TWI Welding Software

Quick Start Tutorial
for
Weldspec™, Welderqual™ & NDTspec™

Contains:

How to create a PQR (plus printout samples)
ASME IX Procedure Qualification Record (Weldspec™)

How to create a WPS (plus printout samples)
ASME IX Welding Procedure Specification (Weldspec™)

How to create a pWPS (plus printout samples)
AWS D1.1 Prequalified WPS (Weldspec™)

How to create a WPQ (plus printout samples)
ASME IX Welder Performance Qualification (Welderqual™)

How to create an NDE Report (plus printout samples)
Radiographic Report used as example (NDTspec™)

TWI, Granta Park, Great Abington, Cambridge, CB21 6AL, UK Tel.+44(0)1223 899000
http://www.twisoftware.com support@twisoftware.com

How to create a PQR (page 1)

Start Weldspec by clicking on the Weldspec icon on your desktop. The system displays a form giving you various options. Click “close” to remove the form.

1

Click on the small drop-down arrow as shown. Select **ASME IX PQR.**

2

For the fastest possible data entry, always select the desired data from the drop-down menus or databases rather than typing the information manually. Notice how this form grows dynamically based on the information that you select.

3

Weldspec is equipped with an extensive database of pre-drawn typical joint details. For more information on these sketches refer to the help system by clicking on Help/Contents. Then select topic 2.2.3.

4

As you select a welding process, the form will grow, supplying you with the required fields specific to the process selected. Notice that Weldspec allows the use of up to three processes on a single PQR.

5

When specifying the filler metal, select it from the Filler Material Database instead of manually typing the information. To do this, place the cursor in the “SFA spec” field and click on the database icon. Locate the same material listed in this example and double-click on it. Notice that Weldspec enters the proper SFA, AWS, F and A numbers automatically.

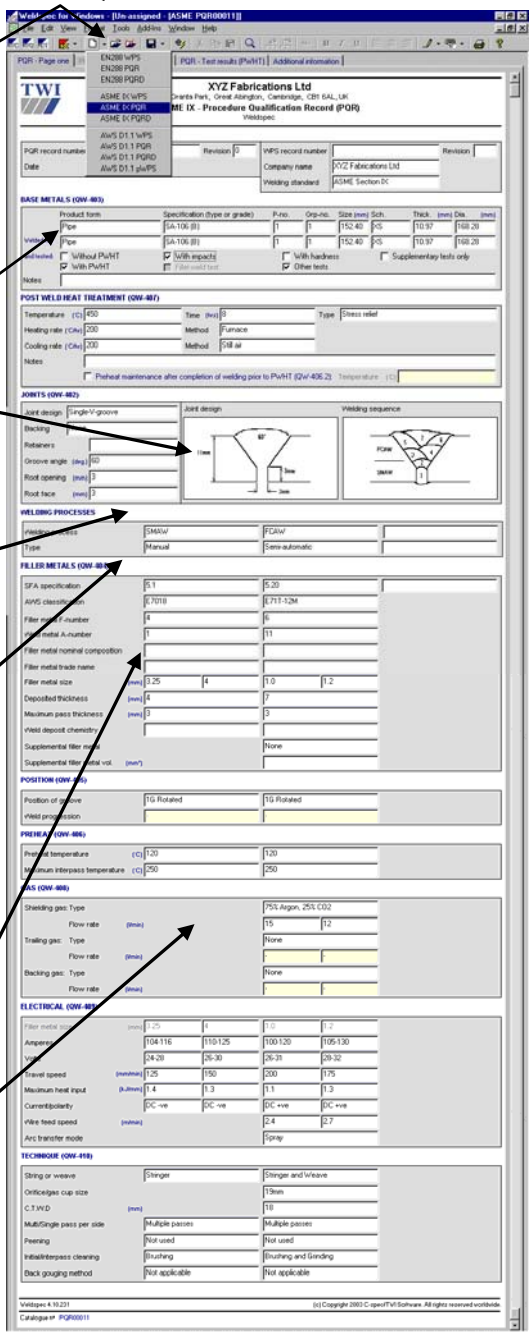
NOTE: Only a few filler metals and base metals are visible in the materials database while in demonstration mode.

6

In addition to three welding processes, Weldspec also allows you to specify up to five different filler metal sizes for each process. To do this, click inside the filler metal size field and then locate the Add Column icon on the Tool Bar at the top of the screen. Click this icon and watch how this field splits with each click. This will also split any other applicable fields such as the electrical parameters.

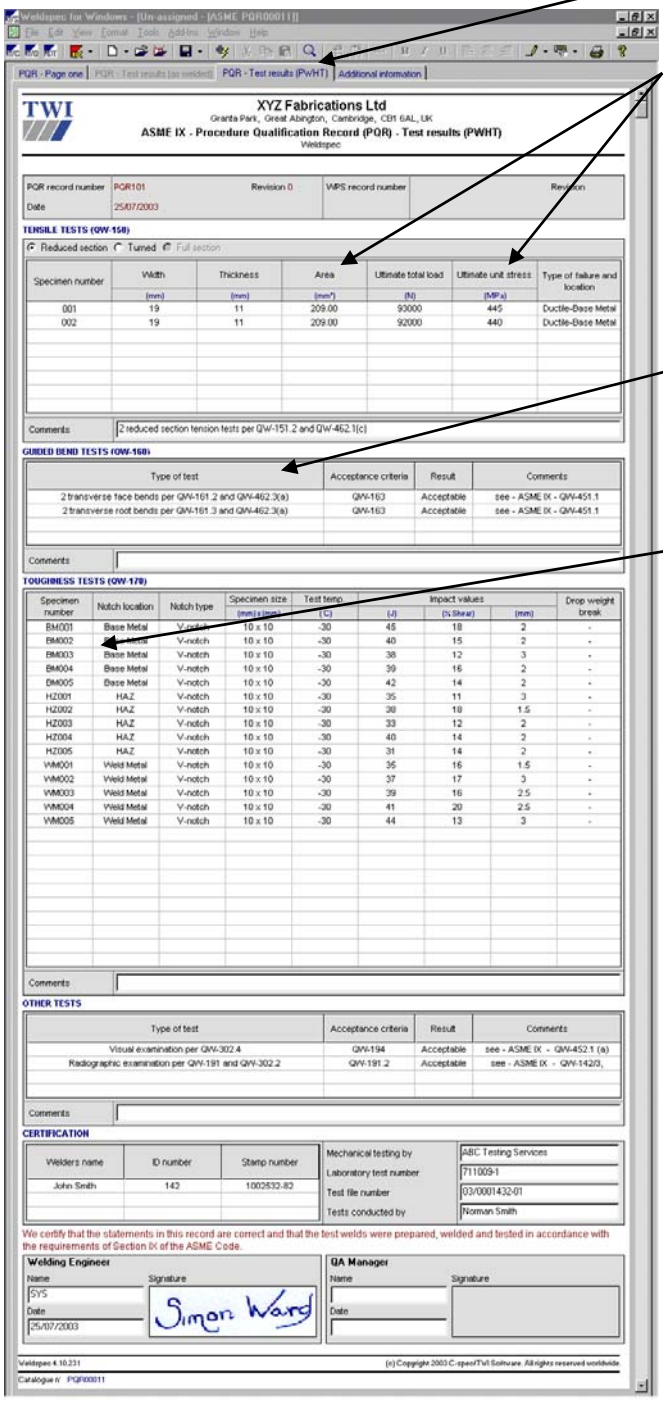
7

Notice the missing “Gas” fields for SMAW. This is another feature of the dynamic forms. Weldspec prevents entry of non-relevant information and minimises potential introduction errors. Helpful features like this are included in many places.



PQR (page 2)

To enter data into the second page of the PQR, click on the tab at the top of the page entitled **"PQR – Test Results (PWHT)"**.



8

As you enter data in the Tensile Test section, notice how Weldspec automatically calculates "Area" and "Ultimate Unit Stress". Note: If the calculated Ultimate stress is below the specified requirements for the base metals on page one, Weldspec will prompt you with a Code Checking warning after selecting "Type of failure and location".

9

Bend test information is already entered for you. Based on the information entered on page one, Weldspec's Code Checking automatically specifies the required testing.

10

When entering Toughness Test information, enter ONLY the top line of data. When the first line is completed, click the cursor in the "Specimen Number" field on the second line. Weldspec automatically replicates the test information from the previous line.

11

Printing this PQR:

To print this record, go to the top of the screen and click on File. Select the second print option which should say Print **Unassigned ASME PQR000x**.

12

Instantly create a WPS from this PQR:

Now that you are finished creating this PQR, Weldspec can automatically create a WPS using the data on this record. To do this, go to the top of the screen and click on **File/Save As New**. Then select **WPS**. Weldspec will then take all applicable data from this PQR and place it on the WPS. Additionally, notice how the Code Checking supplies you with even more data straight out of the code such as the Thickness and Diameter ranges qualified.

PQR printout sample (page 1)

XYZ Fabrications Ltd
Granta Park, Great Abington, Cambridge, CB1 6AL, UK
ASME IX - Procedure Qualification Record (PQR)
Weldspec

PQR record number	PQR101 Revision 0	WPS record number	Revision
Date	25/07/2003	Company name	XYZ Fabrications Ltd
		Welding standard	ASME Section IX

BASE METALS (QW-403)

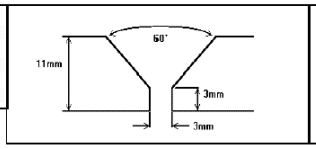
	Product form	Specification (type or grade)	P no.	Grp-no.	Size	Sch.	Thick. (mm)	Dia. (mm)
	Pipe	SA-106 (B)	1	1	152.40	XS	10.97	168.28
Welded to:	Pipe	SA-106 (B)	1	1	152.40	XS	10.97	168.28
and tested:	With PWHT, With impacts							
Notes								

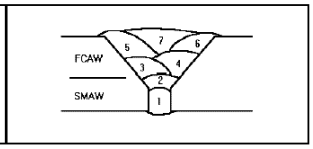
POST WELD HEAT TREATMENT (QW-407)

Temperature	(°C) 450	Time	(hrs) 8	Type	Stress relief
Heating rate	(°C/hr) 200	Method	Furnace		
Cooling rate	(°C/hr) 200	Method	Still air		
Notes					

JOINTS (QW-402)

Joint design		Single-V-groove
Backing:		None
Retainers		
Groove angle	(deg.)	60
Root opening	(mm)	3
Root face	(mm)	3





WELDING PROCESSES

Welding process	SMAW		FCAW	
Type	Manual		Semi-automatic	

FILLER METALS (QW-404)

SFA specification	5.1		5.20	
AWS classification	E7018		E71T-12M	
Filler metal F-number	4		6	
Weld metal A-number	1		11	
Filler metal nominal composition				
Filler metal trade name				
Filler metal size (mm)	3.25	4	1.0	1.2
Deposited thickness (mm)	4		7	
Maximum pass thickness (mm)	3		3	
Weld deposit chemistry				
Supplemental filler metal	-		None	
Supplemental filler metal vol. (mm³)	-			

POSITION (QW-405)

Position of groove	1G Rotated	1G Rotated
Weld progression	-	-

PREHEAT (QW-406)

Preheat temperature (°C)	120	120	
Maximum interpass temperature (°C)	250	250	

GAS (QW-408)

Shielding gas:	Type	-	75% Argon, 25% CO2		
	Flow rate (l/min)	-	15	12	
Trailing gas:	Type	-	None		
	Flow rate (l/min)	-	-	-	
Backing gas:	Type	-	None		
	Flow rate (l/min)	-	-	-	

ELECTRICAL (QW-409)

Filler metal size (mm)	3.25	4	1.0	1.2	
Amperes	104-116	110-125	100-120	105-130	
Volts	24-28	26-30	26-31	28-32	
Travel speed (mm/min)	125	150	200	175	
Maximum heat input (kJ/mm)	1.4	1.3	1.1	1.3	
Current/polarity	DC -ve	DC -ve	DC +ve	DC +ve	
Wire feed speed (m/min)	-		2.4	2.7	
Arc transfer mode	-		Spray		

TECHNIQUE (QW-410)

String or weave	Stringer	Stringer and Weave
Orifice/gas cup size	-	19mm
C.T.W.D (mm)	-	18
Multi/Single pass per side	Multiple passes	Multiple passes
Peening	Not used	Not used
Initial/interpass cleaning	Brushing	Brushing and Grinding
Back gouging method	Not applicable	Not applicable

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PQR printout sample (page 2)

XYZ Fabrications Ltd
Granta Park, Great Abington, Cambridge, CB1 6AL, UK
ASME IX - Procedure Qualification Record (PQR) - Test results (PWHT)
Weldspec

PQR record number	PQR101	Revision 0	WPS record number		Revision
Date	25/07/2003		Company name	XYZ Fabrications Ltd	
			Welding standard	ASME Section IX	

TENSILE TESTS (QW-150) Reduced section

Specimen number	Width (mm)	Thickness (mm)	Area (mm²)	Ultimate total load (N)	Ultimate unit stress (MPa)	Type of failure and location
001	19	11	209.00	93000	445	Ductile-Base Metal
002	19	11	209.00	92000	440	Ductile-Base Metal

Comments: 2 reduced section tension tests per QW-151.2 and QW-462.1(c)

GUIDED BEND TESTS (QW-160)

Type of test	Acceptance criteria	Result	Comments
2 transverse face bends per QW-161.2 and QW-462.3(a)	QW-163	Acceptable	see - ASME IX - QW-451.1
2 transverse root bends per QW-161.3 and QW-462.3(a)	QW-163	Acceptable	see - ASME IX - QW-451.1

Comments:

TOUGHNESS TESTS (QW-170)

Specimen number	Notch location	Notch type	Specimen size (mm) x (mm)	Test temperature (°C)	Impact values (J)	(% Shear)	(mm)	Drop weight break
BM001	Base Metal	V-notch	10 x 10	-30	45	18	2	-
BM002	Base Metal	V-notch	10 x 10	-30	40	15	2	-
BM003	Base Metal	V-notch	10 x 10	-30	38	12	3	-
BM004	Base Metal	V-notch	10 x 10	-30	39	16	2	-
BM005	Base Metal	V-notch	10 x 10	-30	42	14	2	-
HZ001	HAZ	V-notch	10 x 10	-30	35	11	3	-
HZ002	HAZ	V-notch	10 x 10	-30	38	18	1.5	-
HZ003	HAZ	V-notch	10 x 10	-30	33	12	2	-
HZ004	HAZ	V-notch	10 x 10	-30	40	14	2	-
HZ005	HAZ	V-notch	10 x 10	-30	31	14	2	-
WM001	Weld Metal	V-notch	10 x 10	-30	35	16	1.5	-
WM002	Weld Metal	V-notch	10 x 10	-30	37	17	3	-
WM003	Weld Metal	V-notch	10 x 10	-30	39	16	2.5	-
WM004	Weld Metal	V-notch	10 x 10	-30	41	20	2.5	-
WM005	Weld Metal	V-notch	10 x 10	-30	44	13	3	-

Comments:

OTHER TESTS

Type of test	Acceptance criteria	Result	Comments
Visual examination per QW-302.4	QW-194	Acceptable	see - ASME IX - QW-452.1 (a)
Radiographic examination per QW-191 and QW-302.2	QW-191.2	Acceptable	see - ASME IX - QW-142/3, QW-304/5

Comments:

CERTIFICATION

Welder's name	ID Number	Stamp number		
John Smith	142	1002532-82	Mechanical testing by	ABC Testing Services
			Laboratory test number	711009-1
			Test file number	03/0001432-01
			Tests conducted by	Norman Smith

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

Welding Engineer		QA Manager	
Name	Signature	Name	Signature
SYS	Simon Ward		
Date		Date	
25/07/2003			

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How to create a WPS (page 1)

For automatic creation of a WPS, refer to item 9 on the next page.

1

From Weldspec's main menu bar, click on the small drop-down arrow as shown. Select **ASME IX WPS**.

2

Fill out your WPS with the same data that appears in this example. For fast data entry, always select the desired data from the drop-down menus or databases rather than typing the information manually. See how this form grows dynamically based on the data entered.

3

When specifying the filler metal, remember to select it from the Filler Material Database instead of manually typing the information. To do this, place the cursor in the "SFA" field and click on the database icon. Locate and select the same filler metals listed in this example and then press the Accept button. Notice that the proper SFA, Classification, F and A numbers are entered automatically. **Note**: Multiple filler metal classifications may be specified. However, in this example we will only use one for demonstration purposes.

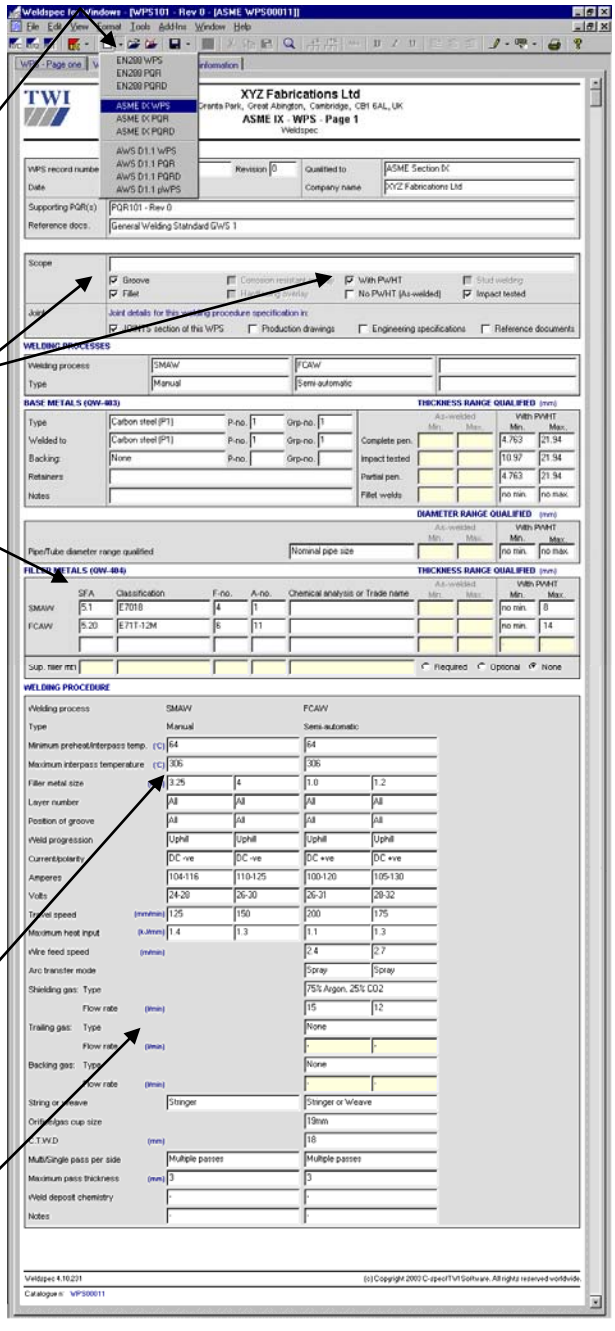
NOTE: Only a few filler metals and base metals are visible in the materials database while in demo mode.

4

In addition to three welding processes, Weldspec also allows you to specify up to five different filler metal sizes for each process. To do this, click inside the filler metal size field and then locate the Add Column icon on the Tool Bar at the top of the screen. Click this icon and watch how this field splits with each click. This will also split any other applicable fields such as the electrical parameters.

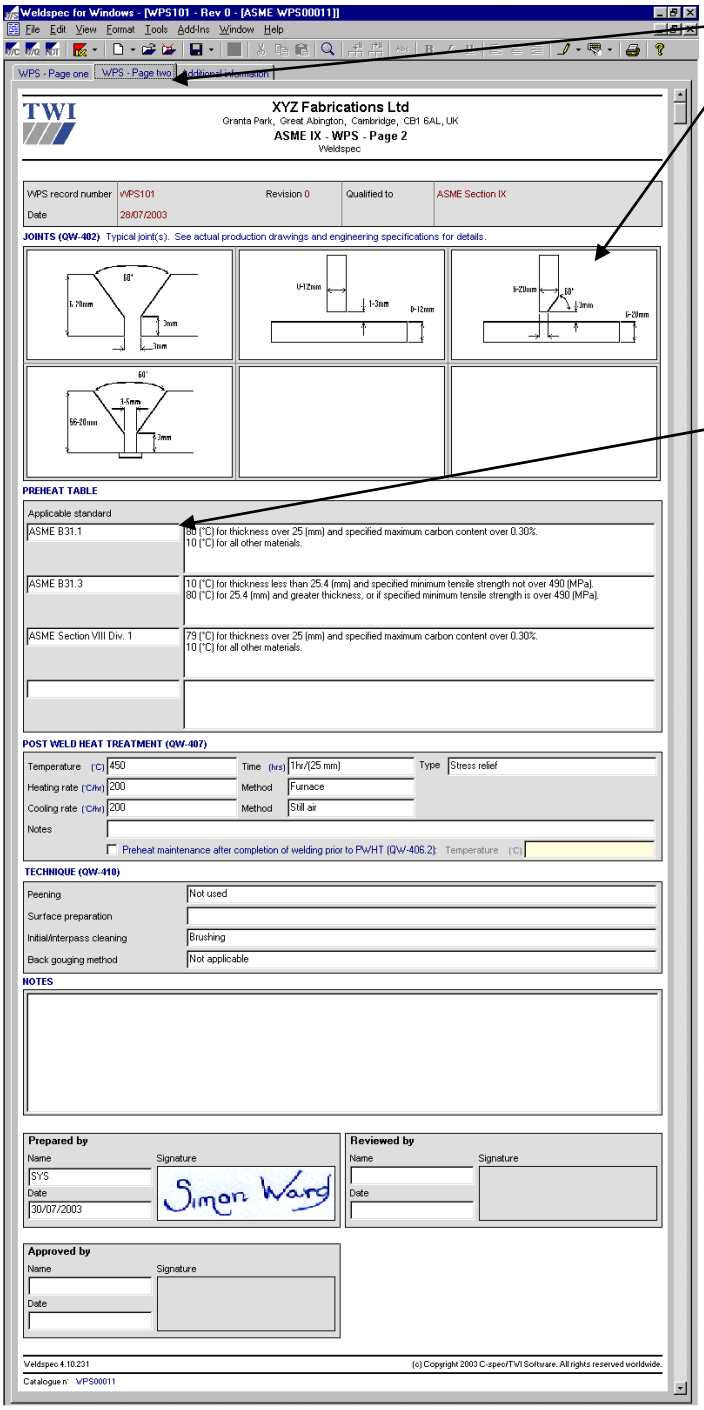
5

Notice the missing "Gas" fields for SMAW. This is another feature of the dynamic forms. Weldspec prevents entry of non-relevant information and minimises potential introduction of errors. Helpful features like this are included throughout the software.



WPS (page 2)

To continue entering data into the second page of the WPS, click on the tab at the top of the page entitled **"WPS – Page Two"**.



6

Weldspec is equipped with a comprehensive database of typical joint details already drawn for you. For more information on these sketches refer to the help system by clicking on **Help/Contents.** Then select topic **2.2.3.**

7

To specify the applicable preheat for the materials entered on page one, simply select up to four standards from Weldspec's drop-down lists and the Code Checking will supply the appropriate data.

8

Printing this WPS:
When you are ready to print this record, go to the top of the screen and click on **File.** Then select the second print option which should say Print **Unassigned ASME WPS000x**.

9

Automatically create a WPS from a PQR:
another way to create a WPS is to have Weldspec automatically generate the WPS from a PQR. To do this you will need to open a completed PQR. If you have not yet made a PQR, please follow the instructions on the page entitled **"How to create a PQR"**. With a PQR opened, go to the top of the screen and click on **File/Save As New**. Then select **WPS**. Weldspec will begin to take all applicable data from the PQR and place it on the WPS. Additionally, notice how the Code Checking supplies you with even more data straight out of the code such as the Thickness and Diameter ranges qualified.

WPS printout sample (page 1)

XYZ Fabrications Ltd
Granta Park, Great Abington, Cambridge, CB1 6AL, UK
ASME IX - WPS - Page 1
Weldspec

WPS record number	WPS101 Revision 0	Qualified to	ASME Section IX
Date	28/07/2003	Company name	XYZ Fabrications Ltd
Supporting PQR(s)	PQR101 - Rev 0		
Reference docs.	General Welding Statndard GWS 1		

Scope	Groove, fillet, impact testing, with PWHT
Joint	Joint details for this welding procedure specification in: JOINTS section of this WPS

BASE METALS (QW-403)

Type	Carbon steel (P1)	P-no. 1	Grp-no. 1
Welded to	Carbon steel (P1)	P-no. 1	Grp-no. 1
Backing:	None	P-no.	Grp-no.
Retainers			
Notes			

THICKNESS RANGE QUALIFIED (mm)

	As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
Complete pen.	-	-	4.763	21.94
Impact tested	-	-	10.97	21.94
Partial pen.	-	-	4.763	21.94
Fillet welds	-	-	no min.	no max.

DIAMETER RANGE QUALIFIED (mm)

	As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
Nominal pipe size	-	-	no min.	no max.

FILLER METALS (QW-404)

	SFA	Classification	F-no.	A-no.	Chemical analysis or Trade name	As-welded Min.	As-welded Max.	With PWHT Min.	With PWHT Max.
SMAW	5.1	E7018	4	1		-	-	no min.	8
FCAW	5.20	E71T-12M	6	11		-	-	no min.	14
Sup. filler						None			

THICKNESS RANGE QUALIFIED (mm)

WELDING PROCEDURE

Welding process		SMAW		FCAW	
Type		Manual		Semi-automatic	
Preheat temperature	(°C)	64		64	
Maximum interpass temperature	(°C)	306		306	
Filler metal size	(mm)	3.25	4	1.0	1.2
Layer number		All	All	All	All
Position of groove		All	All	All	All
Weld progression		Uphill	Uphill	Uphill	Uphill
Current/polarity		DC -ve	DC -ve	DC +ve	DC +ve
Amperes		104-116	110-125	100-120	105-130
Volts		24-28	26-30	26-31	28-32
Travel speed	(mm/min)	125	150	200	175
Maximum heat input	(kJ/mm)	1.4	1.3	1.1	1.3
Wire feed speed	(m/min)	-		2.4	2.7
Arc transfer mode		-		Spray	Spray
Shielding: Gas type		-		75% Argon, 25% CO2	
Flow rate	(l/min)	-		15	12
Trailing: Gas type		-		None	
Flow rate	(l/min)	-		-	-
Backing: Gas type		-		None	
Flow rate	(l/min)	-		-	-
String or weave		Stringer		Stringer or Weave	
Orifice/gas cup size		-		19mm	
C.T.W.D	(mm)	-		18	
Multi/Single pass per side		Multiple passes		Multiple passes	
Maximum pass thickness	(mm)	3		3	
Weld deposit chemistry		-		-	
Notes		-		-	

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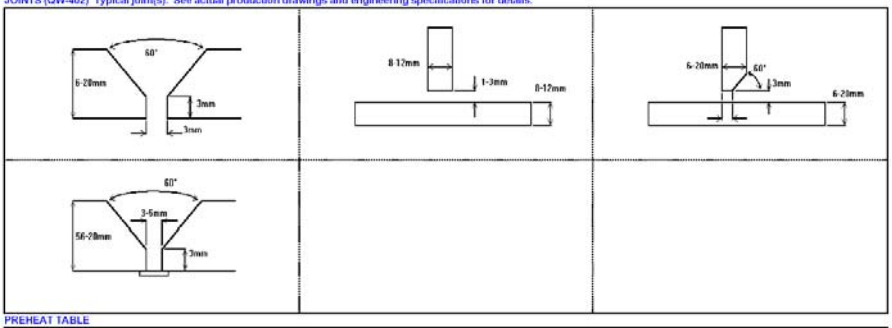
WPS printout sample (page 2)

XYZ Fabrications Ltd
Granta Park, Great Abington, Cambridge, CB1 6AL, UK
ASME IX - WPS - Page 2
Weldspec

WPS record number	WPS101	Revision 0	Qualified to	ASME Section IX
Date	28/07/2003		Company name	XYZ Fabrications Ltd

JOINTS (QW-402) Typical joint(s). See actual production drawings and engineering specifications for details.



PREHEAT TABLE

Applicable standard	
ASME B31.1	80 (°C) for thickness over 25 (mm) and specified maximum carbon content over 0.30%. 10 (°C) for all other materials.
ASME B31.3	10 (°C) for thickness less than 25.4 (mm) and specified minimum tensile strength not over 490 (MPa). 80 (°C) for 25.4 (mm) and greater thickness, or if specified minimum tensile strength is over 490 (MPa).
ASME Section VIII Div. 1	79 (°C) for thickness over 25 (mm) and specified maximum carbon content over 0.30%. 10 (°C) for all other materials.

POST WELD HEAT TREATMENT (QW-407)

Temperature	(°C)	450	Time	(hrs)	1hr/(25 mm)	Type	Stress relief
Heating rate	(°C/hr)	200	Method		Furnace		
Cooling rate	(°C/hr)	200	Method		Still air		
Notes							

TECHNIQUE (QW-410)

Peening	Not used
Surface preparation	
Initial/interpass cleaning	Brushing
Back gouging method	Not applicable

NOTES

Prepared by

Name	Signature	Reviewed by Name	Signature
SYS	Simon Ward		
Date		Date	
30/07/2003			

Approved by

Name	Signature
Date	

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How to create a prequalified WPS

1

From Weldspec's main menu, click on the small drop-down arrow as shown. Select **AWS D1.1 pWPS**.

2

In one step most of the prequalified WPS will be filled out automatically. Place the cursor in the "Joint Type" field and click on the database button. Locate the joint entitled **B-U2a-GF** from the database of prequalified joints and double-click on it.

3

For the fields that were not automatically filled in, duplicate the **SAME** data that appears in this example. Whenever possible, select the desired data from the drop-down menus or databases rather than typing the information manually.

4

When specifying the filler metal, select it from the Filler Material Database instead of manually typing the information. To do this, place the cursor in the "AWS spec" field and click on the database icon. Locate the same material listed in this example and double-click on it. Weldspec will enter the proper AWS Specification and Classification automatically.

NOTE: Only a few filler metals and base metals are visible in the materials database while in demo mode.

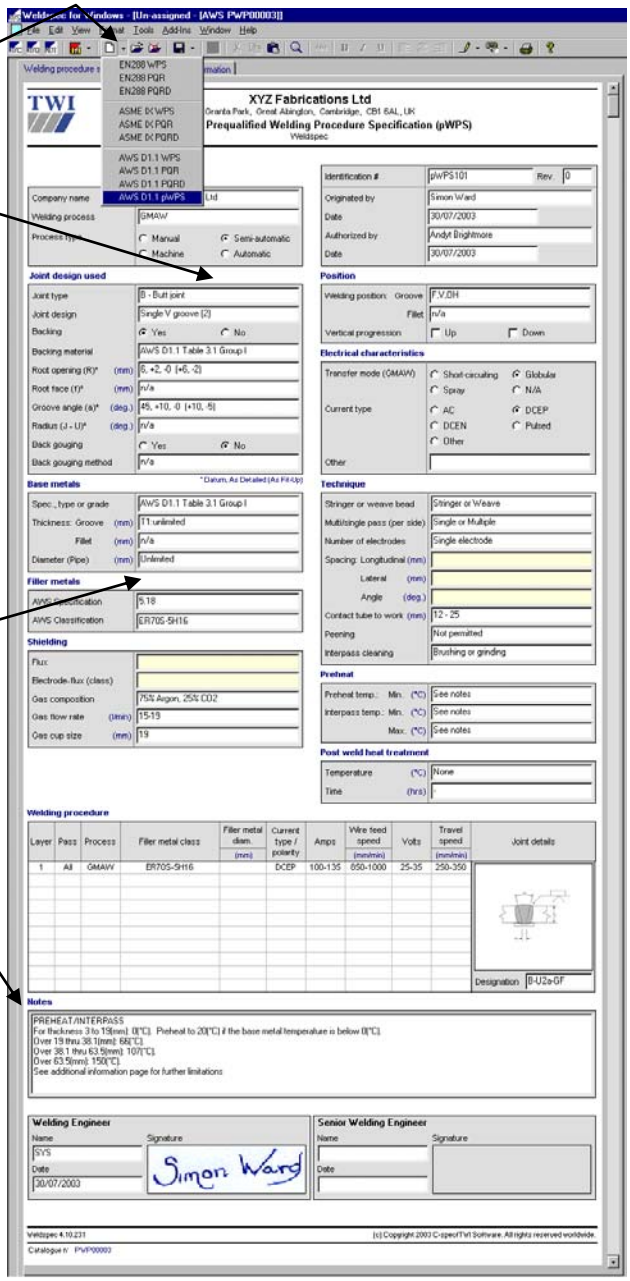
5

Based on the information entered, the Code Checking in Weldspec automatically supplies the proper Preheat/Interpass data. With code intelligent features like this, Weldspec will greatly reduce (or eliminate) the need to waste time looking for information in the code.

6

Printing this WPS:

When you are ready to print this record, go to the top of the screen and click on File. Select the second print option which will say: Print **Unassigned ASME PWP000x.**



pWPS printout sample

XYZ Fabrications Ltd

Granta Park, Great Abington, Cambridge, CB1 6AL, UK

AWS - D1.1 Prequalified Welding Procedure Specification (pWPS)

Weldspec

Company name	XYZ Fabrications Ltd
Welding process	GMAW
Process type	Semi-automatic

Identification #	pWPS101	Rev. 0
Originated by	Simon Ward	
Date	30/07/2003	
Authorized by	Andyt Brightmore	
Date	30/07/2003	

Joint design used

Joint type		B - Butt joint
Joint design		Single V groove (2)
Backing		Yes
Backing material		AWS D1.1 Table 3.1 Group I
Root opening (R)*	(mm)	6, +2, -0 (+6, -2)
Root face (f)*	(mm)	n/a
Groove angle (a)*	(deg.)	45, +10, -0 (+10, -5)
Radius (J - U)*	(deg.)	n/a
Back gouging		No
Back gouging method		n/a

Position

Welding position:	Groove	F,V,OH
	Fillet	n/a
Vertical progression		

Electrical characteristics

Transfer mode (GMAW)	Globular
Current type	DCEP
Other	

Base metals * Datum, As Detailed (As Fit-Up)

Spec., type or grade			AWS D1.1 Table 3.1 Group I
Thickness:	Groove	(mm)	T1:unlimited
	Fillet	(mm)	n/a
Diameter (Pipe)		(mm)	Unlimited

Technique

Stringer or weave bead			Stringer or Weave
Multi/single pass (per side)			Single or Multiple
Number of electrodes			Single electrode
Spacing:	Longitudinal	(mm)	-
	Lateral	(mm)	-
	Angle	(deg.)	-
Contact tube to work		(mm)	12 - 25
Peening			Not permitted
Interpass cleaning			Brushing or grinding

Filler metals

AWS Specification	5.18
AWS Classification	ER70S-5H16

Preheat

Preheat temp.:	Min.	(°C)	See notes
Interpass temp.:	Min.	(°C)	See notes
	Max.	(°C)	See notes

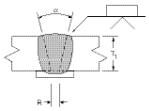
Shielding

Flux		-
Electrode-flux (class)		-
Gas composition		75% Argon, 25% CO2
Gas flow rate	(l/min)	15-19
Gas cup size	(mm)	19

Post weld heat treatment

Temperature	(°C)	None
Time	(hrs)	-

Welding procedure

Layer	Pass	Process	Filler metal class	Filler metal diameter (mm)	Current type / polarity	Amps	Wire feed speed (m/min)	Volts	Travel speed (m/min)	Joint details
1	All	GMAW	ER70S-5H16		DCEP	100-135	850-1000	25-35	250-350	
								Designation		B-U2a-GF

Notes

PREHEAT/INTERPASS
For thickness 3 to 19(mm): 0(°C). Preheat to 20(°C) if the base metal temperature is below 0(°C).
Over 19 thru 38.1(mm): 66(°C).
Over 38.1 thru 63.5(mm): 107(°C).
Over 63.5(mm): 150(°C).
See additional information page for further limitations

Welding Engineer

Name	Signature
SYS	Simon Ward
Date	
30/07/2003	

Senior Welding Engineer

Name	Signature
Date	

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How to create a WPQ

Start Welderqual by clicking on the Welderqual icon on your desktop. The system displays a form giving you various options. Click “close” to remove the form.

1

Click on the small drop-down arrow as shown. Select **ASME IX WPQ.**

2

For the fastest possible data entry, always select the desired data from the drop-down menus or databases rather than typing the information manually.

3

Do not enter “Range Qualified” data manually. All you need to enter are the **“Actual Values”** of the welder qualification test and the Code Checking will fill in the Qualified Ranges based on the Actual Values that you enter.

4

As you select a welding process, the form will grow supplying you with the required fields specific for the process selected. Notice that Welderqual allows the use of up to three processes on one WPQ.

5

When specifying the filler metal, select it from the Filler Material Database instead of manually typing the information. To do this, place the cursor in the “Filler metal spec” field and click on the database icon. Locate the same material listed in this example and double-click on it. Welderqual enters the proper Specification, Classification and F numbers automatically.

NOTE: Only a few filler metals and base metals are visible in the materials database while in demonstration mode.

6

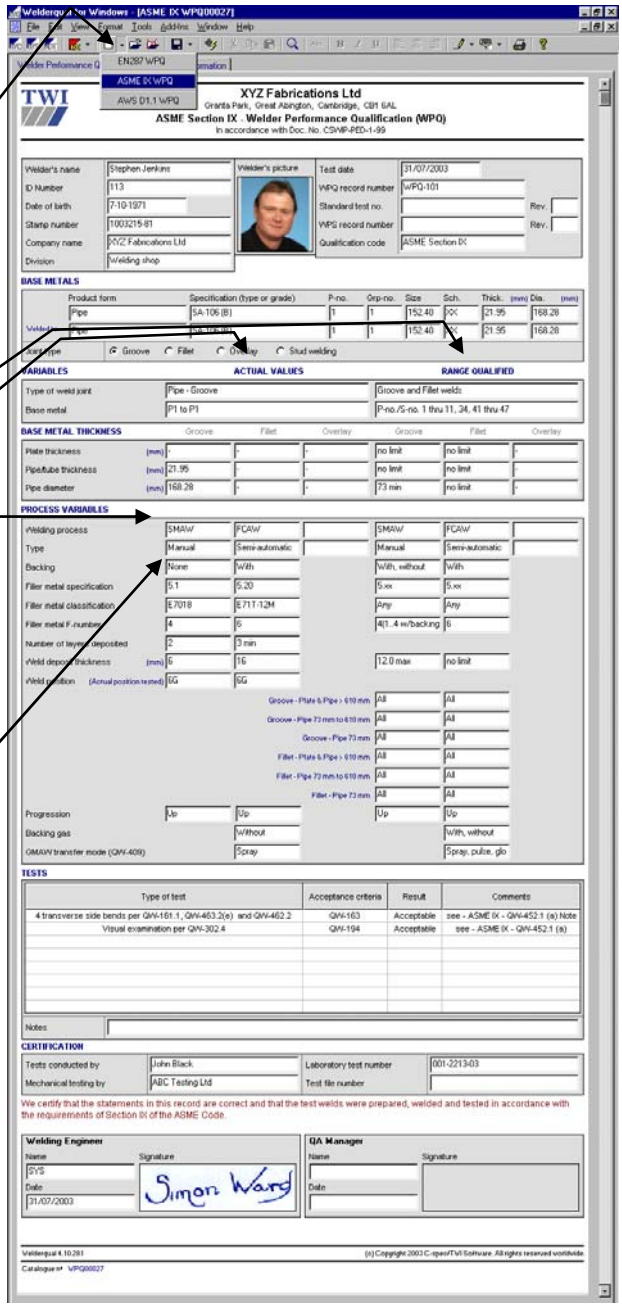
Printing this WPQ:

To print this record, go to the top of the screen and click on File. Select the second print option which will say: **Print Unassigned ASME WPQ000x.**

7

Instantly clone a WPQ:

One of the best time saving features in Welderqual is the ability to create duplicates of a completed WPQ. To do this, go to the top of the screen and click on **File/Save As New**, then select WPQ. Iderqual will create a duplicate of this current record.



WPQ printout sample

XYZ Fabrications Ltd

Granta Park, Great Abington, Cambridge, CB1 6AL

ASME Section IX - Welder Performance Qualification (WPQ)

In accordance with Doc. No. CSWIP-PED-1-99

Welder's name	Stephen Jenkins		Test date	31/07/2003	
ID Number	113		WPQ record number	WPQ-101	
Date of birth	7-10-1971		Standard test number		Rev.
Stamp number	1003215-81		WPS record number		Rev.
Company name	XYZ Fabrications Ltd		Qualification code	ASME Section IX	
Division	Welding shop				

BASE METALS (QW-403)

	Product form	Specification (type or grade)	P no.	Grp-no.	Size	Sch.	Thick. (mm)	Dia. (mm)
	Pipe	SA-106 (B)	1	1	152.40	XX	21.95	168.28
Welded to:	Pipe	SA-106 (B)	1	1	152.40	XX	21.95	168.28
Joint type	Groove							

VARIABLES

	Actual values	RANGE QUALIFIED
Type of weld joint	Pipe - Groove	Groove and Fillet welds
Base metal	P1 to P1	P-no./S-no. 1 thru 11, 34, 41 thru 47

BASE METAL THICKNESS	Groove	Fillet	Overlay	Groove	Fillet	Overlay
Plate thickness (mm)	-	-	-	no limit	no limit	-
Pipe/tube thickness (mm)	21.95	-	-	no limit	no limit	-
Pipe diameter (mm)	168.28	-	-	73 min	no limit	-

PROCESS VARIABLES	Actual values		RANGE QUALIFIED	
Welding process	SMAW	FCAW	SMAW	FCAW
Type	Manual	Semi-automatic	Manual	Semi-automatic
Backing	None	With	With, without	With
Filler metal specification	5.1	5.20	5.xx	5.xx
Filler metal classification	E7018	E71T-12M	Any	Any
Filler metal F-number	4	6	4(1..4 w/backing)	6
Number of layers deposited	2	3 min		
Weld deposit thickness (mm)	6	16	12.0 max	no limit
Weld position (Actual position tested)	6G	6G		
Groove - Plate & Pipe > 610mm			All	All
Groove - Pipe 73mm to 610mm			All	All
Groove - Pipe 73mm			All	All
Fillet - Plate & Pipe > 610mm			All	All
Fillet - Pipe 73mm to 610mm			All	All
Fillet - Pipe < 73mm			All	All
Progression	Up	Up	Up	Up
Backing gas	-	Without	-	With, without
GMAW transfer mode (QW-409)	-	Spray	-	Spray, pulse, globular

TESTS

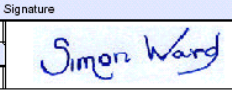
Type of test	Acceptance criteria	Result	Comments
4 transverse side bends per QW-161.1, QW-463.2(e) and QW-462.2	QW-163	Acceptable	see - ASME IX - QW-452.1 (a) Note (1)
Visual examination per QW-302.4	QW-194	Acceptable	see - ASME IX - QW-452.1 (a)

Notes

CERTIFICATION

Tests conducted by	John Black	Laboratory test number	001-2213-03
Mechanical tests by	ABC Testing Ltd	Test file number	

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

Welding Engineer		QA Manager	
Name	Signature	Name	Signature
SYS			
Date		Date	
31/07/2003			

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How to create an NDE Report (RT shown)

Start NDTspec by clicking on the NDTspec icon on your desktop. The system displays a form giving you various options. Click “close” to remove the form.

1

Click on the small drop-down arrow as shown. Select **Radiographic Report**.

2

For fast data entry, always select the desired data from the drop-down menus or databases rather than typing the information manually.

3

When entering the **Examination results**, specify the welder that performed the welding, the length of the examined area, length of rejectable welding and the process used. Tracking this data may enable the use of Performance Reports, which determine reject rates and helps to monitor production.

4

You can enter as many lines of data into the Examination Results section as you wish. NDTspec will automatically print your report over multiple pages if necessary.

5

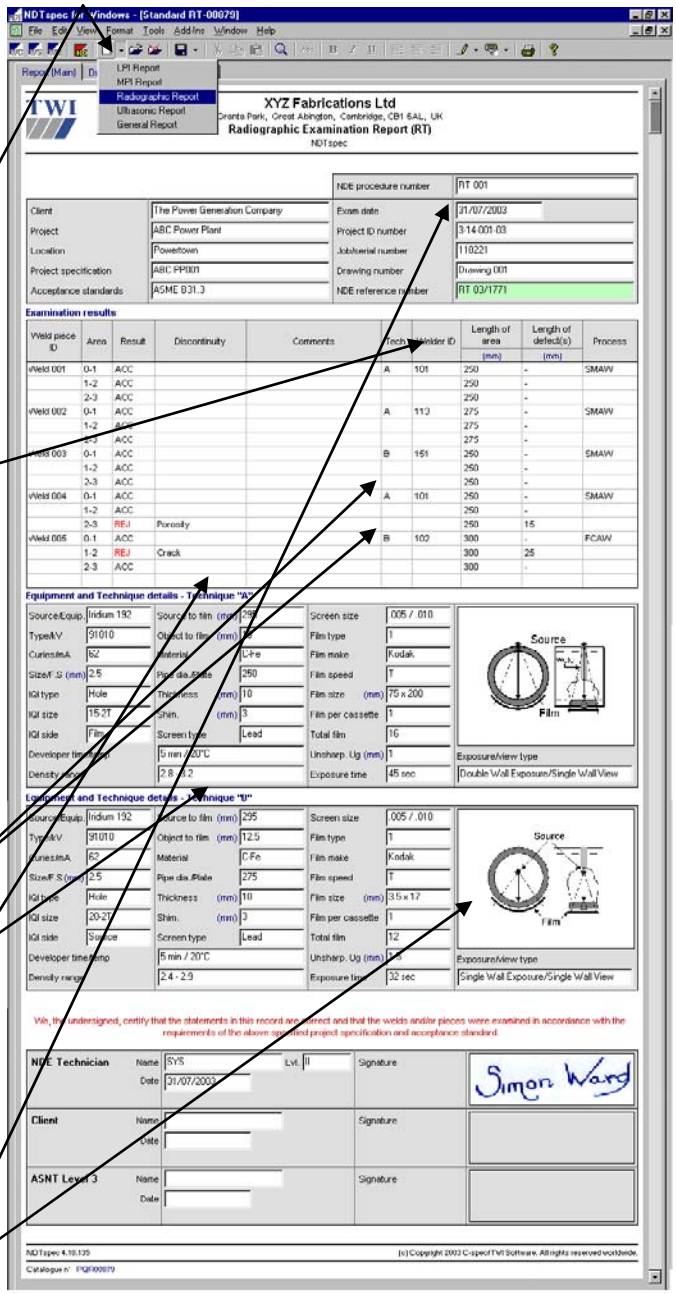
Based on the number of techniques specified in the Examination results section (A,B,C,D), NDTspec provides the proper number of **Equipment and Technique** details sections.

6

When filling out the Equipment and Techniques details, Source and Film data can be entered straight out of the Source and Film Profile databases, preventing the need to ever enter the same information twice. Additionally, Curies will be automatically calculated based on the report date above.

7

Instead of drawing an NDE sketch, the Sketch Selection Manager includes a database of typical pre-drawn images.



RT Report printout sample

The Power Generation Company

Granta Park, Great Abington, Cambridge, CB1 6AL, UK

Radiographic Examination Report (RT)

NDTspec

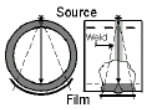
		NDE procedure number	RT 001
Client	The Power Generation Company	Exam date	31/07/2003
Project	ABC Power Plant	Project ID number	3-14-001-03
Location	Powertown	Job/serial number	110221
Project specification	ABC PP001	Drawing number	Drawing 001
Acceptance standards	ASME B31.3	NDE reference number	RT 03/1771

Examination results

Weld piece ID	Area	Result	Discontinuity	Comments	Tech.	Welder ID	Weld Area	Defect length(s)	Process
Weld 001	0-1	ACC			A	101	250	-	SMAW
	1-2	ACC					250	-	
	2-3	ACC					250	-	
Weld 002	0-1	ACC			A	113	275	-	SMAW
	1-2	ACC					275	-	
	2-3	ACC					275	-	
Weld 003	0-1	ACC			B	151	250	-	SMAW
	1-2	ACC					250	-	
	2-3	ACC					250	-	
Weld 004	0-1	ACC			A	101	250	-	SMAW
	1-2	ACC					250	-	
	2-3	**REJ**	Porosity				250	15	
Weld 005	0-1	ACC			B	102	300	-	FCAW
	1-2	**REJ**	Crack				300	25	
	2-3	ACC					300	-	

Equipment and Technique details - Technique "A"

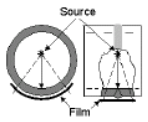
Source/Equipment	Iridium 192	Source to film	295	Screen size	.005 / .010
Type/kV	91010	Object to film	19	Film type	1
Curies/mA	62	Material	C-Fe	Film make	Kodak
Size/Focal size	2.5	Pipe dia./Plate	250	Film speed	T
IQI type	Hole	Thickness	10	Film size	75 x 200
IQI size	15-2T	Shim.	3	Film per cassette	1
IQI side	Film	Screen type	Lead	Total film	16
Dev. time/temp	5 min / 20°C			Unsharpness Ug	1
Density range	2.8 - 3.2			Exposure time	45 sec



Double Wall Exposure/Single Wall View

Equipment and Technique details - Technique "B"

Source/Equipment	Iridium 192	Source to film	295	Screen size	.005 / .010
Type/kV	91010	Object to film	12.5	Film type	1
Curies/mA	62	Material	C-Fe	Film make	Kodak
Size/Focal size	2.5	Pipe dia./Plate	275	Film speed	T
IQI type	Hole	Thickness	10	Film size	3.5 x 17
IQI size	20-2T	Shim.	3	Film per cassette	1
IQI side	Source	Screen type	Lead	Total film	12
Dev. time/temp	5 min / 20°C			Unsharpness Ug	1.5
Density range	2.4 - 2.9			Exposure time	32 sec



Single Wall Exposure/Single Wall View

We, the undersigned, certify that the statements in this record are correct and that the welds and/or pieces were examined in accordance with the requirements of the above specified project specification and acceptance standard.

NDE Technician	Name Date Level	SYS 31/07/2003 II	Signature	Simon Ward
Client	Name Date		Signature	
ASNT Level 3	Name Date		Signature	

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