

## Thermo Vacuum Generators

### Welder Qualification

**Associated Procedure Reference No: WPS BF-000-220-01**

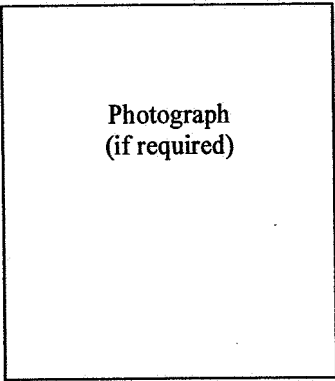


UNIT 18, CRAWLEY MILL INDUSTRIAL ESTATE, WITNEY, OXON. OX29 9TJ. TEL: (01993) 778522 & 702577 FAX: (01993) 708673

## Welder Approval Test Certificate

Designation: BS EN 287-1 141 P BW 9.1 t22 S bs

Manufacturer's Welding Procedure Reference No: WPS BF-000-220-01  
 Welder's Name: Quang Le Xuan  
 Identification: VGT P27  
 Place/Date of Birth: Vietnam 03-02-68  
 Employer: Thermo Vacuum Generators  
 Code/Testing Standard: BS EN 287.1 : 2004 (E)  
 Job Knowledge: Acceptable/Not Tested (Delete as necessary)

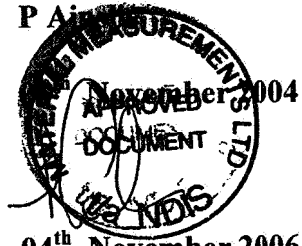


NDIS Job No: 40489  
 Lab Registration No: UKAS 2635  
 Lab References: TVG/017/1104  
 TVG/018/1104  
 TVG/019/1104  
 L42412

	Weld Test Details	Range of Approval
Welding Process	TIG (141)	TIG (141)
Plate or Pipe	Plate (P)	Plate and Pipe (P and T)
Joint Type	Butt (BW)	Butt and Fillet (BW and FW)
Parent Metal Group(s)	9.1	Groups 1.1, 1.2, 1.4, 9.1 & 11
Filler Metal Type/designation	316S92	316S92 or equivalent
Gas/Flux	Stainshield Tig	Stainshield Tig or equivalent
Auxiliaries	Nil	Nil
Test Piece Thickness	22mm	≥ 5mm
Pipe Outside Diameter	N/A	>500mm or >150mm when welded PA position
Welding Position	PA	PA (Butt) & PB (Fillet)
Gouging/backing	Welded from both sides/With backgrinding	Welding from both sides & single side welding with backing

Type of Test	Acceptable	Not Required
Visual	X	
Radiography	X	
Magnetic Particle		X
Penetrant	X	
Macro	X	
Fracture		X
Bend		X
Additional Tests		X

Examiner or Test Body: NDIS  
 Name: P A  
 Date: November 2004  
 Signature: [Signature]  
 Validity of Approval Until: 04<sup>th</sup> November 2006

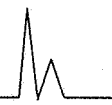


Prolongation of approval by examiner for the following two year period (see 9.3 BS EN 287 Pt 1)

Date	Signature	Position/title

Prolongation of approval by employer/co-ordinator for the following six months (see 9.3 BS EN 287 Pt 1)

Date	Signature	Position



UNIT 18, CRAWLEY MILL INDUSTRIAL ESTATE, WITNEY, OXON. OX29 9TJ. TEL: (01993) 778522 & 702577 FAX: (01993) 708673

VISUAL EXAMINATION		TEST REPORT		Page 1 of 1
Customer	Order No	NDIS Job No	Report No	
Thermo Vacuum Generators	T.B.A	40578	TVG/017/1104	
Maunsell Road	Date of Receipt	Date of Test	Description	
Castleham Industrial Estate	01 <sup>st</sup> November 2004	01 <sup>st</sup> November 2004	Weld Samples	
Hastings	Procedure No	Part No.	Quantity	
East Sussex TN38 9NN	NDIS/GEN/1V	See Below	See Below	
Test Standard	Acceptance Standard	Weld Process	Joint Type	
BS EN 970:1997	BS EN 25817 (B)	TIG	Butt	
Surface	Access	Material	Preparation	
As Welded	External	Stainless Steel	Nil	

Profile Gauge: As Required      Measuring Device: As Required      Light Source: Daylight

Magnification: N/A      Additional Equipment: N/A

**Details of Test**

Visual examination of the welds as specified below was carried out in accordance with the above Procedure and acceptance standard. Inspection was to the requirements of BS EN ISO 15614-1 & BS EN 287-1.

**PROJECT:** Weld Procedure/Welder Qualification

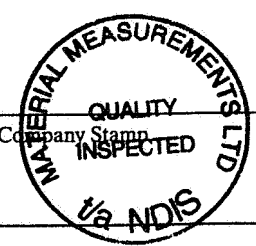
**ITEM 1 DESCRIPTION:** 22mm thick Stainless Steel Plate Butt welded sample

**WELDER IDENTs:** Chris Wickham (VGT P101) & Quang Le Xuan (VGT P27)

**OBSERVATIONS:** Nil significant fault indications were apparent.

**RESULTS:** The above welded samples are therefore considered acceptable to specification

Name of Tester	Signature of Tester	Approved by	Date of Report
P. Ainslie			03 <sup>rd</sup> November 2004





NIT 18, CRAWLEY MILL INDUSTRIAL ESTATE, WITNEY, OXON. OX29 9TJ. TEL: (01993) 778522 & 702577 FAX: (01993) 708673

PENETRANT		TEST REPORT				Page 1 of 1
Customer Thermo Vacuum Generators, Castleham Industrial Est; Maunsell Road, Hastings, East Sussex TN38 9NN		Order No T. B. A.	NDIS Job No 40578		Report No TVG/018/1104	
		Date of Receipt 01 <sup>st</sup> Nov 2004	Date of Test 01 <sup>st</sup> November 2004		Description Weld Samples	
		Procedure No NDIS/GEN/ID	Part No. See below		Quantity See below	
Test Standard BS EN 571.1 1997		Acceptance Standard BS EN 25817	Weld Process TIG		Joint Type Butt	
Surface As Welded		Access External	Material Stainless Steel		Preparation Degreased	
Penetrant Ardrox 907P	Batch No. 486826	Remover/Emulsifier Ardrox 9PR5	Batch No. 500743	Developer Ardrox 9D1B	Batch No. 504037	
Cleaner: S-72	UV-A Light: N/A		Test Piece: N/A			

**CONTACT TIMES**

Penetrant: 30mins      Remover/Emulsifier: N/A      Developer: 10mins

**Details of Test**

A colour contrast dye penetrant examination of the welds below was carried out in accordance with the above procedure and acceptance standard. Inspection was to the requirements of BS EN ISO15614-1 & BS EN 287-1.

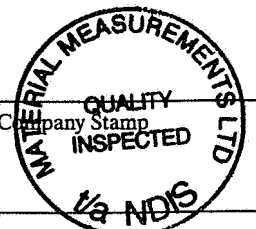
**PROCEDURE No:** WPS BF-000-220-01  
**WELDERS:** Chris Wickham (VGT P101) & Quang Le Xuan (VGT P27)

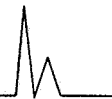
**OBSERVATIONS:** Nil significant indications were apparent.

**RESULTS:** The above welds are therefore considered acceptable to specification.

Tester PCN Details: P. Ainslie - P Level II Cat. efv (PCN No.101513)

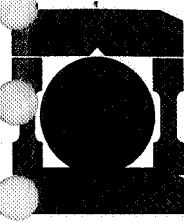
Name of Tester P. Ainslie	Signature of Tester 	Approved by	Date of Report 03 <sup>rd</sup> Nov 2004	Company Stamp INSPECTED 1/2 NDIS
------------------------------	-------------------------	-------------	---	--





NIT 18, CRAWLEY MILL INDUSTRIAL ESTATE, WITNEY, OXON. OX29 9TJ. TEL: (01993) 778522 & 702577 FAX: (01993) 708673

RADIOGRAPHY		TEST REPORT				Page 1 of 1	
Customer Thermo Vacuum Generators Maunsell Rd, Castleham Industrial Est Hastings East Sussex TN38 9NN		Order No T B A	NDIS Job No 40578		Report No TVG/019/1104		
		Date of Receipt 01 <sup>st</sup> November 2004	Date of Test 02 <sup>nd</sup> November 2004		Description Weld Samples		
		Procedure No NDIS/GEN/8R	Joint Type Butt		Weld Process TIG		
Test Standard BS EN 1435:1997	Acceptance Standard BS EN 25817	Outside Diameter N/A		Material Stainless Steel			
Surface As welded	Access External	Thickness 22mm		Film Identification See below			
Source Type: Andrex 300	Serial No: 48052	Activity: N/A					
Focal Spot: 3.25mm	Penetrameter: 10 Fe EN	Film Type: Agfa D7					
DFL Ident: Alphabetic	Screens: Pb F & R	Filters: Nil					
M E T H O D	kV 245	mA 5	Time 150sec	FFD 700mm	UG <0.3mm	Sensitivity 3 wires	Beam Angle As req.
Additional Information SWSI technique carried out. Qty. 1 shot carried out of each weld for complete coverage.							
Details of Test							
Radiographic inspection of Qty.2 off welds as detailed below was carried out in accordance with the above procedure and acceptance standard. Inspection was to the requirements of BS EN 15614 & BS EN 287.1							
WELD IDENT		WELDER	AREA	OBSERVATIONS			
WPS BF-000-220-01		VGT P27	A - B	Nil significant faults apparent - Accept			
WPS BF-000-220-01		VGT P101	A - B	Tungsten inclusions noted (largest inclusion 1.0mm) - Accept			
RESULTS: The above welds are therefore considered to be acceptable to specification.							
Tester PCN details:-P. Ainslie - R level 2 Cat XYInov (PCN No:101513)							
Name of Tester P. Ainslie		Signature of Tester 		Approved by		Date of Report 03 <sup>rd</sup> November 2004	
				Company Stamp			



Material Measurements Ltd trading as  
**MATERIALS TESTING SERVICES**



2635

Unit C, Swain Court, Avenue 2, Station Lane, Witney, Oxon. OX28 4YB Tel: 01993 899855 Fax: 01993 773479

**TEST CERTIFICATE**

Thermo Vacuum Generators  
 Maunsell Road  
 Castleham Industrial Estate  
 Hastings  
 TN38 9NN

Certificate No. L42489 Issue 1  
 Order No. re:Toby Lockwood

Date Tested: 11.11.04  
 Date Reported: 11.11.04

Client Contact: Toby Lockwood

Description: 22mm Thick Stainless Steel Plate Double V Butt Weld Sample  
 Welder: VGT P27 Procedure No. WPS BF-000-220-01

Specification: BS EN 287-1-2004

Macro Examination – BS EN 1321				
	Position	Magnification	Result	Observations
001: Weld	T/T	X5	Acceptable	No significant weld related defects observed within the section examined.
Refer to Photo macrograph BS EN 1321: A-E/9.1/ 9.1/B.1				

**Certificate Comments**

NDIS Req Sheet No. N00408

NDIS Job No. 40578

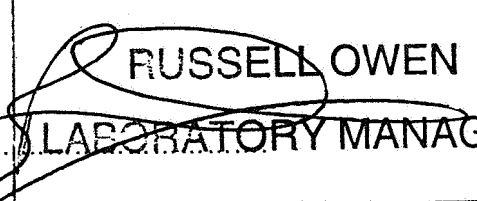
Parent Metal: 316L

Process: TIG

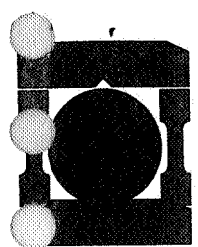
—End of Certificate Comments—

Tested By: R.J.Owen

Authorised Signatory:.....

MATERIAL TESTING SERVICES  
  
 RUSSELL OWEN  
 LABORATORY MANAGER

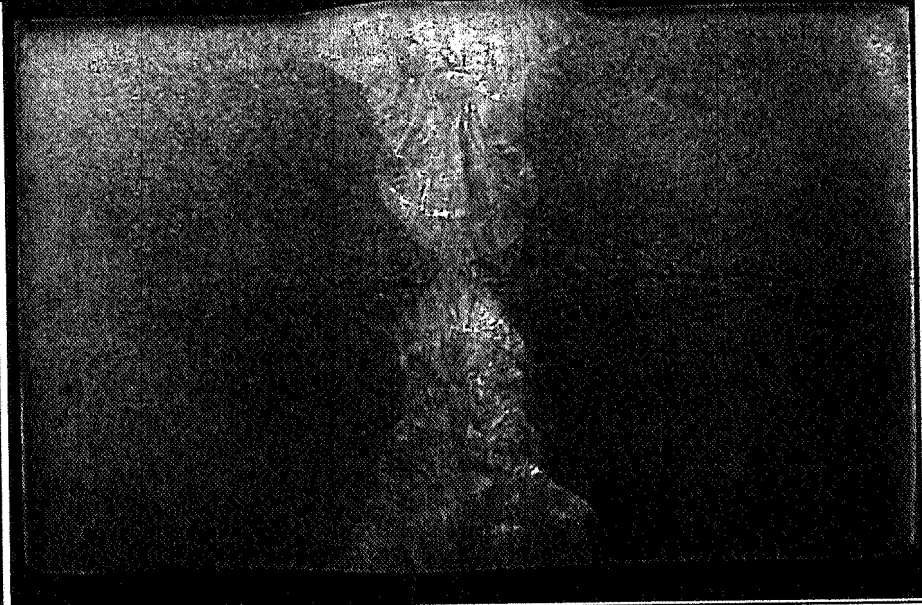
*This certificate should not be reproduced other than in full without the written permission of Materials Testing Services.  
 The results quoted refer only to the item(s) tested as sampled by the client unless otherwise stated.  
 Unless otherwise stated, all testing has been conducted to the version of any specification quoted current at the date of the test.*



Material Measurements Ltd trading as  
**MATERIALS TESTING SERVICES**



2635

Report No.	L42489 Issue 1	
Customer	Thermo Vacuum Generators	
Description	22mm Thick Stainless Steel Palte Double V-Butt Weld Sample Welder: VGT P27 Procedure No. WPS BF-000-220-01	
		Figure: 1
		Magnification: 5
		Etch: Marbles Reagent
L42489		

End of Report



UNIT 18, CRAWLEY MILL INDUSTRIAL ESTATE, WITNEY, OXON. OX29 9TJ. TEL: (01993) 778522 & 702577 FAX: (01993) 708673

ULTRASONIC		TEST REPORT		Page 1 of 1
Customer Thermo Vacuum Generators Maunsell Road Castleham Industrial Estate Hastings, East Sussex TN38 9NN C/O Toby Lockwood Esq.	Order No	NDIS Job No	Report No	
	T.B.A.	40593	TVG/021/1104	
	Date of Receipt	Date of Test	Description	
	01 <sup>st</sup> November 2004	08 <sup>th</sup> November 2004	See below	
	Procedure No	Part No.	Quantity	
	NDIS/GEN/1U	See below	12 off	
Test Standard	Acceptance Standard	Weld Process	Joint Type	
BS EN 1717 :1998	BS EN 10160 (Intent)	N/A	N/A	
Surface	Access	Material	Preparation	
As Manufactured	External	Stainless Steel	None	

Instrument Type: Site Scan 130		Serial No: 1301059.		Couplant: Polycell				
Probe Type	Crystal Size	Frequency	Serial No.	Sensitivity	Timebase	Reject	Cal. Block	Cal. Block
0 deg. Twin	10mm	5 MHz	191792	2 <sup>nd</sup> BWE	Various	Nil	Sample	NDIS179
45 deg. Single	10mm	5 MHz	902/01	2 <sup>nd</sup> BWE	Various	Nil	Sample	NDIS 180

**Details of Test**  
 An ultrasonic examination was carried out on the items indicated below in accordance with the above procedure and acceptance criteria.

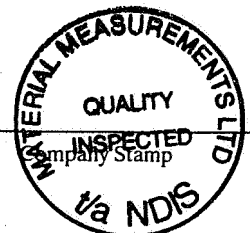
ITEMS:	DIMENSIONS	QUANTITY	IDENT NO.
Curved Plates	1.33m x 0.88m x 6mm	2 off	SEG00141-SK39676
Upstream Flange Ring	1.12m x 0.95m x 55mm	1 off	SEG00141-TVV0204
Downstream Flange Ring	1.12m x 0.80m x 55mm	1 off	SEG00141-TVV0203
Rectangular Plate	1.34m x 60mm x 22mm	4 off	SEG00141-RS+L022A
Rectangular Plate	1.34m x 0.55m x 65mm	2 off	SEG00141-SK39678
Dished End	1.0m Diameter x 8mm	1 off	SEG00141-RDIS950
Cover Flange	1.12m x 80mm x 20mm	1 off	SEG00141-TVV0301

**OBSERVATIONS:** The above samples were inspected and found to be free from any reportable indications at time of test.

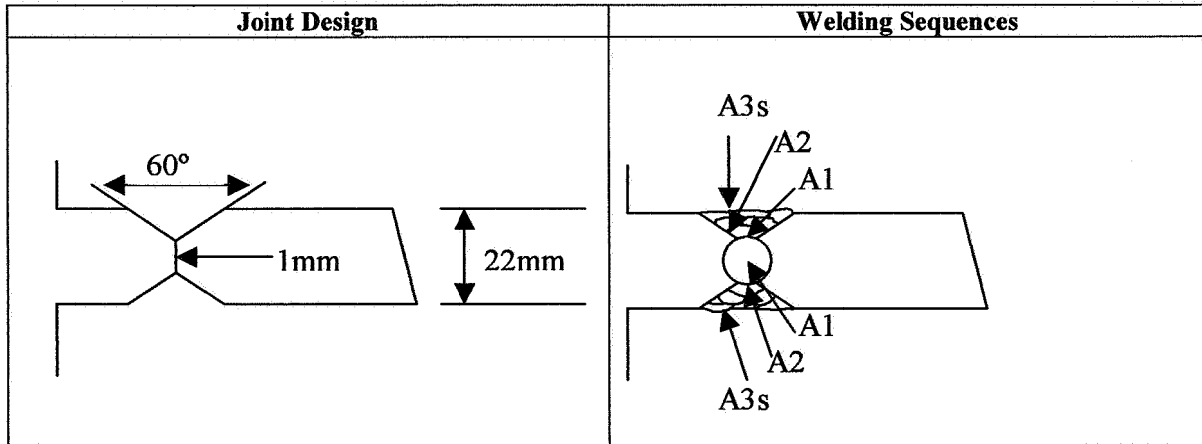
**RESULTS:** The items were therefore considered acceptable to the specification.

Tester Details: R G DOERING - U Level II (PCN No. 100255)

Name of Tester	Signature of Tester	Approved by	Date of Report
R G DOERING	<i>R.G. Doering</i>		09 <sup>th</sup> November 2004



<b>Manufacturer:</b> Thermo Vacuum Generators Maunsell Road Castleham Industrial Estate Hastings East Sussex, TN38 9NN, UK	<b>Method Of Preparation:</b> Machining, Degreasing & Cleaning : <b>Parent Metal Specification:</b> Stainless Steel 316L <b>Parent Metal Thickness:</b> 22 mm <b>Outside Diameter:</b> n/a <b>Welding Position:</b> All Positions
<b>Welding Process:</b> 141 <b>Joint Type:</b> Full Penetration Butt Weld <b>Weld proc spec:</b> WPS BF-000-220-01	



Run	Process	Size of Filler Metal	Current A	Voltage V	Type of Current/Polarity	Wire Feed Speed	Travel Speed	Heat Input
A1	Tack	N/A	50	—	DC	N/A	N/A	N/A
A2	Root Run	N/A	60-90	—	DC	N/A	N/A	N/A
A3s	Filler/Cap	2.4/3.2mm	90-100	—	DC	N/A	N/A	N/A

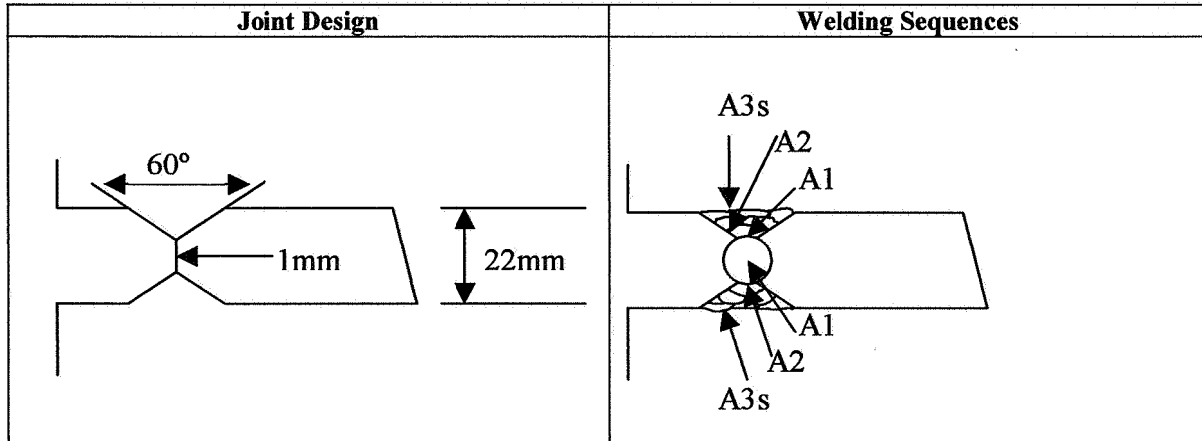
<b>Filler Metal Classification &amp; Trade Name:</b> <b>Special Baking or Drying:</b> <b>Shielding Gas:</b> <b>Backing Gas:</b> <b>Gas Flow Rate Shielding:</b> <b>Backing:</b> <b>Tungsten Electrode Type/Size:</b> <b>Back Gouging/Backing:</b> <b>Preheat Temperature:</b> <b>Post-Weld Heat Treatment:</b> <b>Type of Weld:</b> <b>Notes:</b>	316L S92 N/A Stainshield – TIG(Ar:98.5, H <sub>2</sub> :1.5%) N/A 8 l/min 6-8 l/min W / 2.4mm N/A N/A N/A Manual Cool & wire brush between weld runs
--	---

<b>Originator:</b> 	<b>Reviewed by:</b> 	<b>Approved by:</b> 
------------------------	-------------------------	-------------------------

**Manufacturer:** Thermo Vacuum Generators  
Maunsell Road  
Castleham Industrial Estate  
Hastings  
East Sussex, TN38 9NN, UK

**Method Of Preparation:** Machining, Degreasing & Cleaning :  
**Parent Metal Specification:** Stainless Steel 316L  
**Parent Metal Thickness:** 22 mm  
**Outside Diameter:** n/a  
**Welding Position:** All Positions

**Welding Process:** 141  
**Joint Type:** Full Penetration Butt Weld  
**Weld proc spec:** WPS BF-000-220-01



Run	Process	Size of Filler Metal	Current A	Voltage V	Type of Current/ Polarity	Wire Feed Speed	Travel Speed	Heat Input
A1	Tack	N/A	50	—	DC	N/A	N/A	N/A
A2	Root Run	N/A	60-90	—	DC	N/A	N/A	N/A
A3s	Filler/Cap	2.4/3.2mm	90-100	—	DC	N/A	N/A	N/A

**Filler Metal Classification & Trade Name:** 316L S92  
**Special Baking or Drying:** N/A  
**Shielding Gas:** Stainshield – TIG(Ar:98.5, H<sub>2</sub>:1.5%)  
**Backing Gas:** N/A  
**Gas Flow Rate Shielding:** 8 l/min  
**Backing:** 6-8 l/min  
**Tungsten Electrode Type/Size:** W / 2.4mm  
**Back Gouging/Backing:** N/A  
**Preheat Temperature:** N/A  
**Post-Weld Heat Treatment:** N/A  
**Type of Weld:** Manual  
**Notes:** Cool & wire brush between weld runs

<b>Originator:</b> 	<b>Reviewed by:</b> 	<b>Approved by:</b> 
------------------------	-------------------------	-------------------------