Major Tool and Machine, Inc.

1458 E. 19th Street, Indianapolis, Indiana, 46218

Procedure Qualification Record (PQR) - Details of Welding Test

Weldspec for Windows

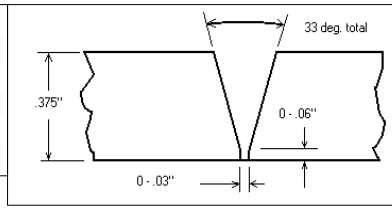
PQR record number	PQR390	Revision 1	WPS record number	WPS390-PPPL	Revision 0
Date	11/5/2004		Company name	Major Tool and Machine, Inc.	
			Welding standard	ASME IX and AWS B2.1	

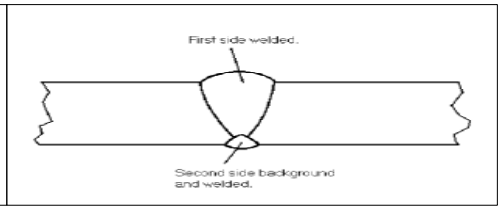
BASE METALS (QW-403)

	Product form	Specification (type or grade)	P no.	Grp-no.	Size	Sch.	Thick. (in.)	Dia. (in.)
	Plate	SB-443 Gr. 1	43		-	-	.375	-
Welded to:	Plate	SB-443 Gr. 1	43		-	-	.375	-
and tested:	Without PWHT							
Notes								

JOINTS (QW-402)

Joint design		Double-V-groove
Backing:		Yes
Retainers		
Groove angle	(deg.)	66 (total)
Root opening	(in.)	0 - .032"
Root face	(in.)	0 - .06"





WELDING PROCESSES

Welding process		GTAW	GTAW
Type		Manual	Manual

FILLER METALS (QW-404)

SFA specification		5.14	5.14
AWS classification		ERNiCrMo-3	ERNiCrMo-3
Filler metal F-number		43	43
Weld metal A-number		N/A	N/A
Filler metal nominal composition		See manufacturers data	See manufacturers data
Filler metal trade name		625 Inconel	625 Inconel
Filler metal size	(in.)	.062	.093
Deposited thickness	(in.)	.125	.250
Maximum pass thickness	(in.)	.12	.12
Weld deposit chemistry		See manufacturers data	See manufacturers data

POSITION (QW-405)

Position of groove		1G	1G
Weld progression		-	-

PREHEAT (QW-406)

Preheat temperature	(°F)	65	65
Maximum interpass temperature	(°F)	350	350

GAS (QW-408)

Shielding gas:	Type		Argon	Argon
	Flow rate	(cfh)	40	40
Trailing gas:	Type		None	None
	Flow rate	(cfh)	-	-
Backing gas:	Type		Argon	Argon
	Flow rate	(cfh)	30	30

ELECTRICAL (QW-409)

Filler metal size	(in.)	.062	.093
Amperes		135 - 175	135 - 175
Volts		13.8 - 15.2	13.8 - 15.2
Travel speed	(in./min)	3 - 5	3 - 5
Maximum heat input	(kJ/in.)		
Tungsten size	(in.)	.093	.093
Tungsten type		SFA 5.12 EWTh-2	SFA 5.12 EWTh-2
Current/polarity		DCEN (straight polarity)	DCEN (straight polarity)
DC pulsing current		Not used	Not used

TECHNIQUE (QW-410)

String or weave	Stringer	Stringer
Orifice/gas cup size	.44"	.44"
Multi/Single pass per side	Multiple passes	Multiple passes
Peening	Not used	Not used
Initial/interpass cleaning	See Additional information	See Additional information
Back gouging method	Grinding	Grinding

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Procedure Qualification Record (PQR) - Test Results (As Welded)

Weldspec for Windows

PQR record number	PQR390 Revision 1	WPS record number	WPS390-PPPL Revision 0
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TENSILE TESTS (QW-150)

Reduced section

Specimen number	Width (in.)	Thickness (in.)	Area (in²)	Ultimate total load (lb)	Ultimate unit stress (psi)	Type of failure and location
1	.759	.389	0.295	37349	126500	Ductile-Weld
2	.758	.383	0.290	36801	126800	Ductile-Weld

Comments	Two reduced section tension tests per QW-151.1 and QW-462.1(a).

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
Visual examination	QW-194	Acceptable	
Radiographic Examination	QW-191	Acceptable	

Comments	See Additional Information for other testing performed.

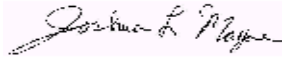
CERTIFICATION

Welder's name	ID Number	Stamp number
Appleby, Kenneth	709	

Mechanical testing by	Sherry Laboratories
Laboratory test number	2003120314
Test file number	
Tests conducted by	Jerry L. Judt

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 the Codes/Specifications referenced within.

Signature

Name	Signature
Josh Mayne	
Date	
11/5/2004	

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1. Interpass cleaning requirements: Wire brush each pass to remove oxides. Light grinding may also be required to remove oxides or surface contaminates. Use only uncontaminated stainless steel brushes and grinding wheels.

2. NDT performed:
   Visual examination - MTM NDT cert no. 7636.
   Radiography - MTM NDT cert no. 371-F0004, dated 12/2/2003.

3. Pre-weld magnetic permeability readings:
   Base material = 1.001 (3 readings taken on each plate - 6 readings total)

4. Post-weld magnetic permeability readings:
   Base material = 1.001 - 1.003 (3 readings taken on each side of each plate - 12 readings total)
   Weld metal = 1.001 (3 readings taken on each weld face - 6 readings total)
   Heat effected zone = 1.001 (3 readings taken on both sides of each weld - 12 readings total)

5. .062" dia. filler was used on the root pass only. .093" dia. filler was used on all fill and cover passes.

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Rev 0 - Added into C Spec - 12/02/03 - DHL
Rev 1 - Added into C Spec - 11/5/04 JLM
- Base Mateiral specification changed from SB-443 (1) to SB-443 Gr. 1
- Gas cup size changed from #6 (.44" dia) to .44"