

Aerospace Metallography and Coating Evaluation Training Program

Course Description

As with any Special Process in the aerospace industry such as welding, brazing, etc., the testing and quality control analysis of the process is critical. Process Engineers need to understand this evaluation process and the interaction with the actual Thermal Spray (TS) Process. The IMR-SE Evaluation of Thermal Spray (TS) Coatings Course is a 5 day course which covers the basic understanding of coating analysis from metallography to tensile and hardness testing. The nuances and pitfalls of each process are covered with correlation to actual TS process parameters. This allows the Process Engineer to correctly interpret the testing data and then confidently plan and implement the TS process solutions to provide consistent and reliable testing data.

Learning Objectives

Upon completion of this course, participants should be able to:

- Comprehend the basics of thermal spray (TS) evaluation and testing
- Focus on the critical nature of each step in the thermal spray testing process and identify needed procedures for each sequence
- Use the tools in the “thermal spray testing toolbox” to solve thermal spray testing issues
- Understand the interaction between the TS testing and spray processes

Who Should Attend

- Thermal Spray Process Engineers and Supervisors

Sincerely,

John P. Sauer P. E.

President and TS Consultant

TRAVEL

IMR Test Labs is located in Lansing, NY – minutes from downtown Ithaca.
The closest airport is Tompkins County Regional Airport (607-257-0808)

Rental Cars: Hertz (607-257-8677)
Avis (607-257-0441)

Syracuse Hancock International Airport has the most flights and carriers to the area on a daily basis and is located about 1 hour from Ithaca.

Shuttle Service: Century Transportation (315-455-5151)
Rental Cars: Hertz (800-654-3131)
Avis (800-331-1212)
Budget (800-527-0700)
Enterprise (800-325-8007)
National (800-227-7326)

Transportation can be provided from the Courtyard Marriott to IMR Test Labs on a daily basis.

ACCOMODATIONS

The Courtyard Marriott is the preferred hotel of IMR Test Labs. Transportation is available to and from IMR each day (notify the front desk if you will be in need of this service). **Please mention discount code 10L when reserving your room.** This is a special rate for IMR Test Labs.

Courtyard by Marriott
29 Thornwood Drive
Ithaca, NY 14850
800-321-2211 / Reservations
800-866-541-3600 / Toll-free
607-330-1000 / Phone
607-330-1500 / Fax
www.marriott.com/ithcy

COST

The cost per student is \$3,500USD. Payment is due in full no later than 30 days prior to the course date. Courses are limited to 10 students. Registrants beyond 10 will be placed on a Stand-by list. All registrants are considered to be on the Stand-by list until payment is received. IMR reserves the right to replace registrants that have not paid by 30 days prior to the course with another Stand-by registrant.

Late registrations or replacements from the Stand-by list, if accepted, require payment in full immediately.

Confirmed registrations canceled more than 30 days prior to the course date are eligible for a full refund minus a \$50USD processing charge.

Confirmed registrations canceled less than 30 days prior to the course date are liable for the full course charge with the option to apply the payment to a future course or transfer the registration to another student of the same company, less a 25% penalty to cover incurred course costs.

Course no-shows are responsible for the full course charge without the option to apply the fee to a future course.

Please note on payment which course you're attending and send payment to:

IMR Test Labs
Box 223765
Pittsburgh, PA 15250-2765

Aerospace Metallography and Coating Evaluation Training Program

Registration Form

Requested Dates: _____

Last Name: _____ First Name: _____ Middle Initial: _____

Job Title: _____ U.S. Citizen: Yes: ___ No: ___

Company Name: _____

Street Address 1: _____

Street Address 2: _____

City: _____ State: _____ Zip: _____

Phone: _____ Alt Phone: _____ Fax: _____

E-mail: _____

Please rate your metallographic laboratory experience on a scale from 1 (no experience) to 10 (great deal of experience).

1 2 3 4 5 6 7 8 9 10

Please rate your technical knowledge of the processing of aerospace coatings on the same scale.

1 2 3 4 5 6 7 8 9 10

Please list any specific issues or topics you are hoping to cover during this course:

Please identify the primary coatings and/or families of coating you deal with on a regular basis:

There will be one-on-one sessions available on Friday afternoon. Please "X" one of the lines below as to whether you are interested in attending.

_____ Yes _____ No

Return this form to Lisa Wackowicz at IMR Test Labs by email (lisa.wackowicz@imrtest.com) or by fax (1-607-533-9210)

Aerospace Metallography and Coating Evaluation Training Program

Course Outline

C – Classroom L – Laboratory

Monday (8:30 – 4:30)

Welcome and Introduction – C

Fundamental Principles of Metallography (Sectioning and Mounting) – C

Lunch

Sectioning and Mounting Lab – L

Fundamental Principles of Metallography (Grinding and Polishing) – C

Tuesday (8:00 – 5:00)

Grinding and Polishing Lab – L

Lunch

Grinding and Polishing Lab (continued) – L

Thermal Spray Process Lecture – C

Wednesday (8:00 – 5:00)

Thermal Spray Coatings Definitions – C

Thermal Spray Coatings Definitions Lab – L

Lunch

Thermal Spray Coatings Evaluation Lab – L

Hardness & Tensile Bond Strength Testing – C

Thursday (8:00 – 5:00)

Thermal Spray Coatings Evaluation – C

Thermal Spray Coatings Definitions and Evaluation Lab – L

Lunch

Thermal Spray Coatings Definitions and Evaluation Lab (continued) – L

Diffusion Coatings Process, Definitions and Evaluation – C

Macro/Microhardness, Tensile Bond Strength Lab – L

Friday (8:00 – 12:00; will run later if staying for one-on-one training)

Diffusion Coatings Evaluation – C

Diffusion Coatings Definitions and Evaluation Lab – L

Lunch

Presentation for Metallographic Preparation Old & New Lessons

Hands-on Group Work

Notes:

STUDENT SAMPLES

Students are encouraged to either bring their own samples of interest to class or provide the samples prior to class for either review by IMR personnel or preparation prior to class.

If samples are provided by the students, individual time can be scheduled for the student to evaluate and review one of their "problem mounts" outside of class hours for individual instruction. This CANNOT be accomplished during class due to proprietary and ITAR restrictions.

LUNCH

Lunch will be provided on a daily basis. Any special dietary considerations should be brought to the attention of Lisa Wackowicz.

Directions to IMR Test Labs

From:

South-East Route 81 (Binghamton)

Take 81 North to Exit 8 Whitney Point. Follow 79 West to downtown Ithaca. Follow 79 around the Ithaca Commons down to Route 13. Turn right on Route 13 North and follow that out of town to the Route 34 Exit (Auburn/Stewart Park). Turn left off of the ramp and continue up 34 North approximately 7 miles. Just after you pass a series of storage buildings you will see the Lansing Business & Technology Park on the right hand side. Take a right onto Cayuga Vista Drive and IMR is at the top of the hill.

North-West NYS Thruway (Buffalo, Rochester)

Take NYS Thruway East to Exit 41 (past 42 which say ITHACA). Pay the toll and take a right off the ramp. When you come to a light take a left on 318 which will take you down to Routes 5 & 20. Take a left on 5/20 east. Travel past the Montezuma Wildlife Refuge and take a right on County Route 90 South. Take 90 S down the east shore of Cayuga Lake until you get to King Ferry. Take a right on Route 34B in King Ferry and follow that all the way to Lansing. When you get to the light in Lansing (Rogues Harbor Inn on the corner) take a right on Route 34 South, and then a left about ½ mile down into Lansing Business & Technology Park. IMR is at the top of Cayuga Vista Drive where it meets Woodsedge Drive.

North 81 (Syracuse)

Take 81 South to Exit 12 - Cortland/Homer. Bear right off of the ramp, and then take a left at the light onto Route 281. Take 281 about 2 miles until you see the PALL Plant on the right (100 yards across RR tracks). Take a right at the Pall Plant onto McLean Road (Rt. 366). Follow McLean Road in to McLean where you will take a right onto Route 34B at the second stop sign (in front of the convenience store). Take 34 all the way to Lansing. When you get to the Lansing 4 corners (convenience store on right) go straight to another stop sign and take a left onto Rt. 34. About 100 yards ahead is Woodsedge Drive. Take a left onto Woodsedge and IMR is all the way at the end on the left.

South Route 13 (Elmira/Corning)

Take Route 13 North to Ithaca and follow that out of town to the Route 34 Exit (Auburn/Stewart Park). Turn left off of the ramp and continue up 34 north approximately 7 miles. Just after you pass a series of storage buildings you will see The Lansing Business & Technology Park on the right hand side. Take a right onto Cayuga Vista Drive and IMR is at the top of the hill.

