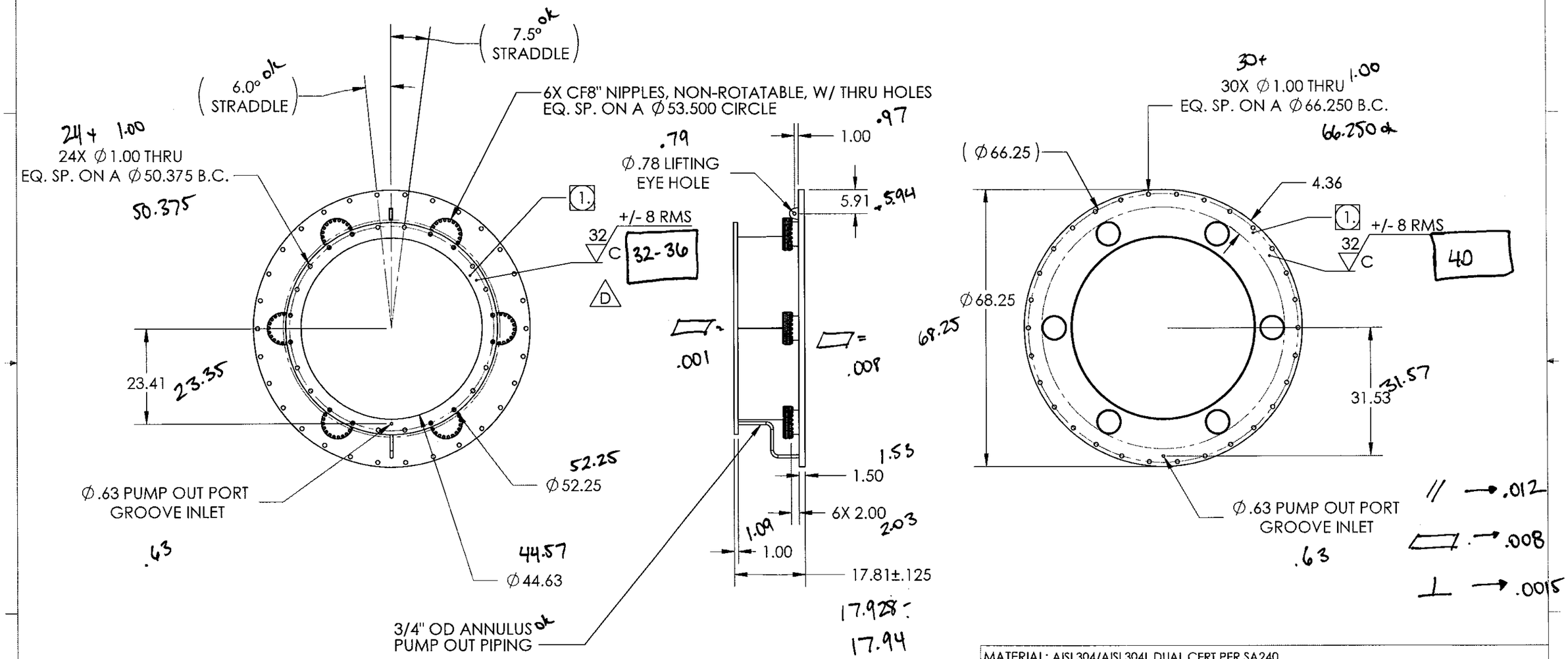
3472/1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	REVISED MODEL TO MATCH MFG. PROCESSES	6/9/10	MKM2
	B	REVISED TOLERANCE BLOCK, GD&T TOLERANCE WAS .05, NOW .03	6/24/10	MKM2
	C	REVISED TOLERANCES ON BOLT CIRCLES, 68.25 WAS 68.50; CALLED OUT FLANGE THICKNESSES. LARGE FLANGE IS NOW 1.5 THK. WAS 1.0	7/20/10	MKM2
	D	ADDED FINISH CALL-OUTS, RELEASED TO PRODUCTION	8/20/2010	MKM2



NOTES

1. VACUUM SEALING SURFACE ✓

2. ALL CONFLAT FLANGES ARE NON-ROTATABLE WITH THRU HOLES. ✓

MATERIAL: AISI 304/AISI 304L DUAL CERT PER SA240

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES: FINISH
ANGULAR: ± 0°30'
.XX ± .06
.XXX ± .005
UNSPECIFIED FILLETS: R.015
BREAK EDGES .010x45°
REMOVE ALL BURRS
125
// . ▱ . ⊥ WITHIN .03
THIRD ANGLE PROJECTION

WEIGHT: 1276.64#

APPROVALS		DATE
DRAFTER	MKM2	6/9/10
CHECKER	RW	6/14/10
ENGINEER	MKM2	6/9/10

GNB CORPORATION
SCIENTIFIC AND INDUSTRIAL EQUIPMENT
3200 DWIGHT RD. SUITE 100
ELK GROVE, CA, 95758
916-395-3003 FAX: 916-395-3363
www.gnbvalves.com

TITLE:
OUTLINE, ADAPTER A-16

DO NOT SCALE DRAWING

DWG. NO. B 114141-00

REV D

SCALE: 1:24 SHEET 1 OF 1

Bake Out Data Collection Sheet

Date: 5/6/11 Technician: Clancey Bleily Component: 1ST A-16 & A-17

	Bake Out Day 1 5/6			Bake Out Day 2 5/7			Bake Out Day 3 5/8		
	Time	Temp	Pressure	Time	Temp	Pressure	Time	Temp	Pressure
1:00 AM									
2:00 AM									
3:00 AM									
4:00 AM									
5:00 AM									
6:00 AM				6:00	102	6.4^{-6}			
7:00 AM				7:00	108	6.0^{-6}			
8:00 AM				8:00	114	6.2^{-6}			
9:00 AM				9:00	120	6.9^{-6}			
10:00 AM				10:00	126	7.9^{-6}			
11:00 AM				11:00	134	8.6^{-6}			
12:00 PM				12:00	140	8.0^{-6}	12:00	150	4.8^{-6}
1:00 PM	1:00	30°	8.9^{-6}	1:00	146	9.5^{-6}			
2:00 PM	2:00	36°	8.0^{-6}	2:00	150	9.7^{-6}			
3:00 PM	3:00	42°	7.2^{-6}						
4:00 PM	4:00	48°	7.8^{-6}						
5:00 PM	5:00	54°	7.4^{-6}						
6:00 PM	6:00	60	7.7^{-6}						
7:00 PM	7:00	66	5.1^{-6}						
8:00 PM	8:00	72	9.0^{-6}						
9:00 PM	9:00	78	9.1^{-6}						
10:00 PM	10:00	84	1.1^{-5}						
11:00 PM	11:00	90	1.2^{-5}						
12:00 AM	12:00	96	1.4^{-5}						

	Bake Out Day 4 5/7			Bake Out Day 5 5/10			Bake Out Day 6		
	Time	Temp	Pressure	Time	Temp	Pressure	Time	Temp	Pressure
1:00 AM									
2:00 AM									
3:00 AM									
4:00 AM									
5:00 AM									
6:00 AM									
7:00 AM				7:00	84	2.2^{-7}			
8:00 AM	8:00	150	3.0^{-6}	8:00	78	1.8^{-7}			
9:00 AM				9:00	72	1.4^{-7}			
10:00 AM				10:00	66	1.3^{-7}			
11:00 AM				11:00	60	1.1^{-7}			
12:00 PM				12:00	54	9.0^{-8}			
1:00 PM									
2:00 PM	2:00	144	3.0^{-6}						
3:00 PM	3:00	138	2.8^{-6}	3:00	48	8.2^{-8}			
4:00 PM	4:00	132	2.4^{-6}	4:00	42	8.2^{-8}			
5:00 PM	5:00	126	2.1^{-6}	5:00	36	NA			
6:00 PM	6:00	120	1.9^{-6}	6:00	30	NA			
7:00 PM	7:00	114	1.7^{-6}						
8:00 PM	8:00	108	1.3^{-6}						
9:00 PM	9:00	102	1.1^{-6}						
10:00 PM	10:00	96	1.0^{-6}						
11:00 PM	11:00	90	1.0^{-6}						
12:00 AM									

Bake Out Data Collection Sheet

Date: 1 / 1 Technician: _____ Component: _____

1.00 5.6-11 Test heater Function - TC function
2:00 30° set point all looks good
3:00 42° Set point all looks good
3:10 Install Jackets.
6:40 RGA Turn on

87°

5-9-11 : 2:00 pm Start ramp down

A-16 view port covers 165° 158° 156°
A-17 view port covers 135° 132° 134°

5-10 - Start disassemble for final leak test QRG disconnected at 4.00 so last 2 pressure readings not available.

GNB - LIGO CLEANLINESS TESTING RECORD

Component (check only 1)

● 114141-00 A16 Adptr	O 114142-00 A17 Adptr	O 114143-00 A18 Adptr	O 114144-00 Mid-St Sp
O 114146-00 MC-B	O 114146-01 MC-B	O 114146-02 MC-B	O 114146-03 MC-B
O 114145-00 MC-A	O 114425-00S Sept. Plt.		
O 114424-01S Sept. Plt.	O 114424-02S Sept. Plt.	O 114424-03S Sept. Plt.	O 114424-04S Sept. Plt.

O Other Items (pn/description/quantity): ALL SAMPLES ARE ISOPROPYL ALCOHOL (IPA). HRGC/HPLC TRACE GRADE

Revision: 114434 005 Serial Number: 85109

Samples

Sample(s) Taken By: RICH REED / CLANCY RILEY

Date: 4/23/11

	Result Comments
Sample 1 - Bottle Number & Area Sampled: #1 - BASELINE FILTER ONLY IPA	
Sample 2 - Bottle Number & Area Sampled: #2 - FILER & COLLECTION TOOL	
Sample 3 - Bottle Number & Area Sampled: #3 - A-16 INSIDE ROLL UP BELLOW WELD SEAM	
Sample 4 - Bottle Number & Area Sampled: #4 - A-16 LARGE FLANGE @ 4 o'clock	
Sample 5 - Bottle Number & Area Sampled: #5 - A-16 1/2 NIPPLE @ 9 o'clock	
Sample 6 - Bottle Number & Area Sampled:	

AstroPak PO Number: LC-0107-01

Ship Date, Carrier, Tracking#:

Test Result Disposition

AstroPak Test Report Attached? (y/n): ____ Is this a Repeated Test? (y/n): ____

Is Component Accepted or Rejected? _____

Title: Signature: Date:

Comments (enter here and.or to right of sample area descriptions):

ASTRO PAK

astropak.com

12201 Pangborn Avenue, Downey, CA 90241 (562) 293-3557 Fax (562) 803-3870
For inquiries regarding in-process orders, please call Customer Service at (562) 293-3552 or (866) 492-7876 ext. 3552

Certificate of Compliance

Astro Pak Corporation hereby certifies that all processes required by your purchase order were performed and that all materials used were in accordance with the applicable specification(s). Any evidence of tampering with the package or seals prior to installation without specific approval, nullifies this certification.

Customer GNB 3200 Dwight Road Suite 100 Elk Grove , CA 95758

P.O. **LC-0107-01** Log **93717021** Total Quantity **5** Date **4/29/2011**

The process specification or service performed: **Particle and NVR Testing**

Tested per IEST-STD-CC1246D for particulte levels and reported results

Line #	Qty	Part #	Part Description	Extended Description	Serial #s	Job #
1	1	Bottle #1	Baseline Filter,100 ml sample			
2	1	Bottle # 2	Filler & Collection Tool, 100 ml sample			
3	1	Bottle #3	A-16 Inside Roll Up Bellow Weld Seam, 100 ml sample			
4	1	Bottle #4	A-16 Large Flange @ 4 o'clock, 100 ml sample			
5	1	Bottle #5	A-16 Large Flange @ 9 o'clock, 100 ml sample100 ml sample			

Quality Assurance Martin Smith, QA Manager Date APR 2 9 2011

Source Required No Date

Astro Pak Corporation's Precision Cleaning Facility - Downey CA is an AS 9100B:2004 and ISO 9001:2008 registered facility.

Cert. #42548

ASTRO PAK

Certified Test Report

Customer: GNB Corporation PO: LC-0107-01 Log # 93717021

Description: Samples Specification: IEST-STD-CC1246D, Level 100A/20

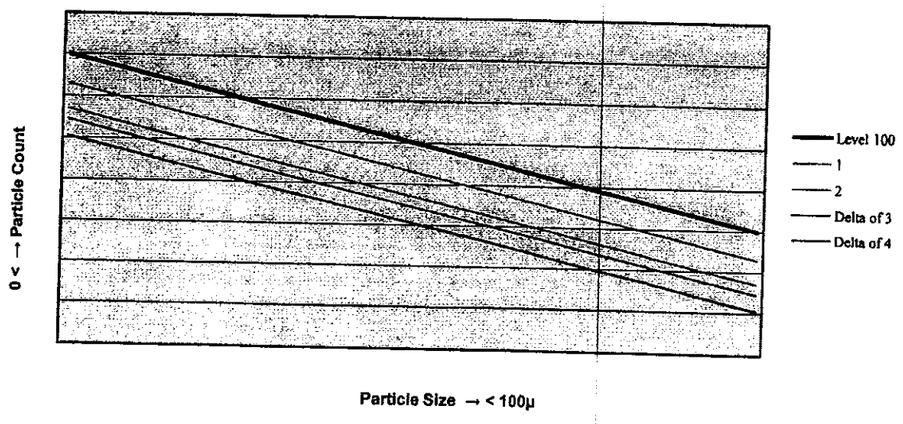
Acceptance Criteria and Results

Size/microns	> 5	> 15	> 25	> 50	> 100		NVR
Allowable	1,780	264	78	11	1		0.05 mg
1	477	77	13	3	0		0.21 mg
2	1,140	140	30	5	0		0.25 mg
Δ of 3	116	16	6	3	1		0.03 mg
Δ of 4	222	22	0	1	0		0.02 mg
IEST-STD-CC1246D Levels	69	71	60	70	NA		A/4.76
IEST-STD-CC1246D Levels	88	84	77	81	NA		A/4.76
IEST-STD-CC1246D Levels	45	43	47	70	100		A/33.3
IEST-STD-CC1246D Levels	55	48	NA	50	NA		A/50

1 = " 95% UCL = 521 particles > 5 µm / 0.1 m^2 ; LCL = 437 "
2 = " 95% UCL = 1,207 particles > 5 µm / 0.1 m^2 ; LCL = 1,077 "
Delta of 3 = " 95% UCL = 139 particles > 5 µm / 0.1 m^2 ; LCL = 97 "
Delta of 4 = " 95% UCL = 253 particles > 5 µm / 0.1 m^2 ; LCL = 195 "

NOTE: The graph below is merely a visual representation of the raw laboratory data reported above.
The graph extrapolates the median cleanliness levels to form a graphable line.

IEST-STD-CC1246D , Level 100



Lab Tech: Sal Martinez
Date/Time: 04/28/11 1700
Relative Humidity: 45%
Temp: 64° F
Sample method: ASTM F303
Test Method: ASTM F311, F312 & F331

THE ABOVE DATA HAS BEEN REVIEWED AND APPROVED

APR 29 2011

Astro Pak Quality

ASTRO PAK

Certified Test Report

Customer: GNB Corporation PO: LC-0107-01 Log # 93717021

Description: Samples Specification: IEST-STD-CC1246D, Level 100A/20

Acceptance Criteria and Results

Size/microns	> 5	> 15	> 25	> 50	> 100		NVR
Allowable	1,780	264	78	11	1		0.05 mg
Delta of 5	32	32	17	9	0		0.01 mg
**	*	*	*	*	*		*
IEST-STD-CC1246D Levels	28	54	65	95	NA		A/100
**	*	*	*	*	*		*

Delta of 5 = " 95% UCL = 45 particles > 5 µm / 0.1 m^2 ; LCL = 23 "

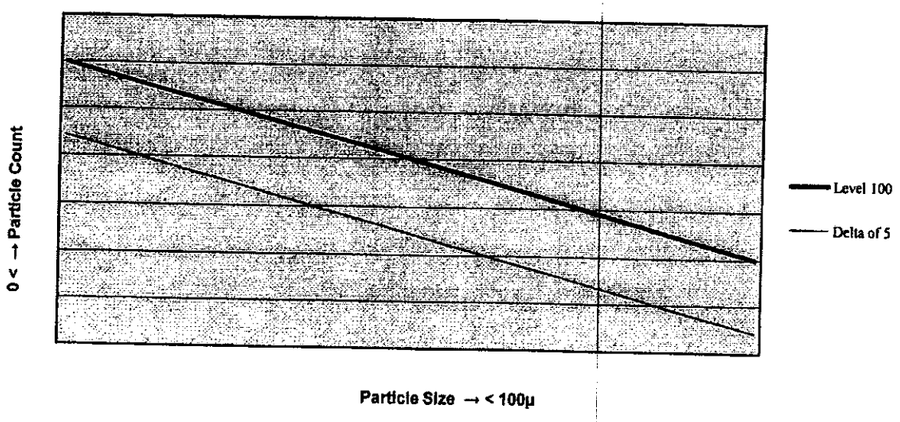
Test 6 = " NA "

Test 7 = " NA "

Test 8 = " NA "

NOTE: The graph below is merely a visual representation of the raw laboratory data reported above. The graph extrapolates the median cleanliness levels to form a graphable line.

IEST-STD-CC1246D , Level 100



Lab Tech: Sal Martinez
Date/Time: 04/28/11 1700
Relative Humidity: 45%
Temp: 64° F
Sample method: ASTM F303
Test Method: ASTM F311, F312 & F331

THE ABOVE DATA HAS BEEN REVIEWED AND APPROVED

AP 15 QA

APR 2 9 2011

Astro Pak Quality

1ST A-16 & A-17 Final Leak Check

GNB Corporation

QP1750-A7

Subject: Leak Test Procedure (LIGO Only)
Revision: B

GNB - LIGO LEAK TEST RECORD AND CERTIFICATION

Detector			
Mdl: Varian VSMD301	SN: LL10076045	Cal.Exp.Date: 6-9-11	Tracer Gas: He4
Std Lk Rate: 9.1E-09		Std Response: 9.1E-08	
Component	(1)	(2)	(3)
Component Name	1ST A-16	1ST A-17	
GNB Drawing No. & Rev.	114141-00	114142-00	
Serial No.	85109	85111	
Leak Test Data			
Pressure	.9 mtorr	.9 mtorr	
Duration	20 min	20 min	
Response	No Leak Detected	NO Leak Detected	
Leak Rate	Allowable: ≤1x10^{-9} Torr-L/S		
Welds I, Measured	1.0-9 Torr L/S	1.0-9 Torr L/S	
Welds II, Measured	" "	" "	
CF III, Measured	" "	" "	
Performed By/Date: Mark Putz		Pre-Final Clean ____ Post Bakeout X	
Witnessed By: Clancy Bixby		Title: Lead Tech	
Signature/Date: Clancy Bixby		5-10-11	
Comments: Chamber isolated to ambient during leak check. 20 minutes of heavy He Flood area and no leaks detected only the leak checker pumping on vessels			
		Annulus Pump-down	
Allowable: ≤1x10^{-5} Torr	Pass / Fail	Pass / Fail	Pass / Fail
Annulus1/CategoryIV			
Annulus1/CategoryV	1ST A-16	1ST A-17	
Measured Vacuum	1x10^{-5}	N/A	
Annulus2/CategoryIV			
Annulus2/CategoryV			
Measured Vacuum			
Performed By/Date: Clancy Bixby			
Witnessed By:		Signature/Date: Clancy Bixby 5-10-11	
Comments:			

GNB - LIGO FINAL CLEANING RECORD

This Version For MC or Mid-Station Tubes

Component Name:	GNB Dwg Number:	Serial Number:	Date:
16 #1	114434-005	85109	4-21-11

External Surfaces - Detergent Wash & Rinse

Start Time: 1:00	End Time: 1:25

VBS - Pre-Rinse / Component Heat-Up

Start Time: 1:25	Rinse Water Temperature: 160°			
Int#1: 99.2	Int#2: 98.3	Int#3: 101.1	Ext#1: 99.4	Ext#2: 100.7
End Time: 2:15				

VBS - Detergent Wash

Washing with Fixture-	Start Time:	End Time:	
Typical Surface Temps Attained:	#1: 99.4	#2: 100.2	#3: 98.7

Washing with Wand(s)-	Start Time: 2:15	End Time: ~~4~~ 3:00	
Area Location:	Approx Sq.Ft.:	Start Temp:	Time to get to 130F:
#1 Top Flange	3	74	
#2 Roll up	15	74	
#3 Bottom Flange with ports	10	74	

First DI Rinse

Start Time: 3:00	End Time:	Rinse Duration at least 15 minutes? (y/n): Y

Spot Check for Film or Residue

Swab Coloration Evident? (y/n): N. If yes, comments & title/signature:

4/23/11

Final DI Rinse

Start Time: 10:00	End Time:	Rinse Duration at least 15 minutes? (y/n):

10:00 to 12:00 ***Nitrogen Blow Dry***

Start Time: 12:00	End Time: 12:15

Operators:	1: Daniel Radford	2: Clancey Reilly

Comments:

Visual Inspection (VC-Exterior / Vis+UV-VB Surfaces)

Vacuum Boundary? (pass/fail): Pass	Title of Inspector: Clancey Reilly, Lead Tech
External Surfaces? (pass/fail): Pass	Signature/Date: 4/23/11

Comments:

GNB - LIGO LEAK TEST RECORD AND CERTIFICATION

Detector			
Mdl: Varian VSMD301	SN: LL10074045	Cal.Exp.Date: 6-9-11	Tracer Gas: He4
Std Lk Rate: 7.6E-8		Std Response: 7.6E-8	

Component	(1)	(2)	(3)
Component Name	A-16 1st		
GNB Drawing No. & Rev.	114434-005		
Serial No.	85109		

Leak Test Data			
Pressure	5.8×10^{-4}		
Duration			
Response	Pass		

Leak Rate	Allowable: $\leq 1 \times 10^{-9}$ Torr-L/S		
Welds I, Measured	Pass	2.4×10^{-10}	
Welds II, Measured	Pass	2.4×10^{-10}	
CF III, Measured	Pass	2.4×10^{-10}	
Performed By/Date:	3-28-11 Clausing	Pre-Final Clean X	Post Bakeout
Witnessed By:		Title:	
Signature/Date:			
Comments:			

Annulus Pump-down			
Allowable: $\leq 1 \times 10^{-5}$ Torr	Pass / Fail	Pass / Fail	Pass / Fail
Annulus1/CategoryIV	Pass		
Annulus1/CategoryV			
Measured Vacuum	1×10^{-5}		
Annulus2/CategoryIV			
Annulus2/CategoryV			
Measured Vacuum			
Performed By/Date:	Clausing 3/28/11		
Witnessed By:		Signature/Date:	
Comments:			