

13TH PROVINCIAL SKILLS COMPETITION

2010 SKILLS CANADA NEWFOUNDLAND AND LABRADOR



10

WELDING

Scope Document

Post-Secondary Level

Friday, April 3rd, College of the North Atlantic, PPD Campus – St. John's

Note : Each registered school may enter one competitor

Duration of Contest: 6hours

PURPOSE OF THE CHALLENGE

Assess the contestant's ability in the field of welding. Contestants must demonstrate their knowledge in reading drawings and interpreting welding symbols and mastery of the main welding and cutting processes used in today's industry.

SKILLS AND KNOWLEDGE TO BE TESTED

Based on technical drawings and welding processes, contestants will be assessed on the assembly and welding of projects in all positions, and on cutting exercises.

PRACTICAL

- Oxy-Acetylene Cutting (OAC)
- Shielded Metal Arc Welding (SMAW)
- Gas Metal Arc Welding (GMAW)
- Flux-cored Arc Welding (FCAW)
- Gas Tungsten Arc Welding (GTAW)

NOTE: Flame cutting exercises are to be performed freehand, no guides allowed.

THEORY

The theory portion of the contest is limited to the knowledge required to complete practical work. These knowledge requirements are included in the contest for assessment purposes and involve the following:

- reading drawings
- interpreting welding symbols
- knowledge of basic metals and filler metals

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- adjusting welding machines
- safety regulations

NOTE: All measurements are shown in Metric (mm) only. All orientations, instructions and drawings are to be given in English.

CONTEST DESCRIPTION

The contest is 1 day – 6 hours

TASKS

Oxy-acetylene cutting (OAC) and Welding on mild steel structures:

SMAW:

- 5G pipe or plate
- Root E4310 (E6010) 3.2mm (1/8")
E4311 (E6011) 3.2mm (1/8")
Fill and cap: E4918 (E7018)
2.4 and 3.2mm (3/32 and 1/8")
- Fillets: 2F, 3F, 5F, E4918
3.2 (1/8")

GMAW:

- 2F pipe or plate
- 3F (vertical up)
- 5F
- 1G

FCAW:

- 2F
- 3F

GTAW:

- 2F, 5F

Welding on Stainless Steel and Aluminum structures:

GTAW:

- 2F, 2G, 3G, 3F

JOINTS CAN BE PLATES AND /OR PIPE OR BOTH

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EQUIPMENT, TOOLS, SUPPLIES, CLOTHING

- Low-carbon steel
- Plate thicknesses: 6-9.5mm (1/4-3/8")
- Aluminum and stainless steel
- Plate thickness 3.2mm (1/8)
- Structural shapes: 3.2 – 6.0mm (1/8" – 1/4")
- Pipes: 4.8 – 9.5mm (3/16-3/8") wall
- Diameters: 50 to 100 mm (2" to 4")

Filler Materials

SMAW = E4918 (E7018) 2.4, 3.2 (3/32", 1/8")
E4310 (E6010) 3.2mm (1/8") or E4311 (E6011) 3.2mm (1/8")

GMAW = ER480S-6 (ER70S-6) 0.9mm (0.035")

FCAW= E4801T-9-CH (E71T-1) 1.2mm (0.045")

GTAW= R480S-3 (R70S-3) 3.2 mm and 2.4 mm (1/8" and 3/32")
ER308 or ER316, 1.6 and 2.4mm (1/16" and 3/32")
ER 4043 2.4mm (3/32")

Shielding Gases

GMAW= 75% Ar +25% CO₂

FCAW= 75% Ar +25% CO₂

GTAW = Argon

Tungsten

GTAW= Ceriated tungsten 2.4mm (3/32)
Zirconium tungsten 2.4mm (3/32)

To be provided by the contestant:

- appropriate work clothes
- CSA-approved steel-toed boots
- Welding gloves
- Safety goggles
- Ear plugs or protectors
- Helmet, #10 and/or #11 and /or #12 lens
- Speed lenses are permitted

NOTE: Contestants who do not have the required protective gear will not be allowed to participate in the contest.

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Provided by the organizing committee:

- welding machines and accessories
- mobile OA cutting stations
- #4 or #5 shaded face shields
- drawings and instructions
- all basic materials required to complete projects
- set of practice materials
- all filler materials

Provided by the contestant and is limited to the following tools:

- protective gear listed previously
- measuring tape, millimeters
- soap stone
- centre punch
- cold chisel
- 12" combination square (45° / 90°)
- fillet weld gauge
- OA tip cleaner
- OA striker
- Magnet(s)
- Chipping hammer
- Steel and stainless steel wire brushes
- Needle point compass

In the event of a tie, time will be used to determine the winner. The competitor who finished the project in the least amount of time, will be named the winner.

Technical Committee:

Greg Morey (Chair)	College of the North Atlantic	greg.morey@cna.nl.ca
Bob Quike	Academy Canada	
Sterling Foote	College of the North Atlantic	
Austin Smith	College of the North Atlantic	
Darryl Pike	College of the North Atlantic	