

# Welder Harmonized Foundation

## EXAM BREAKDOWN

The following table shows the number of questions per General Area of Competency (GAC) and Competency on the *Welder Harmonized Foundation Exam*.

**Number of questions on each exam: 100**

Foundation GAC/Competency	#
<b>A. OCCUPATIONAL SKILLS</b>	<b>21</b>
A1. Describe welder apprenticeship and the scope of the trade in BC	0
A2. Describe safe working practices	4
A3. Perform basic trade related mathematical calculations	3
A4. Use and maintain measuring and layout tools	2
A5. Use and maintain hand tools	2
A6. Use and maintain power tools (electric and pneumatic)	4
A7. Describe shop materials	1
A8. Apply lifting, hoisting and rigging procedures	5
<b>B. CUTTING AND GOUGING PROCESSES</b>	<b>11</b>
B1. Describe Oxy-Fuel Cutting (OFC) processes and their applications	1
B2. Describe Oxy-Fuel Cutting (OFC) equipment and its operation	2
B3. Perform freehand and guided cuts on low carbon steel (OFC)	3
B4. Use automatic and semi-automatic cutting machines (OFC)	0
B5. Describe CAC-A and PAC processes, equipment and their applications	3
B6. Use CAC-A and PAC cutting and gouging processes and equipment	2
<b>C. FUSION AND BRAZE WELDING (TB) USING THE OXY-FUEL (OFW) PROCESS</b>	<b>2</b>
C1. Describe fusion welding, braze welding and brazing processes and their applications	0
C2. Describe fusion welding, braze welding and brazing equipment and its operation	1
C3. Describe filler metals, fluxes and tips used for fusion welding, braze welding and brazing	1
C4. Describe joint design and weld positions for OFW	0
C5. Fusion weld on low carbon steel sheet	0
C6. Braze weld (TB) using the OFW process	0
C7. Silver alloy braze on similar and dissimilar metals	0
<b>D. SHIELDED METAL ARC WELDING (SMAW)</b>	<b>24</b>
D1. Describe the SMAW process	3

*Welder: Harmonized Foundation Exam Breakdown*

*January 1, 2023*

<b>Foundation GAC/Competency</b>	<b>#</b>
D2. Describe SMAW equipment and its operation	4
D3. Select electrodes for SMAW	5
D4. Describe basic joint design and weld positions for SMAW	3
D5. Describe weld faults and distortion in fabrications in SMAW	4
D6. Use the SMAW process on low carbon steel plate and pipe	4
D7. Use the hardsurfacing process on low carbon steel	1
D8. Describe the SMAW process on grey cast iron	0
D9. Use the SMAW process on stainless steel and/or low carbon steel plate and pipe	0
<b>E. SEMI-AUTOMATIC AND AUTOMATIC WELDING</b>	<b>24</b>
E1. Describe GMAW, GMAW-P, FCAW, MCAW and SAW processes and their applications	3
E2. Describe semi-automatic and automatic welding equipment and its operation	3
E3. Describe filler metal and shielding gases for semi-automatic and automatic processes	4
E4. Use the GMAW and GMAW-P process	5
E5. Use the FCAW process	5
E6. Use the MCAW process	3
E7. Use the SAW process	1
<b>F. GAS TUNGSTEN ARC WELDING (GTAW)</b>	<b>3</b>
F1. Describe the GTAW process and its application	0
F2. Describe GTAW equipment and its operation	1
F3. Describe the application of GTAW for ferrous metals	1
F4. Use the GTAW process for ferrous metals	0
F5. Use the GTAW process for stainless steel	1
<b>H. BASIC METALLURGY</b>	<b>7</b>
H1. Describe production processes for manufacturing metals	1
H2. Describe mechanical and physical properties of ferrous and non-ferrous metals	3
H3. Describe common ferrous, non-ferrous and reactive metals and their weldability	3
<b>I. WELDING DRAWINGS, LAYOUT AND FABRICATION</b>	<b>8</b>
I1. Identify common welding symbols and bolted connections	1
I2. Read and interpret drawings	1
I3. Perform basic drafting	2
I4. Perform mathematical calculations	2
I5. Interpret and apply mechanical drawings and layout components	1
I6. Fabricate weldments	1
I7. Costing and estimating	0
<b>Total:</b>	<b>100</b>

Welder: Harmonized Foundation Exam Breakdown

January 1, 2023