

EuroTAC 2009

Meeting Purpose The 6th annual meeting of MTI in Europe was held on April 21-23, 2009 at the Best Western Hotel Park Consul, Cologne, Germany. This report will constitute the minutes of the meeting of EuroTAC 2008.

Date, Time & Place Date: April 21 – 23, 2009
Time: 1:00 – 5:00PM, 8:30AM – 5:00PM, 8:30AM to 2:30PM
Place: Best Western Hotel Park Consul, Cologne, Germany

Participants See "**Attendance Sheet**"

Agenda

April 21, 2009
13.00 Meeting for Project Development Committee on Metal Dusting – lead by María Østergård
The objective is to develop project activity in this area by the European Technical Advisory Council
15.00 Coffee break
17.00 Adjourn
18.00 Dinner in Hotel

April 22, 2009
08.30 Welcome coffee
09.00 – 12.30
3 presentations on sprayed coatings that discuss the following areas:
Corrosion resistance
Quality Control
Difficult to coat geometries
What is the future for coatings

Speakers:
Michel Honoré, M.Sc.Eng., Project Manager, Force Technology
Dr. Lutz-Michael.Berger, Fraunhofer Institute für Werkstoff- und Strahltechnik, Dresden
Dr.-Ing. Thorsten Stoltenhoff, PRAXAIR Surface Technologies GmbH

Panel discussion following the presentations to answer questions by the

attendees.
12.30 Lunch
13.30 NMR for non-destructive analysis of O-rings
Review of MTI Website
15.00 Coffee break
16.00 Discussion of new structure of EuroTAC
19.00 Dinner at Restaurant Früh in Köln.

April 23, 2009

08.30 Welcome Coffee
09.00 Reactive Metal Alloy Seminar
10.30 Coffee break
12.30 Lunch
15.00 Adjourn

April 21, 2009

General

While the attendance was lower than desired, a good meeting was held. There were attendees from 10 MTI Member companies 4 prospective member companies, 3 invited speakers from research organizations in Denmark and Germany, and 1 invited speaker from member Praxair. A second individual from Praxair also made a presentation.

Metal Dusting Project Development

On Tuesday afternoon, the group of attendees functioned as a PDC with metal dusting as the subject. Charlotte Appel, Haldor Topsoe, described the current fundamental metal dusting studies in progress at their company, HTAS (**Attachment A**). Elisabeth Slevoden, StatoilHydro, then presented the research that is being done at Statoil in both the laboratory and in field tests (**Attachment B**). Maria Østergård completed the presentations by describing the work that has been completed at Argonne National Laboratories and reviewed the data collected on the Honeywell samples. She then discussed the current projects that are just commencing to study additional alloys and coatings under the Advanced Metal Dusting programs (179-07 and 188-08) and presented the recent work published by John Hoffman and Sheldon Dean on work at APCI (**Attachment C**). Following the presentations, the group discussed what might be done as a project in addition to the current projects. Christine Geers, Dechema, was invited to participate as she is actively involved in metal dusting programs in Europe.

Based on the presentations made today and those made during the 2008 meeting, the group discussed three potential projects that could be considered for execution in Europe as follows:

A proposal from Dr. David Ferrel, Rowan Technologies, was received following his presentation at EuroTAC 2008. The attendees at this meeting were asked if they knew of any test furnaces where we could perform the proposed test. If successful, this could lead the way to a monitoring system that would alert the operator if Metal Dusting was occurring. No furnace was known to exist but we will continue to look.

A project idea "Surface Modification for Poisoning of Metal Dusting" was suggested by Dechema and supported by HTAS. An SPS has been prepared and it will be presented Haldor Topsoefor approval by my colleague from R&D, Charlotte C. Appel. If we get it approved internally, we will finish the preparation of the SPS and try to start the project.

Another idea was "Coatings Other than the Ones Included in Advanced Metal Dusting Resistant Materials – MTI Project 188-08", may be other application methods such as HVOF or other. The conclusion was that Praxair, Fraunhofer and Force (coating suppliers present in the discussion) will suggest coatings or coating methods, and we will ask Bill Watkins whether they can be included in the Project 188-08 or not. This will need to happen very quickly because project 188-08 has already commenced.

The group needs to form a project team and get a champion for these projects to proceed.

April 22, 2009

Sprayed Coatings

On Wednesday morning there were three invited speakers to discuss the current, state of the art applications of coatings using flame spray techniques. Dr. Lutz-Michael.Berger, Fraunhofer Institute für Werkstoff- und Strahltechnik, Dresden, Germany: Dr. Berger presented an overview of the activities of the Fraunhofer Institute and then presented an overview of flame spray basics. Following that, he presented some R&D focus points for the research at IWS. They are focusing primarily on oxide and hard metal coatings. He closed by discussing some Thermal Spray Coating Opportunities based on their Research. (**Attachment D**)

Dr-Ing. Thorsten Stoltenhoff, Praxair Surface Technologies GmbH, Ratingen, Germany: Dr. Stoltenhoff presented a summary of work done at Praxair on the cold spray process for applying coatings. This process has the ability to apply coatings that would otherwise be highly oxidized during deposition. (**Attachment E**)

Michel Honoré, M.Sc.Eng., Project Manager, FORCE Technology, Denmark: Mr. Honoré presented information on work done at FORCE Technology on the application of laser fusing of deposits that have been applied by thermal spray coating processes. This process develops a coating that has no porosity and can be tailored to fit the requirements of the process. (**Attachment F**)

Dimitrij Danshun, Praxair Surface Technologies GmbH, Ratingen, Germany, also made a short presentation on the deposition of Nickel-Boron coatings for wear resistance. This process is an electroless plating process that develops a much better coating that those previously used. (**Attachment E – Page 34**)

These were good presentations regarding coatings and developed a good discussion about the limitations of coating technology in general. While all of

these coating processes have the ability to alter the surface of a part they have definite size limitations because of the application techniques. We discussed problems with geometries, sizes etc. The attendees were also interested in more practical information such as “is it possible to coat a reactor of 6 – 9 cubic meters in the field”? Also, “do QC procedures exist to allow us to know that the coating is sound and how it will perform in the field?” In an attempt to quantify the capabilities of the various processes it was concluded that a questionnaire would be generated that will help to define the state of the art possibilities and limitations of all processes but mainly the plasma spray process. The responsibility of generating an initial questionnaire was accepted by Tony Scribner. This draft will be circulated among the attendees for the addition of other ideas and comments. Once completed, the questionnaire will be sent to coating suppliers to collect their responses. Once the document is finalized, at least one of the limitations will be identified and the members will be asked if they think MTI should start activities to push the limits. The general consent was that it was worth using MTI's energy and rapid way of working to move the existing borders of the technology.

Action Item: Tony Scribner to draft a preliminary document concerning process limitations

NMR

Dr. Bernhard Blümich, RWTH, Aachen, Germany made a presentation (**Attachment G**) on the uses on NMR (Nuclear Magnetic Resonance) in non-destructive testing. In the past, NMR has required very large magnets and the process was far from portable. Dr. Blümich and his students have developed an NMR device that is smaller and portable. MTI has a potential project to find a technique that will allow a pump shop to determine the identity of an O-ring and avoid costly mistakes. This NMR procedure is a potential technique for that function.

Website Discussion

Maria Ostergard then conducted a visit to the MTI website for the attendees so they could see how to navigate through the current website. We had a fast connection to the Internet so it was possible to demonstrate working with the site. Access to all the buttons on the member page was demonstrated. It was mentioned that a review and update of the website was in progress. There were a few suggestions as to how the site might be improved with a flashier opening screen. There was specific interest in the Technical Awareness Bulletins.

One specific suggestion was that we should add the specialty of each member listed in the directory so that if a member wanted to talk to a polymer specialist, they would be able to go directly to that individual without having to search for the right individual.

New EuroTAC Structure

Because of the action of the Board last year, Michael Turner and Maria Ostergard gave a presentation to explain the new structure to the attendees (**Attachment H**). This new structure was well received and they appreciated the Board action. While there had been negative comments made earlier, it was said that there is a "raison d'être" for MTI in Europe and that EuroTAC meetings should include:

- training sessions for the younger generation, specially within the fields of inspection.
- workshops on relevant issues

Mike Turner was selected to be nominated as the EuroTAC Chair and Maria Østergård for EuroTAC Vice Chair.

Maria indicated that her and Mike would like to form a small group of individuals to assist with organizing and coordinating future EuroTAC meetings and MTI activities in Europe. Two individuals indicated they would consider serving and two others will be recruited. In addition to meeting planning, this group will also help as follows:

Determine European issues of interest

Provide the necessary platform for appropriate project definition and execution

Establish strategies for network strengthening across borders

April 23, 2009

Reactive Metals Seminar

The reactive metal seminar that had originally been presented in 2005 was modified slightly and abbreviated and was presented here. Tony Scribner and Galen Hodge presented a couple of sections each and were assisted by Helmut Diekmann with Bayer, Stéphane Pauly, with Dynamic Materials, and Bo Gillesberg with Tantaline also presented segments. A CD containing the modified presentation will be prepared and sent to each attendee.

Future Meetings

The location and timing of future meetings were discussed. The consensus was that the meetings should continue to be in March or April and the location near to the geographic center of the membership locations. Dechema has, in the past, offered a meeting room for our use and this option will be explored for future meetings.
