

Materials Selection & Corrosion

Registration Form

*Photocopies of this form may be used for registrations.
You can also register online at www.corrosionclinic.com*

Please register the following person(s) for the above course (please TYPE or PRINT clearly):

1. Dr/Mr/Ms _____
Designation _____

2. Dr/Mr/Ms _____
Designation _____

3. Dr/Mr/Ms _____
Designation _____

*delete where inappropriate

Enclosed is a cheque / bank draft No. _____
for S\$ _____ (payable to **WebCorr Corrosion Consulting Services**) being Registration Fee for the above person(s).

Organization _____
Contact Person _____
Contact Dept _____
Telephone _____ Fax _____
Email _____

Crossed cheques should be made payable to **WebCorr Corrosion Consulting Services** and mailed together with the registration form to:

WebCorr Corrosion Consulting Services

Toa Payoh Central, PO Box 225,
Singapore 913108

Tel: (65) 64916456 Mobile: (65) 97110759

Fax: (65) 64916456

Email: webcorr@corrosionclinic.com

<http://www.corrosionclinic.com>

Course Details

Date: TBA
Time: 9:00 am to 5:00 pm
Venue: PUB WaterHub
Course Fee: \$1495 (GST not applicable)
Closing Date: 4 weeks before course date
Discount:
Group: (3 or more people): 10%
Early-bird: N% **if paid** "N" months before the course commencing date

Withdrawal/Refund Policy:

Withdrawal or replacement should be conveyed to the organizer in writing (email or fax). An administration charge of 50% of the course fee will be levied if the withdrawal notice is received less than 7 working days before the course commencing date. No refund will be made for withdrawal notice received 3 working days and less.

Certificates:

Certificate of attendance will be given to participants with at least 75% attendance of the course.

Cancellation:

WebCorr reserves the right to cancel the course and fully refund the participants should unforeseen circumstances necessitate it.

Materials Selection & Corrosion

Conducted by:

Dr. Qiu Jianhai *BEng PhD CEng MIM FICorr
NACE Certified Corrosion Specialist*

Date
TBA

Venue
**PUB WaterHub
80 Toh Guan Road East
Singapore 608575**

Organized by:



Course Overview:

Proper selection of materials and design are most effective in cutting the cost of corrosion and achieving low cost reliability as corrosion can be designed out of the system. It is always easier and cheaper to erase lines on a drawing than to repair or replace failed equipment or components in service. The theme throughout the course will be focused on how to put the right material in the right place in the right way. Practical rules in selection of materials and design guidelines against many forms of corrosion will be presented. Numerous case histories of real-life problems and practical solutions will be discussed. This 2-day corrosion short course provides an excellent avenue for corrosion practitioners, researchers, designers, technical managers, inspection and maintenance engineers, quality control personnel and those involved in failure analysis to update their appreciation of corrosion prevention through materials selection and design.

Course Contents

1. Corrosion & Society
 - 1.1 The economic, social, political and environmental impacts
 - 1.2 Liabilities due to corrosion
 - 1.3 Lessons of history
2. Basic Concepts in Corrosion
 - 2.1 Terminologies and conventions
 - 2.2 Why do metals corrode
 - 2.3 How do metals corrode
3. Different Forms of Corrosion: Mechanisms, Recognition & Prevention
 - 3.1 Uniform corrosion
 - 3.2 Galvanic corrosion
 - 3.3 Dealloying and graphitization (graphitic corrosion)
 - 3.4 Intergranular stress corrosion cracking, weld decay and knife-line attack
 - 3.5 Exfoliation
 - 3.6 Crevice corrosion
 - 3.7 Pitting corrosion

- 3.8 Filiform corrosion
 - 3.9 Microbiologically-Influenced Corrosion (MIC)
 - 3.10 Environment-sensitive cracking
 - 3.11 Hydrogen Damage
 - 3.12 Corrosion fatigue
 - 3.13 Fretting
 - 3.14 Erosion corrosion, impingement attack and cavitation damage
 - 3.15 Stray current corrosion
4. Materials Selection Overview
 - 4.1 General classification of materials
 - 4.2 The engineering requirements of materials
 - 4.3 Some guidelines for materials selection
 - 4.4 The natural matching of a material with an environment
 - 4.5 Case studies: the Good, the Bad and the Ugly
 5. Corrosion Resistance of Common Metals and Alloys
 - 5.1 Steels and Cast Irons
 - 5.2 Stainless Steels and Alloys
 - 5.3 Nickel and Its Alloys
 - 5.4 Aluminum and Its Alloys
 - 5.5 Copper and Its Alloys
 - 5.6 Zinc and Its Alloys
 - 5.7 Tin and Tinplate
 - 5.8 Titanium and Its Alloys
 6. Design Against Corrosion
 - 6.1 Good design practice for corrosion prevention
 - 6.5 How can different forms of corrosion be designed out of the system

Who Should Attend

This course has been structured in such a way that it is particularly suited for the technologists, engineers, technical service and maintenance personnel who are concerned with corrosion in the marine environments (seawater, marine atmospheres, and marine soil) and wish to gain an overall knowledge of corrosion and corrosion control. It is also suited for persons without previous

training or experience, who wish to begin a career in this field.

Course Lecturer

Dr. Qiu Jianhai *BEng PhD CEng MIM FICorr*

Dr Qiu obtained his BEng and PhD degrees both in the field of corrosion. He has 27 years of industry, university teaching, research and consulting experience in areas of corrosion and its prevention. He has been working closely with both local and overseas companies and has been an active consultant to governmental agencies, multinational companies and private organizations on corrosion and materials related issues such as corrosion design review, materials selection and life prediction, corrosion inspection and condition assessment, plant process optimization, corrosion training, corrosion testing and monitoring, trouble-shooting and corrosion failure analysis. Dr Qiu has recently completed the design of a cathodic protection system for the upcoming Marina Coastal Expressway (MCE) Tunnels. Dr. Qiu is also experienced in providing expert witness and assistance in litigation and arbitration matters related to corrosion and materials. He has authored over 120 technical papers and reports. Dr. Qiu was an invited contributing author to the latest edition of the world renowned ASM Handbook Vol.13C Corrosion: Environments and Industries. His biographical profile was included in the 7th edition of Marquis Who's Who in Science and Engineering.

Dr. Qiu is a NACE certified Corrosion Specialist (USA), the only person in Singapore certified to the highest professional level by NACE (National Association of Corrosion Engineers, USA). He is a Chartered Engineer registered with the Engineering Council (UK), a Fellow of the Institute of Corrosion (UK) and a professional member of the Institute of Materials, Minerals and Mining (UK). Dr. Qiu is the Singapore representative in the International Corrosion Council (ICC).