

EDISON WELDING INSTITUTE

METALCORE WIRE EVALUATION



May 2006

Prepared By Justin G. Williams



CRC-EVANS Automatic Welding
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- Edison Welding Institute
- Procedure Qualification Record (2802B-4-001)
- 36" x 0.750", Grade X-100
- P260 and Manual Recorded Data





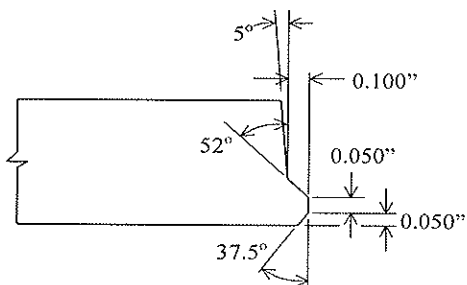
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PROCEDURE QUALIFICATION RECORD

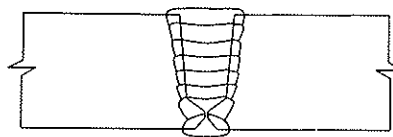
Project: EWI Metalcore Development Weld No: 2802B-4-001 Material Grade: API 5L X100 Material Mfr. / Ht No.: P05-100 Diameter: 36" Wall Thickness: 0.750" Preheat: 100 °C Interpass Temperature: 125 °C Maximum PWHT: Not Applicable	Date Weld Completed: May 12, 2006 Electrode Trade Name: TS-6, 2802B-4-001 Electrode Manufacturer: Thyssen, Metalcore Electrode Class.: ER70S-G Shielding Gas (%): See Shielding Below Electrical Current: Direct Current Polarity: Electrode Positive Position: 5G, 1G Rollout Welded By: Chris Cowan
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Pass No.	Root	Hot	Fill 1-4	Fill 5	Cap			
Travel Direction	Downhill	1G Rollout	1G Rollout	1G Rollout	1G Rollout			
Electrode Diameter	0.035" TS-6 Ht# 265306	0.045" 2802B-4-001	0.045" 2802B-4-001	0.045" 2802B-4-001	0.045" 2802B-4-001			
Gas Flow Rate (CFH)	75 CFH	50 CFH	50 CFH	50 CFH	50 CFH			
Shielding Gas Type (%)	75Ar / 25CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂			
C.T.W.D	0.300"-0.400"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"			
Oscillation Rate (BPM)	Not Applicable	Not Applicable	190	190	160			
Oscillation Width (inch)	Not Applicable	Not Applicable	As Required	As Required	As Required			
Head Angle	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead			
Equipment Type & Process	IWM GMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW			

Joint Design



Pass Sequence



Comments

Power Supplies used: Miller ALT304 for the root / Miller Invision 456MP for the hot pass, fills, and cap

Cleaning and grinding as required using power brush and grinder.

Prepared By: Justin Williams



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PROCEDURE QUALIFICATION RECORD ELECTRICAL CHARACTERISTICS									
Project: EWI Metacore Development		Date Weld Completed: May 12, 2006							
Weld Number: 2802B-4-001		Electrode Tradename: TS-6, 2802B-4-001							
Material Grade: API 5L X100		Electrode Manufacturer: Thyssen, Metacore							
Material Mfr./Heat No.: P05-100		Electrode Classification: ER70S-G							
Diameter: 3/8"		Shielding Gas (%): See Previous Page							
Wall Thickness: 0.750"		Electrical Current: Direct Current							
Preheat: 100 °C		Polarity: Electrode Positive							
Interpass Temperature: 125 °C Maximum		Position: 5G, 1G Rollout							
PWHT: Not Applicable		Welded By: Chris Cowan							
Pass Number	Root	Hot Pass	Fill 1	Fill 2	Fill 3	Fill 4	Fill 5	Cap	
Max Amps (A)	215.0	250.9	246.1	246.6	245.5	245.1	243.1	219.3	
Min Amps (A)	185.0	235.7	236.4	237.2	236.6	237.0	233.1	208.4	
Max Volts (V)	21.5	21.7	23.6	23.5	24.5	24.2	24.1	24.1	
Min Volts (V)	19.5	19.8	21.8	21.9	21.5	22.2	21.4	21.1	
Max WFS (IPM)	380.0	319.7	309.2	321.0	320.9	321.4	331.1	300.1	
Min WFS (IPM)	380.0	316.0	307.6	316.3	315.9	315.4	326.2	296.6	
Max Travel Speed (IPM)	30.0	42.0	19.0	19.1	19.0	19.0	16.1	16.0	
Min Travel Speed (IPM)	30.0	41.7	18.8	18.8	18.7	18.8	15.7	15.8	
Max Heat Input (KJ)	9.2	7.4	18.4	17.8	18.9	18.8	22.3	19.0	
Min Heat Input (KJ)	7.2	6.9	16.3	16.7	16.7	16.9	19.3	16.7	
Comments:									

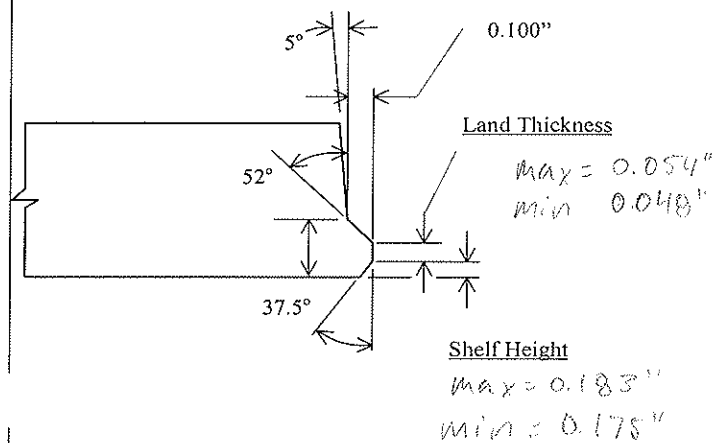


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Procedure Qualification Record Sheet

Project or Customer:	EWI
Date:	05/10/06
Pipe Diameter:	36"
Pipe Heat # & Manufacturer:	P05-100
Wall Thickness:	0.750"
Weld Number:	WELD A

Bevel Dimension Check



Internal Root Bead Parameter Record

CCW Side		CW Side	
185-200(Amps)	Head 1	(Amps) 195-210	
20.5-21.0(Volts)		(Volts) 20.5-21	
390 (WFS)		(WFS) 380	
195-200(Amps)	Head 2	(Amps) 185-200	
20.0-20.5(Volts)		(Volts) 20.0-20.5	
380 (WFS)		(WFS) 380	
185-200(Amps)	Head 3	(Amps) 190-210	
20.5-21.0(Volts)		(Volts) 20.5-21.0	
390 (WFS)		(WFS) 390	
200-215(Amps)	Head 4	(Amps) 185-200	
21.0-21.5(Volts)		(Volts) 20.0-20.5	
380 (WFS)		(WFS) 390	
Time	Travel Speed	Time	Travel Speed
Distance 30		Distance 30	
Travel Speed		Travel Speed	

Preheat and Interpass

Pass	Minimum	Maximum
Root	104°C	112°C
Hot		
Fill 1		
Fill 2		
Fill 3		
Fill 4		
Fill 5		
Fill 6		
Cap 1		
Cap 2		

Consumable Data

Pass	Electrode Type	Electrode Heat #	Dia.	Shielding Gas Type	Shielding Gas Flow Rate
Root	TS-6	265306	0.085	75/25	75
Hot					
Fills					
Fills					
Caps					
Caps					

Miscellaneous

Time Between Root and Hot Pass:	36 hours
Time Between Hot and Remaining:	10 min
Direction Of Welding:	Downhill
Cleaning and Grinding Method:	Power Grinder Power Brush
Welding Power Supply Types:	Miller ALT 304
External Welding Equipment Type:	Miller Invision 456WIP
Welder Names:	Mike Stanislaw
Recorded By:	Justin Williams

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
17	15.9	Cap	22.82	208.7	299.2	0.400	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
16	15.9	Cap	22.17	213.1	298.3	0.400	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
15	15.9	Cap	21.70	208.9	300.0	0.400	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
14	15.8	Cap	23.66	208.7	300.1	0.400	18.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
13	16.0	Cap	22.36	209.2	298.6	0.400	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
12	16.0	Cap	21.08	211.8	298.3	0.400	16.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
11	15.9	Cap	22.56	209.5	299.0	0.400	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
10	15.9	Cap	23.16	208.4	298.9	0.400	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
9	15.9	Cap	24.10	209.4	297.5	0.400	19.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
8	15.9	Cap	23.84	209.2	298.6	0.400	18.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
7	15.9	Cap	23.26	209.1	296.6	0.400	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
6	15.9	Cap	23.52	211.5	299.2	0.400	18.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
5	16.0	Cap	23.60	208.4	298.9	0.400	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
4	16.0	Cap	22.72	219.3	298.8	0.400	18.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
3	15.9	Cap	23.78	209.6	298.2	0.400	18.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
								CCW / Ditch Side	EWI 1G 36in	2202B-4-001
16	16.1	LF	21.39	242.7	330.3	0.180	19.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
15	16.1	LF	22.62	237.1	326.2	0.180	20.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
14	16.0	LF	23.38	236.8	329.1	0.180	20.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
13	15.7	LF	22.37	236.8	329.4	0.180	20.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
12	15.8	LF	22.95	235.8	331.1	0.180	20.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
11	15.7	LF	23.38	241.1	329.8	0.180	21.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
10	15.7	LF	22.85	233.1	330.8	0.180	20.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
9	15.7	LF	23.65	239.3	327.5	0.180	21.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
8	15.7	LF	22.95	240.7	330.6	0.180	21.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
7	15.7	LF	22.93	238.5	330.2	0.180	20.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
6	15.7	LF	22.58	243.1	328.7	0.180	21.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
5	15.7	LF	23.70	237.3	329.9	0.180	21.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
4	15.7	LF	23.99	240.1	328.8	0.180	22.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
3	15.7	LF	24.12	242.2	329.5	0.180	22.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
								CCW / Ditch Side	EWI 1G 36in	2202B-4-001
17	18.9	F4	23.25	239.2	318.4	0.170	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
16	19.0	F4	22.72	242.8	318.7	0.170	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
15	19.0	F4	23.54	241.3	318.0	0.170	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
14	19.0	F4	23.15	240.9	320.9	0.170	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
13	19.0	F4	23.27	245.1	315.4	0.170	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
12	18.9	F4	23.56	238.5	318.4	0.170	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
11	19.0	F4	23.54	238.0	318.3	0.170	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
10	19.0	F4	23.05	242.9	318.1	0.170	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
9	18.9	F4	23.80	237.0	319.1	0.170	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
8	19.0	F4	23.31	238.8	317.9	0.170	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
7	18.8	F4	24.18	243.2	321.4	0.170	18.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
6	19.0	F4	24.22	242.3	318.1	0.170	18.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
5	19.0	F4	23.94	241.3	318.8	0.170	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
4	18.9	F4	22.23	240.1	316.3	0.170	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
3	18.9	F4	23.19	238.3	318.1	0.170	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
								CCW / Ditch Side	EWI 1G 36in	2202B-4-001
17	18.9	F3	23.65	236.6	315.9	0.140	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
16	18.9	F3	21.45	245.5	320.9	0.140	16.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
15	18.8	F3	23.06	236.9	318.1	0.140	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
14	18.9	F3	22.75	240.5	318.5	0.140	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
13	18.8	F3	23.84	242.0	318.4	0.140	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
12	18.9	F3	23.37	241.7	318.2	0.140	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
11	18.9	F3	22.53	240.7	319.0	0.140	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
10	18.9	F3	22.61	241.1	317.8	0.140	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
9	18.9	F3	22.86	245.3	316.9	0.140	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
8	19.0	F3	23.25	240.1	317.9	0.140	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
7	19.0	F3	23.39	243.2	318.6	0.140	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
6	18.9	F3	24.50	243.5	319.3	0.140	18.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
5	18.9	F3	22.52	239.6	316.3	0.140	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
4	18.7	F3	21.90	237.9	318.9	0.140	16.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
3	18.9	F3	23.07	241.0	318.2	0.140	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
								CCW / Ditch Side	EWI 1G 36in	2202B-4-001
16	19.0	F2	22.63	237.4	317.2	0.130	17.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
15	19.0	F2	23.51	237.2	318.9	0.130	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
14	19.1	F2	22.74	243.4	316.3	0.130	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
13	19.0	F2	22.01	240.1	318.5	0.130	16.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
12	19.0	F2	22.01	246.6	320.3	0.130	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
11	18.9	F2	22.50	237.8	320.3	0.130	17.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
10	19.0	F2	22.91	245.1	318.6	0.130	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
9	18.8	F2	22.98	242.5	318.1	0.130	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
8	18.8	F2	21.88	245.1	319.3	0.130	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
7	19.0	F2	23.52	239.5	318.4	0.130	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
6	18.9	F2	23.08	243.5	318.3	0.130	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
5	19.1	F2	22.79	242.4	316.8	0.130	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
4	18.8	F2	22.51	240.9	318.1	0.130	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
3	19.0	F2	23.37	239.3	321.0	0.130	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
								CCW / Ditch Side	EWI 1G 36in	2202B-4-001
17	18.9	F1	23.05	245.5	308.8	0.126	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
16	19.0	F1	21.90	240.6	308.9	0.126	16.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
15	18.9	F1	22.67	242.9	308.4	0.126	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
14	18.9	F1	22.80	246.1	309.2	0.126	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
13	18.9	F1	22.66	243.5	308.8	0.126	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
12	18.8	F1	22.87	244.2	308.3	0.126	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
11	19.0	F1	22.76	245.8	308.1	0.126	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
10	18.9	F1	23.18	238.8	307.6	0.126	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
9	18.8	F1	23.07	241.2	308.4	0.126	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
8	18.9	F1	23.55	245.6	308.1	0.126	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
7	18.9	F1	22.61	242.3	307.8	0.126	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
6	19.0	F1	22.48	237.8	308.1	0.126	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
5	19.0	F1	21.84	236.7	308.8	0.126	16.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
4	18.8	F1	22.50	244.6	308.8	0.126	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
3	18.9	F1	23.04	236.4	309.1	0.126	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
								CCW / Ditch Side	EWI 1G 36in	2202B-4-001
17	41.8	HP	20.53	237.9	318.0	0.046	7.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
16	42.0	HP	20.44	242.7	317.0	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
15	41.8	HP	20.63	236.9	318.5	0.046	7.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
14	42.0	HP	20.99	237.0	317.6	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
13	41.8	HP	21.04	239.2	316.8	0.046	7.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
12	41.8	HP	20.91	236.5	319.2	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
11	42.0	HP	21.18	240.4	319.7	0.046	7.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
10	41.8	HP	20.93	240.4	316.0	0.046	7.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
9	42.0	HP	20.88	236.6	318.6	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
8	42.0	HP	21.70	235.8	318.4	0.046	7.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
7	41.7	HP	21.33	235.7	318.0	0.046	7.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
6	42.0	HP	21.19	241.0	317.4	0.046	7.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
5	42.0	HP	19.98	250.9	318.8	0.046	7.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
4	41.8	HP	21.04	245.2	318.5	0.046	7.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
3	42.0	HP	19.80	245.6	318.2	0.046	6.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-001
								CCW / Ditch Side	EWI 1G 36in	2202B-4-001



CRC-EVANS Automatic Welding

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- Edison Welding Institute
- Procedure Qualification Record (2802B-4-002)
- 36" x 0.750", Grade X-100
- P260 and Manual Recorded Data



www.crc-evans.com

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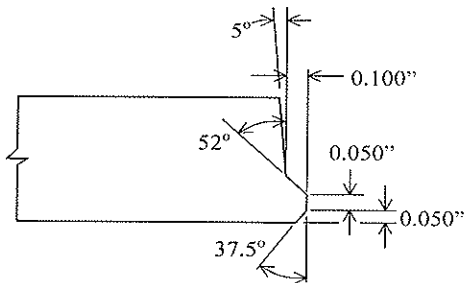
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PROCEDURE QUALIFICATION RECORD

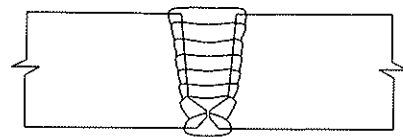
Project: EWI Metalcore Development Weld No: 2802B-4-002 Material Grade: API 5L X100 Material Mfr. / Ht No.: P05-100 Diameter: 36" Wall Thickness: 0.750" Preheat: 100 °C Interpass Temperature: 125 °C Maximum PWHT: Not Applicable	Date Weld Completed: May 12, 2006 Electrode Trade Name: TS-6, 2802B-4-002 Electrode Manufacturer: Thyssen, Metalcore Electrode Class.: ER70S-G Shielding Gas (%): See Shielding Below Electrical Current: Direct Current Polarity: Electrode Positive Position: 5G, 1G Rollout Welded By: Chris Cowan
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Pass No.	Root	Hot	Fill 1-4	Fill 5	Cap			
Travel Direction	Downhill	1G Rollout	1G Rollout	1G Rollout	1G Rollout			
Electrode Diameter	0.035" TS-6 Ht# 265306	0.045" 2802B-4-002	0.045" 2802B-4-002	0.045" 2802B-4-002	0.045" 2802B-4-002			
Gas Flow Rate (CFH)	75 CFH	50 CFH	50 CFH	50 CFH	50 CFH			
Shielding Gas Type (%)	75Ar / 25CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂			
C.T.W.D	0.300"-0.400"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"			
Oscillation Rate (BPM)	Not Applicable	Not Applicable	190	190	160			
Oscillation Width (inch)	Not Applicable	Not Applicable	As Required	As Required	As Required			
Head Angle	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead			
Equipment Type & Process	IWM GMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW			

Joint Design



Pass Sequence



Comments

Power Supplies used: Miller ALT304 for the root / Miller Invision 456MP for the hot pass, fills, and cap

Cleaning and grinding as required using power brush and grinder.

Prepared By: Justin Williams



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PROCEDURE QUALIFICATION RECORD ELECTRICAL CHARACTERISTICS									
Project: EWI Metacore Development					Date Weld Completed: May 12, 2006				
Weld Number: 2802B-4-002					Electrode Tradename: TS-6, 2802B-4-002				
Material Grade: API 5L X100					Electrode Manufacturer: Thyssen, Metacore				
Material Mfr./Heat No.: P05-100					Electrode Classification: ER70S-G				
Diameter: 36"					Shielding Gas (%): See Previous Page				
Wall Thickness: 0.750"					Electrical Current: Direct Current				
Preheat: 100 °C					Polarity: Electrode Positive				
Interpass Temperature: 125 °C Maximum					Position: 5G, 1G Rollout				
PWHT: Not Applicable					Welded By: Chris Cowan				
Pass Number	Root	Hot Pass	Fill 1	Fill 2	Fill 3	Fill 4	Fill 5	Cap	
Max Amps (A)	215.0	243.9	246.1	246.2	245.5	254.2	245.9	225.6	
Min Amps (A)	185.0	236.4	236.7	236.7	236.6	234.9	228.9	203.6	
Max Volts (V)	21.5	22.7	23.5	23.4	23.8	25.4	25.1	23.7	
Min Volts (V)	19.5	20.3	21.7	21.3	21.6	22.9	21.4	20.1	
Max WFS (IPM)	380.0	322.4	312.5	320.9	321.2	321.1	331.2	300.8	
Min WFS (IPM)	380.0	315.8	306.7	317.8	316.8	316.6	326.0	296.4	
Max Travel Speed (IPM)	30.0	42.3	19.0	19.0	19.1	19.0	17.6	13.6	
Min Travel Speed (IPM)	30.0	41.5	18.7	18.7	18.9	18.8	14.7	13.4	
Max Heat Input (KJ)	9.2	7.9	18.1	18.3	18.4	18.9	22.0	23.2	
Min Heat Input (KJ)	7.2	6.9	16.3	15.9	16.3	18.0	18.1	19.4	
Comments:									

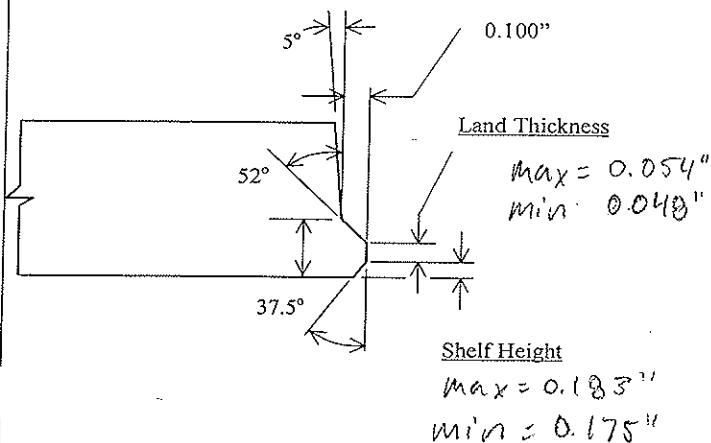


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Houston Tx, 77086
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Procedure Qualification Record Sheet

Project or Customer:	EWI
Date:	05/10/06
Pipe Diameter:	36"
Pipe Heat # & Manufacturer:	POS-100
Wall Thickness:	0.750"
Weld Number:	WELD A

Bevel Dimension Check



Internal Root Bead Parameter Record

CCW Side		CW Side	
185-200(Amps)	Head 1	(Amps) 195-216	(Volts) 20.5-21
20.5-21.8(Volts)		(Volts) 20.5-21	
380 (WFS)		(WFS) 380	
195-200(Amps)	Head 2	(Amps) 185-200	(Volts) 20.0-20.5
20.0-20.5(Volts)		(Volts) 20.0-20.5	
380 (WFS)		(WFS) 380	
185-200 (Amps)	Head 3	(Amps) 190-210	(Volts) 20.5-24.0
20.5-20.8(Volts)		(Volts) 20.5-24.0	
380 (WFS)		(WFS) 380	
200-215 (Amps)	Head 4	(Amps) 185-200	(Volts) 20.0-20.5
21.0-21.5(Volts)		(Volts) 20.0-20.5	
380 (WFS)		(WFS) 380	
Time	Travel Speed	Time	Travel Speed
Distance 30		Distance 30	
Travel Speed		Travel Speed	

Preheat and Interpass

Pass	Minimum	Maximum
Root	104°C	112°C
Hot		
Fill 1		
Fill 2		
Fill 3		
Fill 4		
Fill 5		
Fill 6		
Cap 1		
Cap 2		

Consumable Data

Pass	Electrode Type	Electrode Heat #	Dia.	Shielding Gas Type	Shielding Gas Flow Rate
Root	TS-6	265306	0.035	75/25	75
Hot					
Fills					
Fills					
Caps					
Caps					

Miscellaneous

Time Between Root and Hot Pass:	36 hours
Time Between Hot and Remaining:	10 min
Direction Of Welding:	Downhill
Cleaning and Grinding Method:	Power Grinder Power Brush
Welding Power Supply Types:	Miller ALT 304
External Welding Equipment Type:	Miller Invision 456 MP
Welder Names:	Mike Stanislaw
Recorded By:	Justin Williams

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
19	13.5	Cap	23.11	225.6	298.1	0.400	23.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
18	13.6	Cap	22.05	224.5	298.1	0.400	21.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
17	13.6	Cap	22.28	221.5	298.0	0.400	21.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
16	13.5	Cap	20.66	224.7	297.9	0.400	20.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
15	13.4	Cap	22.15	222.5	297.1	0.400	22.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
14	13.6	Cap	23.71	206.0	298.8	0.400	21.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
13	13.4	Cap	22.64	205.5	300.3	0.400	20.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
12	13.5	Cap	22.33	205.4	300.7	0.400	20.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
11	13.6	Cap	22.65	205.6	300.0	0.400	20.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
10	13.6	Cap	22.42	207.4	296.4	0.400	20.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
9	13.6	Cap	23.50	203.6	300.2	0.400	21.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
8	13.6	Cap	22.78	208.9	298.6	0.400	21.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
7	13.6	Cap	22.06	212.5	298.2	0.400	20.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
6	13.6	Cap	20.10	219.2	300.5	0.400	19.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
5	13.5	Cap	21.31	224.8	300.8	0.400	21.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
4	13.5	Cap	20.62	221.4	300.1	0.400	20.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
3	13.6	Cap	22.68	218.3	298.7	0.400	21.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
								CCW / Ditch Side	EWI 1G 36in	2202B-4-002
18	14.7	LF	21.75	237.1	327.8	0.180	21.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
17	16.9	LF	22.22	238.2	328.5	0.180	18.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
16	16.9	LF	22.55	238.0	330.4	0.180	19.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
15	16.9	LF	23.48	233.5	328.8	0.180	19.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
14	16.9	LF	21.39	242.7	330.7	0.180	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
13	16.8	LF	24.47	234.8	328.5	0.180	20.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
12	16.8	LF	25.12	228.9	331.2	0.180	20.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
11	16.9	LF	23.47	237.6	328.2	0.180	19.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
10	16.7	LF	24.06	229.0	331.1	0.180	19.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
9	16.9	LF	22.00	240.8	327.9	0.180	18.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
8	16.7	LF	21.52	240.8	331.0	0.180	18.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
7	16.9	LF	21.67	243.8	330.0	0.180	18.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
6	17.0	LF	21.61	244.1	328.5	0.180	18.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
5	17.6	LF	21.93	241.8	326.0	0.180	18.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
4	17.6	LF	22.86	245.9	329.4	0.180	19.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
3	15.4	LF	23.54	239.6	328.9	0.180	22.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
								CW / Work Side	EWI 1G 36in	2202B-4-002
18	18.9	F4	23.28	245.1	318.1	0.160	18.1	CW / Work Side	EWI 1G 36in	2202B-4-002
17	19.0	F4	24.04	242.4	317.9	0.160	18.4	CW / Work Side	EWI 1G 36in	2202B-4-002
16	18.9	F4	23.39	250.0	319.7	0.160	18.6	CW / Work Side	EWI 1G 36in	2202B-4-002
15	18.9	F4	22.90	250.7	320.5	0.160	18.2	CW / Work Side	EWI 1G 36in	2202B-4-002
14	18.8	F4	23.42	242.3	319.0	0.160	18.1	CW / Work Side	EWI 1G 36in	2202B-4-002
13	19.0	F4	23.87	248.7	317.8	0.160	18.7	CW / Work Side	EWI 1G 36in	2202B-4-002
12	18.9	F4	23.14	254.2	319.2	0.160	18.7	CW / Work Side	EWI 1G 36in	2202B-4-002
11	19.0	F4	23.40	248.4	318.1	0.160	18.4	CW / Work Side	EWI 1G 36in	2202B-4-002
10	18.8	F4	23.24	249.9	318.2	0.160	18.5	CW / Work Side	EWI 1G 36in	2202B-4-002
9	18.9	F4	23.86	245.9	316.6	0.160	18.6	CW / Work Side	EWI 1G 36in	2202B-4-002
8	19.0	F4	23.36	243.8	317.9	0.160	18.0	CW / Work Side	EWI 1G 36in	2202B-4-002
7	19.0	F4	23.37	244.5	318.2	0.160	18.0	CW / Work Side	EWI 1G 36in	2202B-4-002
6	18.8	F4	24.56	238.6	319.8	0.160	18.7	CW / Work Side	EWI 1G 36in	2202B-4-002
5	18.9	F4	24.14	239.4	319.3	0.160	18.3	CW / Work Side	EWI 1G 36in	2202B-4-002
4	18.9	F4	23.79	238.5	317.4	0.160	18.0	CW / Work Side	EWI 1G 36in	2202B-4-002
3	18.9	F4	25.38	234.9	321.1	0.160	18.9	CW / Work Side	EWI 1G 36in	2202B-4-002
								CCW / Ditch Side	EWI 1G 36in	2202B-4-002
18	18.9	F3	21.56	237.6	318.7	0.140	16.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
17	19.1	F3	23.28	244.6	317.5	0.140	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
16	19.0	F3	22.54	245.0	319.7	0.140	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
15	18.9	F3	22.62	241.0	321.2	0.140	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
14	19.0	F3	22.98	241.3	320.2	0.140	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
13	19.0	F3	22.73	243.6	316.8	0.140	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
12	19.0	F3	23.02	236.6	318.7	0.140	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
11	18.9	F3	22.95	241.7	320.6	0.140	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
10	18.9	F3	22.47	245.5	320.5	0.140	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
9	18.9	F3	22.47	245.4	318.0	0.140	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
8	18.9	F3	22.73	242.4	318.8	0.140	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
7	19.0	F3	23.28	244.2	320.0	0.140	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
6	18.9	F3	22.66	241.8	320.7	0.140	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
5	19.0	F3	23.77	245.5	318.1	0.140	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
4	19.0	F3	23.65	243.5	320.3	0.140	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
3	18.9	F3	23.08	238.6	317.6	0.140	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
								CCW / Ditch Side	EWI 1G 36in	2202B-4-002
18	18.9	F2	21.66	243.3	318.2	0.130	16.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
17	18.9	F2	22.81	240.2	320.4	0.130	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
16	18.9	F2	22.38	244.2	319.5	0.130	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
15	18.9	F2	22.67	244.4	318.7	0.130	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
14	18.8	F2	22.10	246.1	320.9	0.130	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-002

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
13	18.9	F2	22.23	243.7	317.8	0.130	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
12	18.7	F2	22.75	245.2	318.9	0.130	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
11	18.8	F2	22.41	246.2	318.2	0.130	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
10	18.7	F2	22.59	242.8	320.4	0.130	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
9	18.9	F2	21.99	246.2	318.6	0.130	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
8	18.7	F2	23.25	245.2	320.1	0.130	18.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
7	19.0	F2	21.25	237.5	318.9	0.130	15.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
6	18.9	F2	23.38	241.8	317.9	0.130	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
5	18.9	F2	22.51	245.2	320.2	0.130	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
4	18.7	F2	23.24	244.3	318.2	0.130	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
3	19.0	F2	23.17	236.7	320.8	0.130	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
								CCW / Ditch Side	EWI 1G 36in	2202B-4-002
17	18.9	F1	23.18	241.5	308.2	0.126	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
16	18.9	F1	21.90	241.7	308.5	0.126	16.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
15	18.9	F1	22.27	238.1	307.9	0.126	16.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
14	18.9	F1	21.98	241.0	310.2	0.126	16.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
13	18.9	F1	21.70	245.7	308.7	0.126	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
12	18.9	F1	22.32	241.1	308.0	0.126	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
11	18.9	F1	22.78	246.1	308.1	0.126	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
10	18.9	F1	22.23	245.7	308.6	0.126	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
9	18.8	F1	21.75	240.4	312.5	0.126	16.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
8	19.0	F1	22.13	238.0	306.7	0.126	16.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
7	18.9	F1	22.75	241.2	309.1	0.126	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
6	18.9	F1	22.87	245.5	308.7	0.126	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
5	18.9	F1	21.72	236.7	311.8	0.126	16.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
4	18.9	F1	22.87	242.5	307.9	0.126	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
3	18.7	F1	23.51	239.7	307.5	0.126	18.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
								CCW / Ditch Side	EWI 1G 36in	2202B-4-002
17	41.5	HP	20.90	237.3	317.7	0.046	7.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
16	41.8	HP	20.39	243.3	320.7	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
15	42.0	HP	21.02	242.8	322.4	0.046	7.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
14	41.5	HP	20.86	243.9	320.2	0.046	7.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
13	42.1	HP	21.18	240.0	320.2	0.046	7.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
12	42.0	HP	21.79	241.1	318.9	0.046	7.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
11	42.3	HP	20.58	243.9	319.1	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
10	41.8	HP	20.51	238.2	317.9	0.046	7.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
9	42.0	HP	20.56	236.4	317.0	0.046	6.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
8	41.5	HP	22.74	239.4	316.4	0.046	7.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
7	41.8	HP	20.32	243.3	318.6	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
6	41.5	HP	20.78	243.8	318.2	0.046	7.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
5	41.8	HP	20.94	241.9	316.2	0.046	7.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
4	41.7	HP	21.31	239.5	315.8	0.046	7.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
3	41.7	HP	22.58	236.8	318.2	0.046	7.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-002
								CCW / Ditch Side	EWI 1G 36in	2202B-4-002



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- Edison Welding Institute
- Procedure Qualification Record (2802B-4-003)
- 36" x 0.750", Grade X-100
- P260 and Manual Recorded Data



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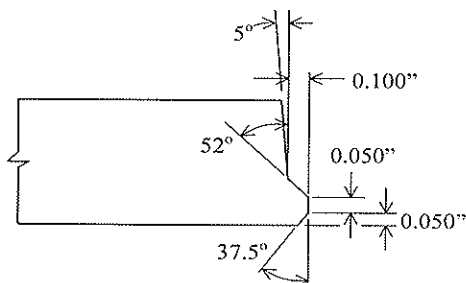
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PROCEDURE QUALIFICATION RECORD

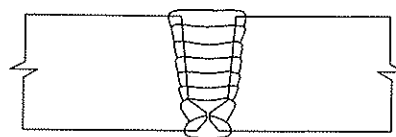
Project: EWI Metalcore Development Weld No: 2802B-4-003 Material Grade: API 5L X100 Material Mfr. / Ht No.: P05-100 Diameter: 36" Wall Thickness: 0.750" Preheat: 100 °C Interpass Temperature: 125 °C Maximum PWHT: Not Applicable	Date Weld Completed: May 12, 2006 Electrode Trade Name: TS-6, 2802B-4-003 Electrode Manufacturer: Thyssen, Metalcore Electrode Class.: ER70S-G Shielding Gas (%): See Shielding Below Electrical Current: Direct Current Polarity: Electrode Positive Position: 5G, 1G Rollout Welded By: Chris Cowan
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Pass No.	Root	Hot	Fill 1-4	Fill 5	Cap			
Travel Direction	Downhill	1G Rollout	1G Rollout	1G Rollout	1G Rollout			
Electrode Diameter	0.035" TS-6 Ht# 265306	0.045" 2802B-4-003	0.045" 2802B-4-003	0.045" 2802B-4-003	0.045" 2802B-4-003			
Gas Flow Rate (CFH)	75 CFH	50 CFH	50 CFH	50 CFH	50 CFH			
Shielding Gas Type (%)	75Ar / 25CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂			
C.T.W.D	0.300"-0.400"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"			
Oscillation Rate (BPM)	Not Applicable	Not Applicable	190	190	160			
Oscillation Width (inch)	Not Applicable	Not Applicable	As Required	As Required	As Required			
Head Angle	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead			
Equipment Type & Process	IWM GMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW			

Joint Design



Pass Sequence



Comments

Power Supplies used: Miller ALT304 for the root / Miller Invision 456MP for the hot pass, fills, and cap

Cleaning and grinding as required using power brush and grinder.

Prepared By: Justin Williams



This information is the proprietary property of CRC-Events Automatic Welding which contains trade secrets and/or know how and may only be used in conjunction with equipment rented from CRC-Events Automatic Welding.

PROCEDURE QUALIFICATION RECORD ELECTRICAL CHARACTERISTICS									
Project:		EWI Metalcore Development			Date Weld Completed: May 12, 2006				
Weld Number:		2802B-4-003			Electrode Tradename: TS-6, 2802B-4-003				
Material Grade:		API 5L X100			Electrode Manufacturer: Thyssen, Metalcore				
Material Mfr./Heat No.:		P05-100			Electrode Classification: ER70S-G				
Diameter:		36"			Shielding Gas (%): See Previous Page				
Wall Thickness:		0.750"			Electrical Current: Direct Current				
Preheat:		100 °C			Polarity: Electrode Positive				
Interpass Temperature:		125 °C Maximum			Position: 5G, 1G Rollout				
PWHT:		Not Applicable			Welded By: Chris Cowan				
Pass Number	Root	Hot Pass	Fill 1	Fill 2	Fill 3	Fill 4	Fill 5	Cap	
Max Amps (A)	215.0	247.9	246.3	247.1	247.1	245.4	242.5	216.6	
Min Amps (A)	185.0	241.6	237.9	236.7	236.7	237.3	236.3	207.9	
Max Volts (V)	21.5	22.0	22.9	24.2	23.9	23.9	23.9	23.6	
Min Volts (V)	19.5	20.8	21.9	21.8	21.8	21.5	22.3	21.5	
Max WFS (IPM)	380.0	319.2	310.6	320.8	320.5	321.1	331.0	300.9	
Min WFS (IPM)	380.0	315.5	306.2	316.6	316.6	317.9	328.0	296.7	
Max Travel Speed (IPM)	30.0	42.0	19.0	19.0	19.0	19.0	20.2	15.0	
Min Travel Speed (IPM)	30.0	41.7	18.7	18.7	18.7	18.8	12.6	14.9	
Max Heat Input (KJ)	9.2	7.7	17.8	18.3	18.3	18.2	27.0	19.8	
Min Heat Input (KJ)	7.2	7.4	16.8	16.5	16.5	16.7	16.6	18.0	
Comments:									

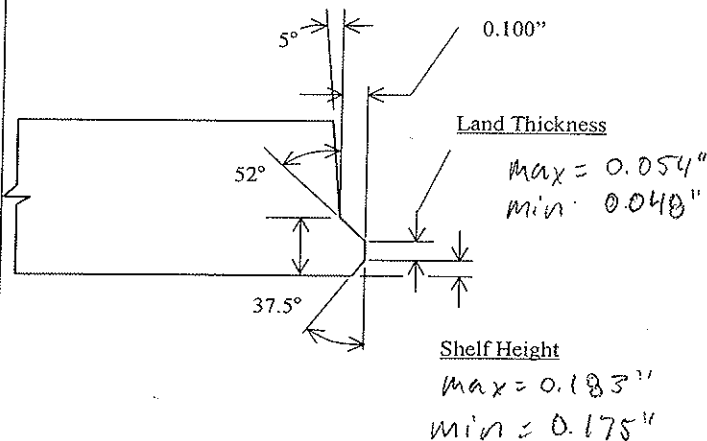


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Procedure Qualification Record Sheet

Project or Customer:	EWI
Date:	05/10/06
Pipe Diameter:	36"
Pipe Heat # & Manufacturer:	P05-100
Wall Thickness:	0.750"
Weld Number:	WELD A

Bevel Dimension Check



Internal Root Bead Parameter Record

CCW Side		CW Side	
185-200 (Amps)	Head 1	(Amps) 195-216	Head 1
20.5-21.2 (Volts)		(Volts) 20.5-21	
380 (WFS)		(WFS) 380	
185-200 (Amps)	Head 2	(Amps) 185-200	Head 2
20.0-20.5 (Volts)		(Volts) 20.0-20.5	
380 (WFS)		(WFS) 380	
185-200 (Amps)	Head 3	(Amps) 190-210	Head 3
20.5-20.8 (Volts)		(Volts) 20.5-21.0	
380 (WFS)		(WFS) 380	
200-215 (Amps)	Head 4	(Amps) 185-200	Head 4
21.0-21.5 (Volts)		(Volts) 20.0-20.5	
380 (WFS)		(WFS) 380	
Time Distance 30	Travel Speed	Time Distance 30	Travel Speed

Preheat and Interpass

Pass	Minimum	Maximum
Root	104°C	112°C
Hot		
Fill 1		
Fill 2		
Fill 3		
Fill 4		
Fill 5		
Fill 6		
Cap 1		
Cap 2		

Consumable Data

Pass	Electrode Type	Electrode Heat #	Dia.	Shielding Gas Type	Shielding Gas Flow Rate
Root	TS-6	265306	0.035	75/75	75
Hot					
Fills					
Fills					
Caps					
Caps					

Miscellaneous

Time Between Root and Hot Pass:	36 hours
Time Between Hot and Remaining:	10 min
Direction Of Welding:	Downhill
Cleaning and Grinding Method:	Power Grinder, Power Brush
Welding Power Supply Types:	Miller ALT 304
External Welding Equipment Type:	Miller Invision 456 MP
Welder Names:	Mike Stanislaw
Recorded By:	Justin Williams

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
12	14.9	Cap	23.59	208.5	298.5	0.400	19.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
11	15.0	Cap	21.96	214.9	300.9	0.400	18.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
10	15.0	Cap	22.64	207.9	296.7	0.400	18.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
9	15.0	Cap	22.87	210.1	298.9	0.400	19.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
8	15.0	Cap	21.53	208.9	297.9	0.400	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
7	14.9	Cap	21.74	208.7	299.7	0.400	18.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
6	14.9	Cap	21.99	216.6	300.1	0.400	19.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
5	15.0	Cap	21.81	209.2	299.0	0.400	18.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
4	14.9	Cap	21.72	213.6	300.9	0.400	18.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
								CCW / Ditch Side	EWI 1G 36in	2202B-4-003
9	14.8	LF	23.87	236.3	328.9	0.180	22.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
8	14.9	LF	22.92	238.3	329.3	0.180	22.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
7	15.8	LF	22.43	242.5	330.5	0.180	20.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
5	12.7	LF	22.27	240.8	328.0	0.180	25.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
4	12.6	LF	23.59	240.2	328.1	0.180	27.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
3	15.8	LF	23.03	240.4	331.0	0.180	21.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
3	16.7	LF	22.97	237.9	330.4	0.180	19.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
4	19.6	LF	22.50	241.4	328.6	0.180	16.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
3	20.2	LF	23.76	237.7	329.3	0.180	16.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
								CCW / Ditch Side	EWI 1G 36in	2202B-4-003
12	19.0	F4	23.01	237.8	318.3	0.170	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
11	18.9	F4	23.55	243.2	318.4	0.170	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
10	18.9	F4	23.37	245.4	319.0	0.170	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
9	18.9	F4	22.75	241.3	317.9	0.170	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
8	18.9	F4	21.52	244.9	321.1	0.170	16.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
7	18.9	F4	23.93	237.3	318.4	0.170	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
6	18.9	F4	22.79	243.9	319.0	0.170	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
5	18.9	F4	22.93	244.6	319.6	0.170	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
4	18.9	F4	23.49	240.7	319.0	0.170	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
3	18.8	F4	23.04	240.0	320.4	0.170	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
								CCW / Ditch Side	EWI 1G 36in	2202B-4-003
13	18.9	F3	22.56	240.0	318.5	0.130	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
12	18.7	F3	22.71	239.0	320.5	0.130	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
11	19.0	F3	22.61	237.5	319.7	0.130	17.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
10	18.9	F3	22.05	238.3	319.1	0.130	16.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
9	19.0	F3	22.04	236.7	318.1	0.130	16.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
8	18.9	F3	23.91	240.9	316.6	0.130	18.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
7	18.8	F3	22.79	242.7	318.1	0.130	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
6	19.0	F3	22.83	244.3	318.5	0.130	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
5	19.0	F3	23.10	244.8	316.6	0.130	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
4	19.0	F3	21.78	247.1	318.1	0.130	17.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
3	18.9	F3	21.78	238.0	319.2	0.130	16.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
								CCW / Ditch Side	EWI 1G 36in	2202B-4-003
4	18.9	F2	22.74	243.8	318.3	0.130	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
3	18.9	F2	23.14	239.2	318.6	0.130	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
13	19.0	F2	21.93	239.9	320.0	0.130	16.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
12	18.9	F2	22.42	243.2	320.2	0.130	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
11	18.8	F2	22.62	246.3	320.0	0.130	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
10	19.0	F2	24.18	238.0	318.4	0.130	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
9	19.0	F2	22.45	240.5	320.0	0.130	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
8	18.8	F2	22.63	240.0	319.3	0.130	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
7	18.8	F2	22.30	240.4	320.8	0.130	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
6	18.9	F2	22.13	239.4	318.1	0.130	16.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
5	19.0	F2	22.24	238.8	320.0	0.130	16.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
4	18.9	F2	22.48	238.0	320.8	0.130	17.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
3	18.8	F2	22.27	239.8	318.7	0.130	17.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
								CCW / Ditch Side	EWI 1G 36in	2202B-4-003
4	18.9	F1	22.69	238.1	307.9	0.126	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
3	19.0	F1	22.41	238.7	307.8	0.126	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
7	18.9	F1	21.86	244.2	309.9	0.126	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
6	18.7	F1	22.68	238.0	310.1	0.126	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
5	18.9	F1	22.69	238.7	308.5	0.126	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
4	19.0	F1	22.72	237.9	310.1	0.126	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
3	19.0	F1	22.89	241.0	308.0	0.126	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
8	19.0	F1	22.15	246.0	307.8	0.126	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
7	19.0	F1	22.59	242.8	306.2	0.126	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
6	19.0	F1	22.93	246.3	308.6	0.126	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
5	18.9	F1	22.30	245.4	308.2	0.126	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
4	19.0	F1	22.18	241.9	308.3	0.126	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
3	19.0	F1	22.40	238.2	310.6	0.126	16.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
								CCW / Ditch Side	EWI 1G 36in	2202B-4-003
16	42.0	HP	21.03	247.7	318.2	0.046	7.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
15	42.0	HP	20.83	247.9	319.0	0.046	7.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
14	41.9	HP	21.28	246.0	319.1	0.046	7.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-003

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
13	41.7	HP	21.53	245.7	318.3	0.046	7.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
12	42.0	HP	21.49	247.6	316.4	0.046	7.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
11	42.0	HP	21.30	246.2	319.1	0.046	7.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
10	41.8	HP	21.66	247.0	318.6	0.046	7.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
9	41.7	HP	21.89	241.6	318.6	0.046	7.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
8	41.8	HP	21.52	244.0	319.2	0.046	7.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
7	42.0	HP	21.40	246.5	318.2	0.046	7.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
6	42.0	HP	21.17	246.9	315.5	0.046	7.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
5	42.0	HP	21.59	246.3	318.4	0.046	7.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
4	41.8	HP	21.95	245.3	318.1	0.046	7.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
3	41.7	HP	21.04	247.4	317.0	0.046	7.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-003
								CCW / Ditch Side	EWI 1G 36in	2202B-4-003



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- Edison Welding Institute
- Procedure Qualification Record (2802B-4-004)
- 36" x 0.750", Grade X-100
- P260 and Manual Recorded Data



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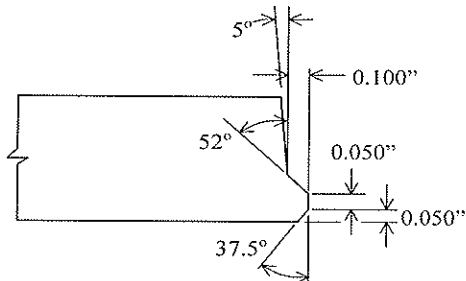
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PROCEDURE QUALIFICATION RECORD

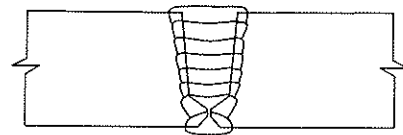
Project: EWI Metalcore Development Weld No: 2802B-4-004 Material Grade: API 5L X100 Material Mfr. / Ht No.: P05-100 Diameter: 36" Wall Thickness: 0.750" Preheat: 100 °C Interpass Temperature: 125 °C Maximum PWHT: Not Applicable	Date Weld Completed: May 12, 2006 Electrode Trade Name: TS-6, 2802B-4-004 Electrode Manufacturer: Thyssen, Metalcore Electrode Class.: ER70S-G Shielding Gas (%): See Shielding Below Electrical Current: Direct Current Polarity: Electrode Positive Position: 5G, 1G Rollout Welded By: Chris Cowan
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Pass No.	Root	Hot	Fill 1-4	Fill 5	Cap			
Travel Direction	Downhill	1G Rollout	1G Rollout	1G Rollout	1G Rollout			
Electrode Diameter	0.035" TS-6 Ht# 265306	0.045" 2802B-4-004	0.045" 2802B-4-004	0.045" 2802B-4-004	0.045" 2802B-4-004			
Gas Flow Rate (CFH)	75 CFH	50 CFH	50 CFH	50 CFH	50 CFH			
Shielding Gas Type (%)	75Ar / 25CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂			
C.T.W.D	0.300"-0.400"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"			
Oscillation Rate (BPM)	Not Applicable	Not Applicable	190	190	160			
Oscillation Width (inch)	Not Applicable	Not Applicable	As Required	As Required	As Required			
Head Angle	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead			
Equipment Type & Process	IWM GMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW			

Joint Design



Pass Sequence



Comments

Power Supplies used: Miller ALT304 for the root / Miller Invision 456MP for the hot pass, fills, and cap

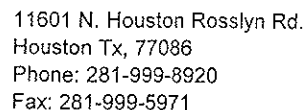
Cleaning and grinding as required using power brush and grinder.

Prepared By: Justin Williams



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PROCEDURE QUALIFICATION RECORD ELECTRICAL CHARACTERISTICS									
Project:		EWI Metacore Development				Date Weld Completed: May 12, 2006			
Weld Number:		2802B-4-004				Electrode Tradename: TS-6, 2802B-4-004			
Material Grade:		API 5L X100				Electrode Manufacturer: Thyssen, Metacore			
Material Mfr./Heat No.:		P05-100				Electrode Classification: ER70S-G			
Diameter:		36"				Shielding Gas (%): See Previous Page			
Wall Thickness:		0.750"				Electrical Current: Direct Current			
Preheat:		100 °C				Polarity: Electrode Positive			
Interpass Temperature:		125 °C Maximum				Position: 5G, 1G Rollout			
PWHT:		Not Applicable				Welded By: Chris Cowan			
Pass Number	Root	Hot Pass	Fill 1	Fill 2	Fill 3	Fill 4	Fill 5	Cap	
Max Amps (A)	215.0	226.9	225.0	225.0	225.4	245.5	244.3	219.3	
Min Amps (A)	185.0	213.5	207.7	207.7	207.9	236.0	210.2	206.1	
Max Volts (V)	21.5	22.7	23.8	23.8	24.2	24.6	24.8	24.7	
Min Volts (V)	19.5	19.5	21.5	21.6	22.2	22.0	21.6	22.3	
Max WFS (IPM)	380.0	321.1	311.1	311.1	320.9	322.6	331.7	300.3	
Min WFS (IPM)	380.0	316.8	306.0	306.0	315.8	316.9	326.3	296.9	
Max Travel Speed (IPM)	30.0	42.3	19.0	19.0	19.0	19.0	15.7	15.8	
Min Travel Speed (IPM)	30.0	41.5	18.8	18.8	18.8	18.7	15.0	15.7	
Max Heat Input (KJ)	9.2	7.2	16.7	16.1	16.9	18.6	23.1	20.4	
Min Heat Input (KJ)	7.2	6.0	14.7	14.7	14.9	16.9	18.7	17.6	
Comments:									



Project or Customer:	EWI
Date:	05/10/06
Pipe Diameter:	36"
Pipe Heat # & Manufacturer:	P05-100
Wall Thickness:	0.750"
Weld Number:	WELD A

Bevel Dimension Check

5°

0.100"

Land Thickness

Max = 0.054"

Min = 0.040"

52°

37.5°

Shelf Height

Max = 0.183"

Min = 0.175"

<u>Internal Root Bead Parameter Record</u>			
CCW Side		CW Side	
185-200(Amps)	Head 1	(Amps) 195-210	
20.5-21.8(Volts)		(Volts) 20.5-21	
380 (WFS)		(WFS) 380	
195-208(Amps)	Head 2	(Amps) 185-200	
20.0-20.5(Volts)		(Volts) 20.0-20.5	
380 (WFS)		(WFS) 380	
185-200 (Amps)	Head 3	(Amps) 190-210	
19.5-20.0(Volts)		(Volts) 20.5-24.0	
380 (WFS)		(WFS) 380	
200-215 (Amps)	Head 4	(Amps) 185-200	
21.0-21.5(Volts)		(Volts) 20.0-20.5	
380 (WFS)		(WFS) 380	
Time	Travel Speed	Time	
Distance 30		Distance 30	
Travel Speed		Travel Speed	

<u>Preheat and Interpass</u>		
Pass	Minimum	Maximum
Root	104°C	113°C
Hot		
Fill 1		
Fill 2		
Fill 3		
Fill 4		
Fill 5		
Fill 6		
Cap 1		
Cap 2		

<u>Consumable Data</u>					
Pass	Electrode Type	Electrode Heat #	Dia.	Shielding Gas Type	Shielding Gas Flow Rate
Root	TS-6	265306	0.035	75/25	75
Hot					
Fills					
Fills					
Caps					
Caps					

Miscellaneous	
Time Between Root and Hot Pass:	36 hours
Time Between Hot and Remaining:	10 min
Direction Of Welding:	Downhill
Cleaning and Grinding Method:	Power Grinder Power Brush
Welding Power Supply Types:	Miller ALT 304
External Welding Equipment Type:	Miller Invision 456 MP
Welder Names:	Mike Stanslaw
Recorded By:	Justin Williams

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
15	15.8	Cap	24.67	207.9	299.1	0.400	19.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
14	15.7	Cap	23.62	206.1	296.9	0.400	18.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
13	15.8	Cap	23.61	207.9	300.1	0.400	18.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
12	15.7	Cap	23.93	206.4	299.1	0.400	18.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
11	15.7	Cap	22.52	208.4	298.8	0.400	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
10	15.7	Cap	23.14	208.0	298.0	0.400	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
9	15.7	Cap	22.32	206.9	298.2	0.400	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
8	15.8	Cap	23.43	209.4	299.0	0.400	18.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
7	15.7	Cap	22.70	208.0	300.0	0.400	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
6	15.8	Cap	23.99	213.2	298.4	0.400	19.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
5	15.8	Cap	22.67	214.0	298.7	0.400	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
4	15.7	Cap	22.74	218.0	299.2	0.400	18.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
3	15.8	Cap	24.44	219.3	300.3	0.400	20.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
								CCW / Ditch Side	EWI 1G 36in	2202B-4-004
4	15.7	LF	22.87	214.2	330.9	0.180	18.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
3	15.7	LF	23.36	210.2	327.8	0.180	18.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
17	15.1	LF	24.79	230.1	329.3	0.180	22.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
16	15.0	LF	22.08	237.0	331.7	0.180	20.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
15	15.1	LF	23.74	236.0	326.7	0.180	22.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
14	15.2	LF	22.68	241.0	328.2	0.180	21.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
13	15.0	LF	23.19	235.3	330.0	0.180	21.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
12	15.1	LF	24.31	234.9	331.1	0.180	22.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
11	15.1	LF	22.83	244.3	329.1	0.180	22.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
10	15.1	LF	23.13	237.5	330.5	0.180	21.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
9	15.0	LF	23.61	242.2	331.1	0.180	22.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
8	15.0	LF	22.18	242.9	329.5	0.180	21.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
7	15.0	LF	23.10	239.1	328.0	0.180	22.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
6	15.0	LF	21.60	238.2	326.5	0.180	20.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
5	15.0	LF	23.88	240.3	326.3	0.180	23.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
4	15.0	LF	23.61	241.0	328.8	0.180	22.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
3	15.1	LF	24.33	238.6	328.4	0.180	23.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
								CCW / Ditch Side	EWI 1G 36in	2202B-4-004
17	18.9	F4	22.19	242.2	320.9	0.170	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
16	18.8	F4	22.83	241.4	319.7	0.170	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
15	18.9	F4	22.74	237.2	319.1	0.170	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
14	18.9	F4	23.66	239.4	322.6	0.170	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
13	19.0	F4	23.16	241.5	316.9	0.170	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
12	19.0	F4	23.31	242.3	318.6	0.170	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
11	18.7	F4	23.38	237.1	320.8	0.170	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
10	18.8	F4	24.46	236.7	318.5	0.170	18.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
9	18.9	F4	24.10	239.7	320.7	0.170	18.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
8	18.7	F4	22.15	241.9	320.5	0.170	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
7	18.8	F4	22.01	240.8	320.8	0.170	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
6	18.7	F4	22.04	245.5	320.1	0.170	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
5	18.7	F4	23.42	242.8	320.9	0.170	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
4	19.0	F4	24.59	239.7	318.1	0.170	18.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
3	19.0	F4	24.10	236.0	318.7	0.170	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
								CCW / Ditch Side	EWI 1G 36in	2202B-4-004
17	18.9	F3	22.40	214.7	320.2	0.140	15.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
16	18.9	F3	23.24	214.9	320.9	0.140	15.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
15	18.8	F3	23.23	207.9	315.8	0.140	15.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
14	19.0	F3	22.86	209.5	320.5	0.140	15.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
13	18.9	F3	23.68	209.3	318.6	0.140	15.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
12	18.9	F3	22.45	218.1	320.5	0.140	15.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
11	19.0	F3	22.19	213.0	320.9	0.140	14.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
10	19.0	F3	22.16	217.1	319.3	0.140	15.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
9	18.9	F3	23.24	217.3	319.2	0.140	16.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
8	18.9	F3	22.89	225.1	317.5	0.140	16.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
7	18.9	F3	23.15	215.7	318.7	0.140	15.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
6	18.9	F3	23.23	219.1	319.9	0.140	16.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
5	18.9	F3	23.19	217.0	316.8	0.140	16.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
4	18.9	F3	23.63	225.4	319.0	0.140	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
3	18.8	F3	24.22	213.4	317.8	0.140	16.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
								CCW / Ditch Side	EWI 1G 36in	2202B-4-004
16	19.0	F2	22.76	217.5	307.5	0.126	15.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
15	18.9	F2	23.01	217.3	310.1	0.126	15.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
14	19.0	F2	21.96	212.4	307.9	0.126	14.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
13	19.0	F2	21.95	216.5	307.9	0.126	15.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
12	19.0	F2	23.78	207.7	308.6	0.126	15.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
11	19.0	F2	22.22	217.8	308.5	0.126	15.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
10	18.9	F2	22.39	217.9	310.6	0.126	15.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
9	19.0	F2	22.27	217.4	309.0	0.126	15.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
8	19.0	F2	22.00	222.7	311.1	0.126	15.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
7	18.9	F2	22.45	218.5	310.5	0.126	15.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-004

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
6	19.0	F2	22.73	223.4	307.9	0.126	16.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
5	18.9	F2	21.58	225.0	306.0	0.126	15.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
4	19.0	F2	22.82	221.4	307.8	0.126	16.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
3	18.8	F2	23.22	216.7	308.1	0.126	16.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
6	18.9	F1	23.02	220.0	308.3	0.126	16.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
5	18.9	F1	22.22	217.9	308.4	0.126	15.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
4	18.8	F1	23.31	224.4	308.1	0.126	16.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
3	18.9	F1	22.95	218.0	306.6	0.126	15.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
5	19.0	F1	23.21	217.1	307.8	0.126	15.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
4	18.8	F1	22.42	222.0	308.5	0.126	15.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
3	19.0	F1	22.79	221.0	308.8	0.126	15.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
9	18.9	F1	21.49	217.8	308.2	0.126	14.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
8	19.0	F1	22.49	217.8	308.0	0.126	15.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
7	19.0	F1	21.89	217.7	308.0	0.126	15.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
6	18.9	F1	22.43	217.6	308.0	0.126	15.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
5	18.8	F1	22.40	218.2	308.6	0.126	15.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
4	19.0	F1	21.52	217.2	308.5	0.126	14.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
3	19.0	F1	23.82	220.5	306.9	0.126	16.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
16	41.7	HP	21.93	220.8	318.7	0.046	7.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
15	41.5	HP	20.29	222.1	319.6	0.046	6.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
14	41.8	HP	21.47	225.7	321.1	0.046	7.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
13	41.8	HP	21.07	226.9	319.4	0.046	6.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
12	41.8	HP	21.96	219.3	316.8	0.046	6.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
11	41.7	HP	21.70	219.4	318.1	0.046	6.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
10	41.8	HP	22.36	220.0	319.2	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
9	41.5	HP	21.88	220.1	319.4	0.046	7.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
8	42.3	HP	22.72	222.8	318.7	0.046	7.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
7	42.0	HP	22.02	224.6	318.5	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
6	42.0	HP	22.45	221.9	320.7	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
5	41.8	HP	19.50	213.5	318.5	0.046	6.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
4	41.5	HP	20.38	214.8	317.2	0.046	6.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
3	42.0	HP	20.21	224.1	319.0	0.046	6.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-004
								CCW / Ditch Side	EWI 1G 36in	2202B-4-004



CRC-EVANS Automatic Welding
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Houston, Texas, USA – 77086
Mobile: 281-658-1935
E-mail: jwilliams@crc-evans.com

- Edison Welding Institute
- Procedure Qualification Record (2802B-4-005)
- 36" x 0.750", Grade X-100
- P260 and Manual Recorded Data



www.crc-evans.com

Tel: (281) 999-8920 Fax: (281) 999-1788 email: autoweld@crc-evans.com



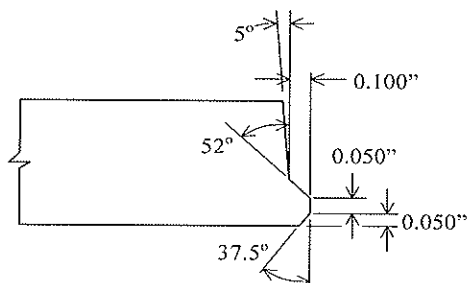
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PROCEDURE QUALIFICATION RECORD

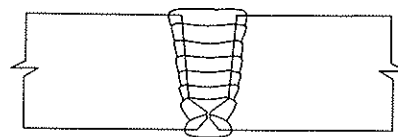
Project: EWI Metalcore Development Weld No: 2802B-4-005 Material Grade: API 5L X100 Material Mfr. / Ht No.: P05-100 Diameter: 36" Wall Thickness: 0.750" Preheat: 100 °C Interpass Temperature: 125 °C Maximum PWHT: Not Applicable	Date Weld Completed: May 12, 2006 Electrode Trade Name: TS-6, 2802B-4-005 Electrode Manufacturer: Thyssen, Metalcore Electrode Class.: ER70S-G Shielding Gas (%): See Shielding Below Electrical Current: Direct Current Polarity: Electrode Positive Position: 5G, 1G Rollout Welded By: Chris Cowan
---	---

Pass No.	Root	Hot	Fill 1-4	Fill 5	Cap			
Travel Direction	Downhill	1G Rollout	1G Rollout	1G Rollout	1G Rollout			
Electrode Diameter	0.035" TS-6 Ht# 265306	0.045" 2802B-4-005	0.045" 2802B-4-005	0.045" 2802B-4-005	0.045" 2802B-4-005			
Gas Flow Rate (CFH)	75 CFH	50 CFH	50 CFH	50 CFH	50 CFH			
Shielding Gas Type (%)	75Ar / 25CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂			
C.T.W.D	0.300"-0.400"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"			
Oscillation Rate (BPM)	Not Applicable	Not Applicable	190	190	160			
Oscillation Width (inch)	Not Applicable	Not Applicable	As Required	As Required	As Required			
Head Angle	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead			
Equipment Type & Process	IWM GMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW			

Joint Design



Pass Sequence



Comments

Power Supplies used: Miller ALT304 for the root / Miller Invision 456MP for the hot pass, fills, and cap

Cleaning and grinding as required using power brush and grinder.

Prepared By: Justin Williams



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PROCEDURE QUALIFICATION RECORD ELECTRICAL CHARACTERISTICS

Project: EWI Metacore Development				Date Weld Completed: May 12, 2006				
Weld Number: 2802B-4-005				Electrode Tradename: TS-6, 2802B-4-005				
Material Grade: API 5L X100				Electrode Manufacturer: Thyssen, Metacore				
Matrerial Mfr./Heat No.: P05-100				Electrode Classification: ER70S-G				
Diameter: 3/16"				Shielding Gas (%): See Previous Page				
Wall Thickness: 0.750"				Electrical Current: Direct Current				
Preheat 100 °C				Polarity: Electrode Positive				
Interpass Temperature: 125 °C Maximum				Position: 5G, 1G Rollout				
PWHT: Not Applicable				Welded By: Chris Cowan				
Pass Number	Root	Hot Pass	Fill 1	Fill 2	Fill 3	Fill 4	Fill 5	Cap
Max Amps (A)	215.0	250.3	245.9	245.3	246.3	246.1	244.7	220.7
Min Amps (A)	180.0	238.8	235.6	235.8	235.3	237.7	231.8	205.1
Max Volts (V)	21.5	22.0	23.4	23.7	24.0	23.9	24.4	23.6
Min Volts (V)	20.0	19.4	21.5	21.0	22.1	22.4	22.5	22.2
Max WFS (IPM)	380.0	321.0	311.2	320.8	320.6	320.4	332.6	300.8
Min WFS (IPM)	380.0	317.0	307.7	314.4	316.9	316.3	326.6	296.7
Max Travel Speed (IPM)	30.0	42.1	19.0	19.1	19.1	19.0	13.8	11.9
Min Travel Speed (IPM)	30.0	41.5	18.8	18.8	18.9	18.8	11.8	11.8
Max Heat Input (KJ)	9.2	7.7	17.9	18.2	18.8	18.7	28.3	25.9
Min Heat Input (KJ)	7.2	6.6	16.6	16.1	16.6	17.1	24.0	23.4

Comments:

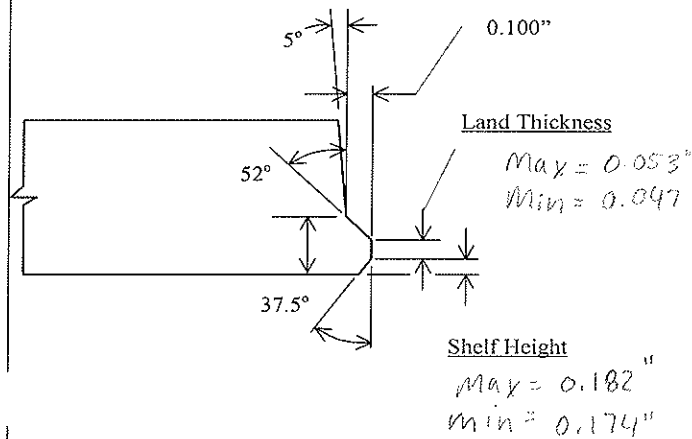


11601 N. Houston Rosslyn Rd.
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Phone: 281-999-8920
Fax: 281-999-5971

Procedure Qualification Record Sheet

Project or Customer:	EWI
Date:	05/11/06
Pipe Diameter:	36"
Pipe Heat # & Manufacturer:	P05-100
Wall Thickness:	0.750
Weld Number:	WELD B

Bevel Dimension Check



Internal Root Bead Parameter Record

CCW Side		CW Side	
190-210 (Amps)	Head 1	(Amps) 195-205	Head 1
20.5-21.0 (Volts)		(Volts) 20.5-21.0	
380 (WFS)		(WFS) 380	
185-195 (Amps)	Head 2	(Amps) 185-200	Head 2
20.0-21.0 (Volts)		(Volts) 21.0-21.5	
380 (WFS)		(WFS) 380	
195-210 (Amps)	Head 3	(Amps) 195-215	Head 3
21.0-21.5 (Volts)		(Volts) 19.5-20.0	
380 (WFS)		(WFS) 380	
185-200 (Amps)	Head 4	(Amps) 180-200	Head 4
20.0-20.5 (Volts)		(Volts) 20.0-20.5	
380 (WFS)		(WFS) 380	
Time	Travel Speed	Time	Travel Speed
Distance 30		Distance 30	
Travel Speed		Travel Speed	

Preheat and Interpass

Pass	Minimum	Maximum
Root	106°C	115°C
Hot		
Fill 1		
Fill 2		
Fill 3		
Fill 4		
Fill 5		
Fill 6		
Cap 1		
Cap 2		

Consumable Data

Pass	Electrode Type	Electrode Heat #	Dia.	Shielding Gas Type	Shielding Gas Flow Rate
Root	TS-6	265306	0.035		
Hot					
Fills					
Fills					
Caps					
Caps					

Miscellaneous

Time Between Root and Hot Pass:	14 hours
Time Between Hot and Remaining:	10 min
Direction Of Welding:	Downhill
Cleaning and Grinding Method:	Power Grinder, Power Brush
Welding Power Supply Types:	Miller ALT 304
External Welding Equipment Type:	Miller Invision 452 MP
Welder Names:	Mike Stanislaw
Recorded By:	Justin Williams

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
15	11.8	Cap	23.09	208.8	298.3	0.400	24.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
14	11.9	Cap	22.57	208.5	299.1	0.400	23.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
13	11.8	Cap	23.63	207.8	300.0	0.400	25.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
12	11.8	Cap	22.22	206.9	300.8	0.400	23.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
11	11.8	Cap	23.62	205.1	296.7	0.400	24.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
10	11.9	Cap	22.60	208.4	298.8	0.400	23.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
9	11.8	Cap	23.55	208.2	298.4	0.400	24.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
8	11.8	Cap	22.82	211.3	298.3	0.400	24.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
7	11.8	Cap	22.21	209.0	296.9	0.400	23.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
6	11.8	Cap	22.47	214.1	299.5	0.400	24.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
5	11.8	Cap	22.99	209.9	298.7	0.400	24.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
4	11.8	Cap	23.16	209.0	299.0	0.400	24.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
3	11.8	Cap	23.07	220.7	298.8	0.400	25.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
								CCW / Ditch Side	EWI 1G 36in	2202B-4-005
15	11.8	LF	23.57	231.8	328.9	0.180	27.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
14	11.8	LF	22.64	238.6	328.5	0.180	27.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
13	11.9	LF	22.48	239.4	329.1	0.180	27.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
12	11.8	LF	22.81	237.1	329.0	0.180	27.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
11	11.8	LF	22.81	237.9	326.6	0.180	27.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
10	11.8	LF	22.74	237.3	329.3	0.180	27.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
9	11.8	LF	23.19	236.7	330.9	0.180	27.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
8	11.8	LF	22.73	241.5	331.1	0.180	27.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
7	11.8	LF	23.06	241.1	331.1	0.180	28.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
6	11.8	LF	22.66	239.6	329.0	0.180	27.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
5	13.8	LF	23.23	244.7	330.5	0.180	24.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
4	13.7	LF	23.14	237.3	327.7	0.180	24.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
3	13.6	LF	24.38	237.6	332.6	0.180	25.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
								CCW / Ditch Side	EWI 1G 36in	2202B-4-005
15	18.9	F4	23.52	237.7	318.6	0.170	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
14	18.8	F4	22.35	239.1	318.1	0.170	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
13	18.9	F4	23.09	242.1	319.0	0.170	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
12	18.9	F4	22.73	240.4	316.3	0.170	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
11	18.9	F4	23.17	239.2	318.4	0.170	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
10	18.8	F4	23.66	243.6	318.8	0.170	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
9	19.0	F4	23.08	245.6	320.2	0.170	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
8	18.8	F4	23.66	243.9	319.1	0.170	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
7	18.9	F4	23.61	245.1	319.7	0.170	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
6	18.9	F4	23.90	246.1	319.2	0.170	18.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
5	18.8	F4	23.39	239.5	320.2	0.170	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
4	19.0	F4	22.94	241.6	318.7	0.170	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
3	18.8	F4	23.27	239.7	320.4	0.170	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
								CCW / Ditch Side	EWI 1G 36in	2202B-4-005
15	19.0	F3	22.87	238.3	320.6	0.140	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
14	18.9	F3	22.14	236.5	317.7	0.140	16.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
13	19.0	F3	22.51	242.1	318.7	0.140	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
12	19.0	F3	23.41	241.4	317.6	0.140	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
11	18.9	F3	22.31	245.9	318.8	0.140	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
10	18.9	F3	22.07	243.4	316.9	0.140	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
9	18.9	F3	23.21	244.1	317.9	0.140	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
8	18.9	F3	24.01	246.3	319.0	0.140	18.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
7	19.0	F3	23.56	245.2	318.1	0.140	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
6	18.9	F3	22.57	244.4	318.5	0.140	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
5	18.9	F3	23.72	239.2	320.5	0.140	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
4	19.1	F3	23.66	242.0	318.5	0.140	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
3	18.9	F3	22.69	235.3	319.3	0.140	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
								CCW / Ditch Side	EWI 1G 36in	2202B-4-005
15	18.9	F2	21.71	243.0	318.4	0.130	16.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
14	18.8	F2	22.61	239.2	319.3	0.130	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
13	18.9	F2	22.17	241.2	319.3	0.130	17.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
12	18.8	F2	22.64	241.8	319.0	0.130	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
11	19.1	F2	21.99	243.9	314.4	0.130	16.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
10	18.9	F2	21.00	240.9	320.8	0.130	16.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
9	19.0	F2	22.94	241.4	318.8	0.130	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
8	18.9	F2	23.54	241.1	318.7	0.130	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
7	18.8	F2	21.92	241.5	318.7	0.130	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
6	18.9	F2	22.66	237.4	319.8	0.130	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
5	18.9	F2	23.41	245.3	318.5	0.130	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
4	19.0	F2	23.73	241.8	320.8	0.130	18.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
3	18.9	F2	21.54	235.8	318.4	0.130	16.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
								CCW / Ditch Side	EWI 1G 36in	2202B-4-005
15	18.9	F1	22.17	245.1	308.0	0.126	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
14	18.9	F1	22.59	240.6	307.7	0.126	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
13	19.0	F1	23.02	237.2	309.9	0.126	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
12	19.0	F1	21.52	243.8	310.1	0.126	16.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-005

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
11	18.9	F1	22.72	244.8	308.0	0.126	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
10	18.8	F1	22.18	245.5	311.2	0.126	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
9	18.9	F1	22.25	242.6	310.9	0.126	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
8	19.0	F1	23.14	242.7	311.2	0.126	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
7	19.0	F1	22.49	245.9	310.4	0.126	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
6	18.9	F1	23.35	240.9	308.1	0.126	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
5	18.9	F1	22.38	241.2	309.9	0.126	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
4	19.0	F1	22.62	237.1	308.9	0.126	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
3	18.9	F1	23.11	235.6	308.3	0.126	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
								CCW / Ditch Side	EWI 1G 36in	2202B-4-005
15	41.7	HP	21.97	243.9	321.0	0.046	7.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
14	41.8	HP	21.39	244.3	318.6	0.046	7.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
13	41.7	HP	21.97	241.9	320.4	0.046	7.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
12	41.5	HP	20.58	239.8	317.0	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
11	42.1	HP	19.41	238.9	318.4	0.046	6.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
10	41.7	HP	21.21	243.8	318.0	0.046	7.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
9	42.0	HP	21.57	242.8	320.5	0.046	7.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
8	41.8	HP	21.04	239.3	318.3	0.046	7.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
7	41.5	HP	21.03	238.8	320.8	0.046	7.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
6	42.0	HP	20.91	239.5	318.6	0.046	7.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
5	41.7	HP	20.58	247.4	319.1	0.046	7.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
4	41.8	HP	21.03	245.5	318.3	0.046	7.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
3	41.8	HP	20.46	250.3	319.7	0.046	7.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-005
								CCW / Ditch Side	EWI 1G 36in	2202B-4-005



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- **Edison Welding Institute**
- **Procedure Qualification Record (2802B-4-006)**
- **36" x 0.750", Grade X-100**
- **P260 and Manual Recorded Data**





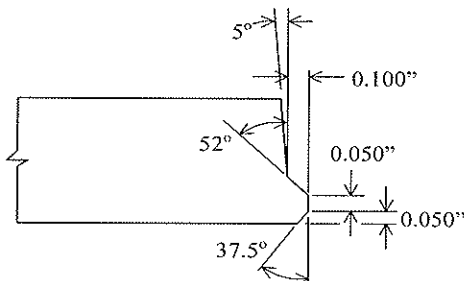
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PROCEDURE QUALIFICATION RECORD

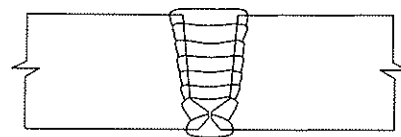
Project: EWI Metalcore Development Weld No: 2802B-4-006 Material Grade: API 5L X100 Material Mfr. / Ht No.: P05-100 Diameter: 36" Wall Thickness: 0.750" Preheat: 100 °C Interpass Temperature: 125 °C Maximum PWHT: Not Applicable	Date Weld Completed: May 12, 2006 Electrode Trade Name: TS-6, 2802B-4-006 Electrode Manufacturer: Thyssen, Metalcore Electrode Class.: ER70S-G Shielding Gas (%): See Shielding Below Electrical Current: Direct Current Polarity: Electrode Positive Position: 5G, 1G Rollout Welded By: Chris Cowan
---	---

Pass No.	Root	Hot	Fill 1-4	Fill 5	Cap			
Travel Direction	Downhill	1G Rollout	1G Rollout	1G Rollout	1G Rollout			
Electrode Diameter	0.035" TS-6 Ht# 265306	0.045" 2802B-4-006	0.045" 2802B-4-006	0.045" 2802B-4-006	0.045" 2802B-4-006			
Gas Flow Rate (CFH)	75 CFH	50 CFH	50 CFH	50 CFH	50 CFH			
Shielding Gas Type (%)	75Ar / 25CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂			
C.T.W.D	0.300"-0.400"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"			
Oscillation Rate (BPM)	Not Applicable	Not Applicable	190	190	160			
Oscillation Width (inch)	Not Applicable	Not Applicable	As Required	As Required	As Required			
Head Angle	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead			
Equipment Type & Process	IWM GMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW			

Joint Design



Pass Sequence



Comments

Power Supplies used: Miller ALT304 for the root / Miller Invision 456MP for the hot pass, fills, and cap

Cleaning and grinding as required using power brush and grinder.

Prepared By: Justin Williams



This information is the proprietary property of CRC-Evans Automatic Welding, which contains trade secrets and/or know how and may only be used in conjunction with equipment rented from CRC-Evans Automatic Welding.

PROCEDURE QUALIFICATION RECORD ELECTRICAL CHARACTERISTICS									
Project: EWI Metalcore Development					Date Weld Completed: May 12, 2006				
Weld Number: 2802B-4-006					Electrode Tradename: TS-6, 2802B-4-006				
Material Grade: API 5L X100					Electrode Manufacturer: Thyssen, Metalcore				
Material Mfr./Heat No.: P05-100					Electrode Classification: ER70S-G				
Diameter: 36"					Shielding Gas (%): See Previous Page				
Wall Thickness: 0.750"					Electrical Current: Direct Current				
Preheat: 100 °C					Polarity: Electrode Positive				
Interpass Temperature: 125 °C Maximum					Position: 5G, 1G Rollout				
PWHT: Not Applicable					Welded By: Chris Cowan				
Pass Number	Root	Hot Pass	Fill 1	Fill 2	Fill 3	Fill 4	Fill 5	Cap	
Max Amps (A)	215.0	228.9	227.2	224.2	224.4	225.0	223.7	222.6	
Min Amps (A)	180.0	216.5	207.7	208.5	208.5	210.5	205.5	202.8	
Max Volts (V)	21.5	22.3	23.3	23.7	24.3	23.8	23.7	24.6	
Min Volts (V)	20.0	17.8	19.9	20.9	21.1	21.9	22.2	20.3	
Max WFS (IPM)	380.0	322.5	311.7	321.5	321.2	321.2	331.0	301.4	
Min WFS (IPM)	380.0	316.8	306.2	316.3	316.5	315.6	326.9	296.8	
Max Travel Speed (IPM)	30.0	42.3	19.0	19.0	19.0	19.0	19.0	19.1	
Min Travel Speed (IPM)	30.0	41.5	18.7	18.8	18.7	18.8	18.9	13.6	
Max Heat Input (KJ)	9.2	7.2	16.7	16.5	16.8	16.6	16.5	21.7	
Min Heat Input (KJ)	7.2	5.6	13.7	14.4	14.5	15.2	14.9	13.9	
Comments:									
Due to undercutting, the cap was ground off and redeposited.									

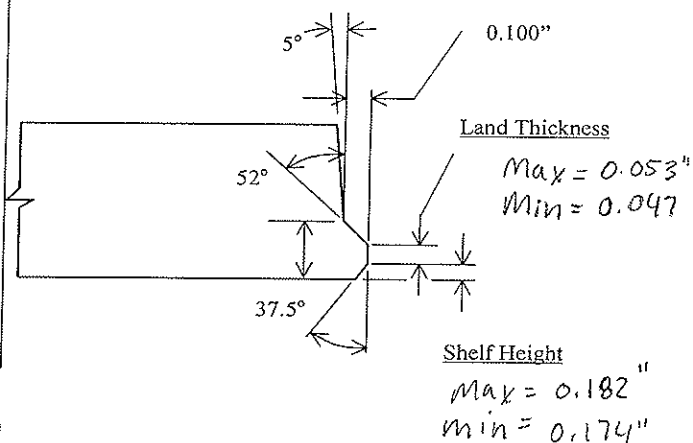


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Fax: 281-999-5971

Procedure Qualification Record Sheet

Project or Customer:	EWI
Date:	05/11/06
Pipe Diameter:	36"
Pipe Heat # & Manufacturer:	P05-100
Wall Thickness:	0.750
Weld Number:	WELD B

Bevel Dimension Check



Internal Root Bead Parameter Record

CCW Side		CW Side	
190-210 (Amps)	Head 1	(Amps) 195-205	
20.5-21.0 (Volts)		(Volts) 20.5-21.0	
380 (WFS)		(WFS) 380	
185-195 (Amps)	Head 2	(Amps) 185-200	
20.0-21.0 (Volts)		(Volts) 21.0-21.5	
380 (WFS)		(WFS) 380	
195-210 (Amps)	Head 3	(Amps) 195-215	
21.0-21.5 (Volts)		(Volts) 19.5-20.0	
380 (WFS)		(WFS) 380	
185-200 (Amps)	Head 4	(Amps) 180-200	
20.0-20.5 (Volts)		(Volts) 20.0-20.5	
380 (WFS)		(WFS) 380	
Time Distance 30	Travel Speed	Time Distance 30	Travel Speed

Preheat and Interpass

Pass	Minimum	Maximum
Root	106°C	115°C
Hot		
Fill 1		
Fill 2		
Fill 3		
Fill 4		
Fill 5		
Fill 6		
Cap 1		
Cap 2		

Consumable Data

Pass	Electrode Type	Electrode Heat #	Dia.	Shielding Gas Type	Shielding Gas Flow Rate
Root	TS-6	265306	0.035"		
Hot					
Fills					
Fills					
Caps					
Caps					

Miscellaneous

Time Between Root and Hot Pass:	14 hours
Time Between Hot and Remaining:	10 min
Direction Of Welding:	Downhill
Cleaning and Grinding Method:	Power Grinder, Power Brush
Welding Power Supply Types:	Miller ALT 304
External Welding Equipment Type:	Miller Invision 452 MP
Welder Names:	Mike Stanislaw
Recorded By:	Justin Williams

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
24	13.6	Cap	23.48	209.6	298.7	0.470	21.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
23	13.7	Cap	23.76	203.0	298.8	0.470	21.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
22	13.6	Cap	23.55	208.4	299.4	0.470	21.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
21	13.6	Cap	21.60	210.1	298.9	0.470	20.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
20	13.6	Cap	22.90	208.5	298.4	0.470	21.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
19	13.7	Cap	23.22	203.4	298.7	0.470	20.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
18	13.7	Cap	23.06	202.8	298.0	0.470	20.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
17	13.6	Cap	23.48	207.7	298.1	0.470	21.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
16	13.6	Cap	22.69	203.5	299.9	0.470	20.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
15	13.7	Cap	23.00	206.1	299.1	0.470	20.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
14	13.7	Cap	23.42	206.8	299.3	0.470	21.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
13	13.6	Cap	22.46	207.5	298.8	0.470	20.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
12	13.6	Cap	23.24	205.9	299.3	0.470	21.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
11	13.7	Cap	21.95	215.5	296.8	0.470	20.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
17	18.9	Cap	23.99	210.1	298.4	0.400	16.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
16	18.9	Cap	23.01	208.2	298.9	0.400	15.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
15	18.9	Cap	23.56	206.2	298.5	0.400	15.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
14	18.9	Cap	24.63	205.7	298.9	0.400	16.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
13	18.9	Cap	22.07	208.8	299.0	0.400	14.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
12	18.9	Cap	20.34	215.7	298.9	0.400	13.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
11	18.9	Cap	22.95	208.6	299.9	0.400	15.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
10	19.1	Cap	22.34	214.0	298.3	0.400	15.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
9	19.0	Cap	22.65	217.3	301.4	0.400	15.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
8	18.9	Cap	20.75	219.4	298.4	0.400	14.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
7	18.9	Cap	23.34	214.2	300.0	0.400	15.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
6	18.9	Cap	22.90	219.5	298.3	0.400	16.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
5	18.8	Cap	21.43	219.9	298.9	0.400	15.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
4	18.9	Cap	21.59	222.6	301.1	0.400	15.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
3	18.9	Cap	21.72	211.2	300.8	0.400	14.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
								CCW / Ditch Side	EWI 1G 36in	2202B-4-006
17	18.9	LF	23.09	205.5	331.0	0.180	15.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
16	18.9	LF	23.54	205.5	328.2	0.180	15.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
15	18.9	LF	23.43	207.9	327.8	0.180	15.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
14	19.0	LF	22.91	208.4	330.8	0.180	15.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
13	19.0	LF	22.43	216.4	329.1	0.180	15.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
12	18.9	LF	23.61	212.0	328.5	0.180	15.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
11	19.0	LF	22.79	208.4	326.9	0.180	15.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
10	19.0	LF	22.95	209.4	329.6	0.180	15.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
9	18.9	LF	22.52	209.7	328.8	0.180	15.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
8	19.0	LF	22.53	218.5	327.6	0.180	15.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
7	18.9	LF	22.18	211.9	328.1	0.180	14.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
6	19.0	LF	23.55	216.9	329.1	0.180	16.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
5	19.0	LF	23.68	218.9	328.8	0.180	16.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
4	18.9	LF	23.22	223.7	327.6	0.180	16.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
3	18.9	LF	23.05	208.5	328.4	0.180	15.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
								CCW / Ditch Side	EWI 1G 36in	2202B-4-006
17	18.9	F4	23.46	211.4	320.9	0.170	15.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
16	18.8	F4	21.87	217.9	318.5	0.170	15.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
15	19.0	F4	23.00	216.8	320.5	0.170	15.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
14	18.9	F4	23.41	215.9	321.2	0.170	16.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
13	18.9	F4	22.46	221.6	320.4	0.170	15.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
12	19.0	F4	23.40	210.5	320.5	0.170	15.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
11	19.0	F4	23.19	218.9	318.6	0.170	16.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
10	19.0	F4	23.12	215.9	319.9	0.170	15.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
9	19.0	F4	23.76	218.3	320.6	0.170	16.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
8	19.0	F4	23.34	218.8	315.6	0.170	16.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
7	19.0	F4	22.76	217.3	316.4	0.170	15.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
6	19.0	F4	22.91	225.0	318.4	0.170	16.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
5	18.9	F4	23.65	221.7	317.9	0.170	16.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
4	19.0	F4	23.63	218.3	318.7	0.170	16.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
3	19.0	F4	23.84	217.9	318.9	0.170	16.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
								CCW / Ditch Side	EWI 1G 36in	2202B-4-006
17	18.8	F3	23.45	210.8	319.0	0.140	15.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
16	18.7	F3	22.90	215.8	317.5	0.140	15.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
15	19.0	F3	24.28	208.5	319.0	0.140	16.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
14	18.9	F3	22.50	211.4	317.7	0.140	15.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
13	19.0	F3	23.19	212.4	318.9	0.140	15.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
12	18.8	F3	22.96	210.5	318.9	0.140	15.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
11	18.9	F3	23.32	210.7	319.9	0.140	15.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
10	18.8	F3	21.38	212.4	321.2	0.140	14.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
9	19.0	F3	22.75	215.8	318.0	0.140	15.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
8	18.9	F3	22.92	222.5	321.0	0.140	16.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
7	18.9	F3	21.05	221.0	320.2	0.140	14.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
6	18.8	F3	23.39	223.5	316.5	0.140	16.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
5	19.0	F3	23.75	224.4	320.8	0.140	16.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
4	18.8	F3	22.88	223.0	319.9	0.140	16.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
3	18.9	F3	24.03	216.7	318.4	0.140	16.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
								CCW / Ditch Side	EWI 1G 36in	2202B-4-006
17	19.0	F2	21.88	208.5	317.2	0.130	14.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
16	18.9	F2	22.29	215.3	318.6	0.130	15.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
15	18.8	F2	22.87	209.8	319.1	0.130	15.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
14	19.0	F2	22.75	217.9	317.7	0.130	15.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
13	18.8	F2	22.25	214.9	321.5	0.130	15.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
12	19.0	F2	22.44	214.6	318.1	0.130	15.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
11	19.0	F2	22.71	213.6	318.5	0.130	15.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
10	18.8	F2	21.52	217.5	320.3	0.130	14.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
9	19.0	F2	22.47	221.3	316.3	0.130	15.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
8	18.9	F2	22.51	223.8	319.3	0.130	16.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
7	18.9	F2	22.07	222.9	319.7	0.130	15.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
6	18.9	F2	21.83	216.9	321.0	0.130	15.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
5	19.0	F2	22.68	224.2	317.6	0.130	16.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
4	18.9	F2	23.66	220.0	319.2	0.130	16.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
3	18.9	F2	20.89	216.4	317.8	0.130	14.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
								CCW / Ditch Side	EWI 1G 36in	2202B-4-006
17	18.9	F1	22.58	213.3	308.2	0.126	15.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
16	18.9	F1	22.59	207.7	310.5	0.126	14.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
15	18.9	F1	23.15	212.8	310.4	0.126	15.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
14	19.0	F1	22.60	217.8	309.2	0.126	15.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
13	18.9	F1	21.50	218.0	309.4	0.126	14.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
12	18.9	F1	21.69	217.9	308.9	0.126	15.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
11	18.9	F1	22.62	217.4	310.4	0.126	15.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
10	19.0	F1	21.82	218.0	308.4	0.126	15.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
9	18.7	F1	22.90	220.2	310.1	0.126	16.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
8	18.8	F1	22.40	219.7	311.7	0.126	15.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
7	19.0	F1	22.70	219.0	306.2	0.126	15.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
6	18.8	F1	22.85	222.7	308.7	0.126	16.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
5	19.0	F1	23.30	227.2	307.0	0.126	16.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
4	19.0	F1	22.61	221.6	310.6	0.126	15.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
3	18.8	F1	19.85	217.0	310.8	0.126	13.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
								CCW / Ditch Side	EWI 1G 36in	2202B-4-006
17	41.8	HP	20.93	227.2	319.6	0.046	6.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
16	42.3	HP	19.92	225.3	320.4	0.046	6.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
15	41.7	HP	20.56	224.9	320.7	0.046	6.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
14	41.8	HP	21.21	223.3	320.0	0.046	6.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
13	41.8	HP	22.17	225.7	318.1	0.046	7.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
12	42.1	HP	21.09	226.5	321.1	0.046	6.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
11	41.7	HP	21.65	220.0	317.9	0.046	6.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
10	41.7	HP	21.53	219.2	318.2	0.046	6.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
9	42.0	HP	21.19	222.4	318.8	0.046	6.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
8	41.5	HP	17.76	216.7	319.0	0.046	5.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
7	41.8	HP	21.18	219.6	319.7	0.046	6.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
6	41.7	HP	21.91	226.2	322.5	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
5	41.8	HP	19.98	216.5	321.3	0.046	6.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
4	41.8	HP	22.29	219.9	320.6	0.046	7.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
3	41.7	HP	18.92	228.9	316.8	0.046	6.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-006
								CCW / Ditch Side	EWI 1G 36in	2202B-4-006



CRC-EVANS Automatic Welding
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11601 North Houston Rosslyn Road
Houston, Texas, USA – 77086
Mobile: 281-658-1935
E-mail: jwilliams@crc-evans.com

- Edison Welding Institute
- Procedure Qualification Record (2802B-4-007)
- 36" x 0.750", Grade X-100
- P260 and Manual Recorded Data





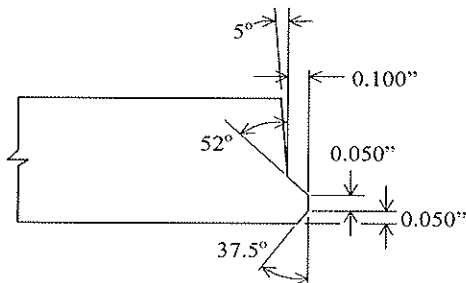
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PROCEDURE QUALIFICATION RECORD

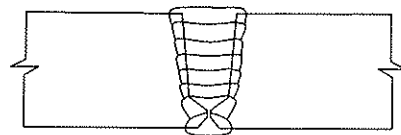
Project: EWI Metalcore Development Weld No: 2802B-4-007 Material Grade: API 5L X100 Material Mfr. / Ht No.: P05-100 Diameter: 36" Wall Thickness: 0.750" Preheat: 100 °C Interpass Temperature: 125 °C Maximum PWHT: Not Applicable	Date Weld Completed: May 12, 2006 Electrode Trade Name: TS-6, 2802B-4-007 Electrode Manufacturer: Thyssen, Metalcore Electrode Class.: ER70S-G Shielding Gas (%): See Shielding Below Electrical Current: Direct Current Polarity: Electrode Positive Position: 5G, 1G Rollout Welded By: Chris Cowan
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Pass No.	Root	Hot	Fill 1-4	Fill 5	Cap			
Travel Direction	Downhill	1G Rollout	1G Rollout	1G Rollout	1G Rollout			
Electrode Diameter	0.035" TS-6 Ht# 265306	0.045" 2802B-4-007	0.045" 2802B-4-007	0.045" 2802B-4-007	0.045" 2802B-4-007			
Gas Flow Rate (CFH)	75 CFH	50 CFH	50 CFH	50 CFH	50 CFH			
Shielding Gas Type (%)	75Ar / 25CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂			
C.T.W.D	0.300"-0.400"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"			
Oscillation Rate (BPM)	Not Applicable	Not Applicable	190	190	160			
Oscillation Width (inch)	Not Applicable	Not Applicable	As Required	As Required	As Required			
Head Angle	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead			
Equipment Type & Process	IWM GMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW			

Joint Design



Pass Sequence



Comments

Power Supplies used: Miller ALT304 for the root / Miller Invision 456MP for the hot pass, fills, and cap

Cleaning and grinding as required using power brush and grinder.

Prepared By: Justin Williams



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PROCEDURE QUALIFICATION RECORD ELECTRICAL CHARACTERISTICS									
Project: EWI Metacore Development					Date Weld Completed: May 12, 2006				
Weld Number: 2802B-4-007					Electrode Tradename: TS-6, 2802B-4-007				
Material Grade: API 5L X100					Electrode Manufacturer: Thyssen, Metacore				
Material Mfr./Heat No.: P05-100					Electrode Classification: ER70S-G				
Diameter: 3/8"					Shielding Gas (%): See Previous Page				
Wall Thickness: 0.750"					Electrical Current: Direct Current				
Preheat: 100 °C					Polarity: Electrode Positive				
Interpass Temperature: 125 °C Maximum					Position: 5G, 1G Rollout				
PWHT: Not Applicable					Welded By: Chris Cowan				
Pass Number	Root	Hot Pass	Fill 1	Fill 2	Fill 3	Fill 4	Fill 5	Cap	
Max Amps (A)	215.0	253.7	246.4	245.7	246.1	247.2	246.4	224.5	
Min Amps (A)	180.0	237.4	236.6	234.3	236.3	235.6	235.5	207.0	
Max Volts (V)	21.5	22.1	23.7	23.4	24.5	25.6	24.3	23.8	
Min Volts (V)	20.0	19.2	21.0	21.2	22.6	21.9	22.4	22.2	
Max WFS (IPM)	380.0	320.2	326.9	321.3	322.4	321.1	331.4	301.1	
Min WFS (IPM)	380.0	316.9	306.3	317.1	317.5	316.0	325.6	296.3	
Max Travel Speed (IPM)	30.0	42.0	19.0	19.0	19.1	19.0	16.0	15.1	
Min Travel Speed (IPM)	30.0	41.8	18.9	18.8	18.7	18.7	14.7	15.0	
Max Heat Input (KJ)	9.2	7.7	18.5	18.2	18.8	20.0	24.2	20.7	
Min Heat Input (KJ)	7.2	7.0	15.9	15.8	17.1	16.3	20.3	18.4	
Comments:									

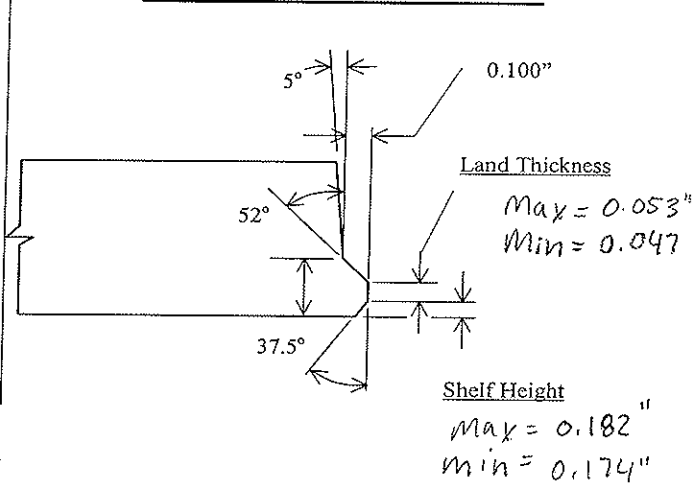


11601 N. Houston Rosslyn Rd.
Houston Tx, 77086
Phone: 281-999-8920
Fax: 281-999-5971

Procedure Qualification Record Sheet

Project or Customer:	EWI
Date:	05/11/06
Pipe Diameter:	36"
Pipe Heat # & Manufacturer:	P05-100
Wall Thickness:	0.750
Weld Number:	WELD B

Bevel Dimension Check



Internal Root Bead Parameter Record

CCW Side		CW Side	
140-210 (Amps)	Head 1	(Amps) 195-265	
20.5-21.0 (Volts)		(Volts) 20.5-21.0	
380 (WFS)		(WFS) 380	
185-195 (Amps)	Head 2	(Amps) 185-200	
20.0-21.0 (Volts)		(Volts) 21.0-21.5	
380 (WFS)		(WFS) 380	
195-210 (Amps)	Head 3	(Amps) 195-215	
21.0-21.5 (Volts)		(Volts) 19.5-20.0	
380 (WFS)		(WFS) 380	
185-200 (Amps)	Head 4	(Amps) 180-200	
20.0-20.5 (Volts)		(Volts) 20.0-20.5	
380 (WFS)		(WFS) 380	
Time	Travel Speed	Time	Travel Speed
Distance 30		Distance 30	
Travel Speed		Travel Speed	

Preheat and Interpass

Pass	Minimum	Maximum
Root	106°C	115°C
Hot		
Fill 1		
Fill 2		
Fill 3		
Fill 4		
Fill 5		
Fill 6		
Cap 1		
Cap 2		

Consumable Data

Pass	Electrode Type	Electrode Heat #	Dia.	Shielding Gas Type	Shielding Gas Flow Rate
Root	TS-6	265306	0.035		
Hot					
Fills					
Fills					
Caps					
Caps					

Miscellaneous

Time Between Root and Hot Pass:	14 hours
Time Between Hot and Remaining:	10 min
Direction Of Welding:	Downhill
Cleaning and Grinding Method:	Power Grinder, Power Brush
Welding Power Supply Types:	Miller ALT 304
External Welding Equipment Type:	Miller Invision 456 MP
Welder Names:	Mike Stanislaw
Recorded By:	Justin Williams

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
17	15.0	Cap	22.59	224.5	297.4	0.400	20.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
16	15.1	Cap	22.65	222.0	300.9	0.400	20.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
15	15.0	Cap	23.76	212.6	297.7	0.400	20.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
14	15.1	Cap	22.24	208.0	297.5	0.400	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
13	15.1	Cap	23.81	208.3	296.3	0.400	19.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
12	15.0	Cap	22.16	208.8	299.1	0.400	18.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
11	15.0	Cap	22.80	207.0	301.1	0.400	18.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
10	15.1	Cap	22.57	216.9	298.4	0.400	19.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
9	15.0	Cap	22.42	209.2	299.3	0.400	18.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
8	15.0	Cap	23.62	210.9	299.8	0.400	19.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
7	15.1	Cap	22.84	209.9	299.3	0.400	19.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
6	15.0	Cap	23.19	215.6	298.7	0.400	20.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
5	15.0	Cap	23.62	219.3	298.5	0.400	20.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
4	15.1	Cap	23.17	224.4	299.4	0.400	20.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
3	15.1	Cap	23.83	218.0	299.9	0.400	20.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
								CCW / Ditch Side	EWI 1G 36in	2202B-4-007
16	15.8	LF	23.20	235.5	328.8	0.180	20.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
15	15.9	LF	23.12	237.8	330.6	0.180	20.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
14	15.9	LF	22.53	242.3	326.6	0.180	20.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
13	15.9	LF	22.65	246.4	328.1	0.180	21.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
12	15.8	LF	22.41	240.5	331.4	0.180	20.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
11	15.9	LF	23.88	245.7	330.2	0.180	22.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
10	15.9	LF	23.50	239.7	331.0	0.180	21.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
9	15.7	LF	23.70	242.1	330.8	0.180	21.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
8	16.0	LF	24.03	246.1	325.6	0.180	22.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
7	15.9	LF	22.43	239.9	328.1	0.180	20.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
6	14.7	LF	24.27	244.3	328.5	0.180	24.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
5	14.8	LF	23.18	246.1	328.0	0.180	23.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
4	14.8	LF	22.95	242.9	329.2	0.180	22.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
3	14.8	LF	23.63	237.9	328.7	0.180	22.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
								CCW / Ditch Side	EWI 1G 36in	2202B-4-007
16	18.9	F4	22.68	243.8	319.4	0.170	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
15	18.9	F4	22.64	246.1	318.5	0.170	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
14	19.0	F4	23.45	239.2	320.7	0.170	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
13	18.9	F4	23.51	246.7	320.4	0.170	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
12	18.9	F4	22.67	241.5	319.2	0.170	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
11	18.9	F4	22.20	246.1	317.8	0.170	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
10	18.9	F4	24.02	247.2	321.1	0.170	18.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
9	18.7	F4	22.76	244.2	319.8	0.170	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
8	18.9	F4	23.54	240.4	321.1	0.170	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
7	19.0	F4	22.86	236.6	318.3	0.170	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
6	19.0	F4	24.34	240.1	320.1	0.170	18.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
5	18.9	F4	23.74	243.4	318.7	0.170	18.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
4	18.9	F4	21.86	235.6	316.0	0.170	16.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
3	18.8	F4	25.61	244.4	320.4	0.170	20.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
								CCW / Ditch Side	EWI 1G 36in	2202B-4-007
16	18.9	F3	23.30	237.4	320.0	0.140	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
15	18.9	F3	23.48	236.3	320.8	0.140	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
14	18.8	F3	22.62	245.6	318.4	0.140	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
13	19.0	F3	22.58	240.4	317.7	0.140	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
12	19.0	F3	22.71	243.5	320.8	0.140	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
11	18.9	F3	23.07	244.3	317.5	0.140	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
10	19.1	F3	23.48	246.1	319.2	0.140	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
9	18.9	F3	22.77	243.7	318.8	0.140	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
8	19.0	F3	23.47	245.2	320.6	0.140	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
7	18.9	F3	22.87	242.5	320.4	0.140	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
6	18.8	F3	22.63	239.9	318.2	0.140	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
5	19.0	F3	23.66	242.5	321.0	0.140	18.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
4	19.0	F3	23.20	237.3	322.4	0.140	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
3	18.7	F3	24.52	238.8	318.3	0.140	18.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
								CCW / Ditch Side	EWI 1G 36in	2202B-4-007
16	18.9	F2	22.85	243.3	317.9	0.130	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
15	18.9	F2	22.21	244.9	318.7	0.130	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
14	18.8	F2	23.17	238.2	318.1	0.130	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
13	18.9	F2	23.22	237.5	319.1	0.130	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
12	18.9	F2	23.31	245.7	321.3	0.130	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
11	18.9	F2	21.81	244.6	317.1	0.130	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
10	18.9	F2	22.36	242.6	321.2	0.130	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
9	18.9	F2	21.51	245.2	320.5	0.130	16.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
8	18.9	F2	22.42	242.6	318.0	0.130	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
7	18.9	F2	22.24	242.0	319.1	0.130	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
6	18.9	F2	21.69	239.4	317.6	0.130	16.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
5	19.0	F2	23.44	243.3	318.2	0.130	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
4	18.8	F2	22.11	234.3	319.9	0.130	16.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-007

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
3	18.9	F2	21.16	234.8	321.0	0.130	15.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
								CCW / Ditch Side	EWI 1G 36in	2202B-4-007
16	18.9	F1	21.79	243.9	310.9	0.126	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
15	18.9	F1	22.64	244.6	310.9	0.126	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
14	19.0	F1	22.63	246.4	306.7	0.126	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
13	19.0	F1	23.29	242.3	310.2	0.126	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
12	18.9	F1	23.24	245.7	308.4	0.126	18.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
11	19.0	F1	21.84	245.9	306.3	0.126	17.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
10	19.0	F1	21.01	240.8	309.7	0.126	16.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
9	19.0	F1	21.98	241.8	307.8	0.126	16.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
8	18.9	F1	21.66	241.3	309.6	0.126	16.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
7	18.9	F1	21.19	239.2	307.2	0.126	16.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
6	19.0	F1	20.99	242.3	310.6	0.126	16.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
5	18.9	F1	23.69	246.2	326.9	0.126	18.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
4	19.0	F1	23.37	245.8	310.9	0.126	18.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
3	19.0	F1	21.25	236.6	309.1	0.126	15.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
								CCW / Ditch Side	EWI 1G 36in	2202B-4-007
13	41.8	HP	21.35	244.2	318.3	0.046	7.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
12	42.0	HP	21.00	238.4	318.9	0.046	7.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
11	41.8	HP	22.03	239.3	317.7	0.046	7.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
10	42.0	HP	19.85	247.0	319.6	0.046	7.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
9	41.8	HP	19.17	253.7	316.9	0.046	7.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
8	42.0	HP	20.81	241.7	317.6	0.046	7.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
7	42.0	HP	21.44	237.4	318.2	0.046	7.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
6	42.0	HP	20.71	239.4	319.9	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
5	41.8	HP	20.72	244.2	318.6	0.046	7.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
4	42.0	HP	20.48	244.6	319.5	0.046	7.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
3	41.8	HP	22.13	243.4	320.2	0.046	7.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-007
								CCW / Ditch Side	EWI 1G 36in	2202B-4-007



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E-mail: jwilliams@crc-evans.com

- **Edison Welding Institute**
- **Procedure Qualification Record (2802B-4-008)**
- **36" x 0.750", Grade X-100**
- **P260 and Manual Recorded Data**



www.crc-evans.com

Tel: (281) 999-8920 Fax: (281) 999-1788 email: autoweld@crc-evans.com



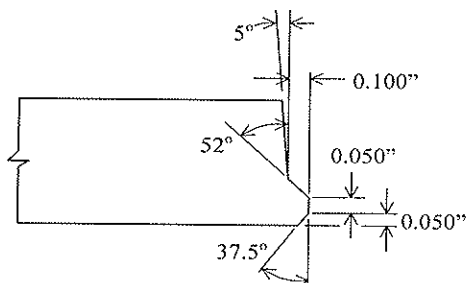
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PROCEDURE QUALIFICATION RECORD

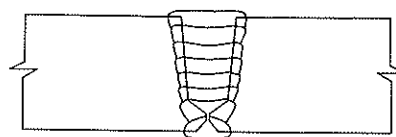
Project: EWI Metalcore Development Weld No: 2802B-4-008 Material Grade: API 5L X100 Material Mfr. / Ht No.: P05-100 Diameter: 36" Wall Thickness: 0.750" Preheat: 100 °C Interpass Temperature: 125 °C Maximum PWHT: Not Applicable	Date Weld Completed: May 12, 2006 Electrode Trade Name: TS-6, 2802B-4-008 Electrode Manufacturer: Thyssen, Metalcore Electrode Class.: ER70S-G Shielding Gas (%): See Shielding Below Electrical Current: Direct Current Polarity: Electrode Positive Position: 5G, 1G Rollout Welded By: Chris Cowan
---	---

Pass No.	Root	Hot	Fill 1-4	Fill 5	Cap			
Travel Direction	Downhill	1G Rollout	1G Rollout	1G Rollout	1G Rollout			
Electrode Diameter	0.035" TS-6 Ht# 265306	0.045" 2802B-4-008	0.045" 2802B-4-008	0.045" 2802B-4-008	0.045" 2802B-4-008			
Gas Flow Rate (CFH)	75 CFH	50 CFH	50 CFH	50 CFH	50 CFH			
Shielding Gas Type (%)	75Ar / 25CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂	85Ar / 15CO ₂			
C.T.W.D	0.300"-0.400"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"	0.250" - 0.625"			
Oscillation Rate (BPM)	Not Applicable	Not Applicable	190	190	160			
Oscillation Width (inch)	Not Applicable	Not Applicable	As Required	As Required	As Required			
Head Angle	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead	0° to 7° Lead			
Equipment Type & Process	IWM GMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW	P260 PGMAW			

Joint Design



Pass Sequence



Comments

Power Supplies used: Miller ALT304 for the root / Miller Invision 456MP for the hot pass, fills, and cap

Cleaning and grinding as required using power brush and grinder.

Prepared By: Justin Williams



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PROCEDURE QUALIFICATION RECORD ELECTRICAL CHARACTERISTICS										
Project:		EWI Metacore Development				Date Weld Completed: May 12, 2006				
Weld Number:		2802B-4-008				Electrode Tradename: TS-6, 2802B-4-008				
Material Grade:		API 5L X100				Electrode Manufacturer: Thyssen, Metacore				
Material Mfr./Heat No.:		P05-100				Electrode Classification: ER70S-G				
Diameter:		36"				Shielding Gas (%): See Previous Page				
Wall Thickness:		0.750"				Electrical Current: Direct Current				
Preheat:		100 °C				Polarity: Electrode Positive				
Interpass Temperature:		125 °C Maximum				Position: 5G, 1G Rollout				
PWHT:		Not Applicable				Welded By: Chris Cowan				
Pass Number	Root	Hot Pass	Fill 1	Fill 2	Fill 3	Fill 4	Fill 5	Cap		
Max Amps (A)	215.0	227.0	246.3	246.8	246.1	245.4	246.6	224.4		
Min Amps (A)	180.0	217.1	236.4	235.5	234.1	237.6	237.6	205.7		
Max Volts (V)	21.5	22.7	23.8	24.0	24.6	24.4	24.1	24.0		
Min Volts (V)	20.0	18.9	21.0	20.9	22.2	20.5	22.1	21.3		
Max WFS (IPM)	380.0	319.1	310.9	321.0	320.2	320.7	330.8	301.1		
Min WFS (IPM)	380.0	316.4	306.9	316.2	316.2	316.1	327.9	296.8		
Max Travel Speed (IPM)	30.0	42.0	19.0	19.0	18.9	19.1	19.0	18.9		
Min Travel Speed (IPM)	30.0	41.5	18.7	18.7	18.7	18.7	18.7	15.1		
Max Heat Input (Kj)	9.2	7.2	18.4	18.7	18.9	18.6	18.2	19.8		
Min Heat Input (Kj)	7.2	6.1	16.3	15.7	17.0	15.9	16.7	14.8		
Comments:										

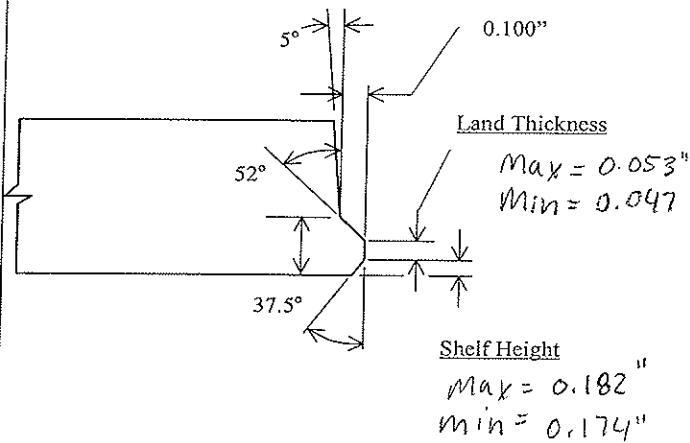


11601 N. Houston Rosslyn Rd.
Houston Tx, 77086
Phone: 281-999-8920
Fax: 281-999-5971

Procedure Qualification Record Sheet

Project or Customer:	EWI
Date:	05/11/06
Pipe Diameter:	36"
Pipe Heat # & Manufacturer:	P05-100
Wall Thickness:	0.750
Weld Number:	WELD B

Bevel Dimension Check



Internal Root Bead Parameter Record

CCW Side		CW Side	
190-210 (Amps)	Head 1	(Amps) 195-205	(Volts) 20.5-21.0
20.5-21.0 (Volts)		(Volts) 20.5-21.0	
380 (WFS)		(WFS) 380	
185-195 (Amps)	Head 2	(Amps) 185-200	(Volts) 21.0-21.5
20.0-21.0 (Volts)		(Volts) 21.0-21.5	
380 (WFS)		(WFS) 380	
195-210 (Amps)	Head 3	(Amps) 195-215	(Volts) 19.5-20.0
21.0-21.5 (Volts)		(Volts) 19.5-20.0	
380 (WFS)		(WFS) 380	
185-200 (Amps)	Head 4	(Amps) 180-200	(Volts) 20.0-20.5
20.0-20.5 (Volts)		(Volts) 20.0-20.5	
380 (WFS)		(WFS) 380	
Time Distance 30	Travel Speed	Time Distance 30	Travel Speed

Preheat and Interpass

Pass	Minimum	Maximum
Root	106°C	115°C
Hot		
Fill 1		
Fill 2		
Fill 3		
Fill 4		
Fill 5		
Fill 6		
Cap 1		
Cap 2		

Consumable Data

Pass	Electrode Type	Electrode Heat #	Dia.	Shielding Gas Type	Shielding Gas Flow Rate
Root	TS-6	265306	0.035		
Hot					
Fills					
Fills					
Caps					
Caps					

Miscellaneous

Time Between Root and Hot Pass:	14 hours
Time Between Hot and Remaining:	10 min
Direction Of Welding:	Downhill
Cleaning and Grinding Method:	Power Grinder, Power Brush
Welding Power Supply Types:	Miller ALT 304
External Welding Equipment Type:	Miller Invision 452 MP
Welder Names:	Mike Stanislaw
Recorded By:	Justin Williams

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
17	15.5	Cap	21.26	212.2	300.2	0.400	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
16	15.1	Cap	23.84	208.9	300.7	0.400	19.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
15	16.8	Cap	22.82	207.9	299.9	0.400	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
14	16.8	Cap	22.60	205.7	301.1	0.400	16.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
13	16.8	Cap	23.21	208.7	299.3	0.400	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
12	16.8	Cap	23.10	207.9	298.6	0.400	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
11	16.9	Cap	23.51	208.7	299.9	0.400	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
10	18.8	Cap	23.37	208.5	299.0	0.400	15.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
9	18.7	Cap	22.08	208.9	298.9	0.400	14.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
8	18.8	Cap	23.49	218.1	298.3	0.400	16.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
7	18.7	Cap	23.81	215.5	297.7	0.400	16.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
6	18.6	Cap	23.53	215.7	296.8	0.400	16.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
5	18.7	Cap	23.27	220.5	297.2	0.400	16.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
4	18.8	Cap	24.04	224.4	298.9	0.400	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
3	18.9	Cap	21.72	219.1	298.1	0.400	15.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
								CCW / Ditch Side	EWI 1G 36in	2202B-4-008
17	19.0	LF	22.88	242.6	328.1	0.180	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
16	18.9	LF	23.49	237.6	328.3	0.180	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
15	19.0	LF	22.22	238.2	328.5	0.180	16.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
14	18.9	LF	23.84	237.8	328.3	0.180	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
13	18.7	LF	23.22	237.6	328.1	0.180	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
12	18.9	LF	23.22	243.2	328.1	0.180	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
11	19.0	LF	22.11	245.6	329.0	0.180	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
10	19.0	LF	22.96	245.6	330.5	0.180	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
9	18.9	LF	23.36	243.2	329.9	0.180	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
8	18.7	LF	23.22	242.3	330.7	0.180	18.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
7	19.0	LF	22.83	242.6	330.8	0.180	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
6	19.0	LF	22.34	238.6	327.9	0.180	16.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
5	19.0	LF	23.41	246.6	329.3	0.180	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
4	19.0	LF	22.50	237.7	329.0	0.180	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
3	19.0	LF	24.07	237.9	329.3	0.180	18.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
								CCW / Ditch Side	EWI 1G 36in	2202B-4-008
17	18.9	F4	20.47	245.1	318.2	0.170	15.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
16	18.9	F4	23.42	239.7	320.5	0.170	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
15	18.8	F4	23.08	238.2	317.9	0.170	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
14	18.8	F4	23.10	242.1	318.9	0.170	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
13	18.9	F4	23.88	241.5	317.8	0.170	18.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
12	18.9	F4	22.47	243.4	316.5	0.170	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
11	18.9	F4	22.18	243.5	316.1	0.170	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
10	18.9	F4	23.63	243.5	318.7	0.170	18.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
9	18.9	F4	23.73	243.8	318.4	0.170	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
8	18.9	F4	22.35	238.3	318.4	0.170	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
7	19.1	F4	23.20	244.8	320.7	0.170	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
6	18.7	F4	23.31	243.5	318.0	0.170	18.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
5	18.9	F4	21.67	237.9	318.8	0.170	16.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
4	18.9	F4	23.93	245.4	317.8	0.170	18.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
3	18.7	F4	24.40	237.6	318.6	0.170	18.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
								CCW / Ditch Side	EWI 1G 36in	2202B-4-008
16	18.9	F3	23.17	242.1	318.0	0.140	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
15	18.9	F3	23.03	238.2	320.2	0.140	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
14	18.9	F3	23.36	236.9	318.8	0.140	17.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
13	18.8	F3	23.40	237.5	318.1	0.140	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
12	18.9	F3	23.63	244.6	318.7	0.140	18.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
11	18.9	F3	22.80	245.8	316.2	0.140	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
10	18.7	F3	22.81	243.7	318.6	0.140	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
9	18.9	F3	24.60	242.3	316.4	0.140	18.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
8	18.9	F3	22.18	240.9	318.4	0.140	17.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
7	18.9	F3	23.08	246.1	318.9	0.140	18.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
6	18.9	F3	22.93	245.6	317.9	0.140	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
5	18.9	F3	22.48	243.4	319.2	0.140	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
4	18.9	F3	24.15	239.7	317.4	0.140	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
3	18.9	F3	22.98	234.1	319.1	0.140	17.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
								CCW / Ditch Side	EWI 1G 36in	2202B-4-008
16	19.0	F2	22.85	245.9	318.6	0.130	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
15	18.7	F2	22.18	241.4	319.8	0.130	17.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
14	19.0	F2	22.65	244.2	319.3	0.130	17.5	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
13	18.9	F2	23.16	242.1	318.1	0.130	17.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
12	19.0	F2	21.52	243.8	321.0	0.130	16.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
11	19.0	F2	21.54	246.8	319.8	0.130	16.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
10	18.8	F2	22.50	241.5	320.5	0.130	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
9	18.9	F2	23.98	245.7	320.3	0.130	18.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
8	18.9	F2	20.88	236.4	318.2	0.130	15.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
7	19.0	F2	21.25	240.6	319.4	0.130	16.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
6	18.9	F2	23.49	242.6	317.7	0.130	18.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-008

Log Number	Travel Speed	Pass Name	Volts	Amps	Wire Speed	Osc Width	Heat	Bug Type	Job Number	Weld Number
5	18.9	F2	23.32	242.4	316.2	0.130	17.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
4	19.0	F2	22.00	236.1	318.6	0.130	16.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
3	18.9	F2	21.65	235.5	318.0	0.130	16.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
								CCW / Ditch Side	EWI 1G 36in	2202B-4-008
16	18.7	F1	22.49	245.2	308.5	0.126	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
15	19.0	F1	21.76	246.0	308.7	0.126	16.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
14	19.0	F1	22.78	245.9	308.1	0.126	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
13	19.0	F1	22.88	244.8	308.7	0.126	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
12	18.9	F1	21.52	245.5	306.9	0.126	16.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
11	19.0	F1	21.01	245.8	308.1	0.126	16.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
10	18.8	F1	22.04	245.5	308.5	0.126	17.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
9	19.0	F1	23.71	245.7	307.9	0.126	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
8	19.0	F1	22.29	238.7	308.4	0.126	16.8	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
7	19.0	F1	22.79	246.3	308.3	0.126	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
6	19.0	F1	22.76	246.3	310.9	0.126	17.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
5	18.9	F1	23.75	244.2	307.4	0.126	18.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
4	19.0	F1	23.00	240.0	309.1	0.126	17.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
3	19.0	F1	22.21	236.4	309.8	0.126	16.6	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
								CCW / Ditch Side	EWI 1G 36in	2202B-4-008
15	41.5	HP	20.56	224.4	318.2	0.046	6.7	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
14	41.7	HP	21.17	225.7	318.1	0.046	6.9	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
13	42.0	HP	22.14	223.7	318.2	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
12	41.5	HP	18.93	224.5	318.6	0.046	6.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
11	41.8	HP	19.51	221.4	317.7	0.046	6.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
10	42.0	HP	21.83	226.1	318.4	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
9	42.0	HP	21.86	227.0	319.1	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
8	41.7	HP	22.08	224.2	317.9	0.046	7.1	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
7	42.0	HP	22.71	223.1	316.4	0.046	7.2	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
6	41.8	HP	20.64	217.1	318.4	0.046	6.4	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
5	42.0	HP	22.21	219.1	318.5	0.046	7.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
4	42.0	HP	22.35	220.2	317.6	0.046	7.0	CCW / Ditch Side	EWI 1G 36in	2202B-4-008
3	41.8	HP	19.51	226.3	318.9	0.046	6.3	CCW / Ditch Side	EWI 1G 36in	2202B-4-008



CRC-EVANS Automatic Welding

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- **Edison Welding Institute**
- **Radiographic Report**



www.crc-evans.com

Tel: (281) 999-8920 Fax: (281) 999-1788 email: autoweld@crc-evans.com

Radiographic Numbers

Weld C

2802B-4-001	0	75
2802B-4-002	75	160
2802B-4-003	160 C	220
2802B-4-004	220 C	0

Weld D

2802B-4-005	0 C	66
2802B-4-006	67 C	140
2802B-4-007	140 C	210
2802B-4-008	210 C	0

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Fax: 281-999-5971

RADIOGRAPHY REPORT

CUSTOMER:	EWI
INSPECTION STD:	API 1104
BASE METAL:	API 5L X-100
DIA/WT:	36" x .750"
WELD NO:	715-C
PROJECT:	

DATE: 08/15/2006
FILM TYPE: FUJI 50
NO FILMS: 1
SENSITIVITY:1.7%
100% X-RAY
RT Procedure #:

WELD ACCEPTED

❑REJECTED

[illegible]

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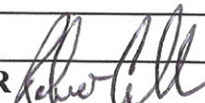
RADIOGRAPHY REPORT

CUSTOMER:	EWI
INSPECTION STD:	API 1104
BASE METAL:	API 5L X-100
DIA/WT:	36" x .750"
WELD NO:	715-D
PROJECT:	

DATE: 08/15/2006
FILM TYPE: FUJI 50
NO FILMS: 1
SENSITIVITY:1.7%
100% X-RAY
RT Procedure #:

□WELD ACCEPTED

☐REJECTED

Film Number	Acceptable	Unacceptable	No Discontinuities	Porosity	Slag Inclusions	LSF	LCP	Undercut	Incomplete Penetration	Excessive Penetration	REMARKS
0-4	√					√					
5-65	√		√								
66-69	√			√		√					
70-154	√		√								
155-158	√					√					
159-189	√		√								
190-191	√					√					
192-213	√		√								
214-217	√					√					
218-284	√		√								
285-0	√					√					
RADIOGRAPHER /INTERPRETED BY: ROBERT COLLIER 											LEVEL: II
ACCEPTED BY:											

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CRC-EVANS Automatic Welding
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E-mail: jwilliams@crc-evans.com

- Edison Welding Institute
- Preheat Temperatures



Preheat Temperatures

2802B-4-001			2802B-4-002			2802B-4-003		
Pass	Min	Max	Pass	Min	Max	Pass	Min	Max
Root	104 C	112 C	Root	104 C	112 C	Root	104 C	112 C
Hot	104 C	116 C	Hot	96 C	120 C	Hot	101 C	114 C
Fill 1	95 C	105 C	Fill 1	95 C	14 C	Fill 1	91 C	106 C
Fill 2	106 C	126 C	Fill 2	103 C	120 C	Fill 2	98 C	105 C
Fill 3	109 C	116 C	Fill 3	108 C	112 C	Fill 3	99 C	106 C
Fill 4	106 C	126 C	Fill 4	110 C	120 C	Fill 4	100 C	109 C
Fill 5	108 C	116 C	Fill 5	100 C	115 C	Fill 5	100 C	110 C
Cap	110 C	120 C	Cap	110 C	123 C	Cap	94 C	100 C

2802B-4-004			2802B-4-005			2802B-4-006		
Pass	Min	Max	Pass	Min	Max	Pass	Min	Max
Root	104 C	112 C	Root	106 C	115 C	Root	106 C	115 C
Hot	100 C	103 C	Hot	110 C	115 C	Hot	105 C	115 C
Fill 1	100 C	119 C	Fill 1	105 C	120 C	Fill 1	110 C	120 C
Fill 2	91 C	111 C	Fill 2	108 C	118 C	Fill 2	106 C	113 C
Fill 3	100 C	121 C	Fill 3	106 C	115 C	Fill 3	101 C	117 C
Fill 4	95 C	115 C	Fill 4	112 C	120 C	Fill 4	115 C	121 C
Fill 5	100 C	118 C	Fill 5	102 C	110 C	Fill 5	106 C	118 C
Cap	99 C	116 C	Cap	106 C	119 C	Cap	110 C	115 C

2802B-4-007			2802B-4-008		
Pass	Min	Max	Pass	Min	Max
Root	106 C	115 C	Root	106 C	115 C
Hot	106 C	116 C	Hot	100 C	118 C
Fill 1	92 C	102 C	Fill 1	110 C	117 C
Fill 2	107 C	116 C	Fill 2	106 C	120 C
Fill 3	112 C	121 C	Fill 3	110 C	119 C
Fill 4	105 C	118 C	Fill 4	106 C	116 C
Fill 5	105 C	120 C	Fill 5	112 C	121 C
Cap	108 C	120 C	Cap	111 C	118 C



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Houston, Texas, USA – 77086
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E-mail: jwilliams@crc-evans.com

- **Edison Welding Institute**
- **Calibration Certificates**



www.crc-evans.com

Tel: (281) 999-8920 Fax: (281) 999-1788 email: autoweld@crc-evans.com



Computer Weld Technology, Inc.

"Automating, controlling and monitoring the welding process."

CERTIFICATE OF CONFORMANCE / CALIBRATION

Certificate Number: GTFM-3135

This is to certify that the material supplied as referenced below has been tested and calibrated on equipment traceable to the National Institute of Standards and Technology. The NIST traceability numbers are:

LBL111
821/253616-94
821/251185-93
P-7485

Reference Calibration Instruments:

Fluke Digital Multimeter
Model Number: 45
Serial Number: 7105009
Calibrated By: Transcat, Inc.
Certificate Number: 5-VQ3F3-1-1
Certificate Date: 12/16/2005
Expiration Date: 12/16/2006

Brooks Instruments Flow Meter
Model Number: 1110-WB82 Fullview
Serial Number: 9502HC037379/001
Certificate Number: 0105030280824001
Calibrated By: Brooks Instruments
Certificate Date: 3/9/2005
Expiration Date: 3/9/2006

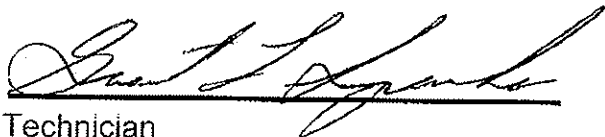
Brooks Instruments Flow Meter
Model Number: 1110-07H2G1Y Fullview
Serial Number: 9502HC037378/001
Certificate Number: 0105030280821001
Calibrated By: Brooks Instruments
Certificate Date: 3/9/2005
Expiration Date: 3/9/2006

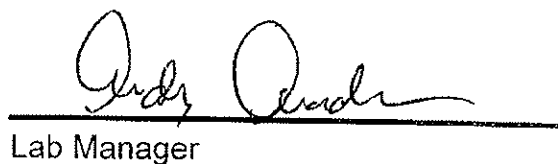
Description: GTFM IV Enclosure Assembly
Part Number: A3A0179
Serial Number: 0130606005
Calibration Date: 3/7/2006
Customer's Reference No:

Medium: Air
Range: 10 CFH - 250 CFH
Accuracy: +/- 1% of full scale +/- 1 digit

Flow Input (CFH)	As Received	Variance	As Calibrated	Variance
10			8	-2
15			14	-1
25			24	-1
30			29	-1
50			49	-1
70			68	-2
90			89	-1
110			109	-1
130			130	0
150			151	1
170			171	1
190			191	1
210			212	2
230			232	2
250			253	3

Test reports are on file with Computer Weld Technology or our suppliers, and may be examined upon request.


Technician


Lab Manager

The Meter Shop
4202 Directors Row #110
Houston Texas 77092

Certificate of Calibration

For Instrument: Fluke 112 Multimeter

CUSTOMER: CRC-Evans

Serial Number: 90200023

11601 N. Houston Rosslyn

Asset Number: 1286

Houston Tx 77086

The Meter Shop certifies that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration complies with MIL-STD-45662A and ANSI/NCSL Z540-1-1994.

This report may not be reproduced, except in full, unless permission for the publication of an approved abstract is obtained in writing from the calibration organization issuing this report.

CALIBRATION INFORMATION

Cal Date: 7 Mar 2006

Temperature 23.5°C

Pass Y

Next Cal Due: 7 Mar 2007

Humidity 37 %

Seals OK Y

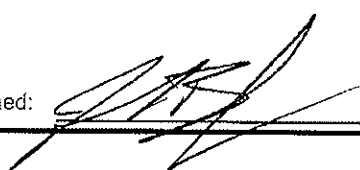
Remarks: P.O.# A20065

Cal Procedure MANUFACTURES SPECIFICATIONS 5520A

Revision

STANDARDS USED FOR CALIBRATION

Asset Number	Description	Cal. Date	Due Date
5001	fluke 5520A calibrator	28 Sep 2005	28 Sep 2006

Signed: 

SERIAL NUMBER: 90200023

ASSET NUMBER: 1286

PRINTED ON: 7 Mar 2006

Certificate of Calibration or Failed Calibration Report

Page 1 of 1

The Meter Shop
4202 Directors Row #110
Houston Texas 77092

Certificate of Calibration

For Instrument: Amprobe ACDC-3000 Clampmeter

CUSTOMER: CRC-Evans

Serial Number: 97100331E

11601 N Houston Rosslyn

Asset Number: 1216

Houston Tx 77086

The Meter Shop certifies that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration complies with MIL-STD-45662A and ANSI/NCSL Z540-1-1994

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CALIBRATION INFORMATION

Cal Date: 15 Feb 2006

Temperature 23.0°C

Pass Y

Next Cal Due: 15 Feb 2007

Humidity 60 %

Seals OK Y

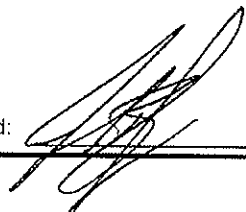
Remarks:

Cal Procedure CLAMP METER 1 YEAR AC/DC AMPS

Revision

STANDARDS USED FOR CALIBRATION

Asset Number	Description	Cal. Date	Due Date
5000	Fluke 5500A calibrator	08 Feb 2006	08 Feb 2007
002	Fluke 50/1 5500A/Coil	08 Feb 2006	08 Feb 2007

Signed: 

SERIAL NUMBER: 97100331E

ASSET NUMBER: 1216

PRINTED ON: 15 Feb 2006

Certificate of Calibration or Failed Calibration Report

Page 1 of 1

The Meter Shop
4202 Directors Row #110
Houston Texas 77092

Certificate of Calibration

For Instrument: Fluke 51 Thermometer

CUSTOMER:

Serial Number: 7057027

Wong Way

Asset Number: 1449

Somehere ST 50001

The Meter Shop certifies that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted) It has been calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques This calibration complies with MIL-STD-45662A and ANSI/NCSL Z540-1-1994.

This report may not be reproduced, except in full, unless permission for the publication of an approved abstract is obtained in writing from the calibration organization issuing this report

CALIBRATION INFORMATION

Cal Date: 8 May 2006

Temperature 23.0°C

Pass Y

Next Cal Due: 8 May 2007

Humidity 60 %

Seals OK Y

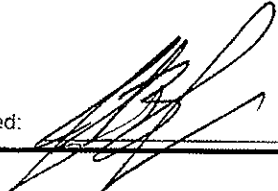
Remarks:

Cal Procedure Fluke 51: (1 year) CAL VER /5500

Revision \$Revision: 1.5 \$

STANDARDS USED FOR CALIBRATION

Asset Number	Description	Cal. Date	Due Date
5000	Fluke 5500A calibrator	08 Feb 2006	08 Feb 2007

Signed: 

SERIAL NUMBER: 7057027

ASSET NUMBER: 1449

PRINTED ON: 8 May 2006

Certificate of Calibration or Failed Calibration Report

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