

# Manitoba Welder Practical Examination for Approved Trades Qualifiers (TQ)

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# PRESSURE

The Manitoba Welder Practical Examination is designed to test the scope of practical knowledge and skills of the trade. The Interprovincial (Theory) Examination must be successfully completed prior to applying for your practical exams. Please read all the information throughout this package.

Once you have successfully completed your Practical Examination, you must apply to the Office of the Fire Commissioner (OFC) to receive your pressure welder licence. In order to receive a Certificate of Qualification (Red Seal Endorsement), you must successfully complete the above and submit a copy of the pressure welder licence (front and back) issued by the OFC to Apprenticeship Manitoba.

All candidates must follow safety procedures, including the use of equipment, hand tools, safety glasses, CSA approved steel toe boots, leathers, gloves, helmets, safety goggles/visor and hearing protection.

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## CANDIDATE MUST PROVIDE AND USE:

Helmet, goggles, gloves, personal hand tools and appropriate safety equipment including CSA approved work boots. Only candidates having this safety equipment will be allowed to perform the test at this time. You may ask the examiners for clarification on instructions at any time. Candidates are responsible for the proper set up of equipment and clean up of the workstation once the exam is complete.

Persons engaged in the welding of pressure equipment as described in *The Steam and Pressure Plants Act* in Manitoba must be licensed by passing this practical examination required by the Office of the Fire Commissioner. This examination must be conducted by an authorized welding examiner in accordance with Section IX of the ASME boiler and pressure vessel code in order to obtain a Manitoba High Pressure Welder Licence.

Candidates may use this examination as the practical component in order to obtain their Certificate of Qualification bearing the Red Seal Endorsement for Welder.

## ELIGIBILITY

To qualify to take a Manitoba Welder Practical Examination, a candidate must have completed and passed the Interprovincial (Theory) Examination for Welder with a score of 70% or higher.

## APPLYING FOR A WELDING TEST:

1. A candidate shall apply by telephone or in person for a mutually acceptable test date (at least 48 hours prior notification for a test is normally required).
2. Each person applying to take a test shall pay the fee specified in *The Steam and Pressure Plants Act* regulation at the time of the test.
3. The candidate must show government issued photo identification at the time of the test. The approved 3<sup>rd</sup> party testing providers reserve the right to reject any candidate with outdated photo identification.
4. No licence, certificate or other service will be issued or conducted for any individual or company who have outstanding unpaid fees. Fees may not normally be deferred to a private company or contractor without prior written approval from that company or contractor and as agreed to by Inspection and Technical Services.
5. Any person who, in the opinion of the Welding Examiner, is incapable of performing the test or complying with other safety procedures will be asked to leave the test site.

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## PROCEDURE FOR "INITIAL" WELDER PERFORMANCE QUALIFICATION TEST

### **Test Coupon:**

The test coupon will be NPS 6, Schedule 80, SA106 grade B, carbon steel pipe prepared with a 37.5 degree bevel to a feathered edge. Each coupon half, prior to welding, shall be 3 inches.

### **Test Position:**

The test coupon will be welded in the 6G position (pipe axis 45 degrees from vertical) (see Figure 1 - "A")

### **Electrodes:**

The electrodes used for the test shall be: E-6010 (1/8" diameter) for tacking and the root pass  
E-7018 (3/32" &/or 1/8" diameters) for the fill and cap passes.

### **Examination Time:**

Candidates will have three (3) hours to prepare, tack and weld the coupon, and one (1) hour to prepare the bend specimens.

### **Preparation and Tacking:**

When preparing the coupon for tacking, the size of the root opening shall be 3/32" +/- 1/16" and the root face land may be up to 1/8" maximum. Three equally spaced tack welds are to be made using the E-6010 electrode and may be up to 3/8" in length. All tack welds shall be of good quality as they will become part of the finished root. After tacking the coupon, the candidate will inform the Welding Examiner.

### **Welding:**

The Welding Examiner will position the coupon in the 6G position (see Figure 1 - "A") on the test stand with one of the tack welds located at approximately 6 o'clock. The candidate will securely tack weld the coupon onto the stand and the Welding Examiner will re-check the required degree of inclination. The Welding Examiner will then apply reference marks on the test coupon and also secure the height of the positioner. Once the height of the positioner has been secured, it may not be altered.

The candidate will then weld the root pass using an E-6010 electrode, with an uphill progression. The candidate will inform the Welding Examiner upon completion of the root pass.

Once the root pass is deemed acceptable by the Welding Examiner, the candidate shall proceed to fill and cap the test coupon using an E-7018 electrode with an uphill progression. The fill passes shall be welded using a string or weave pattern as required. The cap shall be welded using either two or three stringers.

Upon completion of welding of the test coupon, the candidate will inform the Welding Examiner. The Examiner will then evaluate the completed weld.

### **Bend Specimens:**

Eight specimens will be prepared for guided bend tests. The cut lines for the specimens will be marked on the coupon by the Welding Examiner and numbered as per (Figure1 - "B").

The specimens will be ground flush on both sides and the edges de-burred. Candidates may radius the edges of the specimen to 1/8" maximum (See Figure 1 - "C"). Excessive grinding that reduces the thickness of the specimens below the nominal thickness of the test coupon shall result in the test being considered a failure.

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## REQUIRED PERFORMANCE STANDARDS

- The root pass shall be of uniform width.
- The finished weld shall be uniform.
- The guided bend tests shall have no open defects (cracks, porosity, etc.) in the weld or heat affected zone exceeding 1/8" inch in any direction on the convex surface of the specimen. Open defects that occur on the corners of the specimen during bending shall not be considered, unless there is evidence that they result from slag inclusions, lack of fusion or other internal defects.
- The failure of any bend test specimen shall be considered as a complete failure of the test.
- The performance test may be terminated at any stage if it becomes apparent that the candidate does not have the required skill to produce the necessary results or is taking an excessive length of time to complete any phase of the test.

## ACCEPTANCE CRITERIA (Figure 2)

## ALLOWABLE LIMITS

Cracks and lack of fusion	None
Incomplete penetration	None
Undercutting	1/32" of an inch
Surface porosity and exposed slag inclusion	None
Concave Root Surface	None
Weld Reinforcement	1/8" of an inch
Arch strikes	Not allowed outside of joint
Open Defects after bending	1/8" per specimen
Flame cutting	Cut lines must be on the lines, smooth and straight.
Grinding	All welds must be ground smooth and flush with parent material, welds ground below parent material may be cause for failure.

## PERFORMANCE RESULTS FOR THE EXAMINATION

Candidates successful in passing this examination will be issued a Provincial High Pressure Welders Licence for the positions, electrodes, thickness ranges, base metal and progression direction that was performed during the test. The licence is valid for one (1) year from the date of the test or six (6) months of non-welding in the qualified process, whichever comes first.

Candidates failing the examination shall not be permitted to take a re-test for a period of thirty (30) days from the date of the test, unless permitted to do so by the Welding Examiner.

A candidate failing to pass two (2) consecutive performance tests conducted by the Welding Examiner shall not be permitted to take a further re-rest for a period of three (3) months from the date of his/her last test unless the candidate provides proof of having successfully completed an upgrading course in pressure welding satisfactory to the Welding Examiner.

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For Appointments Contact:

ALL PIPE & MECHANICAL LTD.  
222 RICHMOND AVE. EAST  
BRANDON, MANITOBA  
(204) 729-1333  
[allpipe@live.co.uk](mailto:allpipe@live.co.uk)

AXIS INSPECTION GROUP LTD.  
1239 MANAHAN AVE., UNIT B  
WINNIPEG, MB  
204-488-6790  
[wtc@axisinspection.com](mailto:wtc@axisinspection.com)

FRE-FLO  
2005 PACIFIC AVENUE  
BRANDON, MANITOBA  
(204) 727-1314  
[kansteel@mts.net](mailto:kansteel@mts.net)

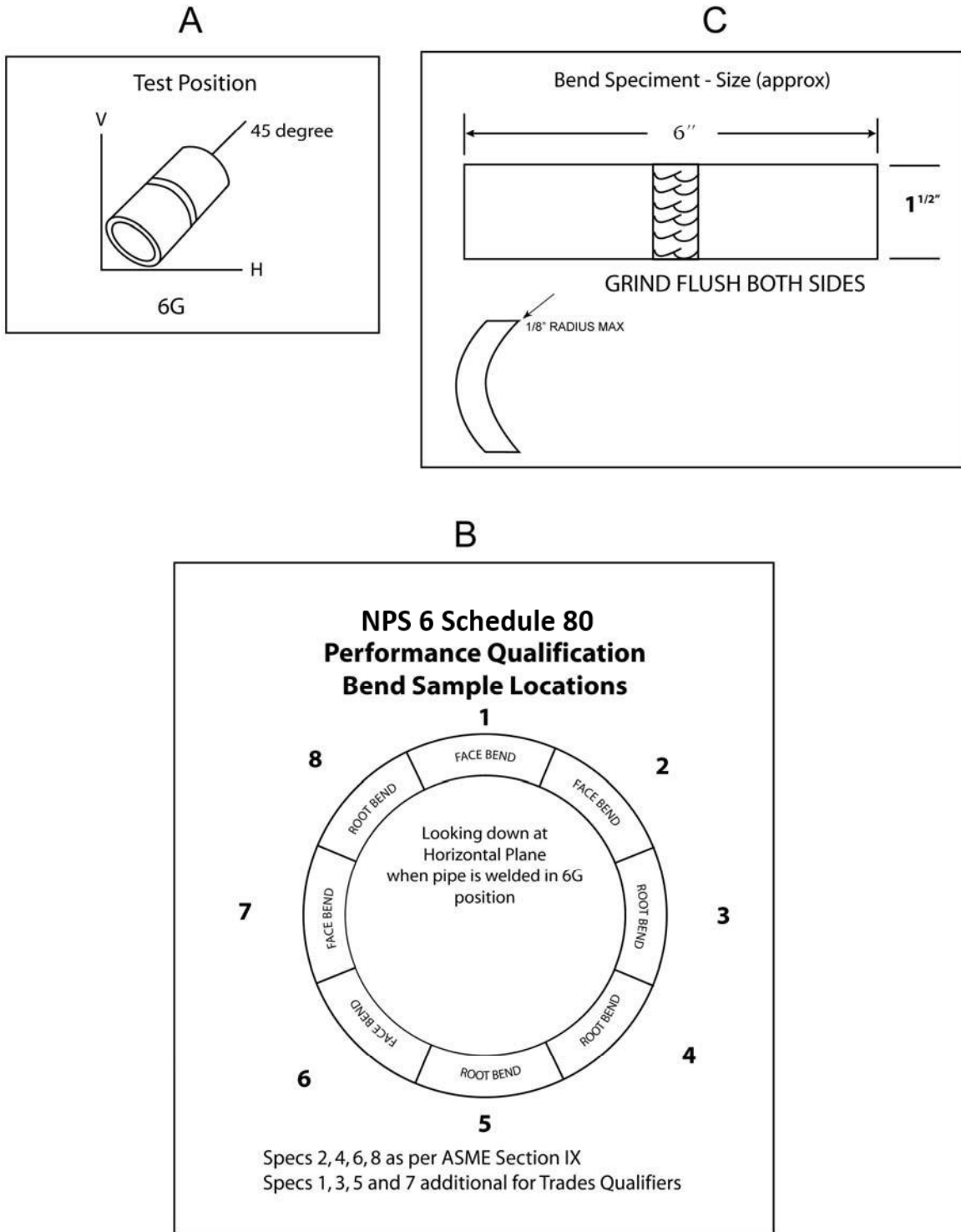
NORTHERN SHIELD ENGINEERING  
1 – 1660 KENASTON BLVD.  
WINNIPEG, MB  
204-391-9558  
[nsengineering@shaw.ca](mailto:nsengineering@shaw.ca)

UNITED ASSOCIATION LOCAL 254  
34 HIGGINS AVENUE  
WINNIPEG, MANITOBA  
(204) 881-2666  
[mark@pipingindustrytechnicalcollege.ca](mailto:mark@pipingindustrytechnicalcollege.ca)

For further information, refer to: [http://www.firecomm.gov.mb.ca/itsm\\_welding.html](http://www.firecomm.gov.mb.ca/itsm_welding.html)

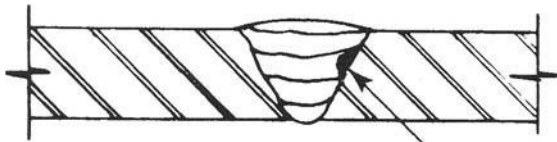
# Manitoba Welder Practical Examination for Approved Trades Qualifiers (TQ)

Figure 1



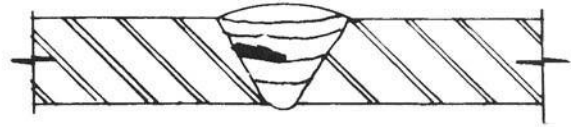
Manitoba Welder Practical Examination  
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Figure 2

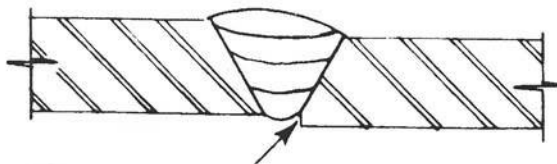


Lack of Fusion Between Weld Bead and Base Metal

Side Wall Lack of Fusion

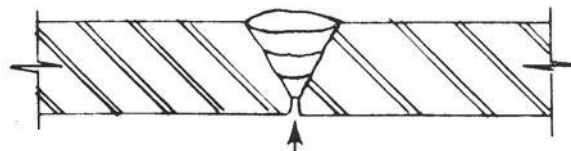


Lack of Fusion Between  
Adjacent Passes



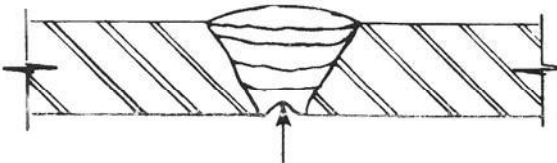
NOTE: Incomplete Filling at Root on One Side Only

Incomplete Penetration Due to Internal  
Misalignment



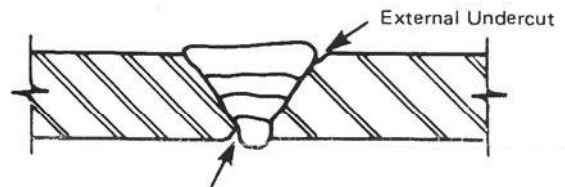
NOTE: Incomplete Filling at Root

Incomplete Penetration  
of Weld Groove



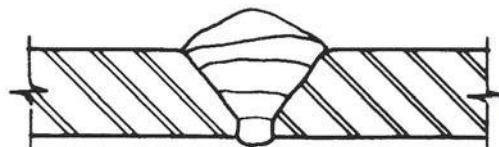
Root Bead Fused to Both Inside Surfaces But  
Center of Root Slightly Below Inside  
Surface of Pipe (Not Incomplete Penetration)

Concave Root Surface (Suck-Up)



Internal Undercut

Undercut



Excess External Reinforcement

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## Frequently Asked Questions

1. Am I required to pass all the required practical tests in order to obtain my Certificate of Qualification? Yes.
2. Will I receive a pressure ticket(s) for the test(s) that are passed? *Yes, once the practical exam is successfully completed, the testing facility will submit the exam results and application forms to the Office of the Fire Commissioner (OFC) for review. Provided that the requirements set forth by the OFC are met, and any outstanding fees paid, the OFC can issue the welders/brazers licence directly to the applicant by mail or in person if they choose to pick it up. For further information, refer to: [http://www.firecomm.gov.mb.ca/itsm\\_welding.html](http://www.firecomm.gov.mb.ca/itsm_welding.html).*
3. Will my pressure welder qualifications be recognized by the pressure welding industry? Yes, however in some cases additional testing may be required.
4. Is there an expiry date on the ticket? Yes, one (1) year from the date of evaluation or after an inactive period of six (6) months.
5. If I already hold valid pressure welder qualifications can I be exempt from testing? Current qualifications will be considered on a case by case basis.
6. Can I use any welding parameters/settings to complete the weld tests? Some restrictions may apply and should be discussed with the examiner. Can I adjust the parameters/settings at any time? Yes.
7. What is the most common cause of failure that occurs in the test specimen? Lack of fusion/penetration in the root pass.
8. Will I get a chance to retest if a failure occurs? Yes.
9. What is the time limit allowed to complete the test? You will have three (3) hours to complete the test.
10. What happens if I have problems with my welding machine during the test? Inform examiner and in most cases, additional time will be allowed.
11. Will I be able to ask questions any time prior to or during the tests? Yes.
12. Can I move my test coupon for cleaning or re-adjust for welding? No.

### End of Exam

Results will not be given over the telephone.