PERFORMANCE ACCREDITATION TASKS

The Performance Accreditation Tasks (PATs) correspond to and support the learning objectives in AWS EG2.0, Curriculum Guide for the Training of Welding Personnel: Level 1 – 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 fillet and groove welds with GMAW equipment. Perform each task when you are instructed to do so by the instructor. As you complete each task, show it to the instructor for evaluation. Do not proceed to the next task until instructed to do so by the instructor.

Have trainees complete PAT 1 through PAT 8, according to the acceptance criteria.

PAT 1, Make a Fillet Weld in the (1F) Flat Position. This task corresponds to AWS EG2.0, Module 5, Gas Metal Arc Welding (GMAW-S, GMAW), Key Indicators 5 and 7.

PAT 2, Make a Fillet Weld in the (2F) Horizontal Position. This task corresponds to AWS EG2.0, Module 5, Gas Metal Arc Welding (GMAW-S, GMAW), Key Indicators 5 and 7.

PAT 3, Make a Fillet Weld in the (3F) Vertical Position. This task corresponds to AWS EG2.0, Module 5, Gas Metal Arc Welding (GMAW-S, GMAW), Key Indicators 5 and 7.

PAT 4, Make a Fillet Weld in the (4F) Overhead Position. This task corresponds to AWS EG2.0, Module 5, Gas Metal Arc Welding (GMAW-S, GMAW), Key Indicators 5 and 7.

PAT 5, Make a Groove Weld, With or Without Backing, in the (1G) Flat Position. This task corresponds to AWS EG2.0, Module 5, Gas Metal Arc Welding (GMAW-S, GMAW), Key Indicators 6 and 11.

PAT 6, Make a Groove Weld, With or Without Backing, in the (2G) Horizontal Position. This task corresponds to AWS EG2.0, Module 5, Gas Metal Arc Welding (GMAW-S, GMAW), Key Indicators 6 and 11.

PAT 7, Make a Groove Weld, With or Without Backing, in the (3G) Vertical Position. This task corresponds to AWS EG2.0, Module 5, Gas Metal Arc Welding (GMAW-S, GMAW), Key Indicators 6 and 11.

PAT 8, Make a Groove Weld, With or Without Backing, in the (4G) Overhead Position. This task corresponds to AWS EG2.0, Module 5, Gas Metal Arc Welding (GMAW-S, GMAW), Key Indicators 6 and 11.
MAKE A FILLET WELD IN THE (1F)
FLAT POSITION

As directed by the instructor, use GMAW with carbon steel solid electrodes and appropriate shielding gas to make a six-pass fillet weld using stringer beads on carbon steel plate, as shown.

NOTES:
BASE METAL THICKNESS IS AT
THE INSTRUCTOR’S DISCRETION

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 welds
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No undercut
- No overlap
- No inclusions
MAKE A FILLET WELD IN THE (2F) HORIZONTAL POSITION

As directed by the instructor, use GMAW with carbon steel solid electrodes and appropriate shielding gas to make a six-pass fillet weld using stringer beads on carbon steel 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 welds
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No undercut
- No overlap
- No inclusions

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MAKE A FILLET WELD IN THE (3F) VERTICAL POSITION

As directed by the instructor, use GMAW with carbon steel solid electrodes and appropriate shielding gas to make a vertical fillet weld on carbon steel 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)
- 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
Performance Accreditation Tasks

Module 29209-15

MAKE A FILLET WELD IN THE (4F)
OVERHEAD POSITION

As directed by the instructor, use GMAW with carbon steel solid electrodes and appropriate shielding gas to make a six-pass fillet weld using stringer beads on carbon steel plate, as shown.

NOTE: BASE METAL THICKNESS IS AT THE INSTRUCTOR’S DISCRETION

<table>
<thead>
<tr>
<th>Criteria for Acceptance:</th>
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<tbody>
<tr>
<td>• Uniform rippled appearance on the bead face</td>
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<td>• No inclusions</td>
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<td>• No cracks</td>
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</table>

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Performance Accreditation Tasks

MAKE A GROOVE WELD, WITH OR WITHOUT BACKING, IN THE (1G) FLAT POSITION

As directed by the instructor, use GMAW with carbon steel solid electrodes and appropriate shielding gas to make a multiple-pass groove weld using stringer beads on carbon steel plate, with or without 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
- Uniform weld width ±1/16" (1.6 mm)
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth transition with complete fusion at the toes of the weld
- Complete joint penetration with uniform root and face reinforcement at least flush with the base metal to a maximum buildup of 1/8" (3.2 mm), if applicable
- No porosity
- No undercut
- No inclusions
- No cracks

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MAKE A GROOVE WELD, WITH OR WITHOUT BACKING, IN THE (2G) HORIZONTAL POSITION

As directed by the instructor, use GMAW with carbon steel solid electrodes and appropriate shielding gas to make a multiple-pass groove weld on carbon steel plate, with or without 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
- Uniform weld width ±\(\frac{1}{6}''\) (1.6 mm)
- Acceptable weld profile in accordance with the applicable code or standard
- Complete joint penetration with uniform root and face reinforcement at least flush with the base metal to a maximum buildup of \(\frac{1}{8}''\) (3.2 mm), if applicable
- Smooth transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No inclusions
- No cracks

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MAKE A GROOVE WELD, WITH OR WITHOUT BACKING, IN THE (3G) VERTICAL POSITION

As directed by the instructor, use GMAW with carbon steel solid electrodes and appropriate shielding gas to make a multiple-pass groove weld on carbon steel plate, with or without 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
- Uniform weld width ±\(\frac{1}{32}\)" (1.6 mm)
- Acceptable weld profile in accordance with the applicable code or standard
- Complete joint penetration with uniform root and face reinforcement at least flush with the base metal to a maximum buildup of \(\frac{1}{8}\)" (3.2 mm), if applicable
- Smooth transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No inclusions
- No cracks

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MAKE A GROOVE WELD, WITH OR WITHOUT BACKING, IN THE (4G) OVERHEAD POSITION

As directed by the instructor, use GMAW with carbon steel solid electrodes and appropriate shielding gas to make a multiple-pass groove weld on carbon steel plate, with or without 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
- Uniform weld width ±1/16" (1.6 mm)
- Acceptable weld profile in accordance with the applicable code or standard
- Complete joint penetration with uniform root and face reinforcement at least flush with the base metal to a maximum buildup of 1/8" (3.2 mm), if applicable
- Smooth transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No inclusions
- No cracks

NOTE: BASE METAL THICKNESS IS AT THE INSTRUCTOR'S DISCRETION
Appendix

Performance Accreditation Tasks

The Performance Accreditation Tasks (PATs) correspond to and support the learning objectives in *AWS EG2.0, Curriculum Guide for the Training of Welding Personnel: Level 1 – 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 fillet and groove welds with FCAW equipment. 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 instructed to do so by your instructor.

Have trainees complete PAT 1 through PAT 8, according to the acceptance criteria.

PAT 1, Make a Fillet Weld in the (1F) Flat Position. This task corresponds to *AWS EG2.0, Module 6, Flux-Cored Arc Welding (FCAW-G, FCAW)*, Key Indicators 5, 7, 10, and 12.

PAT 2, Make a Fillet Weld in the (2F) Horizontal Position. This task corresponds to *AWS EG2.0, Module 6, Flux-Cored Arc Welding (FCAW-G, FCAW)*, Key Indicators 5, 7, 10, and 12.

PAT 3, Make a Fillet Weld in the (3F) Vertical Position. This task corresponds to *AWS EG2.0, Module 6, Flux-Cored Arc Welding (FCAW-G, FCAW)*, Key Indicators 5, 7, 10, and 12.

PAT 4, Make a Fillet Weld in the (4F) Overhead Position. This task corresponds to *AWS EG2.0, Module 6, Flux-Cored Arc Welding (FCAW-G, FCAW)*, Key Indicators 5, 7, 10, and 12.

PAT 5, Make a Groove Weld, with or without Backing, in the (1G) Flat Position. This task corresponds to *AWS EG2.0, Module 6, Flux-Cored Arc Welding (FCAW-G, FCAW)*, Key Indicators 6 and 11.

PAT 6, Make a Groove Weld, with or without Backing, in the (2G) Horizontal Position. This task corresponds to *AWS EG2.0, Module 6, Flux-Cored Arc Welding (FCAW-G, FCAW)*, Key Indicators 6 and 11.

PAT 7, Make a Groove Weld, with or without Backing, in the (3G) Vertical Position. This task corresponds to *AWS EG2.0, Module 6, Flux-Cored Arc Welding (FCAW-G, FCAW)*, Key Indicators 6 and 11.

PAT 8, Make a Groove Weld, with or without Backing, in the (4G) Overhead Position. This task corresponds to *AWS EG2.0, Module 6, Flux-Cored Arc Welding (FCAW-G, FCAW)*, Key Indicators 6 and 11.
MAKE A FILLET WELD IN THE (1F) FLAT POSITION

As directed by the instructor, use FCAW with flux-cored electrodes and, if required, the appropriate shielding gas to make a six-pass fillet weld using stringer beads on carbon steel 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 welds
• Acceptable weld profile in accordance with the applicable code or standard
• No porosity
• No undercut
• No overlap
• No inclusions
MAKE A FILLET WELD IN THE (2F) HORIZONTAL POSITION

As directed by the instructor, use FCAW with flux-cored electrodes and, if required, the appropriate shielding gas to make a six-pass fillet weld using stringer beads on carbon steel 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 ±1/8" (1.6 mm)
- Smooth flat transition with complete fusion at the toes of the welds
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No undercut
- No overlap
- No inclusions
MAKE A FILLET WELD IN THE (3F) VERTICAL POSITION

As directed by the instructor, use FCAW with flux-cored electrodes and, if required, the appropriate shielding gas to make a vertical fillet weld on carbon steel 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)
- 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

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MAKE A FILLET WELD IN THE (4F) OVERHEAD POSITION

As directed by the instructor, use FCAW with flux-cored electrodes and, if required, appropriate shielding gas to make a six-pass fillet weld using stringer beads on carbon steel 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)
- 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

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MAKE A GROOVE WELD, WITH OR WITHOUT BACKING, IN THE (1G) FLAT POSITION

As directed by the instructor, use FCAW with flux-cored electrodes and, if required, the appropriate shielding gas to make a multiple-pass groove weld using stringer beads on carbon steel plate, with or without 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
- Uniform weld width ±1/16" (1.6 mm)
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth transition with complete fusion at the toes of the weld
- Complete joint penetration with uniform root and face reinforcement at least flush with the base metal to a maximum buildup of 1/8" (3.2 mm), if applicable
- No porosity
- No undercut
- No inclusions
- No cracks

NOTE: BASE METAL THICKNESS IS AT THE INSTRUCTOR'S DISCRETION

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Performance Accreditation Tasks

MAKE A GROOVE WELD, WITH OR WITHOUT BACKING, IN THE (2G) HORIZONTAL POSITION

As directed by the instructor, use FCAW with flux-cored electrodes and, if required, the appropriate shielding gas to make a multiple-pass groove weld on carbon steel plate, with or without 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
- Uniform weld width ±\(\frac{1}{16}\)" (1.6 mm)
- Acceptable weld profile in accordance with the applicable code or standard
- Complete joint penetration with uniform root and face reinforcement at least flush with the base metal to a maximum buildup of \(\frac{3}{8}\)" (3.2 mm), if applicable
- Smooth transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No inclusions
- No cracks

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MAKE A GROOVE WELD, WITH OR WITHOUT BACKING, IN THE (3G) VERTICAL POSITION

As directed by the instructor, use FCAW with flux-cored electrodes and, if required, the appropriate shielding gas to make a multiple-pass groove weld on carbon steel plate, with or without 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
- Uniform weld width ±1/16" (1.6 mm)
- Acceptable weld profile in accordance with the applicable code or standard
- Complete joint penetration with uniform root and face reinforcement at least flush with the base metal to a maximum buildup of 1/8" (3.2 mm), if applicable
- Smooth transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No inclusions
- No cracks
MAKE A GROOVE WELD, WITH OR WITHOUT BACKING, IN THE (4G) OVERHEAD POSITION

As directed by the instructor, use FCAW with flux-cored electrodes and, if required, the appropriate shielding gas to make a multiple-pass groove weld on carbon steel plate, with or without 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
- Uniform weld width ±1/16" (1.6 mm)
- Acceptable weld profile in accordance with the applicable code or standard
- Complete joint penetration with uniform root and face reinforcement at least flush with the base metal to a maximum buildup of 1/8" (3.2 mm), if applicable
- Smooth transition with complete fusion at the toes of the weld
- No porosity
- No undercut
- No inclusions
- No cracks

NOTE: BASE METAL THICKNESS IS AT THE INSTRUCTOR’S DISCRETION

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NOTE to SENSE instructors: The AWS SENSE program also requires welding activities on aluminum and stainless steel base metals. This module does not support aluminum and stainless steel welding.

PATs 1 through 5 correspond to *AWS EG2.0, Module 7, Gas Tungsten Arc Welding (GTAW)*, Key Indicators 1, 3, 4, and 5.

PATs 6 through 9 correspond to *AWS EG2.0, Module 7, Gas Tungsten Arc Welding (GTAW)*, Key Indicators 1, 3, 4, and 6.
WELD A PAD ON CARBON STEEL PLATE IN THE FLAT POSITION USING GTAW STRINGER BEADS

As directed by the instructor, use GTAW process with carbon steel filler metal to build a pad on a carbon steel coupon in the flat position.

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 = CARBON STEEL PLATE AT LEAST \(\frac{1}{4}\)" (6 MM) THICK

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MAKE MULTIPLE-PASS FILLET WELDS ON CARBON STEEL PLATE IN THE (1F) FLAT POSITION

As directed by the instructor, use GTAW process with carbon steel filler metal to make a six-pass fillet weld using stringer beads on carbon steel 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 ± 1/8" (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 welds
- No porosity
- No undercut
- No overlap
- No inclusions
- No cracks

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

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Performance Accreditation Tasks

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

As directed by the instructor, use GTAW process with carbon steel solid filler metal to make a six-pass fillet weld using stringer beads on carbon steel 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)
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the welds
- No porosity
- No undercut
- No overlap
- No inclusions
- No cracks

NOTE: BASE METAL = CARBON STEEL PLATE AT LEAST 1/4” (6 MM) THICK

BEAD SEQUENCE
As directed by the instructor, use GTAW process with carbon steel filler metal to make a vertical fillet weld on carbon steel 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 ±\( \frac{1}{32} \)" (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 welds
- No porosity
- No undercut
- No inclusions
- No cracks

**NOTE:** BASE METAL = CARBON STEEL PLATE AT LEAST \( \frac{1}{4} " \) (6 MM) THICK

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As directed by the instructor, use GTAW process with carbon steel filler metal to make a six-pass fillet weld using stringer beads on carbon steel 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)
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the welds
- No porosity
- No undercut
- No inclusions
- No cracks
MAKE MULTIPLE-PASS OPEN V-GROOVE WELDS ON CARBON STEEL PLATE IN THE FLAT (1G) POSITION

As directed by the instructor, use GTAW process with carbon steel filler metal to make multiple pass open V-groove welds on carbon steel plate in the flat (1G) position, 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 size ±1/16" (1.6 mm)
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth transition with complete fusion at the toes of the weld
- Complete uniform root and face reinforcement at least flush with the base metal to a maximum buildup of 1/4" (3.2 mm)
- No porosity
- No overlap
- No undercut
- No inclusions
- No cracks
- No pinholes

NOTE: BASE METAL, CARBON STEEL PLATE AT LEAST 1/4" (6 MM) THICK
MAKE MULTIPLE-PASS OPEN V-GROOVE WELDS ON CARBON STEEL PLATE IN THE HORIZONTAL (2G) POSITION

As directed by the instructor, use GTAW process with carbon steel filler metal to make multiple-pass open V-groove welds on carbon steel plate in the horizontal (2G) position, 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 size ±1/16" (1.6 mm)
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth transition with complete fusion at the toes of the weld
- Complete uniform root reinforcement at least flush with the base metal to a maximum buildup of 1/8" (3.2 mm)
- No porosity
- No overlap
- No undercut
- No inclusions
- No cracks
- No pinholes

NOTE: BASE METAL, CARBON STEEL PLATE AT LEAST 1/4" (6 MM) THICK

JOINT DETAILS

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MAKE MULTIPLE-PASS OPEN V-GROOVE WELDS ON CARBON STEEL PLATE IN THE VERTICAL (3G) POSITION

As directed by the instructor, use GTAW process with carbon steel filler metal using stringer or weave beads to make multiple-pass open V-groove welds on carbon steel plate in the vertical (3G) position, 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 size ±1/16" (1.6 mm)
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth transition with complete fusion at the toes of the weld
- Complete uniform root reinforcement at least flush with the base metal to a maximum buildup of 1/4" (3.2 mm)
- No porosity
- No overlap
- No undercut
- No inclusions
- No cracks
- No pinholes

NOTE: BASE METAL, CARBON STEEL PLATE AT LEAST 1/4" (6 MM) THICK

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MAKE MULTIPLE-PASS OPEN V-GROOVE WELDS ON CARBON STEEL PLATE IN THE OVERHEAD (4G) POSITION

As directed by the instructor, use GTAW process with carbon steel filler metal to make multiple-pass open V-groove welds on carbon steel plate in the overhead (4G) position, 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 size ±1/64" (1.6 mm)
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth transition with complete fusion at the toes of the weld
- Complete uniform root reinforcement at least flush with the base metal to a maximum buildup of 1/8" (3.2 mm)
- No porosity
- No overlap
- No undercut
- No inclusions
- No cracks
- No pinholes

NOTE: BASE METAL, CARBON STEEL PLATE AT LEAST 1/4" (6 MM PLATE) THICK

75° GTAW

JOINT DETAILS

MAX 1/8" (3.2 MM)

0"-1/6" (0 MM – 3.2 MM)