

On-site and lab investigation



Materials Testing & Corrosion Engineering

Failure Analysis, Risk Assessment, Corrosion Investigation, Mitigation

Featuring:

Dr. Mehrooz Zamanzadeh (Dr. Zee)

Fellow of NACE, Fellow of ASM

NACE Certified Corrosion, Coatings,

Materials Selection and Design

Cathodic Protection Specialist

Exova Pittsburgh

Exova Pittsburgh specializes in root cause failure analysis, materials testing, risk assessment and corrosion engineering. Our NACE certified corrosion and materials engineers offer on-site materials testing, inspection and risk assessment, supported by state-of-the-art laboratory testing, to identify risk or cause of failure.

Our approach enables us to identify underlying problems arising from improper materials choices, processes, environmental factors, fabrication, design, damage, quality control or other concerns.

Our primary corrosion and materials engineer, Dr. Zee, is one of the foremost experts in corrosion, coatings, materials selection/design, and cathodic protection. He is certified by the National Association of Corrosion Engineers in these areas and is an approved NACE Instructor. Our team also includes materials engineers, chemists, electrochemists, and micro-characterization specialists.

Our state-of-the-art materials testing laboratory offers a TESCAN scanning electron microscope (SEM) with 4-lens Wide Field Optics™, Ultra-High-Resolution Digital Image Acquisition with an integrated elemental dispersive system (EDAX); as well an array of other analytical testing equipment.

Exova Pittsburgh is part of Exova, one of the world's leading providers of testing, calibration and advisory services, with over 4500 colleagues in 32 countries worldwide.

Company Services

MATERIALS TESTING & CORROSION ENGINEERING

- In-House Testing Laboratory
- Failure Analysis / Metallurgical Testing
- Paint and Coatings Testing
- SEM/EDS, FTIR, X-Ray Diffraction
- PMI Testing – Niton XRF and OES
- Electrochemical Testing
- Environmental Testing Chambers (MFG, QUV, Salt Spray)
- Petrographic Testing
- Soil Testing
- Polymers Testing

CORROSION RISK ASSESSMENT

- Below Grade Corrosion Detection and Risk Analysis, Minimal Excavation
- Structural Integrity Assessment
- Corrosion Rate Determinations
- Estimated Remaining Life Assessment
- Coatings Assessment
- Corrosion Mapping
- Electrochemical EIS, DC and AC Testing

CATHODIC PROTECTION

- NACE Certified Cathodic Protection Specialist, Engineers & Technicians
- Design, Installation and Monitoring
- Earth Bond Cathodic Protection Testing
- System Wide Cathodic Protection
- Development of CP Criteria / Design
- Internal & External Corrosion Monitoring
- CP Audits and Trouble-Shooting for Underground Assets

CORROSION MITIGATION

- Corrosion Management Programs
- Paint / Coating Selection
- Materials Selection
- Development of Specification Requirements
- Backfill Selection
- Sensor Development
- Corrosion Mitigation Consultation

SPECIAL SERVICES

- Soil Testing
- Coating System Selection for Corrosion Applications

DATA MANAGEMENT & GIS MAPPING

- Safe, secure access to your data in the cloud
- Real time data access
- Integrate with existing GIS and database solution
- Secure communication, global data recovery

Dr. M. Zamanzadeh, Fellow of NACE, Fellow of ASM

NACE Certified Corrosion, Coatings, Materials Selection/Design,
Cathodic Protection Specialist

Degree

- Ph.D., Materials Science & Engineering
- M.S., Materials Science & Engineering
- B.S., Materials Science & Engineering

NACE

- NACE Fellow Award
- NACE Certified Corrosion, Coatings, Materials Selection and Design, Cathodic Protection Specialist
- **NACE Instructor**

Awards

- ASM Fellow Award
- NACE Fellow Award
- Colonel Cox Award
- NACE Outstanding Service Award
- ASM Entrepreneur of the Year Award

Expert

- 35+ Patents
- NACE 60+ Technical Publications
- Speaker: NACE, IEEE, EUCI, EPRI, ASM, AFM, SSPC



“For aging structures, past performance is not an indication of the future.”

Dr. Zee is a NACE Certified Corrosion Specialist with over 25 years of practical experience in corrosion engineering, materials selection and design, protective coatings, and cathodic protection. He has worked in the oil and gas, electric power utility, and other industries throughout his career, and has resolved a wide range of materials and corrosion engineering concerns for these industries including pipeline integrity assessment and failure analysis of pipeline explosions and ruptures. He has served as an expert witness with “wins” exceeding \$41,000,000.00.

Dr. Zee is the Technical Director at Exova Pittsburgh and primary consultant on projects involving the gas and oil industry, electric power and nuclear energy sectors. His expertise includes Setting-Up Corrosion Risk Assessment/Corrosion Mitigation Programs for Large Energy Related Companies; Corrosion Mitigation (Coatings, Cathodic Protection, Corrosion Inhibitors, Materials Selection); Failure Analysis Root Cause Determination; Big Data Analysis; QA/QC Management; Corrosion Engineering Courses (NACE Approved Instructor).

Dr. Zee has a B.S. and M.S. in Materials Science and Engineering and a Ph.D. in Materials Science from Pennsylvania State University. He joined NIOC as a corrosion engineer upon completion of his doctoral work in 1980. In 1985 he joined Carnegie Mellon University in the capacity of a Post-Doctoral Research Associate under a corrosion grant from IBM. He holds four certifications from the National Association of Corrosion Engineers (NACE) Coatings, Materials Selection and Design Specialist and Corrosion Specialist.

Dr. Zamanzadeh is the recipient of the NACE Fellow Award (2008); ASM Fellow Award (2006); NACE Outstanding Service Award (1996), ASM Entrepreneur of the Year Award (2004), and the Colonel Cox Award for the Appalachian Underground Corrosion Short Course (2010).

Recent Technical Publications

1. Fusion Bonded Epoxy (FBE) Coatings and Disbondment: Mehrooz Zamanzadeh, Huiping Xu; NACE International Corrosion Conference 2016, Paper C2016-7246
 2. Galvanized Steel Pole and Lattice Tower Corrosion Assessment and Corrosion Mitigation, Authors: M. Zamanzadeh, C. Kempkes, D. Riley, A. Gilpin-Jackson, NACE International Corrosion Conference 2016, Paper C2016-7245
 3. Corrosion Risk Assessment and Failure Analysis in Industrial Water Systems, Authors: Mehrooz Zamanzadeh, Huiping Xu; NACE International Corrosion Conference 2016, Paper C2016-7248
 4. Corrosion Risk Strategies for Below-Grade Foundations of Transmission and Distribution Structures – Parts 1 and 2. Authors: Zamanzadeh, M; Jackson, Journal Name: Materials Performance March and April, 2014.
 5. Corrosion Risk Strategies for Below-Grade Foundations of Transmission and Distribution Structures – Parts 1 and 2. Authors: Zamanzadeh, M; Jackson, Journal Name: Materials Performance March and April, 2014.
 6. Don't Bury Your Problems. Authors: S. Fagot, M. Zamanzadeh, G. T. Bayer; T&D World, February, 2015
 7. Using Electrochemical Impedance Spectroscopy to Evaluate Corrosion Behavior on Coated Galvanized Steel in Atmospheric and Soil Exposure, Authors: Bayer, G; Zamanzadeh, M, was presented at PACE 2006: The Coatings Expo, Tampa, Florida, January 29-February 1, 2006
 8. Fatigue Failure Analysis Case Studies, Authors: Mehrooz Zamanzadeh, Edward Larkin, Reza Mirshams; Journal of Failure Analysis Prevention, 12/15/15, Issue 6, pp 803-809.
 9. When Paint Fails on Football Stadium Seats, It's Back to the Lab for a Post-Game Analysis, Authors: Bayer, G; Zamanzadeh, M; Journal Name: Coatings Pro; Date: January 2005
 10. Laboratory and Field Investigation of Galvanized Utility Poles, Authors: Zamanzadeh, M; Kempkes, C; Aichinger, D; Riley, D, was presented at the 2006 Electrical Transmission Conference Structural Reliability in a Changing World Birmingham, Alabama, October 15-19, 2006
 11. When Paint Fails on Football Stadium Seats, It's Back to the Lab for a Post-Game Analysis, Authors: Bayer, G; Zamanzadeh, M; Journal Name: Coatings Pro; Date: January 2005
 12. Failure Analysis of Paints and Coatings for Transmission and Distribution (T&D), Pipeline and Utility Structures Case Studies; Authors: Mehrooz Zamanzadeh, George T. Bayer; presented at SSPC Conference 2/5/15
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Patent Examples

1. Method for Protecting Electrical Poles and Galvanized Anchors from Galvanic Corrosion, Zamanzadeh et al. (Patent No. US 9,222.175 B2)
2. Atmospheric Corrosion Sensor (Patent No. US 7678253)
3. Reference Electrode (Patent No. US 7462267)
4. Non-Destructive Testing Apparatus for the Detection of Graphitization of Iron (Patent No. 8154279 B1)

Training Seminar Examples

Kern River Gas Transmission	Corrosion Engineering & Cathodic Protection for Gas Transmission Pipelines
Dominion Cove Pont LNG	Training seminars (4) in Lusby MD for OQ education: corrosion, coatings, materials selection and design, cathodic protections.
Al Hayathem, Kuwait	Training seminars for four oil and gas companies: corrosion, coatings, materials selection and design, cathodic protections.
San Diego Gas a& Electric	Corrosion Risk Assessment and Mitigation T&D Assets
Kansas City Power & Light	Training seminars to plant electricians and electrical engineers: corrosion, coatings, materials selection and design, cathodic protections.

General Information

Registered Company Name: Exova (formerly MATCO Services, Inc.)
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Exova Web Site Pages:

1. <http://www.exova.com/capabilities/corrosion-services/on-site-and-lab-investigation/>
2. <http://www.exova.com/capabilities/corrosion-services/failure-analysis-and-corrosion-investigation/>
3. <http://www.exova.com/capabilities/corrosion-services/inspection-and-risk-assessment/>
4. <http://www.exova.com/capabilities/corrosion-services/cathodic-protection/>

Client Examples

- American Airlines / US Airways
- Eaton Corporation
- Columbia Gas
- Mitsubishi
- Dominion
- Pacific Gas and Electric
- GE Hitachi
- Kern River Gas Transmission
- San Diego Gas & Electric
- NiSource

Key Contacts

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