Appendix

Performance Accreditation Tasks

The Performance Accreditation Tasks (PATs) correspond to and support learning objectives in *AWS EG2.0, Curriculum Guide for the Training of Welding Personnel; Level I—Entry Welder*.

PATs provide specific acceptable criteria for performance and help to ensure a true competency-based welding program for students.

The following tasks are designed to evaluate your ability to run stringer beads, weave beads, and overlapping beads. In addition, fillet and V-groove welds must be completed with GMAW equipment in four standard test positions using aluminum filler wire of the appropriate diameter and shielding gas. Perform each task when you are instructed to do so by your instructor. As you complete each task, show it to your instructor for evaluation. Do not proceed to the next task until told to do so. For AWS 2G and 5G certifications, refer to *AWS EG3.0, Guide for the Training and Qualification of Welding Personnel; Level II—Advanced Welder* for bend test requirements. For AWS 6G certifications, refer to *AWS EG4.0, Guide for the Training and Qualification of Welding Personnel; Level III—Expert Welder* for bend test requirements.

PAT 1 has no AWS correlation. PATs 2 through 5 correspond to *AWS EG3.0, Section 3.3.6.2, Unit #2 GMAW, Learning Objective #6*. PATs 6 through 9 correspond to *AWS EG3.0, Section 3.3.6.2, Unit #2 GMAW, Learning Objective #7*.
WELD A PAD ON ALUMINUM PLATE IN THE FLAT (1G) POSITION USING GMAW STRINGER BEADS

As directed by the instructor, use the GMAW process with the appropriate aluminum filler wire to make the following welds on aluminum plate: stringer beads, weave beads, weld restarts, weld terminations, and overlapping beads.

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±\(\frac{1}{16}\)" (1.6 mm)
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No inclusions
- No cracks

NOTE: BASE METAL = ALUMINUM PLATE AT LEAST \(\frac{3}{8}\)" (6 MM) THICK
MAKE MULTIPLE-PASS FILLET WELDS ON ALUMINUM PLATE IN THE FLAT (1F) POSITION

As directed by the instructor, use the GMAW process with the appropriate aluminum wire to make a six-pass fillet weld using stringer beads on aluminum plate, as shown.

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±\( \frac{1}{6} \)" (1.6 mm)
- Smooth flat transition with complete fusion at the toes of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No undercut
- No overlap
- No inclusions

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MAKE MULTIPLE-PASS FILLET WELDS ON ALUMINUM PLATE IN THE HORIZONTAL (2F) POSITION

As directed by the instructor, use the GMAW process with the appropriate aluminum wire to make a six-pass fillet weld using stringer beads on aluminum plate, as shown.

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±1/32" (1.6 mm)
- Smooth flat transition with complete fusion at the toes of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No undercut
- No overlap
- No inclusions

NOTE: BASE METAL = ALUMINUM PLATE AT LEAST 1/4" (6 MM) THICK

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MAKE MULTIPLE-PASS FILLET WELDS ON ALUMINUM PLATE IN THE VERTICAL (3F) POSITION

As directed by the instructor, use the GMAW process with the appropriate aluminum wire to make a six-pass fillet weld using stringer beads on aluminum plate, as shown.

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±\(\frac{1}{16}\)" (1.6 mm)
- Smooth flat transition with complete fusion at the toes of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No undercut
- No inclusions
- No cracks

NOTE: BASE METAL = ALUMINUM PLATE AT LEAST \(\frac{1}{4}\)" (6 MM) THICK
MAKE MULTIPLE-PASS FILLET WELDS ON ALUMINUM PLATE IN THE OVERHEAD (4F) POSITION

As directed by the instructor, use the GMAW process with the appropriate aluminum wire to make a six-pass fillet weld using stringer beads on aluminum plate, as shown.

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±1/6" (1.6 mm)
- Smooth flat transition with complete fusion at the toes of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No undercut
- No inclusions
- No cracks
MAKE MULTIPLE-PASS V-GROOVE WELDS ON ALUMINUM PLATE WITH BACKING IN THE FLAT (1G) POSITION

As directed by the instructor, use the GMAW process with the appropriate aluminum wire to make a multiple-pass groove weld using stringer beads on aluminum plate with backing, as shown.

NOTE: BASE METAL, ALUMINUM PLATE  
1/4" – 1/2" (6 – 12 MM) THICK

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No overlap
- No inclusions
- No cracks
 MAKE MULTIPLE-PASS V-GROOVE WELDS ON ALUMINUM PLATE WITH BACKING IN THE HORIZONTAL (2G) POSITION

As directed by the instructor, use the GMAW process with the appropriate aluminum wire to make a multiple-pass groove weld on aluminum plate with a 1" (25 mm) backing, as shown. Either joint design may be used for the 2G position, at the discretion of the instructor.

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No overlap
- No inclusions
- No cracks
MAKE MULTIPLE-PASS V-GROOVE WELDS ON ALUMINUM PLATE WITH BACKING IN THE VERTICAL (3G) POSITION

As directed by the instructor, use the GMAW process with the appropriate aluminum wire to make a multiple-pass groove weld on aluminum plate with a 1" (25 mm) backing, as shown.

Note: Run the root vertical up.

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No overlap
- No inclusions
- No cracks

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MAKE MULTIPLE-PASS V-GROOVE WELDS ON ALUMINUM PLATE WITH BACKING IN THE OVERHEAD (4G) POSITION

As directed by the instructor, use the GMAW process with the appropriate aluminum wire to make a multiple-pass groove weld on aluminum plate with a 1" (25 mm) backing, as shown.

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No overlap
- No inclusions
- No cracks

NOTE: BASE METAL, ALUMINUM PLATE AT LEAST ¼" (6 MM) THICK

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PERFORMANCE ACCREDITATION TASKS

The Performance Accreditation Tasks (PATs) correspond to and support learning objectives in *AWS EG3.0, Guide for the Training and Qualification of Welding Personnel: Level II—Advanced Welders*. PATs provide specific acceptable criteria for performance and help to ensure a true competency-based welding program for students.

The following tasks are designed to evaluate your ability to run V-groove welds with GMAW equipment in three standard test positions using aluminum filler wire of the appropriate diameter and shielding gas. Perform each task when you are instructed to do so. As you complete each task, show it to your instructor for evaluation. Do not proceed to the next task until told to do so. For AWS 2G and 5G certifications, refer to *AWS EG3.0, Guide for the Training and Qualification of Welding Personnel; Level II—Advanced Welder* for bend test requirements. For AWS 6G certifications, refer to *AWS EG4.0, Guide for the Training and Qualification of Welding Personnel; Level III—Expert Welder* for bend test requirements.

PATs 1 and 2 have no AWS correlation. PAT 3 corresponds to *AWS EG4.0, Section 3.3.6.3, Unit #3 GMAW, Learning Objective #8 (6G).*
V-GROOVE WELDS ON ALUMINUM PIPE WITH BACKING IN THE 2G POSITION

Using aluminum filler wire of the appropriate diameter, proper shielding gas, and stringer beads make V-groove welds on aluminum pipe in the 2G position.

Criteria for Acceptance:

- Uniform appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Acceptable weld profile in accordance with the applicable codes and standards
- Smooth transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No underfill
- No cracks
- No overlap
- No incomplete fusion
V-GROOVE WELDS ON ALUMINUM PIPE WITH BACKING IN THE 5G POSITION

Using aluminum filler wire of the appropriate diameter, proper shielding gas, and stringer or weave beads, make V-groove welds on aluminum pipe in the 5G position.

Criteria for Acceptance:
• Uniform appearance on the bead face
• Craters and restarts filled to the full cross section of the weld
• Acceptable weld profile in accordance with the applicable codes and standards
• Smooth transition with complete fusion at the toes of the weld
• No porosity
• No undercut
• No underfill
• No cracks
• No overlap
• No incomplete fusion
V-groove welds on aluminum pipe with backing in the 6G (or 6GR) position

Using aluminum filler wire of the appropriate diameter, proper shielding gas, and stringer beads, make V-groove welds on aluminum pipe in the 6G (or 6GR) position.

**Criteria for Acceptance:**

- Uniform appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Acceptable weld profile in accordance with the applicable codes and standards
- Smooth transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No underfill
- No cracks
- No overlap
- No incomplete fusion

**NOTE:** If required for qualification purposes, a restricting ring may be added to the 6G position coupon to form a 6GR position coupon.

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Performance Accreditation Tasks

The Performance Accreditation Tasks (PATs) correspond to and support learning objectives in the *AWS EG2.0, Curriculum Guide for the Training of Welding Personnel; Level I—Entry Welder*.

PATs provide specific acceptable criteria for performance and help to ensure a true competency-based welding program for students.

The following tasks are designed to evaluate your ability to run stringer beads, weave beads, overlapping beads, and to make fillet and multiple-pass V-groove plate welds with GTAW equipment in four standard test positions using an aluminum filler wire of the appropriate diameter and shielding gas. Perform each task when you are instructed to do so.

As you complete each task, show it to your instructor for evaluation. Do not proceed to the next task until told to do so by your instructor. For AWS 3F and 4F certifications, as well as 2G, 3G, and 4G certifications, refer to *AWS EG3.0, Guide for the Training and Qualification of Welding Personnel; Level II—Advanced Welder* for bend test requirements.

PAT 1 has no direct AWS correlation. PATs 2 and 3 correspond to *AWS EG2.0, 3.3.1, Module 7, Key Indicator 15 (1F and 2F)*. PATs 4 and 5 correspond to *AWS 3.0, 3.3.6.4, Unit #4, GTAW, Learning Objective #6 (3F and 4F)*. PAT 6 corresponds to *AWS EG2.0, 3.3.1, Module 7, Key Indicator 16 (1G)*. PATs 7 through 9 correspond to *AWS EG3.0, 3.3.6.4, Unit #4, GTAW, Learning Objective #7 (2G, 3G, and 4G)*.
WELD A PAD ON ALUMINUM PLATE IN THE FLAT (1G) POSITION USING GTAW STRINGER BEADS

As directed by the instructor, use the GTAW process with the appropriate aluminum filler wire to make the following welds on aluminum plate: stringer beads, weave beads, weld restarts, weld terminations, and overlapping beads.

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±1/64" (1.6 mm)
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No inclusions
- No cracks
MAKE MULTIPLE-PASS FILLET WELDS ON ALUMINUM PLATE IN THE FLAT (1F) POSITION

As directed by the instructor, use the GTAW process with the appropriate aluminum wire to make a six-pass fillet weld using stringer beads on aluminum plate, as shown.

Criteria for Acceptance:
- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±\(\frac{1}{16}\)" (1.6 mm)
- Smooth flat transition with complete fusion at the toes of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No undercut
- No overlap
- No inclusions
- No cracks

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As directed by the instructor, use the GTAW process with the appropriate aluminum wire to make a six-pass fillet weld using stringer beads on aluminum plate, as shown.

**Criteria for Acceptance:**

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±1/16" (1.6 mm)
- Smooth flat transition with complete fusion at the toes of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No undercut
- No overlap
- No inclusions
- No cracks

**NOTE:** BASE METAL = ALUMINUM PLATE AT LEAST 1⁄4" (6 MM) THICK
MAKE MULTIPLE-PASS FILLET WELDS ON ALUMINUM PLATE IN THE VERTICAL (3F) POSITION

As directed by the instructor, use the GTAW process with the appropriate aluminum wire to make a six-pass fillet weld using stringer beads on aluminum plate, as shown.

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±1/64" (1.6 mm)
- Smooth flat transition with complete fusion at the toes of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No undercut
- No overlap
- No inclusions
- No cracks

NOTE: BASE METAL = ALUMINUM PLATE AT LEAST 1/8" (6 MM) THICK

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MAKE MULTIPLE-PASS FILLET WELDS ON ALUMINUM PLATE IN THE OVERHEAD (4F) POSITION

As directed by the instructor, use the GTAW process with the appropriate aluminum wire to make a six-pass fillet weld using stringer beads on aluminum plate, as shown.

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±1/16" (1.6 mm)
- Smooth flat transition with complete fusion at the toes of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No undercut
- No overlap
- No inclusions
- No cracks

NOTE: BASE METAL = ALUMINUM PLATE AT LEAST 1/4" (6 MM) THICK
MAKE MULTIPLE-PASS V-GROOVE WELDS ON ALUMINUM PLATE WITH BACKING IN THE FLAT (1G) POSITION

As directed by the instructor, use the GTAW process with the appropriate aluminum wire to make a multiple-pass groove weld using stringer beads on aluminum plate with backing, as shown.

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No overlap
- No inclusions
- No cracks
MAKE MULTIPLE-PASS V-GROOVE WELDS ON ALUMINUM PLATE WITH BACKING IN THE HORIZONTAL (2G) POSITION

As directed by the instructor, use the GTAW process with the appropriate aluminum wire to make a multiple-pass groove weld on aluminum plate with backing, as shown.

Criteria for Acceptance:
- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No overlap
- No inclusions
- No cracks
MAKE MULTIPLE-PASS V-GROOVE WELDS ON ALUMINUM PLATE WITH BACKING IN THE VERTICAL (3G) POSITION

As directed by the instructor, use the GTAW process with the appropriate aluminum wire to make a multiple-pass groove weld on aluminum plate with backing, as shown.

Note: Run the root vertical up.

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No overlap
- No inclusions
- No cracks

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MAKE MULTIPLE-PASS V-GROOVE WELDS ON ALUMINUM PLATE WITH BACKING IN THE OVERHEAD (4G) POSITION

As directed by the instructor, use the GTAW process with the appropriate aluminum wire to make a multiple-pass groove weld on aluminum plate with backing, as shown.

Criteria for Acceptance:

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No overlap
- No inclusions
- No cracks

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PERFORMANCE ACCREDITATION TASKS

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PATs provide specific acceptable criteria for performance and help to ensure a true competency-based welding program for students.

The following tasks are designed to evaluate your ability to run groove welds on aluminum pipe with GTAW equipment in three standard test positions, using an aluminum filler rod of the appropriate diameter and argon shielding gas. Perform each task when you are instructed to do so. As you complete each task, show it to your instructor for evaluation. Do not proceed to the next task until told to do so. For AWS 2G and 5G certifications, refer to *AWS EG3.0, Guide for the Training and Qualification of Welding Personnel; Level II—Advanced Welder* for bend test requirements. For AWS 6G certifications, refer to *AWS EG4.0, Guide for the Training and Qualification of Welding Personnel; Level III—Expert Welder* for bend test requirements.

PATs 1 and 2 correspond to *AWS EG3.0, 3.3.6.4, Unit #4, GTAW, Learning Objective #14 (2G and 5G). PAT 3 corresponds to *AWS EG3.0, 3.3.6.5, Unit #5, GTAW, Learning Objective #12.*
MODIFIED U-GROOVE WELDS ON ALUMINUM PIPE IN THE 2G POSITION

As directed by the instructor, use the GTAW process with the appropriate aluminum filler wire, argon shielding gas, and stringer beads to make a multiple-pass groove weld on aluminum pipe in the 2G position.

Criteria for Acceptance:

- Uniform appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Acceptable weld profile in accordance with the applicable codes and standards
- Smooth transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No cracks
- No overlap
- No incomplete fusion
As directed by the instructor, use the GTAW process with the appropriate aluminum filler wire, argon shielding gas, and stringer beads to make a multiple-pass groove weld on aluminum pipe in the 5G position.

**Criteria for Acceptance:**

- Uniform appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Acceptable weld profile in accordance with the applicable codes and standards
- Smooth transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No cracks
- No overlap
- No incomplete fusion
As directed by your instructor, use the GTAW process with the appropriate aluminum filler wire, argon shielding gas, and stringer beads to make a multiple-pass groove weld on aluminum pipe in the 6G (or 6GR) position.

Criteria for Acceptance:

- Uniform appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Acceptable weld profile in accordance with the applicable codes and standards
- Smooth transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No cracks
- No overlap
- No incomplete fusion

NOTE: IF REQUIRED FOR QUALIFICATION PURPOSES, A RESTRICTING RING MAY BE ADDED TO THE 6G POSITION COUPON TO FORM A 6GR POSITION COUPON.