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# NCPWB

## WELDER PERFORMANCE QUALIFICATIONS

# POLICY & PROCEDURE

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## NATIONAL CERTIFIED PIPE WELDING BUREAU "TESTING EVENT" POLICY & PROCEDURE "TRAINING PROGRAM"

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## NCPWB POLICY & PROCEDURE

**A tutorial for the Contractor when participating in a Joint Welder Qualification testing event with the United Association Welder Certification Program**

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As the NCPWB member contractor present during United Association welder/brazer qualification testing, you are satisfying the requirements in ASME Section IX, Para. QW-300.2 and QB-300.2, which states in part that

*"…welders/brazers or welding operators/brazing operators…shall be tested under the full supervision and control of the manufacturer, contractor, assembler or installer…"*

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The NCPWB Technical Committee has ***recommended*** and the NCPWB Board of Trustees has ***approved*** the following to be followed by the participating contractor.

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# NCPWB

**WELDER PERFORMANCE QUALIFICATIONS**
**IN-PROCESS RESPONSIBILITIES**

# SECTION – I.

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## I. CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING A TESTING EVENT

Whenever a welder/brazer is tested, there shall be a NCPWB member contractor present in the facility where the test coupon will be welded/brazed. This person shall be a regular paid employee of a NCPWB contractor. This contractor shall work together with the UA Authorized Testing Representative (ATR) in administering the test.

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### CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING

The following tasks shall be performed by the contractor in coordination with the UA Authorized Testing Representative (ATR) prior to and during the welding/brazing of the test coupon/coupons:

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### CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING

1.) Verify the **identity** of the welder/brazer using the picture I.D. and other documentation the welder/brazer has provided to the ATR during the joint test session briefing and roll call.

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**CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING**

2.) Verify that the welder/brazer has access to a copy of the applicable Welding/Brazing Procedure **Test Specification** (WPS) (BPS) that the welder/brazer will follow during welding/brazing of the test coupon.

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## UA-63 Weld Test Specification

Manual GTAW/SMAW Welding Processes

**MAXIMUM TIME PERMITTED FOR TEST IS 5 HOURS**

**Pipe Coupon Material**
- Specification of Base Metal(s): SA 106
- Pipe Size: 2.750" O. D. Thickness: 0.625" Wall

**Joint Configuration**
- Single Vee Groove without backing or retainers
- Bevel: 35 deg. ± 5 deg. Land: 0 to 1/8"
- Root Gap: 1/16" to 1/8"
- Misalignment: 1/16" maximum

**Test Position**
- 6G fixed position, coupon position maintained without rotation or change in height
- Uphill progression required on vertical portions of weld joint

**Welding Conditions**

**Root**
- ER 70S-2 3/32" or 1/8" Diameter
- Deposit 0.125" of ER 70S-2
- Amperage Range: 3/32" 65 to 95; 1/8" 75 to 125
- Direct Current & Electrode Negative
- Pulsing current not permitted.
- Tungsten: EWTh-2 or EWCe-2, 3/32" or 1/8" Diameter
- Cup Size: #4 through #12
- Shielding Gas: Argon @ 8 to 35 CFH
- Backing Gas or Trailing Gas is not permitted

**Balance**
- E 7018 3/32", 1/8" or 5/32" Diameter
- Amperage Range: 3/32" 70 to 100 ; 1/8" 115 to 165; 5/32" 150 to 220
- Direct Current & Electrode Positive
- Deposit a minimum of three layers

**General Welding Techniques**
- Minimum Preheat of 50° F is required.
- Back gouging of welds is not permitted.
- I.D. Root Penetration: flush to 1/8" maximum
- O.D. Reinforcement: flush to 1/16" maximum
- Stringer beads required for root pass, subsequent passes may be stringer or weave beads
- Initial & interpass cleaning with brushing & grinding using hand or power tools
- The cover pass must be left in the "as welded" condition, clean with wire brush, (grinding or filing on the completed test coupon is not allowed)

**Inspection and Testing**
- The completed test assembly shall be visually examined over the entire circumference, inside and outside, showing complete joint penetration with complete fusion of weld metal and base metal (no concavity); and shall be uniform and free of cracks, incomplete fusion, incomplete penetration, porosity, slag, and undercut (not to exceed 1/32")
- Test coupon shall be examined by radiography in accordance with ASME Code Section IX

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**CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING**

3.) Verify that the welder/brazer has access to a copy of the applicable UA **Testing Event Inspection Report**. This document covers the in-process inspection hold points, locator stamp, tack welds, start and finish times and requires signatures of both the participating contractor and the ATR.

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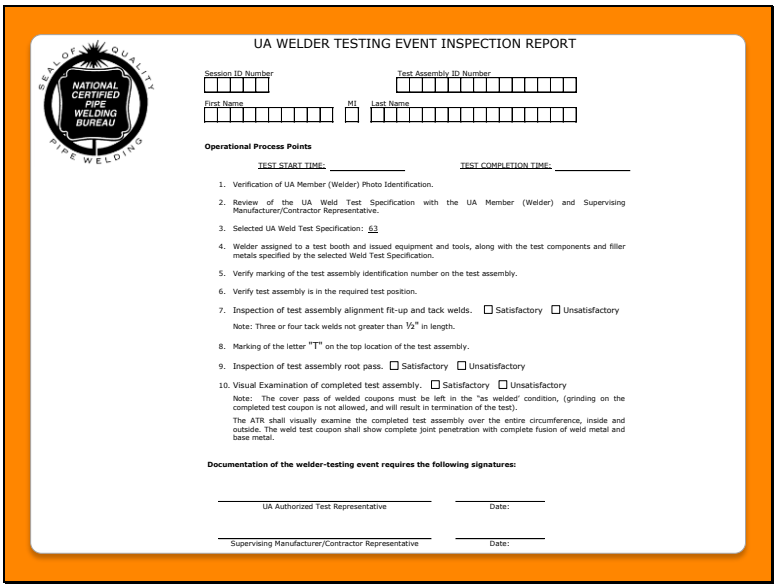

UA WELDER TESTING EVENT INSPECTION REPORT

Session ID Number

Test Assembly ID Number

First Name MI Last Name

**Operational Process Points**

TEST START TIME: _____ TEST COMPLETION TIME: _____

1. Verification of UA Member (Welder) Photo Identification.
2. Review of the UA Weld Test Specification with the UA Member (Welder) and Supervising Manufacturer/Contractor Representative.
3. Selected UA Weld Test Specification: 63
4. Welder assigned to a test booth and issued equipment and tools, along with the test components and filler metals specified by the selected Weld Test Specification.
5. Verify marking of the test assembly identification number on the test assembly.
6. Verify test assembly is in the required test position.
7. Inspection of test assembly alignment fit-up and tack welds. ☐ Satisfactory ☐ Unsatisfactory
   Note: Three or four tack welds not greater than ½" in length.
8. Marking of the letter "T" on the top location of the test assembly.
9. Inspection of test assembly root pass. ☐ Satisfactory ☐ Unsatisfactory
10. Visual Examination of completed test assembly. ☐ Satisfactory ☐ Unsatisfactory
    Note: The cover pass of welded coupons must be left in the "as welded' condition, (grinding on the completed test coupon is not allowed, and will result in termination of the test).
    The ATR shall visually examine the completed test assembly over the entire circumference, inside and outside. The weld test coupon shall show complete joint penetration with complete fusion of weld metal and base metal.

**Documentation of the welder-testing event requires the following signatures:**

_____ _____
UA Authorized Test Representative Date:

_____ _____
Supervising Manufacturer/Contractor Representative Date:

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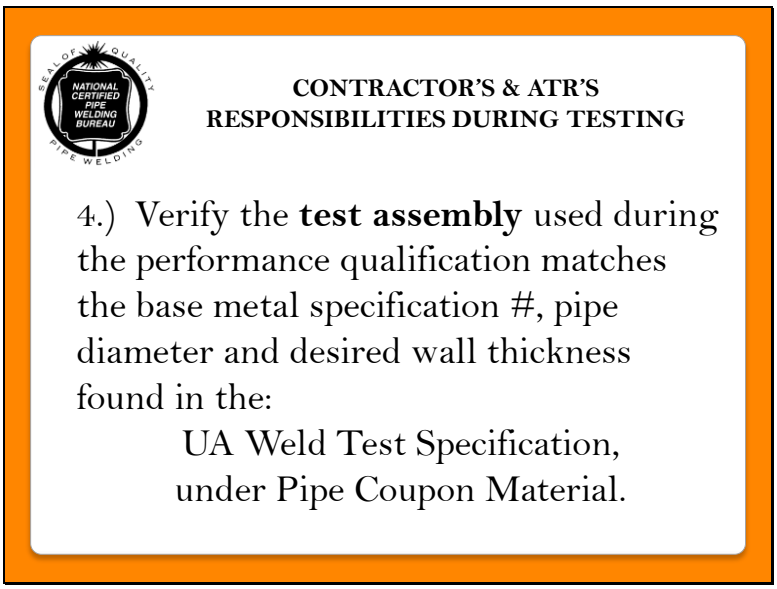

**CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING**

4.) Verify the **test assembly** used during the performance qualification matches the base metal specification #, pipe diameter and desired wall thickness found in the:

UA Weld Test Specification, under Pipe Coupon Material.

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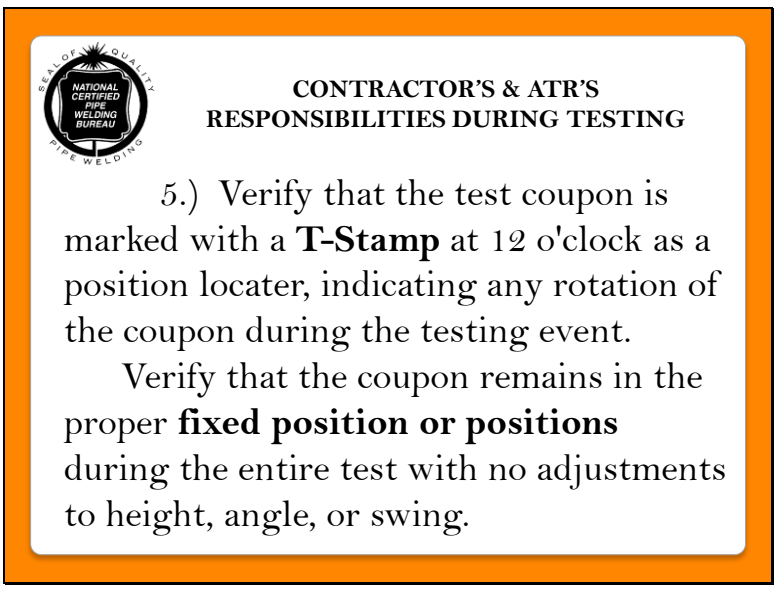

**CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING**

5.) Verify that the test coupon is marked with a **T-Stamp** at 12 o'clock as a position locater, indicating any rotation of the coupon during the testing event.

Verify that the coupon remains in the proper **fixed position or positions** during the entire test with no adjustments to height, angle, or swing.

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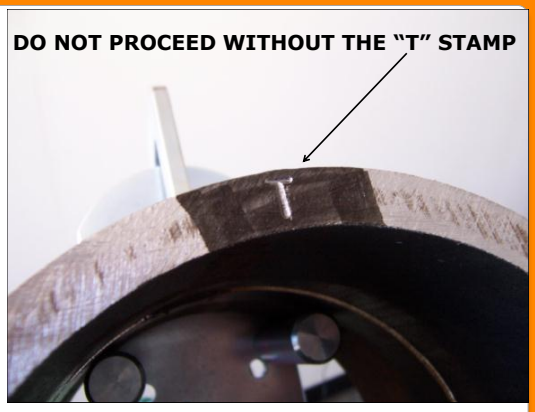


A LOCATION MARKER OR "T" STAMP AT 12 O'CLOCK

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## TEST ASSEMBLY IDENTIFICATION NUMBER

6.) Verify that the test coupon is marked with the welder's/brazer's test assembly I.D. number. e.g., **63CS4567**

63 = UA Test
CS = First & Last initials
4567 = Last four of UA ID#

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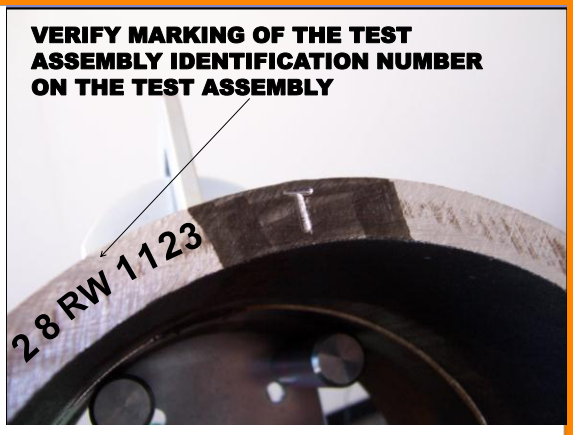

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**CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING**

7.) Verify that the **electrode** or **filler** metal type to be used for the root and fill passes are correct and are used in proper sequence in accordance with the UA Weld Test Specification.

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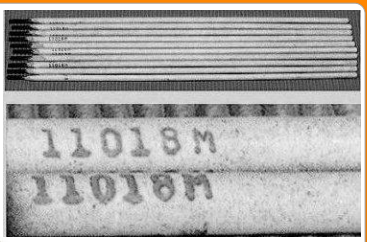


**SMAW-----**
**PRINTED**

**-------GTAW**
**STAMPED**

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**CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING**

8.) Verify with the UA Weld Test Specification that the direction of **weld progression** is correct.

Verify with the UA Weld Test Specification that the coupon is in the correct **test position**.

e.g., 1-G, 2-G, 5-G, or 6-G

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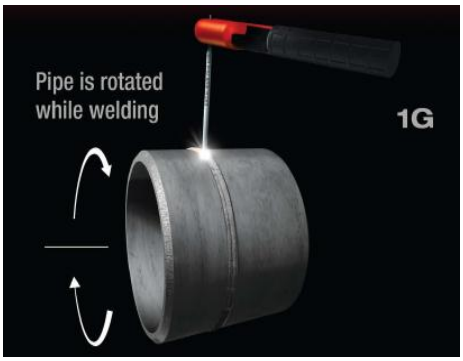
**1G *or* 1-GR "ROLLED" WELDING ON TOP PIPE HORIZONTAL**

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**2-G HORIZONTAL WELDING, PIPE VERTICLE**


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**5-G VERTICLE WELDING PIPE HORIZONTAL**

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## 6-G 45 DEGREE INCLINED WELDING PIPE @ 45 DEGREE ANGLE


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## CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING

9.) Verify with the UA Weld Test Specification that the **selected amperage** is within ranges specified by the WPS. Wire feed speed, voltage, polarity and current can also be verified on this specification document.

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## CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING

10.) Verify approximate thickness of the **weld metal deposited** with each process and filler metal type when more than one process or filler metal type is used.

Deposited weld metal ranges may be found on the UA Weld Test Specification or Welder Qualification Record.

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UNITED ASSOCIATION WELDER QUALIFICATION RECORD

First Name | MI | Last Name

UA Card Number | ATF Local | Session No. | Test Date

**TESTING CONDITIONS**

Weld Test Specification followed: UA-63 / NCPWB 1-32-1

Specification of Base Metal(s): SA 106 Thickness: 0.625"

**QUALIFICATION LIMITS**

| WELDING VARIABLES | ACTUAL VALUES | | RANGES QUALIFIED | |
|---|---|---|---|---|
| Process | GTAW | SMAW | GTAW | SMAW |
| Backing | none | weld metal | with or without | required |
| Use of Filler Metal | with | n/a | required | n/a |
| Filler Metal Product | solid | n/a | solid or metal | n/a |
| Filler Metal F-Number | 6 | 4 | 6 | 4, 3, 2, 1 |
| Consumable Inserts | none | n/a | without | n/a |
| Deposited Weld Thickness | 0.125" | 0.500" deposited over 3 layers | up to 0.250" | unlimited |
| Inert gas backing | none | n/a | with or without | n/a |
| Current / Polarity | DC/EN | n/a | DC/EN | n/a |
| Pipe Diameter | 2.750" O.D. | | 1" O.D. & over | |
| Base Metal P-Number | P-1 to P-1 | | P-1 through P-11 | |
| Position | 6G | | all | |
| Vertical Progression | upward | | upward | |

**EXAMINATION RESULTS**

ATR Visual Examination of Completed Weld (QW-302.4): Acceptable

Test Lab Radiographic Examination Results (QW-191): Acceptable

Lab Test Report

We certify that the statements in this record are correct and that the test coupons were prepared, welded, and tested in accordance with requirements of Section IX of the ASME Code.

Test Lab Company Name | Test Lab Representative Signature | Date:

UA Authorized Test Facility Local Number | UA Authorized Test Representative Signature | Date:

Manufacturer/Contractor Company Name | Manufacturer/Contractor | Date:

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## CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING

11.) Verify **proper backing gas** and flow rates; torch and weld head gas and their **proper mixtures,** including flow rate ranges, can also be found on the UA Weld Test Specification sheet.

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## CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING

12.) The cover pass must be left in the "as welded" condition, cleaning with power or hand wire brush is allowed, **(grinding or filing on the completed test coupon inside or outside is not allowed).**

**Per UA Weld Test Specifications**

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**CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING**

13.) **Safety Check**: a continuous safety check for required Personal Protective Equipment is critical. The testing area shall have **Adequate Ventilation** and be protected from the elements.

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**CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING**

14.) "If at anytime during a weld test the ATR or Contractor Representative determines the welder **does not demonstrate** the necessary welding skills the weld test shall be terminated."

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# NCPWB

**WELDER/BRAZER PERFORMANCE QUALIFICATIONS CONDUCTING VISUAL EXAMINATIONS**

# SECTION – II.

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## II. CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING A TESTING EVENT

After the welder has completed welding any portion of the test coupon and has called for inspection, the Contractor and the UA Authorized Testing Representative (ATR) shall **Visually Examine** the entire test coupon inside and outside for the following:

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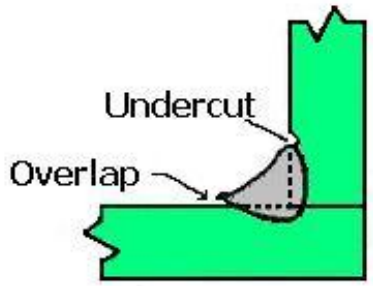
Undercut (not to exceed 1/32") and Overlap / Cold Lap (none permitted)

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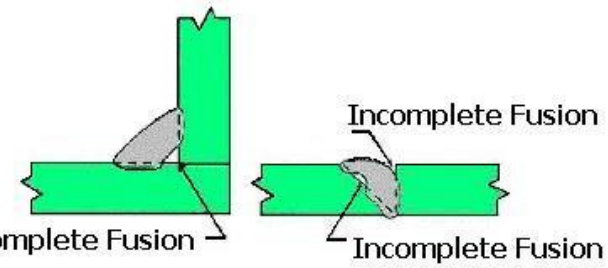
Incomplete Fusion (none permitted)
a.) in the root.
b.) in the side wall.
c.) on the cover pass.



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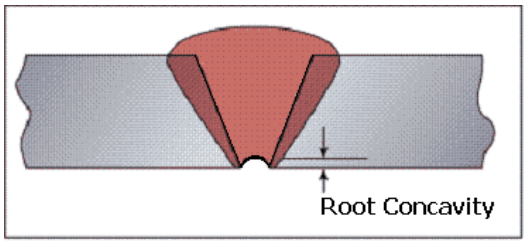
## Root Concavity / Suck Back (none permitted)

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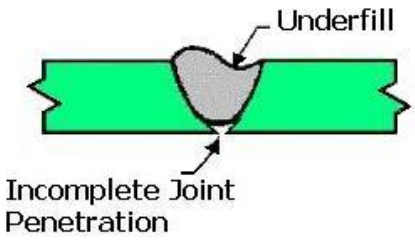
## Underfill and Incomplete Joint Penetration (none permitted)

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## Cracks (none permitted)

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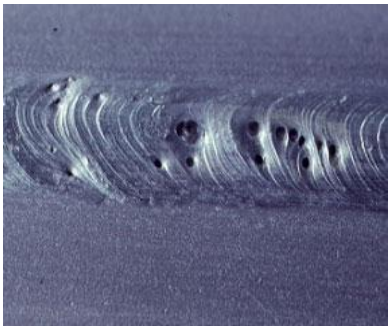
## Porosity (none permitted)



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## Slag (none permitted)
## Trapped / Included

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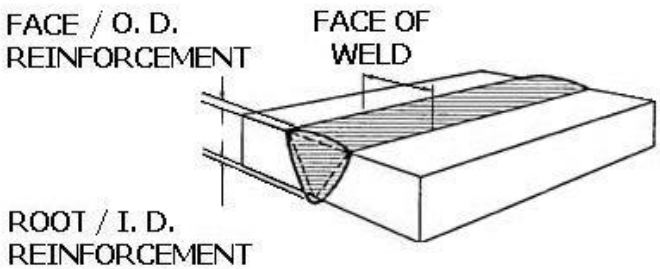
## Weld Reinforcement
## "per UA Weld Test Specifications"



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**CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING**

"If at anytime during a weld test the ATR or Contractor Representative determines the welder **does not demonstrate** the necessary welding skills the weld test shall be terminated."

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# NCPWB

**WELDER/BRAZER PERFORMANCE QUALIFICATIONS CONTINUITY UPDATES**

# SECTION – III.

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**III. CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING CONTINUITY UPDATES**

ASME SECTION IX – QW-322.1a

*"When a welder or welding operator has not welded with a process during a period of six months or more, his qualifications for that process shall expire."*

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## III. CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING CONTINUITY UPDATES

ASME SECTION IX – QW-322.1(1)

*"when the welder has welded with that process under the supervision and control of the qualifying manufacturer or contractor or participating organization that will extend his qualifications for an additional 6 months."*

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## WELDER QUALIFICATION CONTINUITY UPDATES

**UA WCP Quality System Manual:**

*"when unable to maintain continuity from an Employing Manufacturer/Contractor, continuity updates may take place at any UA Authorized Testing Facility and must be supervised by an ATR and at least one Manufacturer / Contractor Representative."*

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## WELDER QUALIFICATION CONTINUITY UPDATES

**UA WCP Quality System Manual:**

*"the continuity demonstration shall consist of welding a minimum of one complete pass for each welding process they are qualified in, using a pipe coupon, in accordance with a UA Weld Test Specification applicable to the welding process involved."*

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## WELDER QUALIFICATION CONTINUITY UPDATES

**UA WCP Quality System Manual:**

*"the continuity report lists the Welder's name, last date each welding process was demonstrated by the individual and is signed and dated by the supervising Representative of the Employing Manufacturer/Contractor."*

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UA WELDER QUALIFICATION CONTINUITY REPORT

Welder's Name: JAMES L ROBERTS

UA Card Number: 9876054321

UA Testing Local: 168

WELDER CONTINUITY INFORMATION

Indicate the last date the process was used

| | | |
|---|---|---|
| SMAW: | 02/28/07 | * Manual Welding |
| GTAW: | 03/08/07 | * Manual Welding |
| GMAW: | 03/12/07 | * This includes Flux-Cored Arc Welding (FCAW) |
| Automatic or Machine Welding (GTAW): | | * This includes orbital welding |
| Torch Brazing: | | * Non Med-Gas |

We certify that the statements made on this record are correct:

Ohio Fabricators Ltd.
Manufacturer/Contractor Company Name

Leonard Walker — Signature of Company Representative
March 14, 2007 — Date Signed
Leonard Walker, QC Manager
Printed Name & Title of Company Representative

Local Union 168
UA Local Union Number

Robert Burton — Signature of UA ATR
March 14, 2007 — Date Signed
Robert Burton
Printed Name of UA ATR

Mail To: The UA Testing Local shown above, ATTN: UA Authorized Testing Representative

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## CONTRACTOR'S & ATR'S RESPONSIBILITIES DURING TESTING

"If at anytime during a continuity update the ATR or Contractor Representative determines the welder **does not demonstrate** the necessary welding skills the continuity update shall be terminated."

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# NCPWB

WELDER/BRAZER PERFORMANCE QUALIFICATIONS

# THE END

QUESTIONS & ANSWERS