

February 10, 2022

## PRESSURE WELDER TESTING PROCEDURE

### TABLE OF CONTENTS

<b>1.0 - Eligibility to Test</b> .....	1
<b>2.0 - Demand Services</b> .....	1
<b>3.0 - Prior to testing</b> .....	2
<b>4.0 - 6" Initial Welders Test Specific</b> .....	2
<b>5.0 - 6G Welders Test Specific</b> .....	4
<b>6.0 - Test specimen removal and bending</b> .....	4
<b>7.0 – Evaluation</b> .....	7
Pressure Welders Test Variables - BPVS-0.....	8
Pressure Welders Test Variables - BPVS-01.....	9
Pressure Welders Test Variables – BPVS-02 .....	10
Pressure Welders Test Variables – BPVS-03 .....	11
Pressure Welders Test Variables – BPVS-04 .....	12
Pressure Welders Test Variables – BPVS-05 .....	13
Appendix A – NPS 6" Coupon Drawing .....	14
Appendix B – NPS 2" Coupon Drawing .....	15
Appendix C – NPS 2.5" Coupon Drawing .....	16

## 1.0 - Eligibility to Test

As per The Boiler & Pressure Vessel Act, 1999, a person is eligible to take an initial pressure welder's qualification test if the person can meet one of the requirements listed below:

1. Has been previously approved by the Authority to test  
Or
1. Possesses a Journeyperson certificate in the welder trade; or
2. Has at least 5400 hrs of certified welding time through a, b or c below
  - a. Letter from employer(s) certifying welding hours obtained
  - b. Certificates of training from recognized institutions
  - c. Trade and Apprenticeship documentation; or
3. Holds a current or expired Pressure Welder's certificate issued by another jurisdiction within Canada. Applicants must submit an application and applicable payment along with copies the supporting documentation. For applications please visit our weld test calendar.

Candidates must pass the initial pressure welders qualification test before they are eligible to attempt any other qualification test.

All testing applications are to be made through the Technical Safety Authority of Saskatchewan website.

## 2.0 - Demand Services

Companies may apply for a TSASK Welding Examiner to administer testing at sites other than the testing facility. The company applying for a demand service will be responsible to provide all testing coupons and filler material with the applicable Material Test Reports, as well as a bending apparatus to bend the test specimens as described in figures QW-466.1, QW-466.2 and QW-466.3 of ASME Section IX

Companies requiring a test that is not on the list of approved tests offered by TSASK will also need to provide a registered weld procedure.

### 3.0 - Prior to testing

Please ensure to bring with you all required PPE and tools to complete this test. Safety glasses, steel toed boots and long sleeved shirts are required to be worn when entering the testing center.

Note: The testing center **Does Not** supply grinding wheels and zip discs.

When arriving at the testing center, have a piece of identification ready so the Examiner may verify the spelling of your name. You may then proceed to the testing booth that the Examiner will assign to you.

Maximum time allotted for the 6" test is **4 hours**, maximum time for all other tests is **3 hours**. If this time is exceeded, the Examiner may stop the test and the test will be disqualified.

TSASK offers 3 different coupons for purchase. These include NPS 6" SCH 80 (initial pressure welders test), NPS 2" XXS (11mm wall thickness) and NPS 2.5" Max ticket (19mm wall thickness). All coupons provided by TSASK are SA106 gr B carbon steel material.

Coupons should follow the dimensions as outlined in the coupon drawings found in Annex A, B and C of this procedure. The Welder shall provide MTRs for any coupons not supplied by the testing center.

If a welder requires a test that is not on the list of standard tests offered by TSASK, that welder will need to supply a registered Weld Procedure Specification for the test as well as their own testing coupon and filler metal. Material Test Reports for the coupon and filler metal will need to be submitted to TSASK prior to the test. If MTRs are not submitted, the test will not commence.

The welder shall ensure all weld metal deposition thickness shall match the test variables in this procedure unless different thickness is requested at the time of application.

### 4.0 - 6" Initial Welders Test Specific

The Examiner will mark on coupon where the 3 required tacks will be placed. See the figure below for tack locations and weld progression.

The Welder shall tack in these spots and place in the 2G – Horizontal position. Joint land and gap is at the welders' discretion. Tacks may be up to be ½" long. Bridge tacks may be used and accepted at the discretion of the examiner.

The Examiner shall visually examine the tacks and verify the position is acceptable, and give approval to start the 2G root.

Once the 2G root is complete, welder shall stop and get visual inspection by the Examiner.

If this part of the root is acceptable, the welder shall then move coupon to 5G – Vertical position, which will be verified by the Examiner and approval given to start the 5G portion of the root.

When the entire root is complete, it shall be visually inspected by the Examiner. If the root is acceptable, the welder shall leave the coupon in the 5G position and complete the fill and cap.

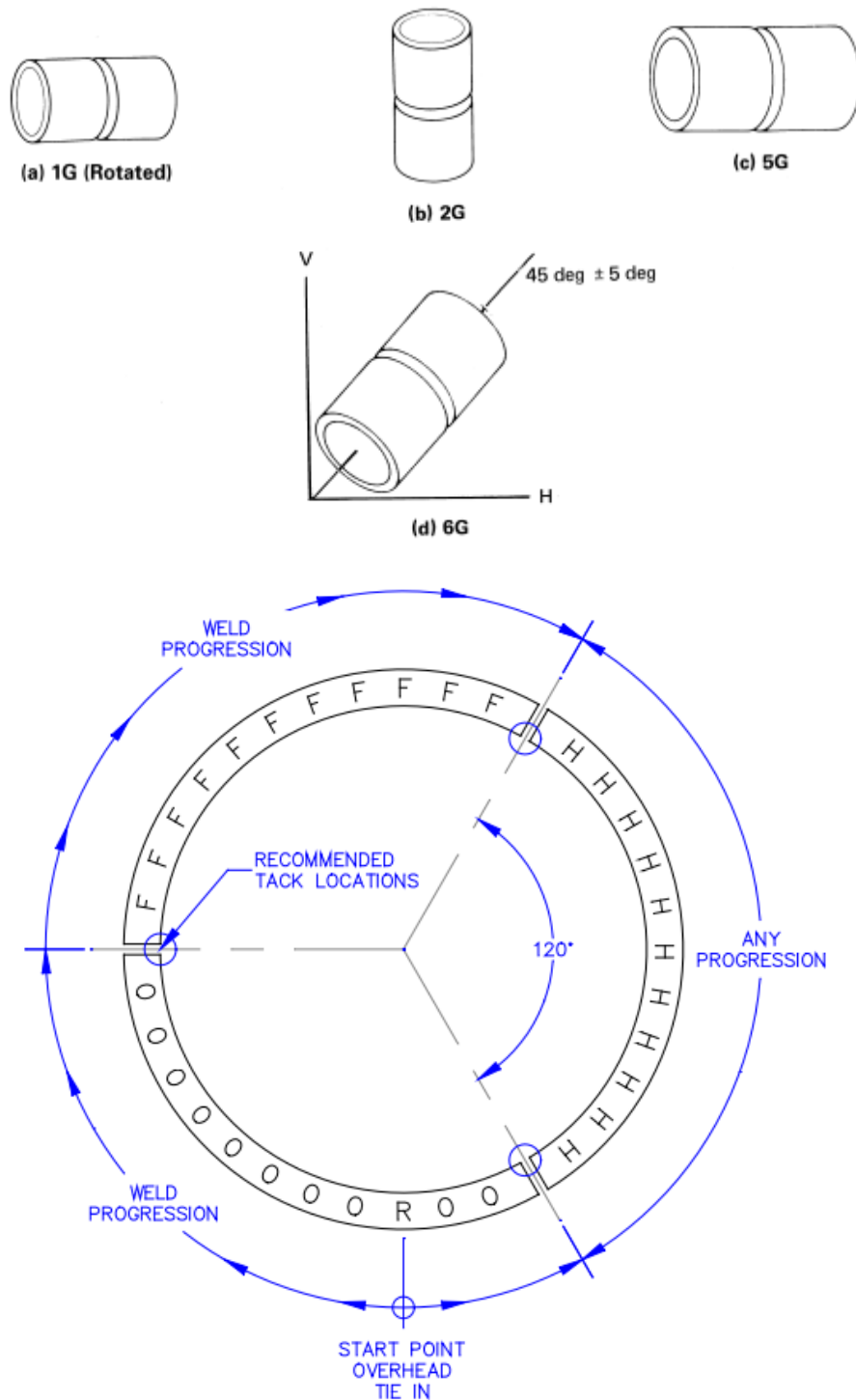
The Examiner shall visually inspect the finished 5G cap before the welder moves the coupon back to the 2G position. The Examiner shall verify the position before the welder starts to weld.

The Examiner will visually inspect finished 2G cap.

the Examiner will mark the locations where test specimens are to be removed from the coupon.



**Figure QW-461.4**  
**Groove Welds in Pipe — Test Positions**



## 5.0 - 6G Welders Test Specific

The welder shall tack this coupon in 2 places and place it in the 6G – 45 degree position. Joint land and gap are at the welders' discretion. Tacks may be up to 1/2" long. Bridge tacks may be used, depending on the process used to complete the root and at the discretion of the Examiner.

The Examiner shall approve the tacks and position and the welder may then start the root.

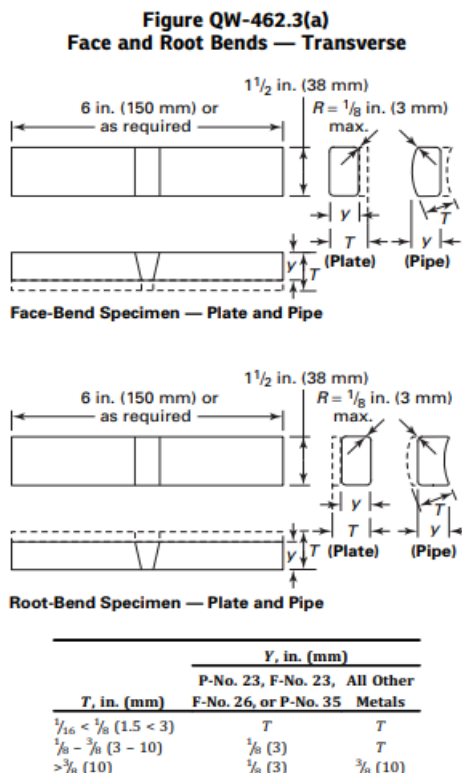
The Examiner shall visually inspect the completed root. If found to be visually acceptable and the weld metal deposition thickness matches the parameters of the test, the welder may start to fill and cap the coupon.

Once the final cap pass is complete, the Examiner shall again visually inspect the weld and give final approval. Final approval must be given before the welder can remove the test coupon from the 6G position.

The Examiner will then mark out locations where test specimens are to be removed from the coupon by the welder. Test specimens may be either Face and root bend, or side bend, depending on the test coupon thickness.

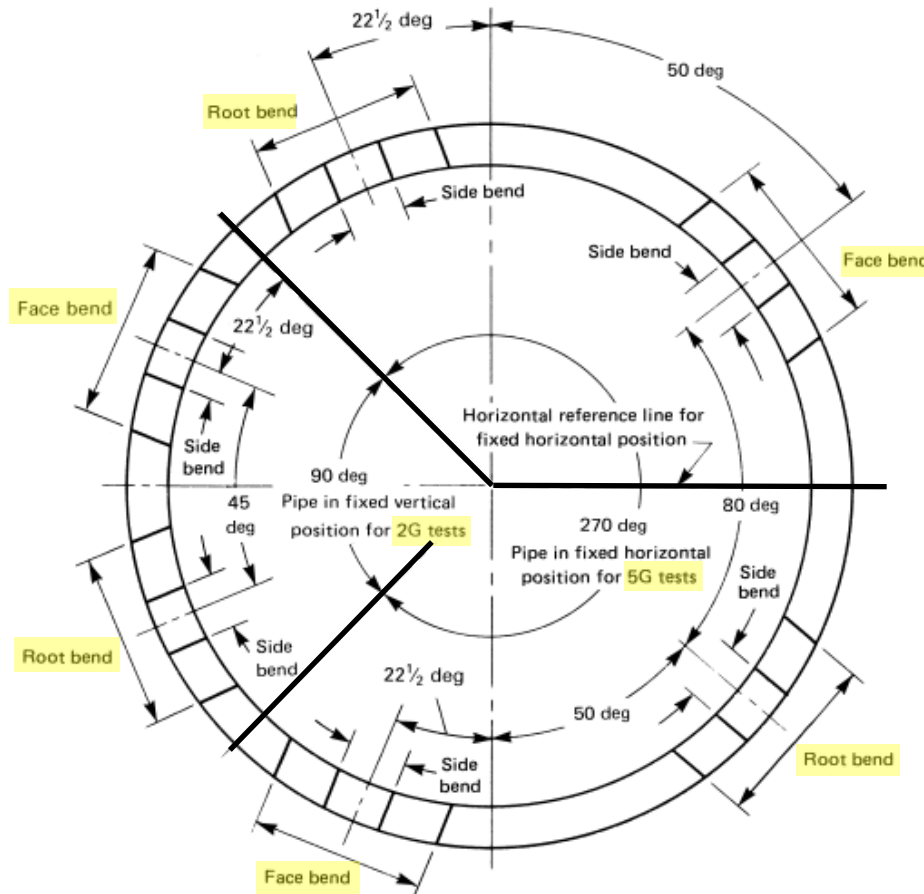
## 6.0 - Test specimen removal and bending.

Face and root test specimens shall conform to dimensions as per QW-462.3(a). They shall be a width of 1.5" and the root/cap reinforcement shall be removed flush with the parent material. **Any dishing or removal of weld metal below that of the parent material shall disqualify that specimen and the entire test shall be considered a fail.**



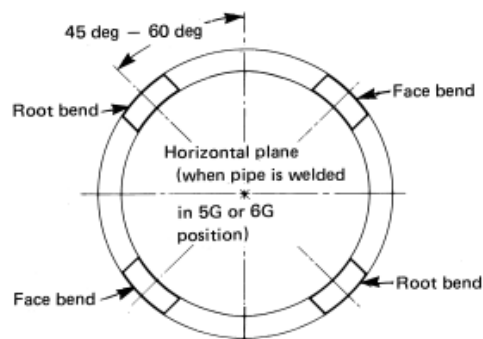
Specimens shall be removed from the 6" test coupon as per figure QW-463.2(g) and shall consist of 3 face and 3 root bends.

**Figure QW-463.2(g)  
NPS 6 (DN 150) or NPS 8 (DN 200) Assembly Performance Qualification**

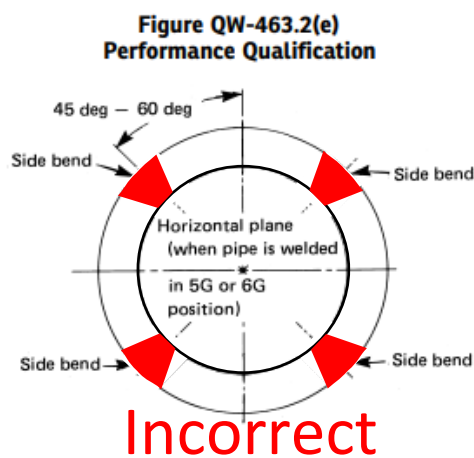
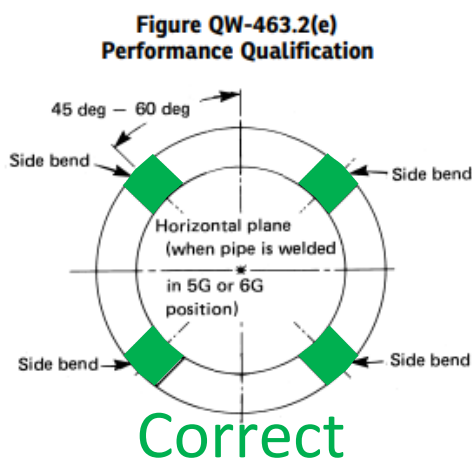


NPS -2" test coupons shall be cut into quarters and will consist of 2 face and 2 root bends as per figure QW-463.2(d).

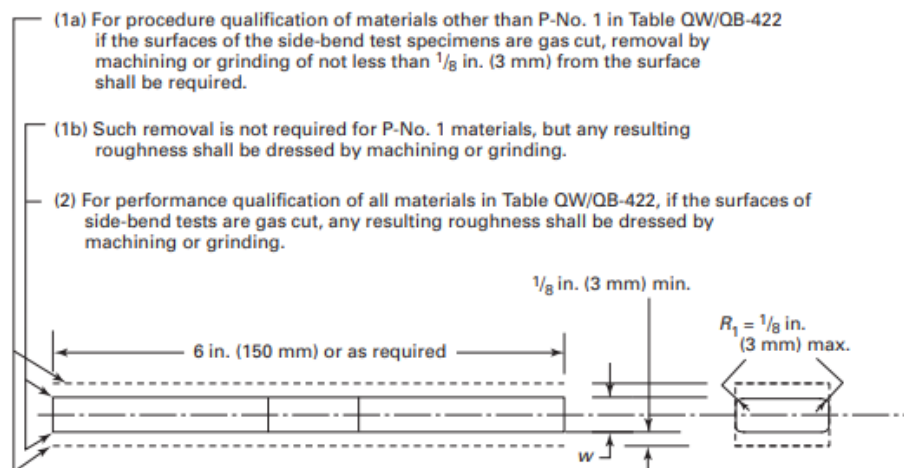
**Figure QW-463.2(d)  
Performance Qualification**



When testing any coupons with a wall thickness of 10mm to less than 19mm, test specimens may be removed as side bends at the discretion of the Examiner. All test coupons with a wall thickness of 19mm and over shall only be removed as side bends as per QW-452.1(a). Side bend specimens shall conform to dimensions as listed in figure QW-462.2. **Specimens must be uniform in width. If specimen is cut in such a way that the width of the root is less than the width of the cap the specimen will be disqualified and the entire test shall be considered a fail.**



**Figure QW-462.2  
Side Bend**



T, in. (mm)	y, in. (mm)	w, in. (mm)	
		P-No. 23, F-No. 23, F-No. 26, or P-No. 35	All other metals
$\frac{3}{8}$ to $< 1\frac{1}{2}$ (10 to $< 38$ )	T [Note (1)]	$\frac{1}{8}$ (3)	$\frac{3}{8}$ (10)
$\geq 1\frac{1}{2}$ ( $\geq 38$ )	Notes (1) and (2)	$\frac{1}{8}$ (3)	$\frac{3}{8}$ (10)

## 7.0 – Evaluation

Visual acceptance of the test coupon shall be as per QW-194. Performance test coupons shall show no cracks and complete joint penetration with complete fusion of weld metal and base metal. Root penetration shall be at a minimum flush with the parent material.

All guided-bend specimens shall be evaluated as per QW-163. The guided-bend specimens shall have no open discontinuity in the weld or heat-affected zone exceeding 1 /8 in. (3 mm), measured in any direction on the convex surface of the specimen after bending. Open discontinuities occurring on the corners of the specimen during testing shall not be considered unless there is definite evidence that they result from lack of fusion, slag inclusions, or other internal discontinuities.

If any of these conditions exist, the test will be considered a fail. **Candidates that fail the attempted 6" initial pressure welders test will be required to wait 30 days before they are eligible to retest.**

If the test has been visually acceptable throughout the welding process and no indications fail as per the above criteria are found, the test will be considered a pass and the Examiner shall issue a Pressure Welders Qualification.

**The TSASK Examiner has the right to stop and reject the test at any time if the inspection points as outlined in this procedure are not followed, or the weld is found not to be visually acceptable at any point during the test.**

As an alternative to the mechanical testing described above, there is the option to evaluate the performance qualification coupon by Radiographic examination at the welders own expense. The welder shall notify the Examiner before the start of the test that this is the evaluation method they have chosen. The examination technique and acceptance criteria shall be in accordance with QW-191.

The technician performing the inspection shall hold a valid CGSB RT Level 2 certification. An inspection report shall be made showing the size and thickness of the test coupon, as well as the welders' name and any other coupon identification required by the Examiner. This report shall be signed by the RT Tech.

The test report showing the weld is acceptable as well as the welded test coupon shall be brought to the Examiner. **The Examiner must have both before the test can be considered complete.**



## Pressure Welders Test Variables - BPVS-0

The following table shows specific essential variables for the standard test offered by TSASK. Any deviation from these variables will require a specific testing application.

TEST INFORMATION AND QUALIFICATION LIMITS				
		<i>As Tested</i>		<i>Range Qualified</i>
<b>Process</b>		SMAW	SMAW	SMAW
<b>Process Type</b>		Manual	Manual	Manual
<b>Backing</b>		None	Metal	None
<b>Material</b>	<b>Size:</b>	NPS 6		73 mm OD
	<b>ASME Spec.:</b>	A106B		
	<b>P No.:</b>	P1		P1 – 15F, P34, P4x
	<b>Thickness (mm):</b>	11mm		
<b>Filler Metal</b>	<b>F No.:</b>	F3	F4	F3
	<b>Spec. No.:</b>	5.9	5.9	N/R
	<b>Class:</b>	6010-x	7018-x	N/R
	<b>Type:</b>	N/A	N/A	N/R
<b>Weld Deposited (mm)</b>		3 mm	8 mm	6 mm
<b>Position</b>		2G/5G		ALL
<b>Weld Progression</b>		Upward		Upward
<b>Backing Gas</b>		None	None	None
<b>Transfer Mode</b>		N/A	N/A	N/A
<b>Current Type / Polarity</b>		ANY	ANY	ANY

## Pressure Welders Test Variables - BPVS-01

The following table shows specific essential variables for the standard test offered by TSASK. Any deviation from these variables will require a specific testing application.

TEST INFORMATION AND QUALIFICATION LIMITS				
		<i>As Tested</i>		<i>Range Qualified</i>
<b>Process</b>		SMAW	SMAW	SMAW
<b>Process Type</b>		Manual	Manual	Manual
<b>Backing</b>		None	Metal	None
<b>Material</b>	<b>Size:</b>	NPS 2		25 mm OD
	<b>ASME Spec.:</b>	A106B		
	<b>P No.:</b>	P1		P1 – 15F, P34, P4x
	<b>Thickness (mm):</b>	11mm		
<b>Filler Metal</b>	<b>F No.:</b>	F3	F4	F3
	<b>Spec. No.:</b>	5.9	5.9	N/R
	<b>Class:</b>	6010-x	7018-x	N/R
	<b>Type:</b>	N/A	N/A	N/R
<b>Weld Deposited (mm)</b>		3 mm	8 mm	6 mm
<b>Position</b>		6G		ALL
<b>Weld Progression</b>		Upward		Upward
<b>Backing Gas</b>		None	None	None
<b>Transfer Mode</b>		N/A	N/A	N/A
<b>Current Type / Polarity</b>		ANY	ANY	ANY

## Pressure Welders Test Variables – BPVS-02

The following table shows specific essential variables for the standard test offered by TSASK. Any deviation from these variables will require a specific testing application.

TEST INFORMATION AND QUALIFICATION LIMITS						
		As Tested		Range Qualified		
		GTAW	SMAW	GTAW	SMAW	
		Manual	Manual	Manual	Manual	
		None	Metal	None	Metal	
		Size:	NPS 2	25 mm OD		
		ASME Spec.:	A106B			
		P No.:	P1	P1 – 15F, P34, P4x		
		Thickness (mm):	11mm			
		F No.:	F6	F5	F6	F5
		Spec. No.:	5.9	5.4	N/R	N/R
Class:	ER70-S	309L-x	N/R	N/R		
Type:	N/A	N/A	N/R	N/R		
Weld Deposited (mm)		3 mm	8 mm	6 mm	16 mm	
Position		6G		ALL		
Weld Progression		Upward		Upward		
Backing Gas		None	None	None	None	
Transfer Mode		N/A	N/A	N/A	N/A	
Current Type / Polarity		DCSP	ANY	DCSP	ANY	

## Pressure Welders Test Variables – BPVS-03

The following table shows specific essential variables for the standard test offered by TSASK. Any deviation from these variables will require a specific testing application.

TEST INFORMATION AND QUALIFICATION LIMITS						
<div>Process</div> <div>Process Type</div> <div>Backing</div> <div>Material</div> <div>Filler Metal</div> <div>Weld Deposited (mm)</div> <div>Position</div> <div>Weld Progression</div> <div>Backing Gas</div> <div>Transfer Mode</div> <div>Current Type / Polarity</div>		As Tested		Range Qualified		
		GTAW	SMAW	GTAW	SMAW	
		Manual	Manual	Manual	Manual	
		None	Metal	None	Metal	
		Size:	NPS 2		25 mm OD	
		ASME Spec.:	A106B			
		P No.:	P1		P1 – 15F, P34, P4x	
		Thickness (mm):	11mm			
		F No.:	F43	F43	F43	F43
		Spec. No.:	5.11	5.11	N/R	N/R
Class:	ENiCrFe-x	ENiCrFe-x	N/R	N/R		
Type:	N/A	N/A	N/R	N/R		
		3 mm	8 mm	6 mm	16 mm	
		6G		ALL		
		Upward		Upward		
		Yes	None	Yes	None	
		N/A	N/A	N/A	N/A	
		DCSP	ANY	DCSP	ANY	

## Pressure Welders Test Variables – BPVS-04

The following table shows specific essential variables for the standard test offered by TSASK. Any deviation from these variables will require a specific testing application.

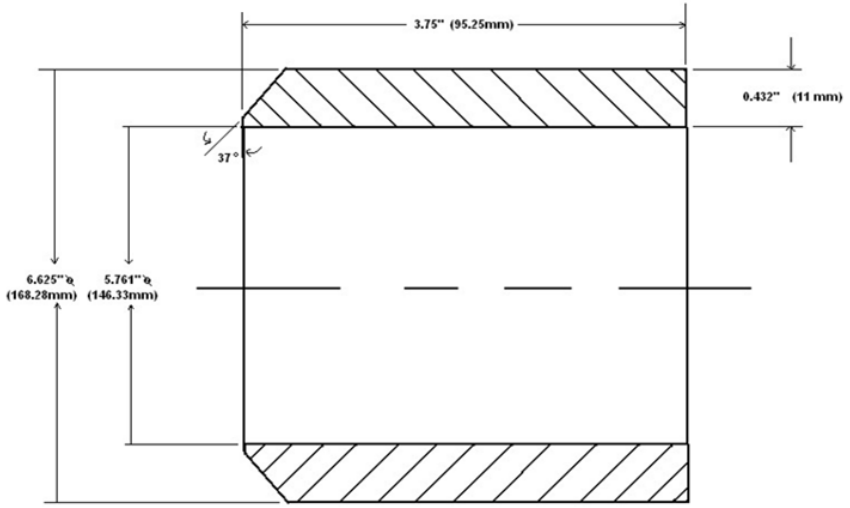
TEST INFORMATION AND QUALIFICATION LIMITS						
		As Tested		Range Qualified		
		GTAW	SMAW	GTAW	SMAW	
		Manual	Manual	Manual	Manual	
		None	Metal	None	Metal	
		Size:	NPS 2	25 mm OD		
		ASME Spec.:	A106B			
		P No.:	P1	P1 – 15F, P34, P4x		
		Thickness (mm):	11mm			
		F No.:	F6	F4	F6	F4
		Spec. No.:	5.9	5.1	N/R	N/R
Class:	ER70-S	7018-x	N/R	N/R		
Type:	N/A	N/A	N/R	N/R		
Weld Deposited (mm)		3 mm	8 mm	6 mm	16 mm	
Position		6G		ALL		
Weld Progression		Upward		Upward		
Backing Gas		None	None	None	None	
Transfer Mode		N/A	N/A	N/A	N/A	
Current Type / Polarity		DCSP	ANY	DCSP	ANY	

## Pressure Welders Test Variables – BPVS-05

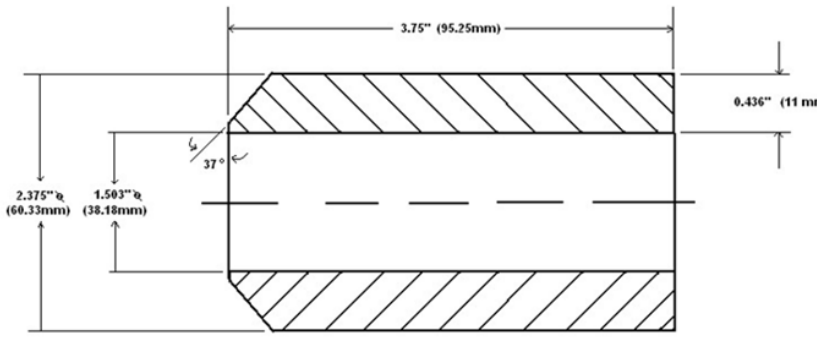

The following table shows specific essential variables for the standard test offered by TSASK. Any deviation from these variables will require a specific testing application.

TEST INFORMATION AND QUALIFICATION LIMITS					
		As Tested		Range Qualified	
Process		GTAW		GTAW	
Process Type		Manual		Manual	
Backing		None		None	
Material	Size:	NPS 2		25 mm OD	
	ASME Spec.:	A106B			
	P No.:	P1		P1 – 15F, P34, P4x	
	Thickness (mm):	11mm			
Filler Metal	F No.:	F6		F6	
	Spec. No.:	5.9		N/R	
	Class:	ER70-S		N/R	
	Type:	N/A		N/R	
Weld Deposited (mm)		11 mm		22 mm	
Position		6G		ALL	
Weld Progression		Upward		Upward	
Backing Gas		None		None	
Transfer Mode		N/A		N/A	
Current Type / Polarity		DCSP		DCSP	

## Appendix A – NPS 6" Coupon Drawing

<p><b>NOTES:</b></p> <ol style="list-style-type: none"> <li>1. If you are bringing your own test coupon, please be sure to have a copy of the Material/Mill Test Report/Record (MTR) available for review by the inspector for material verification and traceability. (SA 106 Gr. B is recommended)</li> <li>2. Instructions for tacking your coupon and stamping with the proper markings for the test will be given by the inspector at the weld test centre. See also IP-2008-04-002; Information paper on 'Initial Pressure Welder's Qualification Test'</li> <li>3. The test will be SMAW process, F3 (6010 electrode) open root, F4 (7018 electrode) fill and cap, performed in the 2G (1/3 of pipe circumference) &amp; 5G (2/3 pipe circumference) positions.</li> <li>4. If you do not pass the initial qualification test on your first attempt, you must wait 30 days before testing again.</li> <li>5. Acceptance of the test will be in accordance with ASME Sec. IX and test samples pieces will be selected by the inspector and will be destructively tested by the inspector using the bending jig.</li> </ol>	<p><b>DWG NO: NPS6-WC</b></p>															
																
<p><b>Material (as per ASME B36.10M)</b> NPS-6 SCHD 80(XS) SA-106-B Pipe (P1 Material)</p> <p><b>Special Process/ HT Treat</b> None</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;"><b>Technical Safety Authority of Saskatchewan</b></td> </tr> <tr> <td colspan="2"><b>Title: 6" Pipe (NPS-6) Weld Coupon Specifications</b></td> </tr> <tr> <td style="width: 50%;">OWN: J.WRIGHT</td> <td style="width: 50%;">DATE: May 26, 2020</td> </tr> <tr> <td>CHKD: T. Deaussy</td> <td>DATE: December 16, 2020</td> </tr> <tr> <td>APPD: R. Campbell</td> <td>DATE: December 16, 2020</td> </tr> <tr> <td>PAGE: 1 OF 1</td> <td>REV: 2</td> </tr> <tr> <td colspan="2">PART No: NPS-6 COUPON</td> </tr> </table>		<b>Technical Safety Authority of Saskatchewan</b>		<b>Title: 6" Pipe (NPS-6) Weld Coupon Specifications</b>		OWN: J.WRIGHT	DATE: May 26, 2020	CHKD: T. Deaussy	DATE: December 16, 2020	APPD: R. Campbell	DATE: December 16, 2020	PAGE: 1 OF 1	REV: 2	PART No: NPS-6 COUPON	
<b>Technical Safety Authority of Saskatchewan</b>																
<b>Title: 6" Pipe (NPS-6) Weld Coupon Specifications</b>																
OWN: J.WRIGHT	DATE: May 26, 2020															
CHKD: T. Deaussy	DATE: December 16, 2020															
APPD: R. Campbell	DATE: December 16, 2020															
PAGE: 1 OF 1	REV: 2															
PART No: NPS-6 COUPON																

## Appendix B – NPS 2" Coupon Drawing

<p><b>NOTES:</b></p> <ol style="list-style-type: none"> <li>1. If you are bringing your own test coupon, please be sure to have a copy of the Material/Mill Test Report/Record (MTR) available for review by the inspector for material verification and traceability. (SA 106 Gr. B is recommended)</li> <li>2. For thicker test coupons for "Max" qualification of a Filler Metal F#, please see DWG NO. NPS2.5-WC for further details.</li> <li>3. For qualification of the minimum qualified pipe diameter down to less than 1" O.D., testing needs to be performed on the smaller diameter pipe or tubing sizes less than 1" O.D. If required, please indicate the smaller pipe diameter on the application and the inspector will verify pipe size, thickness, and determine qualified variables on the WQR at the time of the test.</li> <li>4. Pipe coupons may be bend tested at the test centre by the inspector or may be taken for X-Ray, at the expense of the applicant. X-Ray reports shall be accepted based on ASME Sec. IX acceptance criteria, and submitted to TSASK before a welder licence will be issued.</li> </ol>	<p><b>DWG NO: NPS2-WC</b></p>											
												
<p><u>Material (as per ASME B36.10M)</u> NPS-2 XXS SA-106-B Pipe (P1 Material)</p>	<p> <b>Technical Safety Authority of Saskatchewan</b></p>		<p><u>Title:</u> 2" Pipe (NPS-2) Weld Coupon Specifications</p>									
<p><u>Special Process/ HT Treat</u> None</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">DWN: J.WRIGHT</td> <td style="width: 50%;">DATE: May 26, 2020</td> </tr> <tr> <td>CHKD: T. Deaussy</td> <td>DATE: December 16, 2020</td> </tr> <tr> <td>APPD: R. Campbell</td> <td>DATE: December 16, 2020</td> </tr> <tr> <td>PAGE: 1 OF 1</td> <td>REV: 2</td> </tr> <tr> <td colspan="2">PART No: NPS-2 COUPON</td> </tr> </table>		DWN: J.WRIGHT	DATE: May 26, 2020	CHKD: T. Deaussy	DATE: December 16, 2020	APPD: R. Campbell	DATE: December 16, 2020	PAGE: 1 OF 1	REV: 2	PART No: NPS-2 COUPON	
DWN: J.WRIGHT	DATE: May 26, 2020											
CHKD: T. Deaussy	DATE: December 16, 2020											
APPD: R. Campbell	DATE: December 16, 2020											
PAGE: 1 OF 1	REV: 2											
PART No: NPS-2 COUPON												



## Appendix C – NPS 2.5" Coupon Drawing

<b>NOTES:</b> 1. If you are bringing your own test coupon, please be sure to have a copy of the Material/Mill Test Report/Record (MTR) available for review by the inspector for material verification and traceability. (SA 106 Gr. B is recommended) 2. For Maximum weld deposit qualification, weld thickness shall be > 12.7 mm, excluding any reinforcement of the root or cap. 3. Test coupons with a thickness of 14 mm or 16 mm, and an O.D. no greater than 73 mm, may also be used. If required, please indicate the thickness of the pipe on the application and the inspector will verify pipe size, thickness, and determine qualified variables on the WQR at the time of the test. 4. Pipe coupons may have a side bend test performed at the test centre by the inspector or may be taken for X-Ray, at the expense of the applicant. X-Ray reports shall be accepted based on ASME Sec. IX acceptance criteria, and submitted to TSASK before a welder licence will be issued.		<b>DWG NO: NPS2.5-WC</b>									
<b>Material (as per ASME B36.10M)</b> NPS 2.5 - 3/4" SA 106 Gr. B Tube (P1 Material)		<b>Title:</b> 2.5" Pipe (NPS-2.5) Weld Coupon Specifications									
<b>Special Process/ HT Treat</b> None		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">DWN: J.WRIGHT</td> <td style="width: 50%;">DATE: May 27, 2020</td> </tr> <tr> <td>CHKD: T. Deaussy</td> <td>DATE: December 16, 2020</td> </tr> <tr> <td>APPD: R.Campbell</td> <td>DATE: December 16, 2020</td> </tr> <tr> <td>PAGE: 1 OF 1</td> <td>REV: 0</td> </tr> <tr> <td colspan="2">PART No: NPS-2.5 COUPON</td> </tr> </table>	DWN: J.WRIGHT	DATE: May 27, 2020	CHKD: T. Deaussy	DATE: December 16, 2020	APPD: R.Campbell	DATE: December 16, 2020	PAGE: 1 OF 1	REV: 0	PART No: NPS-2.5 COUPON
DWN: J.WRIGHT	DATE: May 27, 2020										
CHKD: T. Deaussy	DATE: December 16, 2020										
APPD: R.Campbell	DATE: December 16, 2020										
PAGE: 1 OF 1	REV: 0										
PART No: NPS-2.5 COUPON											