Chair’s Message

Welcome into this new year 2019. My wish for you all is good health, and a prosperous new year for you and your families.

Our meeting in January will bring Mr. Efram Abrams from The American Welding Society headquarters in Miami Florida. He is interested in educating all our members, particularly CTE Directors, Deans, Principals and Instructors about resources that are available.

Mr. Abrams is very knowledgeable in Workforce Development / Skill Gaps in Welding, Online courses and Educational Library, The SENSES Program the AWS Academic Access and The AWS Accredited Testing Facility and Certified Welding Program the AWS Institutional Memberships, AWS Student Sections, and last, but not least, AWS Foundation Scholarships and Workforce Development. He has a wealth of information for you to tap into.

Please also feel free to join us at the 4:30 Executive Meeting tp see what we’re doing and join in the conversation.

Hope to see you there.

Larry Abernethy, BASF
AWS NJ Section Chairman
larry.abernethy@basf.com

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January 16th Meeting 6:00pm

Workforce Development/Skills Gap in Welding — and what can be done about it

Speaker: Efram Abrams, Senior Sales Executive, Education and Development Sales, American Welding Society

This presentation will cover:
- Workforce Development/Skills Gap in Welding
- AWS Online Courses and Educational Library
- AWS SENSE Program
- AWS Academic Access (AA)
- AWS Accredited Testing Facility (ATF) and Certified Welder Program
- AWS Educational Institutional Memberships
- AWS Student Sections
- AWS Foundation Scholarships and Workforce Development Grant

It will be an interesting and informative discussion for all those concerned about improving the skills level in the welding industry; and it is ideal for educators (CTE Directors, Deans, Principals, Instructors)

Efram has been with the American Welding Society for over 7 years, first working in the Standards Development department as a secretary to many of the volunteer technical committees tasked with the development and revision of the AWS Welding Specifications, Codes, Recommended Practices and is now responsible for the promotion of the Educational resources that AWS has to offer. Efram works hard to promote welding education and to continuously improve and add to AWS’s educational resources.

—AWS NJ Section News January, 2019—
Identification of Cracks in Weld Sections

This article first appeared in The Weld Nugget newsletter published by WJM Technologies
www.welding-consultant.com
and is used here with permission.

Cracks are probably the worst of all welding defects that can be found in a welded joint as they can start small but grow over time. Cracks can be found in just about every type of weld, solder, or braze joint, and in practically every location including the bond region, HAZ (Heat Affected Zone), and parent metal. There are multiple tools available for detecting cracks including non-destructive techniques such as ultrasound, x-ray, and CT scans, but those techniques are not always applicable for a particular joint design, or can be quite expensive for frequent use.

The most commonly used technique for detecting crack is a metallographic evaluation of the weld. But, that technique has its own problems which makes cracks difficult to detect for multiple reasons which is the focus of this article.

The first is the effect of sample preparation process that can smear material into or over the crack.

Smearing is a common problem, especially in soft alloys such as copper and aluminum; polishing of soft alloys requires practice and is not a trivial operation. Polishing of soft alloys does require mounting the samples with epoxy so that they can be held on fixed plane during polish; polishing has to be performed in gradual decreasing increments of sandpapers grades and then with colloidal ceramic powders such as alumina and diamond. Careful polishing is essential to ensure there is no smearing on the surface where material can get pushed around and end up smothering the crack.

The second reason it is difficult to detect cracks as their appearance is not always like a straight line as is in schematics; but can meander around grain boundaries making it difficult to differentiate between the two. In the absence of any stress trying to open up the crack, the crack width can be very fine and sometimes indistinguishable from grain boundary.

The third reason cracks are difficult to identify is that the metallographic section is a 2-dimensional cut, while the actual crack may have 3-dimensional profile which is only partially captured the plan of sectioning. If you suspect that the crack is bigger than it appears, one option is to keep polishing the section down and track the crack along the z-direction. Cracks can sometimes have path or plane which is aligned

Figure 1 above shows an arc weld before (left) and after etching. The crack, which in this case is a line showing lack of fusion is clearly evident in the un-etched section, but not so obvious in the etched section.

(Continued on page 4)
Identification of Cracks in Weld Sections
by Girish P. Kelkar, Ph.D.

(Continued from page 3)

to a specific orientation as relates to the joint or applied stress and perhaps you may have to section multiple samples along different planes to get a good understanding on the crack morphology.

The final and often the main reason for difficulty in identifying cracks is due to the lack of sufficient contrast in metallographic sections that are often etched before review. Since cracks will often resemble features in a metallograph such as a long grain boundary or a boundary between two phases, some of the finer cracks may be missed altogether.

Hence, I recommend that metallographic sections be photographed twice; first after fine polishing, and then, after etching. A photograph of an un-etched but finely polished section will provide sufficient contrast for positive identification of a crack. Comparison of the un-etched and etched photographs will help identify location and potential reasons for crack formation.

At the Meeting
November 21, 2018
at Pantagis Renaissance, Scotch Plains, NJ

“Past, Present and Future of Construction Production Welding In NJ & NYC Markets”
Seann Bradley, Sr. Sales Engineer
Peter Shapiro, Sales Engineer
The Lincoln Electric Co., Inc.

This interesting and timely presentation discussed past, present and future construction projects. How quality, productivity and safety all play key roles. The great opportunity for the men and women of tomorrow in the welding industry.

Photo courtesy of Vince Murray
AGL Welding Supply Co., Inc.

Figure 2 above shows a laser weld section in similar situation where the crack is more obvious in the un-etched section (left) but not so obvious in the etched section (right).

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Coming Events

AWS NJ Section Meetings are held on the 3rd Wednesday of each month, September through May except for December. Unless otherwise posted, the meeting location is: Pan tags Renaissance/Snuffy’s Clambar, 250 Park Ave., Scotch Plains, NJ.

January 16, 2019 6:00pm
AWS NJ Section Meeting
“Workforce Development / Skills Gap in Welding”
Efram Abrams, Senior Sales Executive, Education & Development Sales, American Welding Society

February 20, 2019 6:00pm
AWS NJ Section Meeting
“D1.5—Repair Procedure”
Paul Lenox, CWI, CW, Field Operations Manager, Owen Steel Company

March 20, 2019 6:00pm
AWS NJ Section Meeting
“Autogenous Welding and the Passivation of Stainless Steel”
Joseph Manfredi, President & CEO, GMP Systems, Inc.

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