



Update

Edition 5, Volume 3

Canadian Welding Association - Toronto Chapter

March 2003

Plan to Attend our Tour!

Tuesday, March 11, 2003

Babcock & Wilcox (Cambridge)

Bus Departure: 6:00 pm SHARP, Tour starts: 7:00 pm

Bus Pickup: Take HWY 401 to Hurontario Street (HWY 10) in Mississauga. Go north 1 km to the parking lot of the AMC Theatre at Courtneypark Road.

Please reserve your Tour Tickets

by leaving a message at
our Administration Office
905-821-6916 by
Friday March 7, 2003

EVENT

Babcock & Wilcox Tour Cambridge

Babcock & Wilcox Canada (B&W) a subsidiary of The Babcock & Wilcox Company is North America's largest manufacturer of steam generation products and services. B&W have designed, engineered and manufactured some of the worlds largest boilers and are acknowledged as the leading global supplier of fossil fuel boilers. They have been supplying innovative solutions to meet the worlds growing energy needs for over 130 years.

**Reserve Now!
Space is Limited!**

There is a limit of 40 people for the plant tour, please make your reservation as soon as possible by leaving a message at our Administration Office (905) 821 6916

Payment must be made in advance by MasterCard, Visa or Cheque.

(includes Dinner and Bus)

- Members \$30
- Non-Members \$35

Please leave a phone number where you can be contacted.

Earthquake Rattles Thinking and Practice

The February CWA all-day seminar, presented by Duane Millar from Lincoln Electric, Cleveland, enlightened us on the challenges faced by structural engineers and steel fabricators when battling cyclical loads imposed by earthquakes.

The Northridge earthquake provided engineers with new information. Although there were no structural collapses resulting from the cracked welds and connections, the engineering community was very concerned with the associated weld cracking observed in approx. 200 buildings.

An interesting problem discovered following Northridge, was the weld performance inconsistency of lab test samples welded by separate fabricators. It was found that the poor groove weld performance specimens were a result of welding without following any welding procedure and that the welder of 20 years had never seen a welding WPS before. In the US and Canada, many companies have documented welding procedures and welding data sheets (or WPS) sitting in a binder collecting dust. This example shows us that an experienced welder is only one piece of a welded joint puzzle.

Interesting design results and findings from Northridge are reported in numerous FEMA documents that are free to download from their web site www.fema.com.

Next Event

Tuesday, April 15, 2003

Student Appreciation Night

Presentations from University of Waterloo, Northern College and Conestoga College

Contact any Toronto Chapter Board Member for tickets or visit our web site at www.cwa-acs.org/toronto



Electrodes – Designation Changes

Recent changes to the CSA Standard for Electrodes have resulted in many new designations for electrodes and consumables. These changes will appear on the shop floor in the near future as manufacturers apply the new standard.

Classification System for Covered Electrodes for Carbon and Low Alloy Steels

The system used by CSA and AWS standards for classification of carbon steel SMAW electrodes comprises the letter E (denoting an electric arc electrode) followed by four or more digits. For low alloy electrodes, this is followed by a designator defining the chemical analysis of the weld deposit.

For CSA W48-01, the first two digits denote the minimum tensile strength of the deposited weld metal in the as-welded condition in units of mega Pascals (MPa) divided by 10. In the AWS A5.1 US customary units version, the first two digits denote

the minimum tensile strength in ksi (i.e., thousands of pounds per square inch).

For example, in W48-01 the symbol E4918 indicates an electrode with a minimum tensile strength of 490 mega Pascals, whilst US customary

units version, an E7018 indicates that the electrode has a minimum tensile strength of 70 ksi or 70,000 psi (pounds per square inch). Note: the CSA W48 Technical Committee on Welding Electrodes adopted the European system in March 2001. AWS is also considering the European System that uses just two digits to denote strength. Consequently the former E48018 designation has become an E4918. In the new designation the 9 is another adjustment to the European System.

The third digit (i.e. the one following the strength group), gives information on the welding positions in which the electrode may be satisfactorily operated.

- 1 = all positions, except vertical down***
- 2 = flat and horizontal fillets**
- 3 = flat only (no longer used by CSA or AWS)**

* These are the specified (or required) welding positions for the operation of the electrode. A particular electrode may also be capable of welding in the vertical down position.

The final digit, in combination with the positional digit just described, signifies the type of coating on the electrode and the type of electrical current that the electrode is designed for, as follows.....

- EXX10 = cellulose, sodium (dc electrode positive)
- EXX11 = cellulose, potassium (ac or dc electrode positive)
- EXX12 = titania, sodium (ac or dc electrode negative)
- EXX13 = titania, potassium (ac or dc either polarity)
- EXX14 = titania, iron powder (ac or dc either polarity)
- EXX15 = basic, sodium (dc electrode positive)
- EXX16 = basic, potassium (ac or dc electrode positive)
- EXX18 = basic, iron powder (ac or dc electrode positive)
- EXX22 = iron oxide (ac or dc either polarity)
- EXX24 = titania, high iron powder (ac or dc either polarity)
- EXX27 = iron oxide, high iron powder (ac or dc either polarity)
- EXX28 = basic, high iron powder (ac or dc electrode positive)
- EXX48 = basic, iron powder (ac or dc either polarity)

The above where "XX" symbolizes any character allowed by the standard - (For example 49 would mean 490 MPa) gives a condensed description of each of the CSA classifications for carbon steel arc welding electrodes.

Resource:

Extracted from the new Gooderham Centre for Industrial Learning Module 6 "Electrodes and Consumables"

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