



 PIPING INDUSTRY
COLLEGE of B.C.



PROGRAM OUTLINE

WELDER FOUNDATION

Program Outline

Welder - Foundation

Occupation Skills

- Describe Welder Apprenticeship and the Scope of the Trade in BC
- Describe Safe Working Practices
- Perform Basic Trade Related Mathematical Calculations
- Use Measuring and Layout Tools
- Use Hand Tools
- Use Power Tools (Electric and Pneumatic)
- Describe Hoisting, Rigging and Material Handling

Oxy-Fuel Cutting and Gouging Processes (OFC and OFG)

- Describe OFC and OFG Processes and their Applications
- Describe OFC and OFG Equipment and its Operation
- Perform Freehand and Guided Cuts on Low Carbon Steel
- Use Automatic and Semi-Automatic Cutting Machines

Fusion and Braze Welding (TB), Using the Oxy-Fuel (OFW) Process

- Describe Fusion Welding, Braze Welding and Brazing Processes and their Applications
- Describe Fusion Welding, Braze Welding and Brazing Equipment and its Operation
- Describe Filler Metals, Fluxes and Tips Used for Fusion and Braze Welding and Brazing
- Describe Joint Design and Weld Positions
- Fusion Weld on Low Carbon Steel Sheet
- Braze Weld (TB) using the OFW Process
- Silver Alloy Braze on Similar and Dissimilar Metals

Shielded Metal Arc Welding (SMAW)

- Describe the SMAW Process
- Describe SMAW Equipment and its Operation
- Select and Use Electrodes for SMAW
- Describe Basic Joint Design and Weld Positions

Program Outline Welder – Foundation Cont'd.

Describe Weld Faults and Distortion in Fabrications
Use the SMAW Process on Low Carbon Steel Plate and Pipe
Describe Using the Hardsurfacing Process on Mild Steel
Describe Using the SMAW Process on Grey Cast Iron
Describe and Use the SMAW Process on Stainless Steel and/or Mild Steel Plate

Electric Arc Cutting, Gouging and Related Processes

Describe CAC-A, PAC, and SMAC Processes, Equipment and their Applications
Use CAC-A and PAC Cutting and Gouging Processes and Equipment

Semi-Automatic Welding

Describe GMAW, GMAW-P, FCAW and MCAW Processes and their Applications
Describe Semi-Automatic Welding Equipment and its Operation
Describe Filler Metal and Shielding Gases for GMAW
Use the GMAW Process
Use the GMAW-P Process
Use the FCAW Process
Use the MCAW Process

Basic Metallurgy

Describe Production Processes for Manufacturing Metals
Describe Mechanical and Physical Properties of Ferrous and Non-Ferrous Metals
Describe Common Non-Ferrous, Reactive Metals and their Weldability

Welding Drawings

Perform Mathematical Calculations Involving Formulas, Angles, Triangles and Geometric Construction
Perform Basic Drafting
Read and Interpret Drawings
Identify Common Welding Symbols and Bolted Connections

Layout and Fabricate Components

Interpret and Apply Mechanical Drawings
Fabricate Weldments



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Program Outline Welder – Foundation Cont'd.

Submerged Arc Welding (SAW)

Describe SAW Process and its Applications
Select Operating Parameters for the SAW Process
Describe Filler Metals and Fluxes for SAW