



News • Seminars • Events

UP date

TORONTO CHAPTER

Edition 7, Volume 2

Canadian Welding Association - Toronto Chapter

November 2004

Attend our next Event!

Tuesday, November 23, 2004

Royal Woodbine Golf Club, 195 Galaxy Blvd., Etobicoke, Ont

Reception: 3:00 pm, Presentation: 3:30 pm- 5:30 pm, Dinner: 6:00 pm

Please reserve your Dinner Tickets by leaving a message at our Administration Office 905-848-9838 by Monday afternoon, November 22, 2004

Welding Forum

Hugh Krentz, Chairman, CSA W471 Technical Committee

Doug Luciani, General Manager, Canadian Welding Bureau

An unique opportunity to discuss how changes in the welding industry are affecting your business.

The welding industry is changing and it's affecting you. This Welding Forum will be a discussion format and will give you the chance to get answers to your

questions so that you will be able to make the right choices. Come prepared to ask our experts about topics such as welder qualification testing, welding engineer requirements, new welding standards and pre-qualification.

Now's your chance, don't miss it!

The Chair's Message:

Outstanding Awards

The Toronto Chapter was pleased to present Mr. Nicholas Leja, a 4th Year Mechanical Engineering student at the University of Waterloo, with a \$2500 cheque as a scholarship in the memory of Mike Cherry, former President of the Welding Products Manufacturers Association of Canada (WPMAC). We were equally honored to present Mr. Nicholas Lazure, who recently graduated from Northern College's two year Welding Engineering Technician (Inspection) Co-op program, with a \$1000 cheque as the winner of the Northern College Scholarship.

Dear members and colleagues, it was a great honour to kick off the 2004-2005 season by presenting these two awards to two outstanding individuals. We wish them continued success and a bright future in the welding industry.

Simply amazing!

Our first event was an amazing experience in which we were introduced to a new and interesting topic, "UNDERWATER WELDING". What a treat that was! It was unbelievable to watch how a welder can weld underwater probably much better than some welders can do in perfect conditions. We would like to thank the Instructor, Mike Van Oetellar and the Seneca Collage crew for an amazing presentation.

This month we have invited Mr. Hugh Krentz, Chairman of the CSA W47.1 Technical Committee and Mr. Doug Luciani, General Manager of the Canadian Welding Bureau to answer all of your questions and clear up any misunderstandings regarding the changes to the W47 & W59 that are affecting the welding industry. So please attend this Welding Forum and voice your opinion.

We hope to see you in our coming events.

WELCOME TO OUR NEW MEMBERS

William Adams, Toronto
Ralph Alfreds, Oshawa
Brian Atkinson, Scarborough
Marcio Bodnariuc, Mississauga
Arnoldo Bostos, Etobicoke
Dave Campbell, Toronto
Bipin Chauman, Toronto
Gang Chen, Toronto
Shawn Chen, Toronto
Andriy Chomyn, Mississauga
Andy Clarke, Oakville

Liliana Constantinescu, Toronto
Resu Danis, Toronto
David Domingo, Toronto
Dan Galbraith, Milton
Bill Glenn, Weston
Ken Godfrey, Oshawa
Nestor Gula, Toronto
W. L. Hal, Willowdale
Thomas Hearsman, Mississauga
Sarah Hirst, Oakville
Xinzhou Hua, Toronto
Paul Lasota, Markham
Wade Maloney, Oakville
John Meyers, Toronto

Saul Nauhaus, Toronto
Dave Noort, Milton
Steven Potter, Toronto
Joe Profenna, Toronto
Mohammad Rafi, Mississauga
Luke Thomson, Milton
Glenn Tilley, Toronto
Dave Van Velzen, Scarborough
Wojtek Wiercienski, Downsview
Peter Wilson, Toronto
Dave Worden, Oakville
Charles Zhang, Mississauga
Daniel Zulian, Toronto



Next Event

December 2004

CINDE/CWA Joint Christmas Dinner & Dance

Quality Inn, Oakville

For information call 905-848-9838

or visit our web site at www.cwa-acs.org/toronto

EDUCATIONAL INFO:

Gas Metal Arc Welding. What Mode Are You In?

A critical variable in Gas Metal Arc Welding (GMAW) is the Mode of Metal Transfer. The mode of metal transfer required for a specific application can vary based on many factors, including base metal thickness and position. The mode of metal transfer is also affected by the shielding gas and the welding parameters used in the welding procedure.

There are three modes of metal transfer in GMAW: Short-Circuit, Globular and Spray. There are variations on these modes, such as pulsed transfer and rotational spray transfer, but these will not be addressed here.

Canadian Standards Changed

Recently, GMAW mode of transfer has become an issue of increased importance as the two major welding standards in Canada, CSA Standard W47.1 and CSA Standard W59, now include new references to this variable, and these will affect fabricators.

CSA Standard W47.1 now requires welders to hold separate qualifications for the short-circuit mode of transfer and for the globular/spray/pulsed mode of transfer.

CSA Standard W59 has introduced prequalified joints for the GMAW process, but only in the spray transfer mode. Welding procedures in other modes of transfer continue to require qualification.

Short-Circuiting Transfer (GMAW-SC)

In the short-circuit mode, weld metal is transferred from the electrode to the work

piece only during the period when the electrode is in contact with the weld pool. No weld metal is transferred across the arc. When the electrode touches the work piece, the current increases and the molten metal is pinched off and released to the work piece. Then an arc is re-established and the process is repeated.

Welding parameters for this mode of transfer are at their lowest range. This mode of transfer is therefore suited for applications such as thin materials, root passes in pipe or out of position welding. Caution should be exercised when welding thicker materials, as the low heat input characteristic of this mode of transfer can result in fusion problems.

Commonly, 100% CO₂ is used for the short-circuiting mode, and this helps with penetration with the relatively low welding parameters. Additions of Argon to CO₂ can also be used to help control high spatter levels.

Globular Transfer (GMAW-GL)

In the globular mode of transfer, filler metal is transferred across the arc in large droplets. The droplets have diameter larger than the diameter of the filler metal. The large droplet is moved by gravity across the arc, and moves in a non-axial manner.

Welding parameters for this mode of transfer are between those for short-circuit and those for spray. The large droplets and non-axial behavior result in problems with spatter and penetration. It is also only suited for use in the flat position.

Although 100% CO₂ may be used for the globular mode, additions of Argon to CO₂ are common to help control high spatter levels.

Generally speaking, there are few

application where globular transfer can be of benefit.

Spray Transfer (GMAW-SP)

In the spray mode of transfer, filler metal is transferred across the arc in a continuous, directed stream of fine (smaller than the wire diameter) droplets. The movement of metal across the arc is distinct from the globular mode of transfer, in that the droplets are smaller and directed, and the arc is more stable. Also, as opposed to globular where a few drops move across the arc each second, spray transfer involves hundreds of drops per second.

The welding parameters required for spray are higher than for globular. The parameters must be above the "transition current", which varies based on wire diameter and shielding gas.

Spray transfer requires the use of argon-rich shielding gases. In general, a minimum of 85% Argon in CO₂ is required for spray transfer. O₂ is also used in small amounts for arc stabilization and improved wetting of the weld metal.

Spray transfer results in low spatter levels, deep (but relatively narrow) penetration, and high deposition rates. It is well suited for the welding of thicker materials, and can be used out of position.

Summary

The selection of the right mode of transfer is always dependent on your specific application. Knowing what mode you need and what mode you are in is critical whether qualifying your welders, writing your procedures or during production welding.

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