Corrosion Testing & Monitoring

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) 84317015
Fax: (65) 64916456
Email: webcorr@corrosionclinic.com
http://www.corrosionclinic.com

Course Details

Date: 25-27 Apr 2011
Time: 9:00 am to 5:00 pm
Venue: PUB WaterHub
Course Fee: S$1995
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.

Corrosion Testing & Monitoring:
Techniques and Applications

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

Date
25-27 Apr 2011

Venue
PUB WaterHub
80 Toh Guan Road East
Singapore 608575

Organized by:

WebCorr CORROSION CONSULTING SERVICES

Course Overview:

The enormous cost of corrosion to industry can be significantly reduced through effective corrosion testing and monitoring. This corrosion short course aims to present to the technologists and engineers a dozen of corrosion testing and monitoring techniques that can be used to solve many of their most tedious and persistent corrosion problems. This corrosion course will provide the participants with a thorough understanding of the basic principles and the practical applications of some simple yet powerful techniques in corrosion testing and monitoring. For each technique, a step by step guide for performing the corrosion measurements will be described. This 3-day course (with practical session) 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 modern techniques for corrosion testing and monitoring.

Course Contents

This corrosion short course covers a wide range of testing and monitoring techniques from conventional weight loss coupons, ER and LPR to advanced electrochemical impedance spectroscopy (EIS) for routine applications such as rapid screening of corrosion inhibitors, materials selection, failure analysis, corrosion rate measurement, life prediction, evaluation of paints, coatings, electroplating, on-line monitoring of industrial processes, determination of resistance to pitting and crevice corrosion, and the degree of sensitization of stainless steels and alloys.

1. Basics of Corrosion Measurements
   - 1.1 corrosion and society
   - 1.2 the need for corrosion testing and monitoring
   - 1.3 terminology and conventions
   - 1.4 the nature of corrosion process
   - 1.5 classification of corrosion test
   - 1.6 electrochemistry and corrosion

2. Corrosion Testing and Monitoring Techniques
   - 2.1 technique No.1: weight loss coupon
   - 2.2 technique No.2: electrical resistance (ER)
   - 2.3 technique No.3: linear polarization resistance (LPR)
   - 2.4 technique No.4: Tafel polarisation
   - 2.5 technique No.5: potentiodynamic anodic polarisation
   - 2.6 technique No.6: potentiostatic polarisation
   - 2.7 technique No.7: cyclic polarisation for pitting corrosion test
   - 2.8 technique No.8: Electrochemical potentiokinetic reactivation (EPR) for sensitisation test
   - 2.9 technique No.9: ZRA for galvanic corrosion of welded structures/components
   - 2.10 technique No.10: electrochemical impedance spectroscopy (EIS)
   - 2.11 technique No.11: electrochemical noise
   - 2.12 technique No.12: hydrogen monitoring

3. On-Line Corrosion Monitoring
   - 3.1 why use on-line corrosion monitoring
   - 3.2 direct methods of on-line corrosion monitoring
   - 3.3 on-line monitoring components & functions
   - 3.4 principle on-line corrosion monitoring methods
   - 3.5 where & when to use it & how much does it cost

4. Applications of Corrosion Testing and Monitoring Techniques
   - 4.1 quality control, performance evaluation and process optimization of plating bath in lectroplating and electroless plating
   - 4.2 quality control, performance evaluation and process optimization in chromating and anodizing operations
   - 4.3 impedance and admittance measurements on anodized aluminum/magnesium alloys
   - 4.4 performance evaluation, equivalent circuit modeling and life-prediction of organic coatings
   - 4.5 determining the effect of surface preparation, optimal coating thickness, edge effect, coatings delamination

Who Should Attend

This course has been structured in such a way that it is particularly suited for the technologists and engineers who are interested in applications of the state of the art technology in corrosion monitoring and testing to solving their most tedious and persistent corrosion problems. It is also suited for technical personnel whose work involves any of the following: materials evaluation, failure analysis, quality assurance, process control and maintenance.

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).