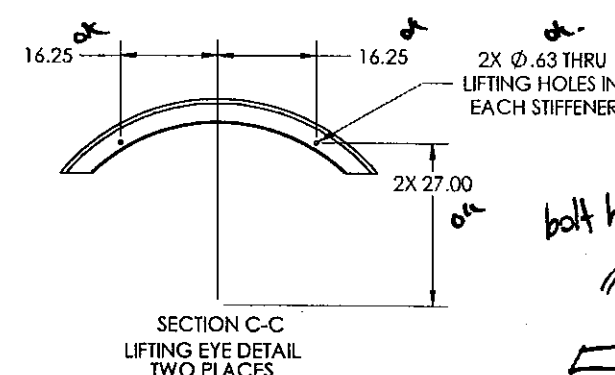
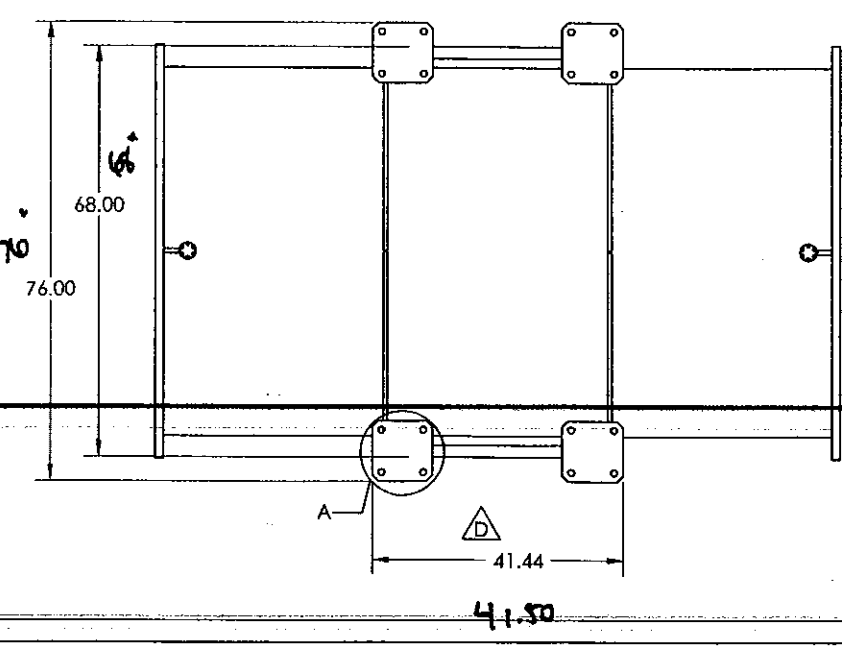
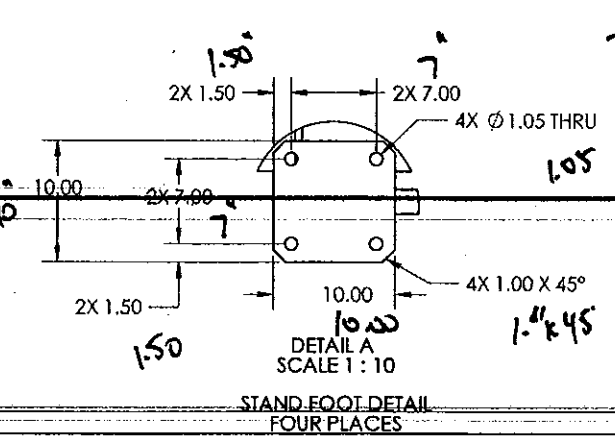
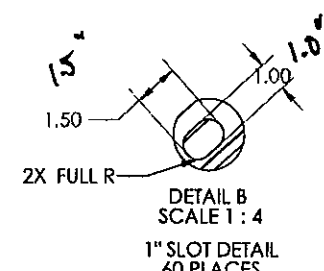
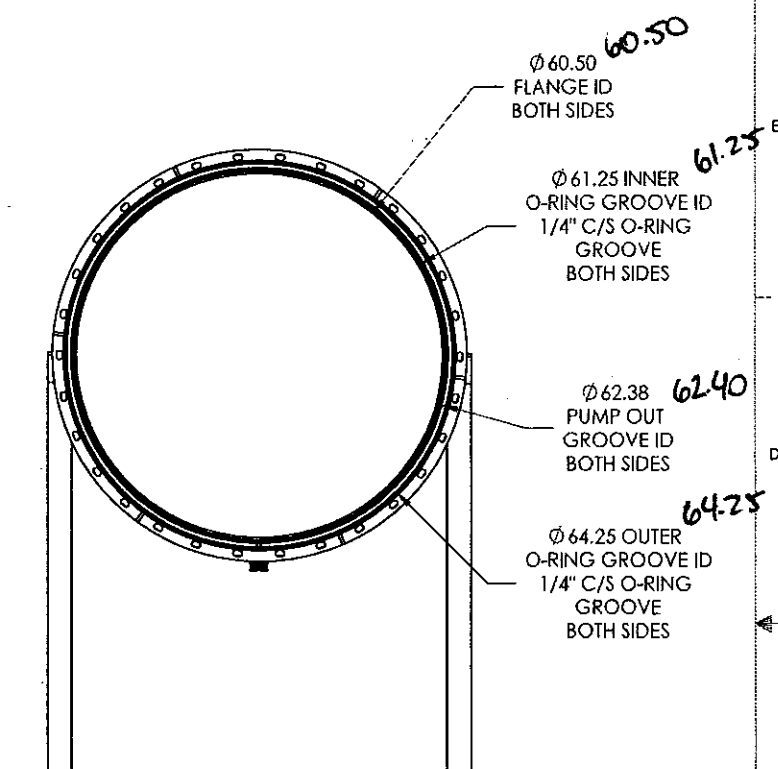
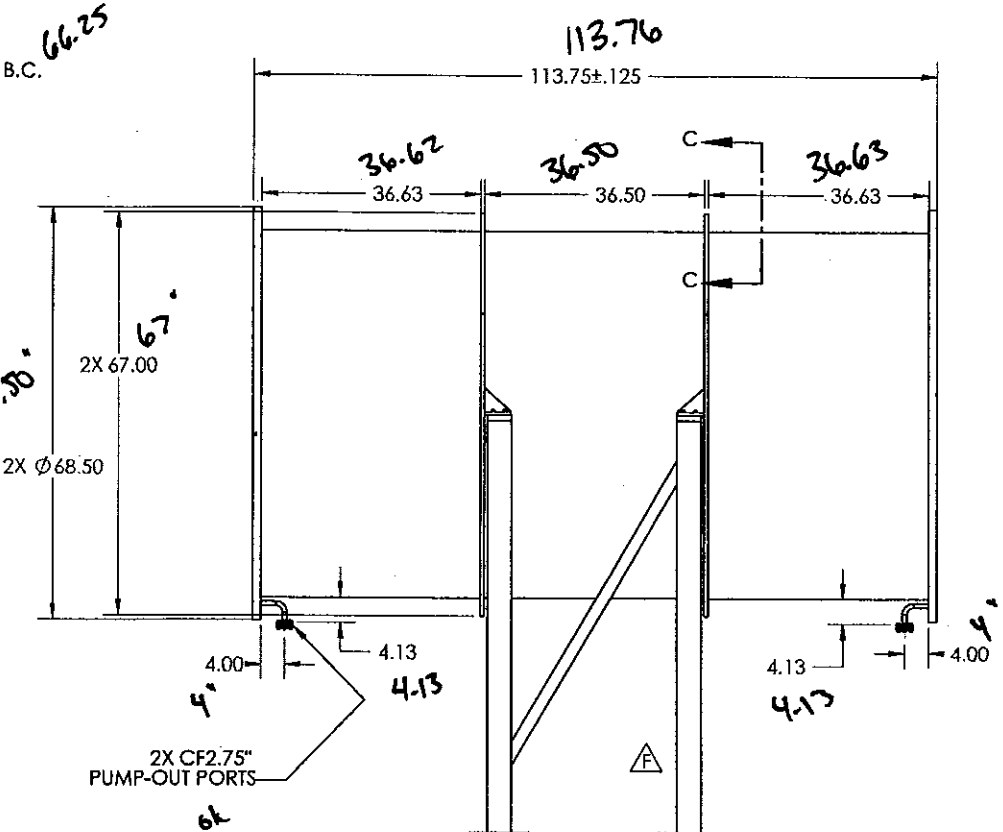
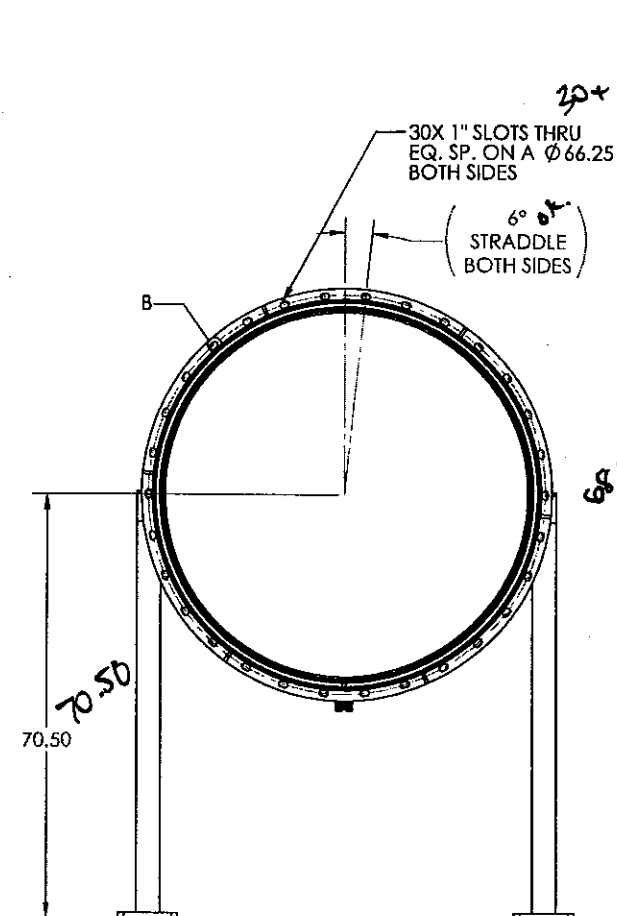


ZNA

3471/1

ZONE	REV.	DESCRIPTION	DATE	APPROVED
SE	A	REVISED MODEL TO MATCH MFG. PROCESSES	6/9/10	MM2
	B	REV A LENGTH OF THE SPOOL WAS .75 SHORT	6/10/10	MM2
	C	REVISED TOLERANCE BLOCK GD&T TOLERANCE WAS .01, NOW .03	6/24/10	MM2
	D	REVISED STAND DETAIL PER PDR RESULTS	7/7/2010	MM2
	E	RELEASED TO PRODUCTION	8/20/2010	MM2
	F	REMOVED SHIPPING FIXTURE HOLES FROM STAND	9/7/2010	MM2



bolt hole alignment - OK

// = PASS

□ = PASS

⊥ = PASS

MATERIAL: AISI 304 / AISI 304L DUAL CERT PER SA 240

WEIGHT: 3059.35#

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES

TOLERANCES: ANGULAR: ± 0°30'

XXX 1.06

XXX 1.05

UNSPECIFIED FINISH: R015

BREAK EDGES 0.0625"

REMOVE ALL BURRS

FINISH WITHIN .03

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

APPROVALS

DRAWER	MM2	DATE	6/9/10
CHECKER	RY	DATE	6/15/10
ENGINEER	MM2	DATE	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.gnbvolves.com

TITLE: OUTLINE, SPOOL, MIDSTATION, LIGO

SCALE: 1:20 SHEET 1 OF 1

**GNB - LIGO LEAK TEST RECORD AND CERTIFICATION**

Detector

Mdl: Varian VSMD301	SN: <u>U1007L045</u>	Cal. Exp. Date: <u>6-9-11</u>	Tracer Gas: He4
Std Lk Rate: <u>9.1E-8</u>	Std Response: <u>9.1E-8</u>		
Component	(1)	(2)	(3)
Component Name	<u>Mid Station Spool #2</u>		
GNB Drawing No. & Rev.	<u>114262-005</u>		
Serial No.	<u>85108</u>		

Leak Test Data

Pressure	<u>1.4 X 10<sup>-4</sup></u>		
Duration	<u>6 hours</u>		
Response	<u>No Leak Detected</u>		

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

Welds I, Measured	<u>1.0E-9 Torr/sec</u>		
Welds II, Measured	<u>1.0E-9 Torr/sec</u>		
CF III, Measured			

Performed By/Date: <u>Clancey Bleily</u>	Pre-Final Clean <input checked="" type="checkbox"/>	Post Bakeout
Witnessed By: <u>Rich Reed</u>	Title:	
Signature/Date: <u>Richard J Reed</u>	<u>3/18/11</u>	
Comments:		

Annulus Pump-down

Allowable: $\leq 1 \times 10^{-5}$ Torr	Pass / Fail	Pass / Fail	Pass / Fail
Annulus1/Category IV	<u>Pass</u>		
Annulus1/Category V	<u>Pass</u>		
Measured Vacuum	<u>7.1 X 10<sup>-6</sup></u>		
Annulus2/Category IV	<u>Pass</u>		
Annulus2/Category V	<u>Pass</u>		
Measured Vacuum	<u>7.8 X 10<sup>-6</sup></u>		

Performed By/Date: <u>Clancey Bleily</u>	Signature/Date: <u>Richard J Reed</u>	<u>3/18/11</u>
Witnessed By: <u>Rich Reed</u>	Comments:	

0/2

**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	114263-000s	85108	3/23/11
<b>External Surfaces - Detergent Wash &amp; Rinse</b>			
Start Time: 10:00 AM	End Time: 11:00 AM		
<b>VBS - Pre-Rinse / Component Heat-Up</b>			
Start Time: 11:00 AM	Rinse Water Temperature: 160°		
Int#1:	Int#2:	Int#3:	Ext#1: Ext#2:
End Time: 12:00 PM			
<b>VBS - Detergent Wash</b>			
Washing with Fixture-	Start Time: 12:00 PM	End Time: 2:30 PM	
Typical Surface Temps Attained:	#1: 100°F	#2: 100°F	#3: 100°F
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	64°	15 MIN
#2 FLANGE #2	10	64°	15 MIN
#3			
<b>4:30 First DI Rinse</b>			
Start Time: 3:30 PM	End Time:	Rinse Duration at least 15 minutes? (y/n): Y	
<b>Spot Check for Film or Residue</b>			
Swab Coloration Evident? (y/n): N. If yes, comments & title/signature:			
<b>5:30 Final DI Rinse</b>			
Start Time: 4:30	End Time:	Rinse Duration at least 15 minutes? (y/n): Y	
<b>Nitrogen Blow Dry</b>			
Start Time: 5:30	End Time: 6:30		
Operators:	1: DANIEL BRADFORD	2: CLAUCEY BLIELY	
Comments:			
<b>Visual Inspection (VC-Exterior / Vis+UV-VB Surfaces)</b>			
Vacuum Boundary? (pass/fail):	Title of Inspector: Patrick M. Magerl		
External Surfaces? (pass/fail):	Signature/Date: [Signature] 3/23/11		
Comments:			

GNB - LIGO LEAK TEST RECORD AND CERTIFICATION			
Detector			
Mdl: Varian VSMD301	SN: LL1007L045	Cal. Exp. Date: 6-9-11	Tracer Gas: He4
Std Lk Rate: 9.8-8	Std Response:		
Component	(1)	(2)	(3)
Component Name	MID-STATION		
GNB Drawing No. & Rev.	114144-00		
Serial No.	85108		
Leak Test Data			
Pressure	9.2 x 10 <sup>-8</sup>	ISO open	
Duration	1.6 x 10 <sup>-7</sup>	ISO close	
Response	7.5 x 10 <sup>-6</sup>	Leak checker open only	
Leak Rate Allowable: ≤1x10 <sup>-9</sup> Torr-L/S			
Welds I, Measured			
Welds II, Measured			
CF III, Measured			
Performed By/Date:	Pre-Final Clean	Post Bakeout	X
Witnessed By:	Title:		
Signature/Date:			
Comments:			
Annulus Pump-down			
Allowable: ≤1x10 <sup>-5</sup> Torr	Pass / Fail	Pass / Fail	Pass / Fail
Annulus1/CategoryIV	Pass	1.0 x 10 <sup>-5</sup> (2 hours)	
Annulus1/CategoryV			
Measured Vacuum			
Annulus2/CategoryIV	Pass	1.1 x 10 <sup>-6</sup> (over night)	
Annulus2/CategoryV			
Measured Vacuum			
Performed By/Date:			
Witnessed By:	Signature/Date:		
Comments:			

$L/R = 1.7^{-10}$   
 RGA 2.8<sup>-10</sup>

GNB - LIGO LEAK TEST RECORD AND CERTIFICATION			
Detector			
Mdl: Varian VSMD301	SN:	Cal. Exp. Date: 6-9-11	Tracer Gas: He4
Std Lk Rate: $8.3 \times 10^{-9}$		Std Response: $8.3 \times 10^{-9}$	
Component	(1)	(2)	(3)
Component Name	MSS #2		
GNB Drawing No. & Rev.	114144-00		
Serial No.	85108		
Leak Test Data			
Pressure	$6.4 \times 10^{-5}$		
Duration			
Response	NO LEAKS FOUND		
Leak Rate Allowable: $\leq 1 \times 10^{-9}$ Torr-L/S			
Welds I, Measured	$0.5 \times 10^{-10}$ Torr-L/S		
Welds II, Measured	$0.5 \times 10^{-10}$		
CF III, Measured	$0.5 \times 10^{-10}$		
Performed By/Date: DANIEL BRADFORD	Pre-Final Clean	Post Bakeout	X
Witnessed By: Mark Jutz	Title: Final Assembly Test Supervisor		
Signature/Date: M.A. Jutz 4-27-11			
Comments:			
Annulus Pump-down			
Allowable: $\leq 1 \times 10^{-5}$ Torr	Pass / Fail	Pass / Fail	Pass / Fail
Annulus1/CategoryIV	PASS		
Annulus1/CategoryV			
Measured Vacuum	$9.9 \times 10^{-6}$		
Annulus2/CategoryIV	PASS		
Annulus2/CategoryV			
Measured Vacuum	$9.4 \times 10^{-6}$		
Performed By/Date: DANIEL BRADFORD			
Witnessed By: Mark Jutz	Signature/Date: M.A. Jutz 4-27-11		
Comments:			

**Appendix C: Bake Out Data Collection Sheet**

Date: 4/20/11 Technician: Clarence Bleily Component: MSSZ

	Bake Out Day 1 $\frac{4}{20}$			Bake Out Day 2 $\frac{4}{21}$			Bake Out Day 3 $\frac{4}{22}$		
	Time	Temp	Pressure	Time	Temp	Pressure	Time	Temp	Pressure
1:00 AM				2:00	132	5.2 <sup>-6</sup>			
2:00 AM				2:00	138	4.9 <sup>-6</sup>			
3:00 AM				<del>3:00</del>	<del>144</del>	<del>3.1<sup>-6</sup></del>			
4:00 AM				<del>4:00</del>	<del>150</del>	<del>3.2<sup>-6</sup></del>			
5:00 AM									
6:00 AM				6:00	144	3.1 <sup>-6</sup>			
7:00 AM				7:00	150	3.2 <sup>-6</sup>			
8:00 AM	8:00	30°	4.0 <sup>-6</sup>						
9:00 AM		36	3.4 <sup>-6</sup>						
10:00 AM		42	2.6 <sup>-6</sup>						
11:00 AM		48	2.6 <sup>-6</sup>						
12:00 PM		54	2.6 <sup>-6</sup>						
1:00 PM		60	2.5 <sup>-6</sup>						
2:00 PM		66	4.4 <sup>-6</sup>						
3:00 PM		72	6.1 <sup>-6</sup>						
4:00 PM		78	3.4 <sup>-6</sup>						
5:00 PM		84	4.4 <sup>-6</sup>						
6:00 PM		90	5.5 <sup>-6</sup>						
7:00 PM		96	5.9 <sup>-6</sup>						
8:00 PM		102	5.6 <sup>-6</sup>						
9:00 PM		108	5.4 <sup>-6</sup>						
10:00 PM		114	5.3 <sup>-6</sup>						
11:00 PM		120	5.4 <sup>-6</sup>						
12:00 AM		126	5.3 <sup>-6</sup>						





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

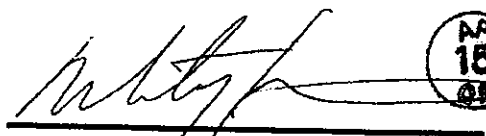
**Certificate of Compliance**

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 Corporation 3200 Dwight Road Suite 100 Elk Grove, CA 95758  
P.O. LC-0107-01 Log 93716603 Total Quantity 7 Date 4/1/2011  
The process specification or service performed: IEST-STD-CC1246D, Level 100A/20

Line #	Qty	Part #	Part Description	Extended Description	Serial #s	Job #
1	1	Sample # 1	AK-225-Supply & Beaker	Sample Tested at Level 76 A/12.5	85108	
2	1	Sample # 3	MSS Inner Wall North End	Sample Tested at Level 70 A/6.25 After Delta (normalization) sample is Level 70 A/16.7	85108	
3	1	Sample # 5	AK225 & Beaker & Squeeze Bottle (Blank 3)	Sample Tested at Level 76 A/11.1	85108	
4	1	Sample # 6	Flange North End	Sample Tested at Level 89 A/11.1 After Delta (normalization) sample is Level 50	85108	
5	1	Sample # 7	AK225 & Beaker & Collection tool (Same as #2)	Sample Tested at Level 70 A/11.1	85108	
6	1	Sample # 2	AK-225-Supply & Beaker & Collection Tool (Blank 2)	Sample Tested at Level 85 A/10	85108	
7	1	Sample # 4	MSS Inner wall South end	Sample Tested at Level 89 A/11.1 After Delta (normalization) sample is Level 50	85108	

Quality Assurance

  
Martin Smith, QA Manager



Date APR 01 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 # 93716603

Description: Samples, SN: 85108

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
5 (Baseline)	78	29	8	4	0	0.09 mg
Δ of 6	25	14	10	3	0	0
7 (Re-Baseline)	72	38	11	3	0	0.08 mg
**	*	*	*	*	*	*
IEST-STD-CC1246D Levels	39	53	51	76	NA	A/11.1
IEST-STD-CC1246D Levels	26	42	55	70	NA	NA
IEST-STD-CC1246D Levels	38	57	57	70	NA	A/12.5
**	*	*	*	*	*	*

5 (Baseline) = " 95% UCL = 97 particles > 5 μm / 0.1 m<sup>2</sup>; LCL = 63 "

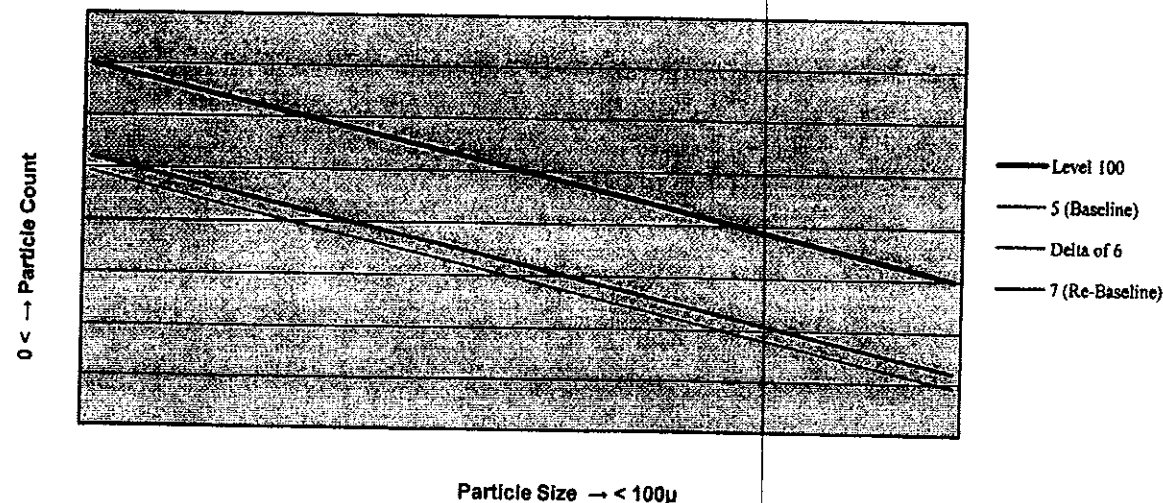
Delta of 6 = " 95% UCL = 37 particles > 5 μm / 0.1 m<sup>2</sup>; LCL = 17 "

7 (Re-Baseline) = " 95% UCL = 90 particles > 5 μm / 0.1 m<sup>2</sup>; LCL = 58 "

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: 03/31/11 1830  
 Relative Humidity: 43%  
 Temp: 64° F  
 Sample method: ASTM F303  
 Test Method: ASTM F311, F312 & F331

**THE ABOVE DATA HAS BEEN REVIEWED AND APPROVED**

*Sal Martinez*  
 Astro Pak Quality

APR 01 2011



# Certified Test Report

Customer: GNB Corporation

PO: LC-0107-01

Log # 93716603

Description: Samples, SN: 85108

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	78	29	8	4	0	0.08 mg
2 (Baseline)	25	14	10	3	0	0.10 mg
Δ of 3	72	38	11	3	0	0.06 mg
Δ of 4	21	16	6	1	0	0
IEST-STD-CC1246D Levels	39	53	51	76	NA	A/12.5
IEST-STD-CC1246D Levels	26	42	55	70	NA	A/10
IEST-STD-CC1246D Levels	38	57	57	70	NA	A/16.47
IEST-STD-CC1246D Levels	24	43	47	50	NA	NA

1 = " 95% UCL = 89 particles > 5 μm / 0.1 m<sup>2</sup>; LCL = 57 "

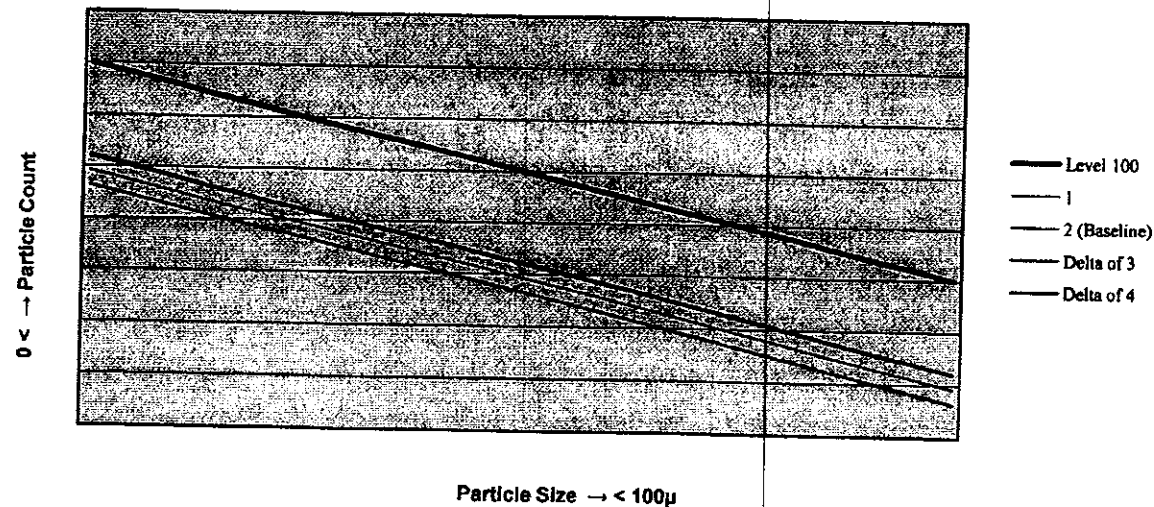
2 (Baseline) = " 95% UCL = 106 particles > 5 μm / 0.1 m<sup>2</sup>; LCL = 70 "

Delta of 3 = " 95% UCL = 57 particles > 5 μm / 0.1 m<sup>2</sup>; LCL = 31 "

Delta of 4 = " 95% UCL = 32 particles > 5 μm / 0.1 m<sup>2</sup>; 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: Sal Martinez  
Date/Time: 03/31/11 1800  
Relative Humidity: 43%  
Temp: 64° F  
Sample method: ASTM F303  
Test Method: ASTM F311, F312 & F331

THE ABOVE DATA HAS BEEN REVIEWED AND APPROVED

*Sal Martinez*  
APR 01 2011  
Astro Pak Quality

**GNB - LIGO CLEANLINESS TESTING RECORD**

*Component (check only 1)*

- |   |   |   |  |
|---|---|---|--|
| <input type="radio"/> 114141-00 A16 Adptr   | <input type="radio"/> 114142-00 A17 Adptr   | <input type="radio"/> 114143-00 A18 Adptr   | <input checked="" type="radio"/> 114144-00 Mid-St Sp |
| <input type="radio"/> 114146-00 MC-B        | <input type="radio"/> 114146-01 MC-B        | <input type="radio"/> 114146-02 MC-B        | <input type="radio"/> 114146-03 MC-B                 |
| <input type="radio"/> 114145-00 MC-A        | <input type="radio"/> 114425-00S Sept. Plt. |   |  |
| <input type="radio"/> 114424-01S Sept. Plt. | <input type="radio"/> 114424-02S Sept. Plt. | <input type="radio"/> 114424-03S Sept. Plt. | <input type="radio"/> 114424-04S Sept. Plt.          |

Other Items (pn/description/quantity):

Revision: Serial Number: *850 85108*

**Samples**

Sample(s) Taken By: *Clancey/Rich/Jeff*

Date: *3-24-11* Result Comments

Sample *1* - Bottle Number & Area Sampled (use to normalize #6)

*AK225 E Beaker E Squeeze Bottle (Blank 3)*

Sample *2* - Bottle Number & Area Sampled (using squeeze bottle)

*AK225 Flange North end*

Sample *3* - Bottle Number & Area Sampled:

*AK225 E Beaker E Collection tool (same as #2)*

Sample *4* - Bottle Number & Area Sampled:

Sample *5* - Bottle Number & Area Sampled:

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):

**GNB - LIGO CLEANLINESS TESTING RECORD**

*Component (check only 1)*

- |   |   |   |  |
|---|---|---|--|
| <input type="radio"/> 114141-00 A16 Adptr   | <input type="radio"/> 114142-00 A17 Adptr   | <input type="radio"/> 114143-00 A18 Adptr   | <input checked="" type="radio"/> 114144-00 Mid-St Sp |
| <input type="radio"/> 114146-00 MC-B        | <input type="radio"/> 114146-01 MC-B        | <input type="radio"/> 114146-02 MC-B        | <input type="radio"/> 114146-03 MC-B                 |
| <input type="radio"/> 114145-00 MC-A        | <input type="radio"/> 114425-00S Sept. Plt. |   |  |
| <input type="radio"/> 114424-01S Sept. Plt. | <input type="radio"/> 114424-02S Sept. Plt. | <input type="radio"/> 114424-03S Sept. Plt. | <input type="radio"/> 114424-04S Sept. Plt.          |

Other Items (pn/description/quantity):

Revision: Serial Number: *85108*

**Samples**

Sample(s) Taken By: *Clancy/Rich/Jeff*

Date: *3-24-11*

Result Comments

Sample 1 - Bottle Number & Area Sampled:

*AK225 & Beaker (Blank)*

Sample 2 - Bottle Number & Area Sampled: *(To be used for normalization)*

*AK225 & Beaker & collector tool (Blank 2)*

Sample 3 - Bottle Number & Area Sampled:

*MSS inner wall North end*

Sample 4 - Bottle Number & Area Sampled:

*MSS inner wall South end*

~~Sample 5 - Bottle Number & Area Sampled:~~

~~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):

*Sample #2 to be used to normalize #3 & 4*

*Sample #5 to be used to normalize #6*