTERNATE REPRESENTATIVE
(MR/MS/DR) _____ POSITION:_____

NOTE: 2 passport-size photos of each representative to be submitted with name written on back of photo.

---

**(V) FOR CORPORATE MEMBERSHIPS OF FELLOW (FIMM), MEMBER(MIMM) & ASSOCIATE MEMBER (AMIMM) ONLY**

The following information shall be provided and verified by the Proposer. One copy of all supporting documents (Degrees, etc) to be submitted and certified by the proposer.

TECHNICAL EDUCATION AND ACADEMIC QUALIFICATIONS:

| Educational Establishment | Course | Year | Verified |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

TRAINING EXPERIENCE:

| Establishment | Position | Year | Verified |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

INDICATE INDUSTRY INVOLVED OR INTERESTED IN :-

| | | | |
|---|---|---|---|
| METALLURGY | ( ) | CORROSION PROTECTION | ( ) |
| MATERIALS FAILURE | ( ) | COMPOSITE MATERIALS | ( ) |
| MATERIALS DESIGN | ( ) | CONCRETE TECHNOLOGY | ( ) |
| MATERIALS RESEARCH | ( ) | WOOD TECHNOLOGY | ( ) |
| POLYMER TECHNOLOGY | ( ) | EDUCATIONAL INSTITUTION | ( ) |
| CERAMICS TECHNOLOGY | ( ) | OTHERS (SPECIFY) _____ | ( ) |
| WELDING | ( ) | | |

I/We hereby accept responsibility for the accuracy of the particulars contained in this application form.

Date: _____ Signature: _____
(and Company Stamp)

Proposer :_____ Seconder:_____
Name:_____ Name:_____
Membership Grade & No:_____ Membership Grade & No:_____

*Delete whichever not applicable.
NB: If proposer and seconder cannot be sourced, mail this form to the Secretariat for assistance.

SCHEDULE OF FEES

| | Entrance Fee | Processing Fee | Transfer Fee | Annual Subscription |
|---|---|---|---|---|
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| Ordinary Member | RM20.00 | - | - | RM20.00 |
| Fellow(F.I.M.M.) | - | RM300.00 | RM10.00 | RM70.00 |
| Member(M.I.M.M.) | - | RM150.00 | RM10.00 | RM50.00 |
| Associate Member (A.M.I.M.M.) | - | RM150.00 | RM10.00 | RM30.00 |
| Student Member | RM10.00 | - | - | RM5.00 |

NB: ALL PAYMENTS TO BE MADE OUT BY CROSSED CHEQUE, BANK DRAFT, OR MONEY ORDER TO "**INSTITUTE OF MATERIALS, MALAYSIA**". ALL APPLICATIONS MUST BE ACCOMPANIED BY THE APPROPRIATE PAYMENTS. APPLICATIONS MADE BETWEEN JULY AND DECEMBER NEED TO PAY 50% OF THE ANNUAL SUBSCRIPTION.

---

**ENCLOSED IS MY/OUR CHEQUE/BANK DRAFT/MONEY ORDER NO:_____**
**FROM BANK_____ FOR THE AMOUNT OF RM_____.**

## IMM Membership Grades

**Company Member**
Any company that is involved or has interest in Materials Science and Engineering will be qualified to join as a company member. All employees of a Company Member are entitled to attend Institute functions at membership rate, however, only the Principal Representative or the Alternate Representative shall have voting rights.

**Ordinary Member**
Any person above the age of 21 years engaged in activities related to research, development and applications in Materials Science and Engineering shall qualify for Ordinary Membership. Only Ordinary Members who meet the necessary minimum requirements may apply for transfer to corporate membership grades of Fellow, Member and Associate Member and may use the abbreviated titles upon transfer

**Honorary Fellow (Hon. F.I.M.M.)**
The Council shall have the power to elect Honorary Fellows who shall be persons of eminence in science or industry The election shall be based on a majority vote within the Council. Honorary Fellows shall enjoy such privileges as may from time to time be determined by the Council.

**Fellow (F.I.M.M.)**
A person at least 35 years of age with approved academic qualifications, training and 8 years relevant responsible experience who has made significant contributions to the science and practice of profession of Materials Science and Engineering or has given distinguished service to industry or education.

**Member (M.I.M.M.)**
A person at least 25 years of age, with approved academic qualifications and training, having at least 3 years responsible experience in Materials Science and Engineering.
OR
A person at least 40 years of age, with at least 15 years of experience with practical responsibility, as demonstrated by thesis and interview.

**Associate Member (A.M.I.M.M.)**
A person at least 25 years of age, who possesses an interest in Materials Science and Engineering but will not yet have acquired the necessary experience or obtained the qualifications governing entry to Member grade. An Associate Member, on obtaining the necessary qualifications, may apply for transfer to Member grade.

**Student Member**
A student member shall be a person not under 17 years of age who at the time of application satisfies the Council that he has received a good general education and is studying subjects related to Materials Science and Engineering. A student member shall transfer to the grade of Ordinary Member after attaining the age of 21 years provided he or she is suitably qualified and as soon as he or she is earning a full-time salary. A Student shall not become a member of the IMM without the prior approval of the Vice-Chancellor of the university or relevant authority concerned.

**Certificate of Membership**
Every member shall receive a membership certificate.

Every application for membership shall be proposed and seconded by two existing ordinary members and shall be forwarded to the Honorary Secretary who shall, at the first convenient opportunity, submit it to the Council for approval. The Council may at its discretion reject any application without assigning any reason thereof.

Each company on admission shall be entitled to nominate one representative to exercise all rights of membership. Only representatives of Company membership and Ordinary members shall have the right to vote and to hold office in IMM

July 1997 Publication of Materials Bulletin Vol 1, by the Publications Committee.

21-25/7/97. Welding Inspector Course at De Palma Inn Hotel, Shah Alam (Module 1), Corrosion and Welding Com.

28-30/7-97 Coatings Inspector Course at De Palma Inn Hotel ,Shah Alam, Corrosion and Welding Com.

11/10/97 Seminar on Materials for Non-Materials Engineers at Pusat Niaga Business Centre, Petaling Jaya. Dr Esah Hamzah and the Secretariat.

5/11/97 Establishment of the IMM Sarawak and Sabah Committee

24/11/97 Presentation on Corrosion of Steel-in-Concrete at SIRIM

9/12/97 Welding Inspector Course (Module 2) at Universiti Malaya

11-12/2/97 IMM-OSFAM Conference at Pan Pacific Hotel, Kuala Lumpur, handled by the Secretariat

15-17/12/97 Cathodic Protection Course at Concorde Hotel, Shah Alam

Fig 6.0 Some of the participants at the Cathodic Protection Course at the Concorde Hotel

All the Corrosion Protection courses were handled by the Corrosion and Welding Committee.

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## PUBLICATION

It gives me great pleasure in this issue to announce the launching of our learned publication, the Journal Of the Institute of Materials , Malaysia, or JIMM. It is a referred publication reporting on the latest developments in research, products and processes. It will published once a year, coming out in July of each year. The format will consist of regular contributions, short communications and a section dealing with contributors' short (extremely short) reports on their products and processes. This means individuals, companies and research institutes may write in to tell of their products and processes, if they do not want to do so to the Bulletin.

There are two methods of submission., the regular and following current trends in publications worldwide, the electronic submission. But first, let me fill in on the format of the contributions solicited.

**Regular contributions:**

Contributions are invited from members of IMM and the general writing public, but being an organ of the IMM, we would like to give preference to our members.

**Submission:**

Manuscripts considered for publication, apart from the products and processes must be original material not published elsewhere. A diskette written in Microsoft Word should accompany the hard copy submitted.. Graphics should also be electronically transcribed. Whenever possible plates and photos should be scanned and the images submitted in diskettes to the Editor. All diskettes should have this information, name of author/authors, title of paper and whether it contained text, graphics or images. The electronic transription should enable the Editor to reproduce the entire paper from the submitted diskettes.

The paper starts with the title, author/r's name/s and address, the name of the contributing author marked with an asterisk . This is followed by an

abstract written in both English and Bahasa Malaysia. All submissions are to be in English. A list of keywords follows this, and then the introduction, materials and methods, results, discussion , conclusion, acknowledgements and lastly a list of nomenclature.

Tables, figures, photos should be placed as they should appear in the text in the hard copy. All material accompanying the text should be labelled and described, with tables labelled at the top and graphics as well as photos at the bottom. Ineligible accompanying material risks being returned. The general principal is that authors should ensure their submitted material should be of the quality suitable for quality reproduction.

References follows the author-year method. The authors are detailed in the references section according to alphabetical order. Authors should follow the normal procedure for author-year referencing method for articles, books and patents.

The Chief Editor reserves the right to edit the paper to the accepted format. The papers become the copyright of the journal and authors will have to sign copyright forms upon acceptance of papers.

The format of communications are as for the regular contributions but shorter. The Chief Editor also reserves the right the place papers according to the length. Generally for regular contributions, the total length should not exceed 15 pages whilst a short communication should not exceed 8 pages. Reports of new products and processes should not exceed one page.

Contributors are not paid but are given a copy of the issue of the journal in which their publication appears and ten offprints of the paper.

Subscribers should contact the Secretariat.

## BULLETIN BOARD

The Bulletin Board makes its maiden appearance in this issue with two topics of great interest, forthcoming events and the annual subscription. But first, the annual subscription.

All annual subscription are due out on the 1st of January of every year and it is with pleasure that I remind all members to remit their dues to the Secretariat as soon as possible. Please issue monies by cheques/money orders/ bank drafts to "Institute Of Materials Malaysia" and include 50 sen for outstation cheques. Please mail to the IMM, at Lot 1908, Batu 7, Jalan Bukit Kemuning, 42450 Shah Alam, Selangor Darul Ehsan.

Now, for the forthcoming events. I have been informed by the Hon. Secretary that these are the planned events for the coming year.

25-27/5/98 Cathodic Protection Course (venue to be revised) Corrosion & Welding Com.

13-17/7/98 Welding Inspector Course at Concorde Hotel, Shah Alam, Welding and Corrosion Com.

20-22/7/98 Coatings Inspector Course at Concorde Hotel, Shah Alam, Corrosion and Welding Com.

10-12/8/98 Cathodic Protection Course (venue to be revised). Corrosion and Welding Com.

5-9/10/98 Welding Inspector Course at Concorde Hotel, Shah Alam, Corrosion & Welding Com.

12-14/10/98 Coatings Inspector Course at Concorde Hotel, Shah Alam, Corrosion & Welding Com.

15-17/12/98 Cathodic Protection Course (venue to be revised). Corrosion & Welding Com.

## THE COMMITTEE PAGE

We would like to report on several changes in this issue on the committee members.A council member, Mr. Kang Kim Ang is at Steelcon Fluid Sdn Bhd, Tel 03-7462312, Fax: 03-7465382 and H/P 012-3227178.

Dr. Samad's fax no is 03-7919458.

Dr. A. Rahim Mohd Noor of the PRSS wish to remind members that PRSS has moved to Lot 3288 & 3289, Jalan Air Itam, Kawasan Institusi, Bangi, 43000 Kajang, Selangor Darul Ehsan. Tel: 03-8252731 extn 2035 and his direct line is 03-8259844.The Council wishes to inform members of two new additions to the Council, ie. The IMM internal auditors, Mr.Alvin Yong Meng Hon (Engineering Materials Sdn Bhd) and Ir. Leong Siew Meng (Miya Engineering Sdn Bhd) from April 1997 to March 1998.

**IMM SARAWAK & SABAH COMMITTEE :**

A committee was finally set up on the 5th November 1997 with committee members comprising of staff from Sarawak Shell, Petronas Carigali/BDO, Velosi Inspection, Dayang Enterprise, MPE Lindung, and Courtalds Coatings.

The formation of the committee was seen as timely in view of the long existence of Materials and Corrosion Engineering in Sarawak and Sabah. Materials & Corrosion expertise existed more than 30 years in the Oil & Gas Industry and these experiences can be extended and shared outside the oil & gas industry through IMM.

The committee is committed on a membership campaign in 1998. One of the activities set up for this was an interview with a local newspaper which was done on 21st December 1997. The committee members also paid a courtesy call to the Miri Municipal Chairman, Councellor Wee Han Wen, on Saturday the 17th January 1998 to introduce IMM and to gain support for IMM's oncoming activities. Mr. Wee mentioned that IMM has a bright opportunity especially in Miri.

The committee will meet every quarterly. Activities for rest of the year include importing the KL-based IMM courses to be done in Miri, career talks to the various institutes of education and an annual dinner.

We are delighted to announce the following members are in the helm of the Sarawak and Sabah Committee; They are

Maimunah Ismail Sarawak Shell Berhad as the Chairperson.

Mohd Adaham Abdullah, Petronas Carigali Deputy Chairperson.

Lucas Anyie, MPE Lindung Sdn. Bhd, Sec/Treasurer

Telajan Luyoh, Dayang Enterprises Sdn Bhd, member

Dr.Edwin Jong, Sarawak Shell Berhad member

Juhari Hussin, Velosi (M) Sdn Bhd member

Robert Lo, Courtaulds Coatings member

Zalina Hj Ali, Petronas Carigali member

Awangko Sa'Adenan, Petronas Carigali member

## NEW PRODUCTS AND PROCESSES

Again, this issue debuts another regular column, or soon to be regular column, new products and processes. I am now inviting manufacturers, inventors and researchers to air their new products and processes in this column. I would very much welcome photos and diagrams of your products as well.

I will have to kick off by citing two exciting new uses of stainless steel in the UK, winners of the 1997 Structural Steel Design Awards.The Paul hamlyn Learning Resource Centre at Thames Valley University in Slough, Bath University's new library extension, and the bascule bridges over the river Hull on the Humberside took the top awards, which recognise the year's most important and innovative uses of structural steelwork.

## COMMITTEE MEMBERS OF THE CORAL PROTECTIVE COATINGS TECHNICIAN TRAINING & CERTIFICATION PROGRAMME:

| **Team Leader:** | Tel. | Fax |
|---|---|---|
| Mr. Marvin Ooi (Sarawak Shell Berhad) | 085-452477 | 085-454808 |
| **Committee Members** | | |
| En. Mohd. Sulastry (Esso Production (M) Inc.) | 09-8654611 | 09-8654712 |
| En. Raja Zahiruddin (Petronas Carigali PMO) | 09-8640722 | 09-8640855 |
| Puan Zalina Hj. Ali (Petronas Carigali SKO) | 085-475636 | 085-475380 |
| Mr. Telajan Luyoh (Dayang Enterprise) | 085-420185 | 085-421654 |
| Mr. Vincent Owi (Haven Engineering) | 09-8631434 | 09-8631733 |
| Mr. Low Keh Teong (Jotun) | 03-5421150 | 03-5421207 |
| En. Musa Mohd. (Courtaulds Coatings) | 03-7330125 | 03-7331270 |
| Mr. Yap Choon Kiat (Dimet) | 03-5593062 | 03-5598758 |
| Ir. Ong Chong Hup (IMM – K.L.) | 03-5218228 | 03-5216116/5219413 |
| Mr. Kang Kim Ang (IMM – K.L.) | 03-7462312 | 03-7465382 |
| Puan Maimunah Ismail (IMM – Miri) | 085-454686 | 085-454919 |
| Mr. Lucas Anyie (IMM – Miri) | 085-439346 | 085-439348 |

Enquiries can be directed to anyone of the above regarding this programme.

## INSTITUTE OF MATERIALS, MALAYSIA - COUNCIL MEMBERS FOR 1998-2000 SESSION

President : Dr. Samad Solbai (Sime Darby Oil & Gas Division)
Deputy President : Dr. Ab. Rahim Md. Nor (Petronas Research & Scientific Services S/B)
Hon. Secretary : Ir. Ong Chong Hup (MPE Lindung S/B)
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Mr. David Lim Chee Cheong (Esso Production (M) Inc.) – *Head, Coatings Sub-committee*
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Mr. Bob Phang (Haven corrosion Engineering S/B)
Dr. Esah Hamzah (University Teknologi Malaysia)
Mr. Kang Kim Ang (Steelcon Fluid S/B) – *Chairman, Corrosion & Welding Committee*
Puan Maimunah Ismail (Sarawak Shell Berhad) – *Chairman, Sarawak & Sabah committee*
Prof. Madya Dr. The Ser Kok (Universiti Malaya) – *Head, Welding Sub-committee*
Dr. Lim Ching Liang (METACOS S/B)
Prof. Madya Dr. Che Husna Azhari (Universiti Kebangsaan Malaysia) – *Publications Committee*
Puan Wan Zaharah (SIRIM Bhd)

## PROTECTIVE COATINGS TECHNICIAN TRAINING / ASSESSMENT & CERTIFICATION SCHEME

The CORAL Blaster & Painter Training/Assessment & Certification Scheme was established in response to industry identifying a need to enhance the skills of blasters and painters in the EP 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. Lesson's learnt is that premature failures not matching the system's life-span capability are often encountered by all asset operators/owners. Root cause analysis by manufacturers and industry research attributed up to 70% of it to surface prep. and application weakness.

The local industry mindset needs to change and recognise the importance of painting. By default of the term "painting", it is often associated with cosmetic and not the protective function that it provides. Hence the often lower priority. 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 painting deserves to be recognised as a skilled task to effectively deliver this "hi-tech" protection.

Traditionally, blasters and painters acquire their trade through on-the-job trial and error experience. Unlike their more "glamorous" welder colleagues, there is very limited training nor do they undergo any assessment/certification. Hence, quality of the final protective coating may not be as optimum as it could be; sometimes requiring costly repainting works at short cycle times.

The objective of the CORAL project is to help industry design, set-up and facilitate implementation of a training/assessment & certification scheme for blasters and painters. 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.

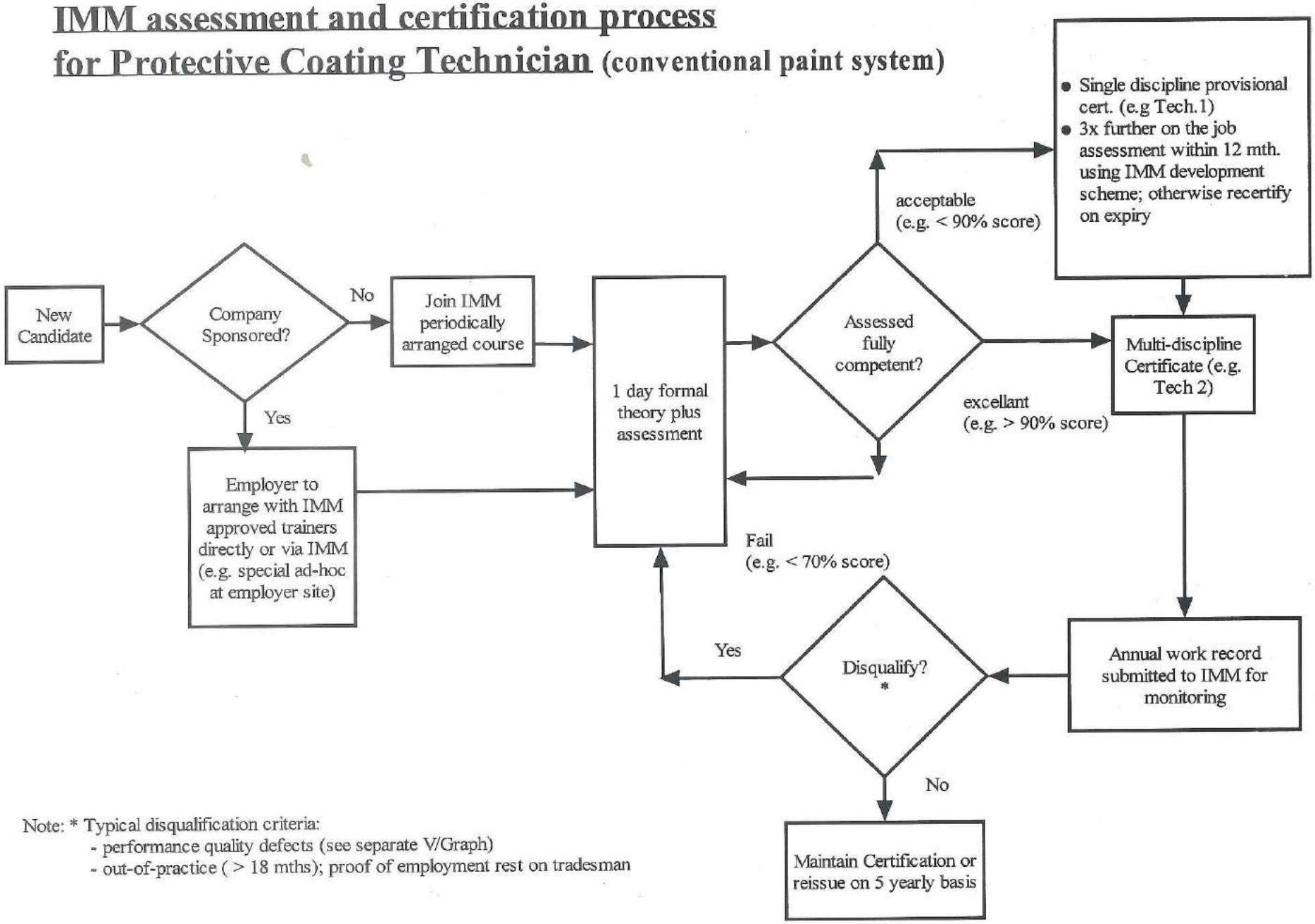
The first avenue opened is via the Institute of Materials Malaysia (IMM): a non-profit Malaysian professional organisation. In line with it's charter to advance this industry, it was approached and accepted the challenge of coordinating and administering this scheme. To minimize cost to the industry, the team has negotiated that IMM certified trainers go instead to the employer's worksite and use existing facilities/equipment to conduct the sessions. Further, the trainer's service shall be free and at no cost to the employers. In turn, employers are expected to do their part and make available their employees (about one manday each) and the necessary facilities. A small membership/registration fee of the employees is however necessary by IMM to cover it's administration cost. Note that none of this goes to the trainers who are sponsored by their respective companies keen to see improvement in this industry. So, this project is a classic example of achieving "of the industry, by the industry, for the industry".

A parallel project on standardization of specification/procedures has noted this qualification (i.e. much like the welding procedures) as a requirement affective 01/01/1999 and 1998 has been allocated as the grace period. A detailed brochure with full information is available from IMM

All EP blasting and painting service providers are requested to contact their nearest IMM branch or directly call the K.L. HQ (tel. 03-5218228; fax 03-5219413) to access this special arrangement to upgrade their workforce. Organisations similar to IMM with the same expertise and national aspiration are invited to be additional avenues to conduct this scheme. However, to protect B&P employers, they must be willing to undertake it on the same non-profit basis.

One of the big implementation challenges is resistance to mindset changes by less enlightened employers who could still insist that there's no need to train/upgrade their employees. CORAL have paved the way and it is hoped that all in the industry will take advantage of the arrangements that have been specially set-up.

# IMM assessment and certification process for Protective Coating Technician (conventional paint system)




Note: * Typical disqualification criteria:
- performance quality defects (see separate V/Graph)
- out-of-practice ( > 18 mths); proof of employment rest on tradesman

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# SPECIALTY MATERIALS

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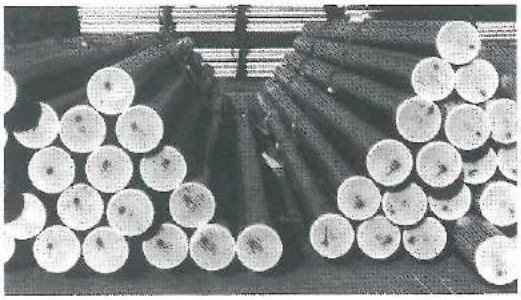
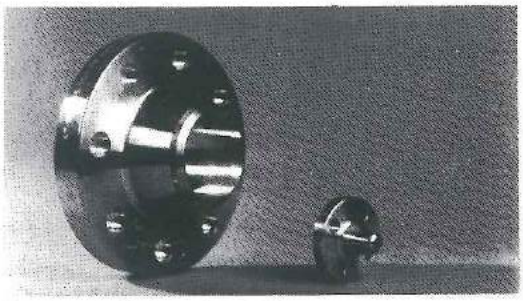
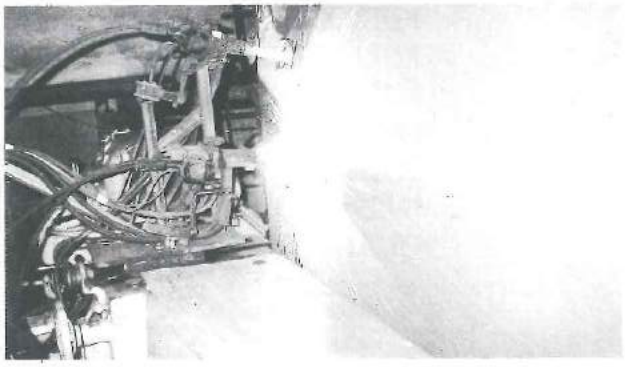


Duplex Stainless Steel Pipes



Duplex Stainless Steel Flanges.

## THERMAL SPRAYED COATINGS



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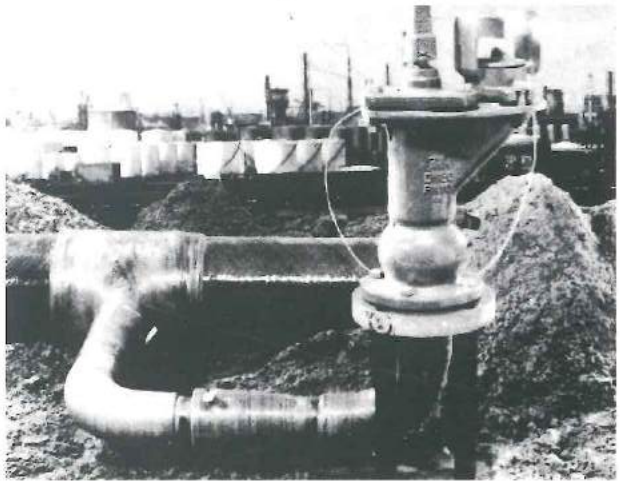

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