

Provincial Scope Document



WELDING (Post-Secondary) 2024

Note:

Check in time: April 16, 3:00 pm contest area – orientation.

Contest Start: Day 1, April 16, 4 hrs. (4:00pm – 8:00p)

(3 hrs. alloy and 1hr. carbon steel preparation)

Contest Start: Day 2, April 17, 5 hrs. (11:30am – 4:30 pm)

Location- Location- Tradex Abbotsford B.C

April 16-17, 2024.

Sponsors: Lincoln Electric, Barry Hamel, University of the Fraser Valley, Brenco Industries, Cascadia Metals.

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 processes used in today's industry.

Skills & 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

<i>Post-Secondary</i>
Shielded Metal Arc Welding (SMAW).
Gas Metal Arc Welding (GMAW).
Flux-Cored Arc Welding (FCAW).
Gas Tungsten Arc Welding (GTAW).

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 aspects:

<ul style="list-style-type: none">• reading drawings;	<ul style="list-style-type: none">• adjusting welding machines;
<ul style="list-style-type: none">• interpreting welding symbols;	<ul style="list-style-type: none">• safety regulations.
<ul style="list-style-type: none">• knowledge of basic metals and filler metals;	

Note:

All measurements are shown in Metric (mm).

All orientations, instructions and drawings are to be given in English.

Students will be expected to:

- Start and use the welding equipment supplied by the organizer, following the appropriate safety regulations.
- Check that the dimensions of the materials are in accordance with the material list and the prints/drawings.
- Prepare the materials by filing or grinding where appropriate.
- Assemble the materials in accordance with the drawings provided.
- Utilize their practical skills in drawing interpretation, fitting, and welding.
- Demonstrate an ability to read blueprints and interpret welding symbols.
- Have a working knowledge of electrode classification and identification.
- The practical and theoretical components for post-secondary students are based on sections from level 1, 2, and 3 training, and may include SMAW, GTAW, GMAW and FCAW.

Contest Description:

TASKS:

Post-Secondary

Welding on low carbon steel and Alloy structures may include some or all:

SMAW: Plate or pipe

Root: E41010 (E6010) 3.2mm (1/8") dia.

Fill and cap: E48018 (E7018)

3.2mm (1/8") dia.

Fillet: 2F, 3F, 4F, E48018 (E7018)

3.2 and 4.0mm (1/8 and 5/32") dia.

GMAW: 2G pipe or plate

3F (vertical up/down)

5F

1G

FCAW: 2F, 3F,

GTAW: 1G, 2G, 2F, 3F

Welding on Stainless steel or Aluminum, structures may include some or all:

GTAW: 2F, 3F, 5F, 1G, 2G, 3G

JOINTS CAN BE PLATES AND/OR PIPE OR BOTH

Basic Materials:

Post-Secondary

Low- carbon steel, and Aluminum or Stainless Steel:

Plate thicknesses: 3mm - 9.5mm (10ga" - 3/8")

Pipe: Sch 40 or Sch 80

Diameters: 50 to 100mm (2" to 6")

FILLER MATERIALS

SMAW = E43010 (E6010), 3.2 and 4.0 mm (1/8" and 5/32") dia. E49018 (E7018) 3.2 and 4.0mm dia. (1/8" and 5/32")

GMAW = ER490S6 (ER70S6), 0.9mm (0.035") dia.

FCAW = E4901T-9-CH (E71T-1) 1.2mm (0.045"), 1.6 mm (1/16") dia.

GTAW = R490S-3 (R70S-3) 1.6 and 2.4mm
(1/16" and 3/32") dia. E308 or E316, ER
5356, 1.6 and 2.4mm dia. (1/16" and 2.4")
Tungsten electrode: (3/32") dia.

SHIELDING GASES

GMAW = 75% Ar + 25% CO₂;

FCAW = 75% Ar + 25% CO₂;

GTAW = Argon

Safety Requirements:

Safety awareness/requirements will be always maintained within Worksafe BC standards. A contestant will not be allowed to compete without the safety equipment noted on this scope document.

Clothing / Equipment / Tools / Materials

Clothing (to be provided by the contestant):

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

Note: Contestants are expected to follow all safety requirements as per Worksafe BC

Provided by the Skills Canada Provincial Tech Committee

- Drawings and instructions
- All materials required to assemble and complete projects
- Welding machines and accessories Scrap plate
- All filler materials
- Grinders (preparation of materials only)
- Shielding gasses

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

• Protective gear listed previously	• Chipping hammer
• Measuring tape, millimetres and inches	• Steel and SS wire brush
• Soap stone	• dividers
• Lead pencil	• Ball peen hammer
• Centre punch	• All-purpose pliers/side cutters
• Cold chisel	• Vice grips (standard)
• 12" Combination square set	• Magnet(s)
• Fillet weld gauge	• 10 inch mill file, bastard cut
Toolbox to contain the above items	

Judging / Distribution of Marks:

EVALUATION

<i>Post-Secondary</i>
SMAW
GMAW
GTAW
FCAW
GENERAL WORKMANSHIP
SAFETY

Judging will take place at the location on the return shipping label. Judges shall be from industry and educational institutions; however, they will not have a student participating in the competition. 50% of the marks will be based on the carbon steel project and 50% on the alloy project.

ADDITIONAL INFORMATION WILL BE PROVIDED DURING CONTEST ORIENTATION.

Proctors, instructors, etc. are not permitted to speak to their contestants during the competitions.

ALL CONTEST MATERIALS, INCLUDING DRAWINGS MUST REMAIN AT THE CONTEST SITE FOR THE DURATION OF THE CONTEST.

Technical Committee:

BC Technical Chair and Co-chair:

Pat McGurk (Pat.McGurk@ufv.ca)

Matt Olafson (Matt.Olafson@ufv.ca)

Technical Committee members:

Scott Stanley, David Drury, John Sutton, John Jacques

Skills Canada BC reserves the right to update contest information. Please check the website for changes.