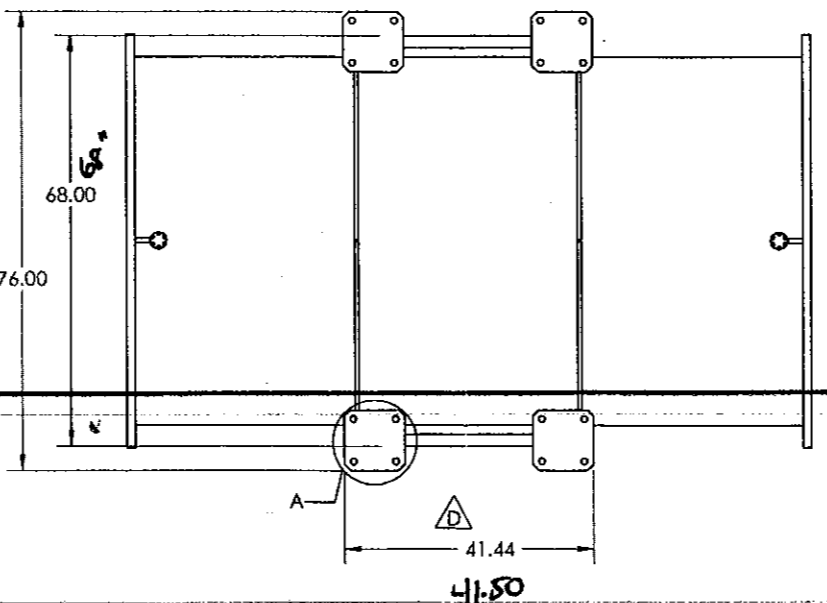
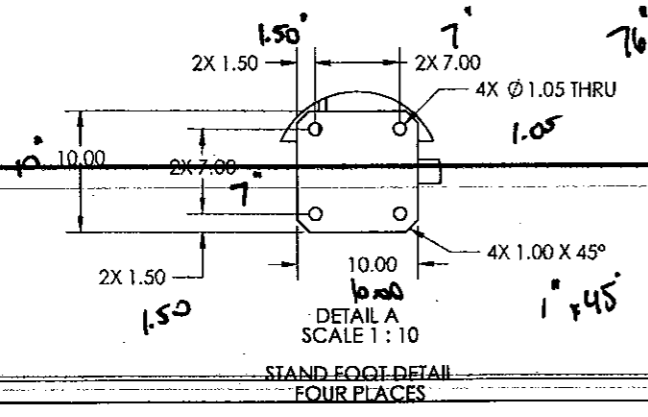
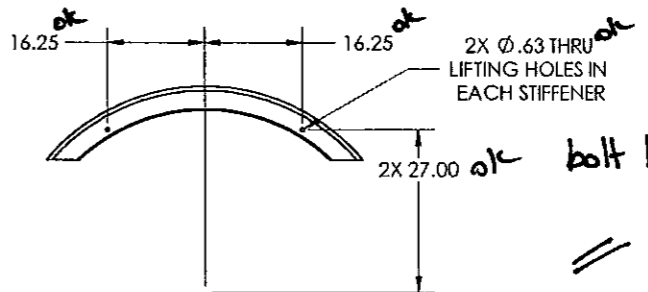
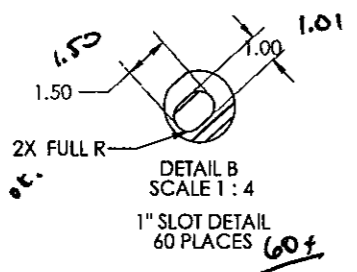
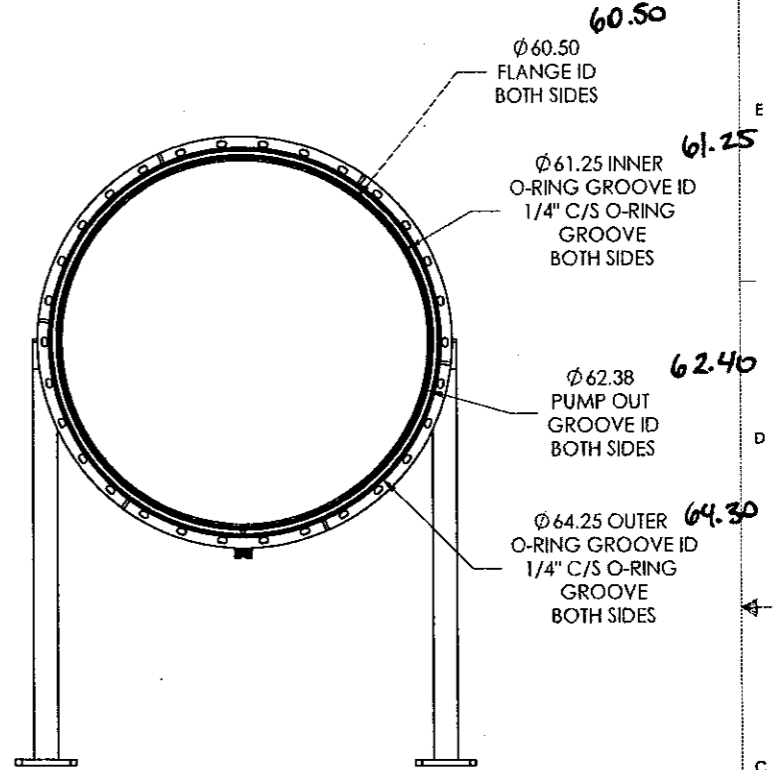
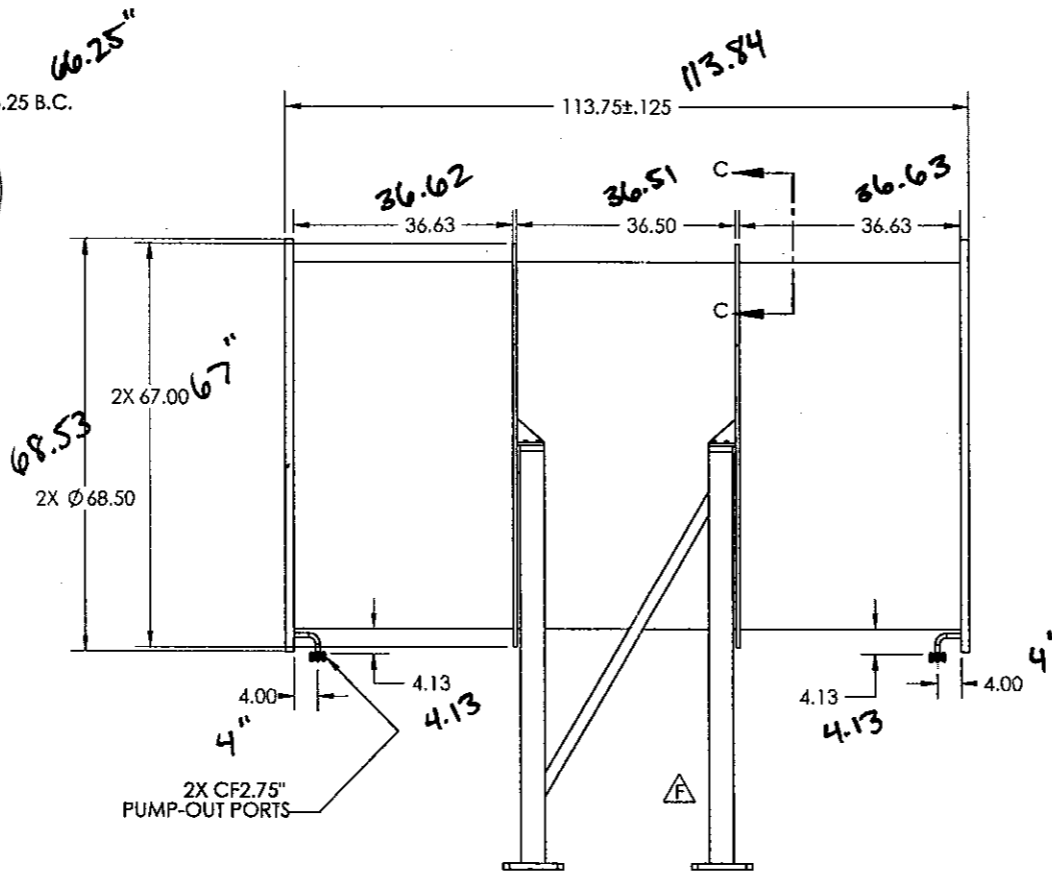
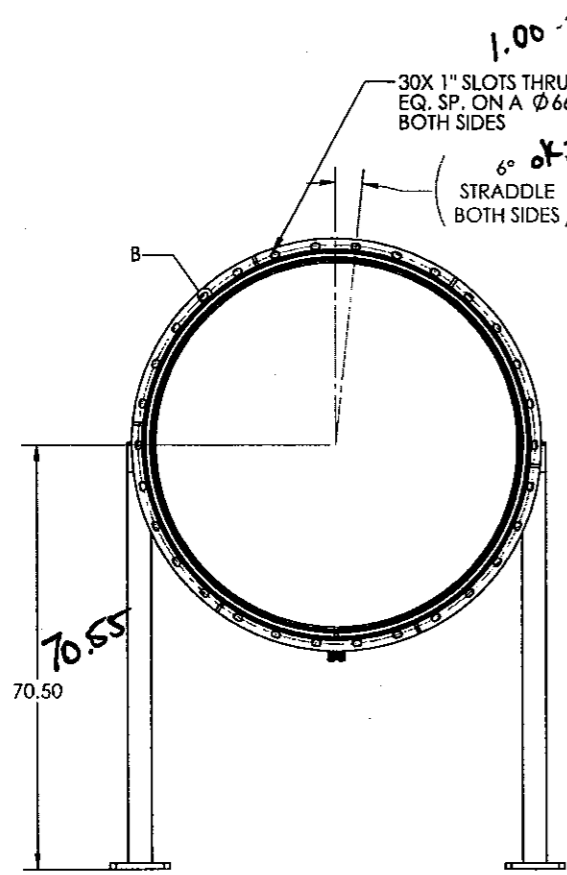


PROPERTY AND CONFIDENTIAL
 INFORMATION CONTAINED
 HEREIN IS THE PROPERTY OF
 GNB CORPORATION. IT IS TO BE
 KEPT CONFIDENTIAL AND NOT
 REPRODUCED OR DISCLOSED
 TO ANY OTHER PERSON OR
 ORGANIZATION WITHOUT THE
 WRITTEN CONSENT OF GNB.

ZONE	REV.	DESCRIPTION	REVISIONS	DATE	APPROVED
	A	REVISED MODEL TO MATCH MFG. PROCESSES		6/9/10	MKM2
SE	B	REV A LENGTH OF THE SPOOL WAS .75 SHORT		6/10/10	MKM2
	C	REVISED TOLERANCE BLOCK GD&T TOLERANCE WAS .01, NOW .03		6/23/10	MKM2
	D	REVISED STAND DETAIL PER PDR RESULTS		7/7/2010	MKM2
	E	RELEASED TO PRODUCTION		8/20/2010	MKM2
	F	REMOVED SHIPPING FIXTURE HOLES FROM STAND		9/7/2010	MKM2

3470/1



ok bolt holes alignment - ok.
 // → PASS
 □ → PASS
 ⊥ → PASS

MATERIAL: AISI 304/ AISI 304L DUAL CERT PER SA 240
 UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES
 TOLERANCES:
 ANGULAR: ± 0°30'
 HOLE: ± .005
 UNFINISHED: ± .005
 UNFINISHED: ± .015
 BREAK EDGES .015±
 REMOVE ALL BURRS
 WITHIN .005

WEIGHT: 3059.35#

APPROVALS	DATE
DRAFTER MKM2	6/9/10
CHECKER RYV	6/15/10
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, SPOOL, MIDSTATION, LIGO

SCALE: 1:20 SHEET 1 OF 1



REQUEST FOR WAIVER OR DEVIATION

SCAN AND EMAIL COMPLETED FORM TO QUALITY@LIGO.CALTECH.EDU
NOTE: DO NOT SUBMIT DISCREPANT MATERIAL UNTIL AUTHORIZED BY LIGO

PART NO.
11462-00S

REV.

PART NAME
Mid Station Spool #1

P.O. NO.
75ADV-1098662

P.O. QTY: 2
DISCREPANT QTY: 1

SUPPLIER: GNB Corporation
CONTACT: Rich Reed

TEL #: 916-233-3560
EMAIL: rreed@gnbvalves.com

DATE: 4/4/11

DESCRIPTION OF REQUEST (PLEASE GIVE COMPLETE TECHNICAL DESCRIPTION OF DEVIATION, REFERENCING DRAWING ZONE AS APPROPRIATE)
Requesting a waiver for the particles analysis on Mid Station Spool #1. The particle analysis passed but the baseline is too high. The FTIR analysis from LIGO passed.

ROOT CAUSE
Contaminated supply.

CORRECTIVE ACTION

GNB has purchased 99.9% isopropyl alcohol distilled in the bottle. This grade of IPA is used for gas chromatography analysis. If needed GNB will run this supply through a filter for more particle reduction.

SIGNATURE

TITLE
Program Manager

IMPLEMENTATION DATE:
4/4/11

ACTION TAKEN / DISPOSITION INSTRUCTION (FOR LIGO USE ONLY)

DATE RECEIVED

PROGRAM

QUALITY ASSURANCE

DATE

DESIGN ENGINEER

DATE

OTHER

DATE

Digitally signed by John Worden
DN: cn=John Worden, o=ou=LIGO Hanford, email, c=us
Date: 2011.04.06 09:31:59 -07'00'

John Worden



REQUEST FOR WAIVER OR DEVIATION

SCAN AND EMAIL COMPLETED FORM TO QUALITY@LIGO.CALTECH.EDU
NOTE: DO NOT SUBMIT DISCREPANT MATERIAL UNTIL AUTHORIZED BY LIGO

PART NO. 114262-00S	REV.	PART NAME Mid Station Spool #1 Flange	P.O. NO. 75ADV-1088662	P.O. QTY: 2 DISCREPANT QTY: 1
-------------------------------	-------------	---	----------------------------------	--

SUPPLIER: GNB Corporation CONTACT: Rich Reed	TEL #: 916-233-3560 EMAIL: reed@gnbvalves .com	DATE: 4/4/11
---	---	---------------------

DESCRIPTION OF REQUEST (PLEASE GIVE COMPLETE TECHNICAL DESCRIPTION OF DEVIATION, REFERENCING DRAWING ZONE AS APPROPRIATE)
Requesting a waiver for Mid Station Spool #1. The flange has surface scratches, in the 11:00 o'clock area. Neither the O-ring groove sealing surface, or the integrity of the flange have been compromised.

ROOT CAUSE Clamping blocks either bent or not flat with ridges causing clamp marks on the flange surface.	CORRECTIVE ACTION it is recommended that the machinist review the quality of the blocks that they are using: Check the flatness with a dial indicator on a granite table and make sure the edges are not proud, that the area of the clamp is as large as the machinist can use without interfering with the cut, and that the clamping force is only as much as is needed to prevent chatter.
---	--

SIGNATURE 	TITLE Program Manager	IMPLEMENTATION DATE: 4/1/11
----------------------	---------------------------------	---------------------------------------

ACTION TAKEN / DISPOSITION INSTRUCTION (FOR LIGO USE ONLY)	
DATE RECEIVED	
PROGRAM	
QUALITY ASSURANCE	DATE
DESIGN ENGINEER	DATE
OTHER	DATE

Digitally signed by John Worden
DN: cn=John Worden, o, ou=LIGO Hanford, email, c=US
Date: 2011.04.06 09:41:31 -07'00'

John Worden



REQUEST FOR WAIVER OR DEVIATION

SCAN AND EMAIL COMPLETED FORM TO QUALITY@LIGO.CALTECH.EDU

NOTE: DO NOT SUBMIT DISCREPANT MATERIAL UNTIL AUTHORIZED BY LIGO

PART NO. 11462-00S	REV.	PART NAME Mid Station Spool #1	P.O. NO. 75ADV-1088662	P.O. QTY: 2
SUPPLIER: GNB Corporation			TEL #: 916-233-3560	DATE: 4/4/11
CONTACT: Rich Reed			EMAIL: reed@gnbvalves.com	DISCREPANT QTY: 1

DESCRIPTION OF REQUEST (PLEASE GIVE COMPLETE TECHNICAL DESCRIPTION OF DEVIATION, REFERENCING DRAWING ZONE AS APPROPRIATE)
Requesting a waiver for the particles analysis on Mid Station Spool #1. The particle analysis passed but the baseline is too high. The FTIR analysis from LIGO passed.

ROOT CAUSE Contaminated supply.	CORRECTIVE ACTION GNB has purchased 99.9% isopropyl alcohol distilled in the bottle. This grade of IPA is used for gas chromatography analysis. If needed GNB will run this supply through a filter for more particle reduction.
---	--

SIGNATURE 	TITLE Program Manager	IMPLEMENTATION DATE: 4/4/11
----------------------	---------------------------------	---------------------------------------

ACTION TAKEN / DISPOSITION INSTRUCTION (FOR LIGO USE ONLY)			
DATE RECEIVED			
PROGRAM			
QUALITY ASSURANCE	DATE	DESIGN ENGINEER	DATE
OTHER			DATE



REQUEST FOR WAIVER OR DEVIATION

SCAN AND EMAIL COMPLETED FORM TO QUALITY@LIGO.CALTECH.EDU

NOTE: DO NOT SUBMIT DISCREPANT MATERIAL UNTIL AUTHORIZED BY LIGO

PART NO. 114262-00S	REV.	PART NAME Mid Station Spool #1 Flange	P.O. NO. 75ADV-1088662	P.O. QTY: 2
			DISCREPANT QTY: 1	

SUPPLIER: GNB Corporation	TEL #: 916-233-3560	DATE: 4/4/11
CONTACT: Rich Reed	EMAIL: reed@gnbvalves.com	

DESCRIPTION OF REQUEST (PLEASE GIVE COMPLETE TECHNICAL DESCRIPTION OF DEVIATION, REFERENCING DRAWING ZONE AS APPROPRIATE)
 Requesting a waiver for Mid Station Spool #1. The flange has surface scratches, in the 11:00 o'clock area. Neither the O-ring groove sealing surface, or the integrity of the flange have been compromised.

ROOT CAUSE Clamping blocks either bent or not flat with ridges causing clamp marks on the flange surface.	CORRECTIVE ACTION it is recommended that the machinist review the quality of the blocks that they are using: Check the flatness with a dial indicator on a granite table and make sure the edges are not proud, that the area of the clamp is as large as the machinist can use without interfering with the cut, and that the clamping force is only as much as is needed to prevent chatter.
---	--

SIGNATURE 	TITLE Program Manager	IMPLEMENTATION DATE: 4/1/11
----------------------	---------------------------------	---------------------------------------

ACTION TAKEN / DISPOSITION INSTRUCTION (FOR LIGO USE ONLY)			
PROGRAM		DATE RECEIVED	DATE
QUALITY ASSURANCE		DATE	DATE
DESIGN ENGINEER		DATE	DATE
OTHER		DATE	DATE



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 93716452 Total Quantity 6 Date 3/22/2011

The process specification or service performed: IEST-STD-C1246D, Level 100A/20

Delta Results = " 95% UCL = 37 particles > 5 µm / 0.1 m2 ; LCL = 22 "

Line #	Qty	Part #	Part Description	Extended Description	Serial #s	Job #
1	1		AK-222 Supply and Pump (Pre 1)	Sample tested at Level 76 A/20		
2	1		Pre 1 Plus all collection tools (Pre 2)	Sample tested at Level 97 A/9.09		
3	1		MSS Inner Wall North End	Sample tested at Level 103 A/5.56, After Delta (normalization) sample is Level 62 A/14.3		
4	1		MSS Flange North End	Sample tested at Level 107 A/7.69, After Delta (normalization) sample is Level 76 A/50		
5	1		MSS Inner Wall South End	Sample tested at Level 98 A/7.69, After Delta (normalization) sample is Level 39 A/50		
6	1		MSS Flange South End	Sample tested at Level 105 A/7.14, After Delta (normalization) sample is Level 70 A/33.3		

Quality Assurance


Martin Smith, QA Manager



Date MAR 22 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.





Certified Test Report

Customer: GNB Corporation

PO: LC-0107-01

Log # 93716452

Description: WO: 3470, SN: 85107

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 (Baseline 1)	76	27	10	4	0		0.05 mg
2 (Baseline 2)	113	63	31	10	0		0.11 mg
Δ of 3	32	12	0	2	0		0.07 mg
Δ of 4	21	16	7	4	0		0.02 mg
IEST-STD-CC1246D Levels	39	51	55	76	NA		A/20
IEST-STD-CC1246D Levels	44	67	77	98	NA		A/9.09
IEST-STD-CC1246D Levels	28	39	NA	62	NA		A/14.3
IEST-STD-CC1246D Levels	24	43	49	76	NA		A/50

1 (Baseline 1) = " 95% UCL = 95 particles > 5 μm / 0.1 m² ; LCL = 61 "

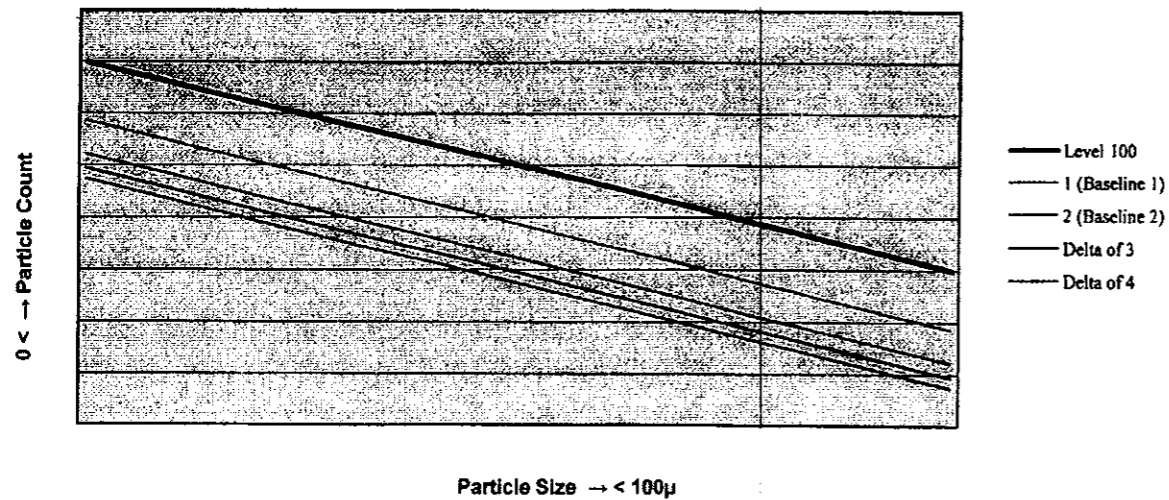
2 (Baseline 2) = " 95% UCL = 135 particles > 5 μm / 0.1 m² ; LCL = 94 "

Delta of 3 = " 95% UCL = 45 particles > 5 μm / 0.1 m² ; LCL = 23 "

Delta of 4 = " 95% UCL = 32 particles > 5 μm / 0.1 m² ; LCL = 14 "

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: Carlos Alcala
Date/Time: 03/21/11 1000
Relative Humidity: 45%
Temp: 64° F
Sample method: ASTM F303
Test Method: ASTM F311, F312 & F331

THE ABOVE DATA HAS BEEN REVIEWED AND APPROVED

[Signature]
AP 15 QA
Astro Pak Quality
MAR 22 2011



Certified Test Report

Customer: GNB Corporation

PO: LC-0107-01

Log # 93716452

Description: WO: 3470, SN: 85107

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
Δ of 5	36	12	3	0	0	0.02 mg
Δ of 6	29	19	0	3	0	0.03 mg
**	*	*	*	*	*	*
IEST-STD-CC1246D Levels	30	39	37	NA	NA	A/50
IEST-STD-CC1246D Levels	27	46	NA	70	NA	A/33.3
**	*	*	*	*	*	*

Delta of 5 = " 95% UCL = 50 particles > 5 μm / 0.1 m²; LCL = 26 "

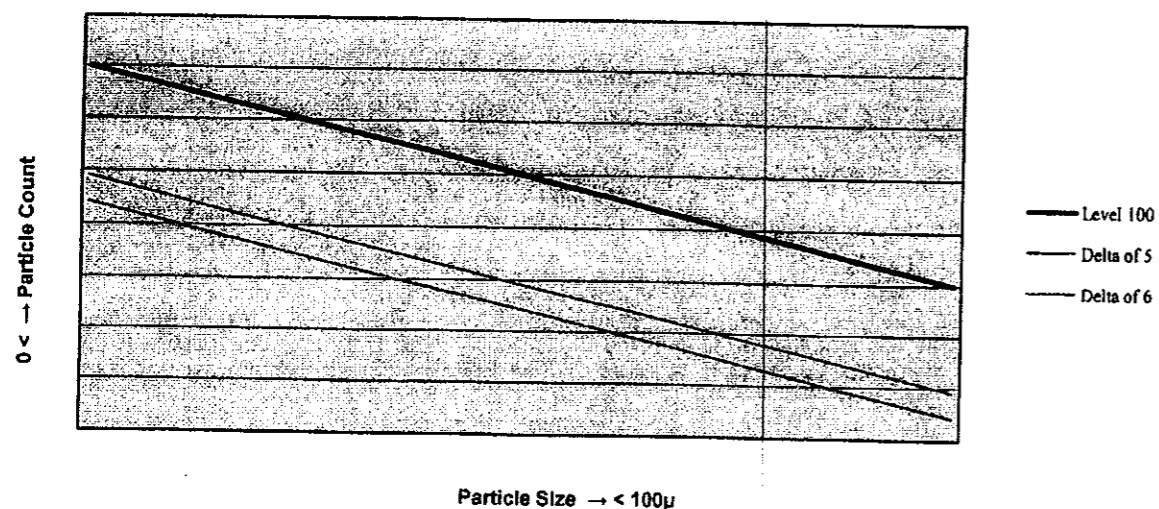
Delta of 6 = " 95% UCL = 41 particles > 5 μm / 0.1 m²; LCL = 20 "

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: Carlos Alcala
Date/Time: 03/21/11 1330
Relative Humidity: 45%
Temp: 66° F
Sample method: ASTM F303
Test Method: ASTM F311, F312 & F331

THE ABOVE DATA HAS BEEN REVIEWED AND APPROVED

[Signature]
AP 15
Astro Pak Quality
MAR 23 2011



QP1750-A3

Subject: Testing, PCL&NVR (LIGO Only)

Revision: A

Page 5 of 7

GNB - LIGO CLEANLINESS TESTING RECORD

Component (check only 1)

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

Other Items (pr/description/quantity):

WD3470

Revision: Serial Number: **85107**

Samples

Sample(s) Taken By: **Clancey Bleily / Rich Reed**

Date: **3-16-11** Result Comments

Sample 1 - Bottle Number & Area Sampled:
AK-222 Supply and Pump (Pre 1)

Sample 2 - Bottle Number & Area Sampled:
Pre 1 plus all collection tools (Pre 2)

Sample 3 - Bottle Number & Area Sampled:
MSS Inner wall North end

Sample 4 - Bottle Number & Area Sampled:
MSS Flange North end

Sample 5 - Bottle Number & Area Sampled:
MSS Inner wall South end

Sample 6 - Bottle Number & Area Sampled:
MSS Flange South end

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):

GNB - LIGO LEAK TEST RECORD AND CERTIFICATION			
Detector			
Mdl: Varian VSMD301	SN: LL1007L045	Cal. Exp. Date: 8/9/11	Tracer Gas: He4
Std Lk Rate: 9.1×10^{-8} @ 19.3°C	Std Response: 9.1×10^{-8}		
Component	(1)	(2)	(3)
Component Name	MSS1		
GNB Drawing No. & Rev.	114262-005		
Serial No.			
Leak Test Data			
Pressure	14-4 @ chamber WRG		
Duration	3 HRS		
Response	NO LEAKS DETECTED		
Leak Rate Allowable: $\leq 1 \times 10^{-9}$ Torr-L/S			
Welds I, Measured	9×10^{-10}		
Welds II, Measured	9×10^{-10}		
CF III, Measured	9×10^{-10}		
Performed By/Date: DANIEL BRADFORD	Pre-Final Clean	Post Bakeout <input checked="" type="checkbox"/>	
Witnessed By: [Signature]	Title:		
Signature/Date: [Signature] 4-19-11			
Comments: Turbos spun down only leak checked pumping on chamber annulus at atm.			
Annulus Pump-down			
Allowable: $\leq 1 \times 10^{-5}$ Torr	Pass / Fail	Pass / Fail	Pass / Fail
Annulus1/CategoryIV			
Annulus1/CategoryV			
Measured Vacuum			
Annulus2/CategoryIV			
Annulus2/CategoryV			
Measured Vacuum			
Performed By/Date:			
Witnessed By:	Signature/Date:		
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: $8.3 \cdot 10^{-8}$	Std Response:		
Component	(1)	(2)	(3)
Component Name	MSS 1		
GNB Drawing No. & Rev.	114262-005		
Serial No.	85107		

Leak Test Data

Pressure	1.5×10^{-6} Torr	checked 1.7×10^{-7}
Duration		
Response	No Leak detected	

Leak Rate Allowable: $\leq 1 \times 10^{-9}$ Torr-L/S

Welds I, Measured	1.7×10^{-7}	1.7×10^{-10}
Welds II, Measured	1.7×10^{-7}	1.7×10^{-10}
CF III, Measured	1.7×10^{-7}	1.7×10^{-10}

Performed By/Date: Clancy Bleily Pre-Final Clean Post Bakeout

Witnessed By: M. Pitz Title: Final Assembly Testing Supervisor

Signature/Date: M. Pitz 4-17-11

Comments:

Annulus Pump-down

Allowable: $\leq 1 \times 10^{-5}$ Torr	Pass / Fail	Pass / Fail	Pass / Fail
Annulus1/Category IV	Pass		
Annulus1/Category V			
Measured Vacuum	1.0×10^{-5}		
Annulus2/Category IV	Pass		
Annulus2/Category V			
Measured Vacuum	1.1×10^{-6}		

Performed By/Date: Clancy Bleily

Witnessed By: M. Pitz Signature/Date: M. Pitz 4-12-11

Comments:

GNB - LIGO LEAK TEST RECORD AND CERTIFICATION

Detector

Mdl: Varian VSMD301	SN: <i>LL10074045</i>	Cal. Exp. Date: <i>6-9-11</i>	Tracer Gas: He4
Std Lk Rate: <i>9.1E-8</i>	Std Response: <i>9.1E-08</i>		
Component	(1)	(2)	(3)
Component Name	<i>Mid Station Spool #1</i>		
GNB Drawing No. & Rev.	<i>114262-005</i>		
Serial No.	<i>85107</i>		

Leak Test Data

Pressure	<i>3.0 x 10⁻⁴</i>		
Duration	<i>3 hours</i>		
Response	<i>No Leak Detected</i>		

Leak Rate Allowable: $\leq 1 \times 10^{-9}$ Torr-L/S

Welds I, Measured	<i>2.4 x 10⁻¹⁰</i>		
Welds II, Measured	<i>2.4 x 10⁻¹⁰</i>		
CF III, Measured	<i>N/A</i>		

Performed By/Date: <i>Clancey Bleily</i>	Pre-Final Clean <input checked="" type="checkbox"/>	Post Bakeout
Witnessed By: <i>Mark Putz</i>	Title: <i>Final Assembly & Test Supervisor</i>	
Signature/Date: <i>M.A. Putz 3/14/11</i>		
Comments:		

Annulus Pump-down

Allowable: $\leq 1 \times 10^{-5}$ Torr	Pass / Fail	Pass / Fail	Pass / Fail
Annulus1/Category IV	<i>Pass</i>		
Annulus1/Category V	<i>Pass</i>		
Measured Vacuum	<i>2.2 x 10⁻⁶</i>		
Annulus2/Category IV	<i>Pass</i>		
Annulus2/Category V	<i>Pass</i>		
Measured Vacuum	<i>4.4 x 10⁻⁶</i>		

Performed By/Date: <i>Clancey Bleily</i>	
Witnessed By: <i>Mark Putz</i>	Signature/Date: <i>M.A. Putz 3/14/11</i>
Comments: <i>measured vacuum for category IV while main vessel under vacuum then category V with main vessel at atmosphere.</i>	

Bake Out Data Collection Sheet

Date: 4/15/11 Technician: Clanvey Bleily Component: MSS1

	Bake Out Day 1 <u>4/15</u>			Bake Out Day 2 <u>4/16</u>			Bake Out Day 3 <u>4/17</u>		
	Time	Temp	Pressure	Time	Temp	Pressure	Time	Temp	Pressure
1:00 AM	11			1:00	110°	2.1 ⁻⁶			
2:00 AM				2:00	116	2.1 ⁻⁶			
3:00 AM									
4:00 AM									
5:00 AM									
6:00 AM									
7:00 AM									
8:00 AM				8:00	122°	1.4 ⁻⁶			
9:00 AM				9:00	128°	1.5 ⁻⁶			
10:00 AM				10:00	134°	1.6 ⁻⁶	10:30	150°	1.7 ⁻⁶
11:00 AM	11:00	26°	7.8 ⁻⁷	11:00	140°	2.1 ⁻⁶			
12:00 PM	12:00	32°	1.5 ⁻⁶	12:00	146°	2.6 ⁻⁶			
1:00 PM		38°	1.9 ⁻⁶	1:00	152°	3.0 ⁻⁶			
2:00 PM		44°	2.1 ⁻⁶						
3:00 PM		50°	2.3 ⁻⁶						
4:00 PM		56°	1.8 ⁻⁶						
5:00 PM		62°	1.6 ⁻⁶	5:00	152°	3.2 ⁻⁶			
6:00 PM		68°	1.7 ⁻⁶						
7:00 PM		74°	1.7 ⁻⁶				2:00	150°	1.6 ⁻⁶
8:00 PM		80°	1.8 ⁻⁶						
9:00 PM		86°	1.9 ⁻⁶						
10:00 PM		92°	1.7 ⁻⁶						
11:00 PM		98°	2.0 ⁻⁶						
12:00 AM		104°	2.1 ⁻⁶						

	Bake Out Day 4 4/18			Bake Out Day 5 4/19			Bake Out Day 6		
	Time	Temp	Pressure	Time	Temp	Pressure	Time	Temp	Pressure
1:00 AM				1:00	62	9.9 ⁻⁸			
2:00 AM				2:00	56	9.5 ⁻⁸			
3:00 AM									
4:00 AM									
5:00 AM									
6:00 AM									
7:00 AM									
8:00 AM	8:20	152° 150	1.2 ⁻⁶	8:00	50	2.8 ⁻⁸			
9:00 AM				9:00	44	2.6 ⁻⁸			
10:00 AM				10:00	38	2.0 ⁻⁸			
11:00 AM		146°	1.4 ⁻⁶	11:00	32	2.0 ⁻⁸			
12:00 PM		140°	1.1 ⁻⁶						
1:00 PM		134°	9.1 ⁻⁷						
2:00 PM		128°	8.2 ⁻⁷						
3:00 PM		122°	7.6 ⁻⁷						
4:00 PM		116°	7.0 ⁻⁷						
5:00 PM		110°	5.3 ⁻⁷						
6:00 PM		104	4.2 ⁻⁷						
7:00 PM		98	3.4 ⁻⁷						
8:00 PM		92	3.0 ⁻⁷						
9:00 PM		86	2.3 ⁻⁷						
10:00 PM		80	2.0 ⁻⁷						
11:00 PM		74	1.6 ⁻⁷						
12:00 AM		68	1.2 ⁻⁷						

FIRST BAKEOUT

GNB oration	Production:	D1751-A6
3200 Dwight Road	Subject: Bakeout Data Collection (LIGO only)	
Suite 100	Revision: A	
Elk Grove, CA 95758	Issue Date: 2/12/11	
Reference ISO 2000: 9001	Page 17 of 17	

Part Name: Clancey Bleily/Danny Bradford Date: 4-7-11
 Drawing # 114262-005 Work Order# 3470 (MSS1)

	Bake Out Day 1 <u>4/7</u>			Bake Out Day 2 <u>4/8</u>			Bake Out Day 3 <u>4/9</u>		
	Time	Temp	Pressure	Time	Temp	Pressure	Time	Temp	Pressure
1:00 AM				1:30	116	3.0 ⁻⁶			
2:00 AM				2:30	122	2.9 ⁻⁶			
3:00 AM				3:30	128	2.9 ⁻⁶			
4:00 AM				4:30	134	3.6 ⁻⁶			
5:00 AM				5:30	140	3.2 ⁻⁶			
6:00 AM				6:30	146	3.7 ⁻⁶			
7:00 AM				7:30	150	3.9 ⁻⁶			
8:00 AM									
9:00 AM									
10:00 AM									
11:00 AM	11:30	32	1.4 ⁻⁶						
12:00 PM	12:30	38	1.6 ⁻⁶						
1:00 PM	1:30	44	2.6 ⁻⁶						
2:00 PM	2:30	50	3.4 ⁻⁶						
3:00 PM	3:30	56	1.9 ⁻⁶						
4:00 PM	4:30	62	2.0 ⁻⁶						
5:00 PM	5:30	68	2.0 ⁻⁶				5:20	150	5.5 ⁻⁷
6:00 PM	6:30	74	2.1 ⁻⁶						
7:00 PM	7:30	80	2.2 ⁻⁶						
8:00 PM	8:30	86	2.35 ⁻⁶						
9:00 PM	9:30	92	2.4 ⁻⁶						
10:00 PM	10:30	98	2.8 ⁻⁶						
11:00 PM	11:30	104	2.7 ⁻⁶						
12:00 AM	12:30	110	2.8 ⁻⁶						

	Bake Out Day 4 4/10			Bake Out Day 5 4/11			Bake Out Day 6		
	Time	Temp	Pressure	Time	Temp	Pressure	Time	Temp	Pressure
1:00 AM							1:00	46	6.7 ⁻⁸
2:00 AM							2:00	40	5.9 ⁸
3:00 AM									
4:00 AM									
5:00 AM									
6:00 AM									
7:00 AM									
8:00 AM				8:00	150	7.4 ⁻⁷	8:00	34	4.8 ⁻⁸
9:00 AM				9:00	142	6.9 ⁻⁷	9:00	28	4.7 ⁸
10:00 AM				10:00	136	6.4 ⁻⁷	10:00	22	4.5 ⁸
11:00 AM				11:00	130	5.4 ⁻⁷			
12:00 PM	12:40	150	1.0 ⁻⁶	12:00	124	5.2 ⁻⁷			
1:00 PM				1:00	118	5.0 ⁻⁷			
2:00 PM				2:00	112	4.3 ⁻⁷			
3:00 PM				3:00	106	3.9 ⁻⁷			
4:00 PM				4:00	100	3.7 ⁻⁷			
5:00 PM				5:00	94	3.5 ⁻⁷			
6:00 PM				6:00	88	3.1 ⁻⁷			
7:00 PM				7:00	82	2.6 ⁻⁷			
8:00 PM				8:00	76	2.1 ⁻⁷			
9:00 PM				9:00	70	1.4 ⁻⁷			
10:00 PM				10:00	64	1.1 ⁻⁷			
11:00 PM				11:00	58	0.9 ⁻⁸			
12:00 AM				12:00	52	0.8 ⁻⁸			



QP1750-D2

Subject: Aqueous Cleaning Procedure (LIGO Only)
 Revision: B Page 8 of 9

GNB - LIGO FINAL CLEANING RECORD**This Version For MC or Mid-Station Tubes**

Component Name:	GNB Dwg Number:	Serial Number:	Date:
MID-STATION SPOOL #1	114263-000US	85107	3/15/11
External Surfaces - Detergent Wash & Rinse			
Start Time: 9:00 AM	End Time: 10:30		
VBS - Pre-Rinse / Component Heat-Up			
Start Time: 10:30	Rinse Water Temperature: 120 160°F		
Int#1:	Int#2:	Int#3:	Ext#1: Ext#2:
End Time: 12:30			
VBS - Detergent Wash			
Washing with Fixture-	Start Time: 12:30	End Time: 2:30	
Typical Surface Temps Attained:	#1: 100°	#2: 100°	#3: 100°
Washing with Wand(s)-	Start Time: 2:30	End Time: 3:30	
Area Location:	Approx Sq.Ft.:	Start Temp:	Time to get to 130F:
#1 FLANGE #1	10	65°	15 MIN
#2 FLANGE #2	10	65°	15 MIN
#3			
First DI Rinse			
Start Time: 3:30	End Time: ^{4:30}	Rinse Duration at least 15 minutes? (y/n): <u>Y</u>	
Spot Check for Film or Residue			
Swab Coloration Evident? (y/n): <u>N</u> . If yes, comments & title/signature:			
Final DI Rinse			
Start Time: 4:30	End Time: ^{5:30}	Rinse Duration at least 15 minutes? (y/n): <u>Y</u>	
Nitrogen Blow Dry			
Start Time: 5:30	End Time: 6:00		
Operators:	1: DANIEL BRADFORD 2: CLAUCEY BLIELY		
Comments:			
Visual Inspection (VC-Exterior / Vis+UV-VB Surfaces)			
Vacuum Boundary? (pass/fail):	Title of Inspector: <u>PAUL H. WANG</u>		
External Surfaces? (pass/fail):	Signature/Date: <u>[Signature]</u> 3/15		
Comments:			