TEMPERATURE CONTROLS PTY LTD

ACN: 650 190 183 ABN: 966 501 901 83 7 YAMMA STREET SEFTON, NSW 2162 AUSTRALIA PH: (02) 9721 8644 FAX: (02) 9738 9339 EMAIL: <u>sales@temperature.com.au</u> www.temperature.com.au



THERMOCOUPLES * RTD SENSORS * THERMOWELLS * EXTENSION CABLES * LEVEL SWITCHES

18/01/07 Ref: #7 INTERNAL PRESSURE TEST FLANGED (1381) <u>FULL PENETRATION</u> <u>WELDING QUALIFICATION CERTIFICATE</u> WELDING PROCEDURE SPECIFICATION & PRESSURE TEST

Customer:

Tag No: Order No:

This certificate is to confirm the Barstock Thermowell supplied against the above order number were subject to the following tests.

(i) HYDRAULIC PRESSURE TEST PROCEDURE - BARSTOCK THERMOWELLS

Thermowells were subjected to an internal hydraulic pressure test of 38,000 KPa for a duration of six minutes.

Each Thermowell was individually tested on our Hydraulic Pressure Comparator. The test pressure gauge is traceable N.A.T.A. test pressure Gauge No. 07/03/013.

(ii) FOUR PART DYE PENETRANT TEST - FLANGED THERMOWELLS

In Accordance to AS.2062-1997 "Methods for non-destructive penetrant testing of testing of products and components and BPV Code, Section V, Article 6 referenced by ASME B31.3 standard for Liquid Penetrant Testing.

All Thermowell flanges were subjected to a four part dye Penetrant test using flaw check dye Penetrant spray.

(iii) WELDING PROCEDURE SPECIFICATION - FLANGED THERMOWELLS In Accordance to AS1210 - SAA Unfired Pressure Vessel Code (Temperature Controls welding procedure specification No. WPO SD 12)

Welding

Full penetration welding, Primary weld is "J" groove type, secondary weld is "J" groove type. Welding is performed by certified welders using inert gas shielded arc.

Individual welding procedure specifications detailing materials used, method of welding, joint type and material specification are available on request.

RAISED FACE: Sealing Finish. Standard RA 16 option 12.5, 8, 6.3, 3.2, 1.6, 0.8 & 0.4.

All Thermowells passed the test without failure.

Michael Donnelly Testing Officer

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Welding Procedure Specification FULL PENETRATION

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Weld Procedure Number & Date	WPS 08/06
Welding Procedure Specification	WPQ SD 12

Manufacturer:	Temperature Controls 7 Yamma Street Sefton NSW 2162 Australia	Method Of Preparation and Cleaning:	Machine and Degrease
Location:	Workshop	Base metal # 1 Specification:	316L 1.4435
Welding Process:	GTAW	Base Metal # 1 Thickness	24mm
Joint Type:	Double J Groove	Base metal # 2 Specification:	316L 1.4435
		Base Metal # 2 Thickness	31.75mm
		Welding Position:	Down hand
		Welding Progression:	Bead



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Run Sequence	Process	Size Of Filler	Current A	Voltage V	Type Current/P	Of olarity	Wire Feed	Travel Speed	Heat Input
		Metal					Speed		
1A	GTAW	N/A ROOT	175	AUTO	DC		N/A	N/A	N/A
1B	GTAW	N/A ROOT	175	AUTO	DC		N/A	N/A	N/A
2A	GTAW	2.4mm	175	AUTO	DC		N/A	N/A	N/A
2B	GTAW	2.4mm	175	AUTO	DC		N/A	N/A	N/A
3A	GTAW	2.4mm	175	AUTO	DC		N/A	N/A	N/A
3B	GTAW	2.4mm	175	AUTO	DC		N/A	N/A	N/A
4A	GTAW	2.4mm	175	AUTO	DC		N/A	N/A	N/A
4B	GTAW	2.4mm	175	AUTO	DC		N/A	N/A	N/A
5A	GTAW	2.4mm	175	AUTO	DC		N/A	N/A	N/A
5B	GTAW	2.4mm	175	AUTO	DC		N/A	N/A	N/A
6A	GTAW	2.4mm	175	AUTO	DC		N/A	N/A	N/A
6B	GTAW	2.4mm	175	AUTO	DC		N/A	N/A	N/A
7A	GTAW	2.4mm	175	AUTO	DC		N/A	N/A	N/A
Welding Co	Welding Consumables:- 2.4 X 1000 mm Rod		<u>Produ</u>	ction S	equence				
Type, Designation Trade Name:		AWS/ASME SFA – 5.9 ER 316L Si HT 155057 SANDVIK		1. Cle met	1. Clean weld and 25mm borders to bright metal using approved degreasing solvent.				
Any Special Baking or Drying: N/A		2. Pos fit u	2. Position items to be welded ensuring good fit up.						
GasARGON 4.2Gas Flow Rate - Shield: - Backing:12 LTR MIN N/A		3. Tac to at le if requ	3. Tack weld parts together using TIG, tacks to at least 5mm min length, align using lathe if required						
Tungsten E Details of E Gouging/Ba	Fungsten Electrode Type/ Size:2% Thoriated 2.4mm DiaDetails of BackGas BackingGouging/Backing:Gas Backing		a 4. Dep	4. Deposit root run no filler					
Preheat Ter	nperature:		50 Deg C		5.Insp	ect root	run interna	lly	
Method of	preheat		CONVECT	ION OVEN	6. Cor stringe	nplete v er beads	veld using 2 as required	2.4mm dia w l.	vire using
Interpass te	mperature:		/ 50 DEG C		7. Cle as req	7. Cleaning of welds with stainless steel brush as required between passes			
Method of o temperature	checking Int	erpass	Hand Held Digital Thermocouple		8. 100	8. 100 % Visual inspection of completed weld			
Post Weld I	Heat Treatm	ent	Not Require	ed					
Time, temp Heating and	erature, met d Cooling Ra	hod: ates*:							
Edge Prepa	ration metho	od	Lathe Mach	ined					
Method of fit up Interference fit									

Revision History

Date	Issue	Changes	Authorization