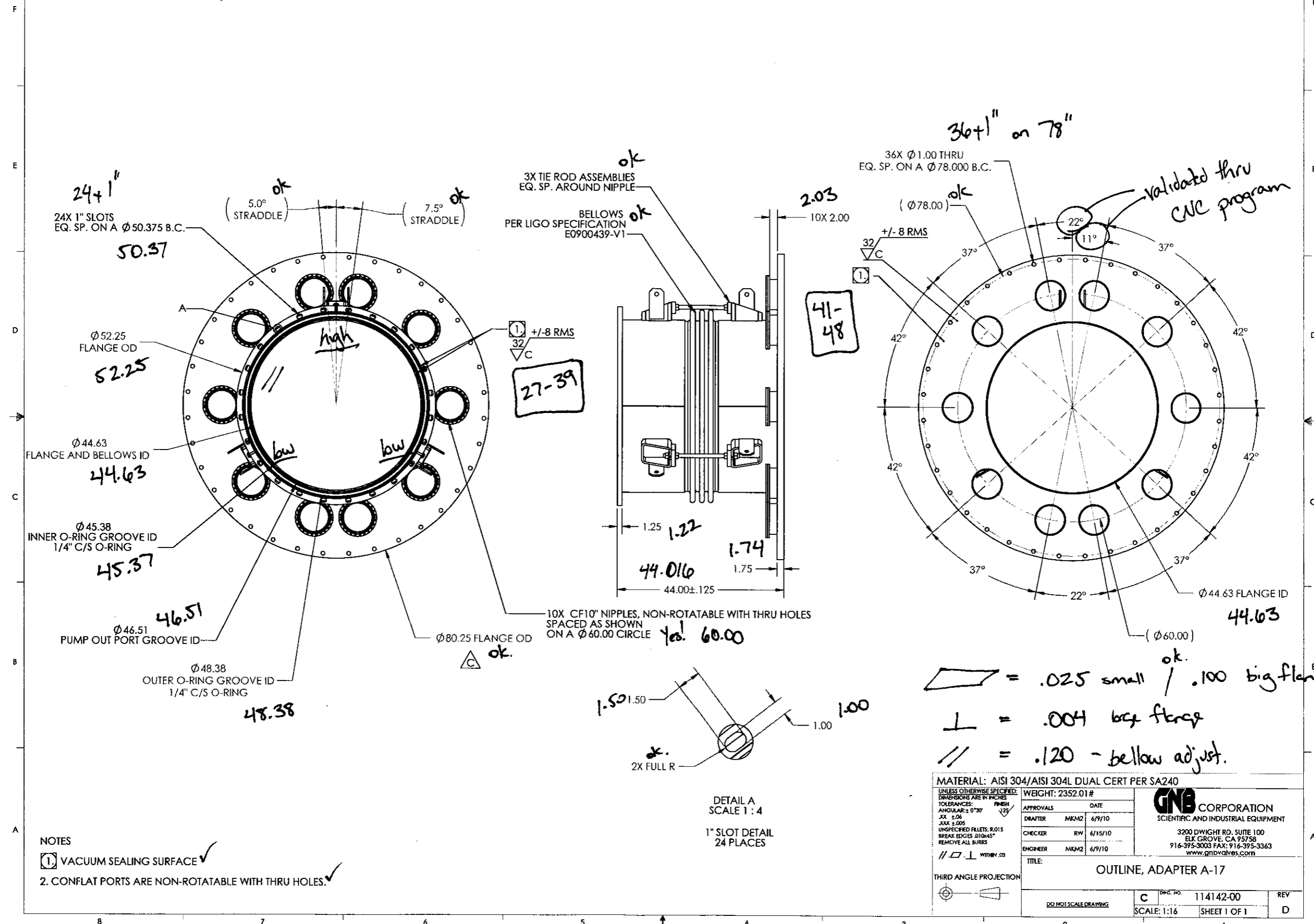


PROPRIETARY AND CONFIDENTIAL
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W03475/1

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	REVISED MODEL TO MATCH MFG. PROCESSES	6/9/10	MKM2
	B	REVISED TOLERANCE BLOCK, GD&T TOLERANCE WAS .01, NOW .03	6/24/2010	MKM2
	C	80.00 WAS 80.30, ADDED THICKNESSES OF FLANGES, BIG FLANGE THICKNESS INCREASED TO 1.75	7/20/2010	MKM2
	D	RELEASED TO PRODUCTION	8/20/2010	MKM2



▭ = .025 small / .100 big flange
 ⊥ = .004 big flange
 // = .120 - bellow adjust.

- NOTES
- VACUUM SEALING SURFACE ✓
 - CONFLAT PORTS ARE NON-ROTATABLE WITH THRU HOLES. ✓

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

UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES
 TOLERANCES: ANGULAR: ± 0°30' FINISH: ✓
 JAX ±.06
 JAX ±.005
 UNSPECIFIED FILLETS: R.015
 BREAK EDGES J10x45°
 REMOVE ALL BURRS

APPROVALS: DRAFTER MKM2 6/9/10, CHECKER RW 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, ADAPTER A-17

DO NOT SCALE DRAWING

SCALE: 1:16 SHEET 1 OF 1

REV D

2ND A-16, 17 1ST A-18 assembled at bakeout

	QP1750-A7
	Subject: Leak Test Procedure (LIGO Only) Revision: B Page 4 of 4

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: 9.1 ⁻⁸ @ 19.2°C		Std Response: 9.1 ⁻⁸ @ 15.8°C	
Component	(1)	(2)	(3)
Component Name	2 ND A-16	2 ND A-17	1 ST A-18
GNB Drawing No. & Rev.	114434-005	114436-005	114444-005
Serial No.	85110	85112	85113
Leak Test Data			
Pressure	1.4 ⁻⁴ with only leak checker		
Duration	#		
Response	NO LEAK DETECTED!		
Leak Rate Allowable: $\leq 1 \times 10^{-9}$ Torr-L/S			
Welds I, Measured	6.7 ⁻¹⁰	6.7 ⁻¹⁰	6.7 ⁻¹⁰
Welds II, Measured	6.7 ⁻¹⁰	6.7 ⁻¹⁰	6.7 ⁻¹⁰
CF III, Measured	6.7 ⁻¹⁰	6.7 ⁻¹⁰	6.7 ⁻¹⁰
Performed By/Date: Clarence Bleby/Dan	Pre-Final Clean	Post Bakeout <input checked="" type="checkbox"/>	
Witnessed By: M. J. Fitz	Title: Final Assembly & Test SUPERVISOR		
Signature/Date: M. J. Fitz			
Comments:	leak checker calibrated at 8:45 "CAL @ 1:30 PRE FINAL L/C"		
Annulus Pump-down			
Allowable: $\leq 1 \times 10^{-5}$ Torr	Pass / Fail	Pass / Fail	Pass / Fail
Annulus1/Category IV			
Annulus1/Category V			
Measured Vacuum			
Annulus2/Category IV			
Annulus2/Category V			
Measured Vacuum			
Performed By/Date:			
Witnessed By:	Signature/Date:		
Comments:			

Base Pressure with turbo + scroll after ramp down
 6.8⁻⁸
 Isolate turbo and spin down so only leak checker is
 pulling on chamber for leak check.
 START LEAK RATE 9⁻⁹ TORR L/SEC
 11⁻⁹ TORR L/SEC



QP1750-A7

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

Page 4 of 4

GNB - LIGO LEAK TEST RECORD AND CERTIFICATION

Detector

Mdl: Varian VSMD301	SN: <i>LLK024045</i>	Cal. Exp. Date: <i>6-9-11</i>	Tracer Gas: He4
Std Lk Rate: <i>1.0-7</i>	Std Response: <i>1.0-7</i>		
Component	(1)	(2)	(3)
Component Name	<i>A-17 #2</i>		
GNB Drawing No. & Rev.			
Serial No.	<i>85112</i>		

Leak Test Data

Pressure	<i>1.4 mTorr off Edwards WRG</i>		
Duration	<i>only leak checker pumping in chamber</i>		
Response	<i>No Leak</i>		

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

Welds I, Measured	<i>6.6×10^{-10}</i>		
Welds II, Measured	<i>6.6×10^{-10}</i>		
CF III, Measured	<i>6.6×10^{-10}</i>		

Performed By/Date: *Clary 4/27* Pre-Final Clean Post Bakeout

Witnessed By: _____ Title: _____

Signature/Date: *Clary 4/27*

Comments:

Pass

Annulus Pump-down

Allowable: $\leq 1 \times 10^{-5}$ Torr	Pass / Fail	Pass / Fail	Pass / Fail
Annulus1/Category IV	<i>N/A</i>		
Annulus1/Category V			
Measured Vacuum			
Annulus2/Category IV			
Annulus2/Category V			
Measured Vacuum			

Performed By/Date: _____

Witnessed By: _____ Signature/Date: _____

Comments: _____

Bake Out Data Collection Sheet

Date: 5/23/11 Technician: Clancey Component: 2nd A-16, A-17, 1st A-18

Time	Pressure	Time	Pressure	Time	Pressure
		86	8.8 ⁻⁶		
		92	9.6 ⁻⁶		
		104	8.3 ⁻⁶		
		110	7.2 ⁻⁶		
		116	8.2 ⁻⁶		
		122	9.4 ⁻⁶	150	6.7 ⁻⁶
		128	9.9 ⁻⁶		
		134	1.1 ⁻⁵		
		140	1.5 ⁻⁵		
		146	1.1 ⁻⁵		
		150	1.2 ⁻⁵		
26	3.4 ⁻⁴				
32	1.7 ⁻⁴				
38	1.3 ⁻⁴			150	4.6 ⁻⁶
44	1.1 ⁻⁴				
50	8.5 ⁻⁵				
56	6.1 ⁻⁶				
62	6.4 ⁻⁶				
68	6.7 ⁻⁶				
74	6.9 ⁻⁶				
80	7.6 ⁻⁶				

Bake Out Data Collection Sheet

Date: 5/23/11 Technician: Clancey Component: 2nd A-16, A-17, 1st A-18

				86	8.8 ⁻⁶			
				92	9.6 ⁻⁶			
				104	8.3 ⁻⁶			
				110	7.2 ⁻⁶			
				116	8.2 ⁻⁶			
				122	9.4 ⁻⁶	150	6.7 ⁻⁶	
				128	9.9 ⁻⁶			
				134	1.1 ⁻⁵			
				140	1.5 ⁻⁵			
				146	1.1 ⁻⁵			
				150	1.2 ⁻⁵			
	26	3.4 ⁻⁴						
	32	1.7 ⁻⁴						
	38	1.3 ⁻⁴				150	4.6 ⁻⁶	
	44	1.1 ⁻⁴						
	50	8.5 ⁻⁵						
	56	6.1 ⁻⁶						
	62	6.4 ⁻⁶						
	68	6.7 ⁻⁶						
	74	6.9 ⁻⁶						
	80	7.6 ⁻⁶						

2ND A-17



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: 2 ND A-17	GNB Dwg Number: 114436-005	Serial Number: 85112	Date: 4-29-11
---	-------------------------------	-------------------------	------------------

External Surfaces - Detergent Wash & Rinse

Start Time: 2:00	End Time: 2:15
------------------	----------------

VBS - Pre-Rinse / Component Heat-Up

Start Time:	Rinse Water Temperature:
-------------	--------------------------

Int#1:	Int#2:	Int#3:	Ext#1:	Ext#2:
--------	--------	--------	--------	--------

End Time:

VBS - Detergent Wash

Washing with Fixture-	Start Time:	End Time:
-----------------------	-------------	-----------

Typical Surface Temps Attained:	#1:	#2:	#3:
---------------------------------	-----	-----	-----

Washing with Wand(s)-	Start Time: 2:15	End Time: 2:45
-----------------------	------------------	----------------

Area Location:	Approx Sq.Ft.:	Start Temp:	Time to get to 130F:
#1		160 @ Pump	
#2		95 @ surface	
#3			

First DI Rinse

Start Time: 2:15	End Time:	Rinse Duration at least 15 minutes? (y/n): <u>Y</u>
------------------	-----------	---

3:00 Spot Check for Film or Residue

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

Final DI Rinse

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

3:30 Nitrogen Blow Dry

Start Time: 3:30	End Time: 3:45
------------------	----------------

Operators: 1: Clancy 2: Danny

Comments:

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

Vacuum Boundary? (pass/fail):	Title of Inspector: <u>Project Manager</u>
-------------------------------	--

External Surfaces? (pass/fail):	Signature/Date: <u>[Signature] 4-29-11</u>
---------------------------------	--

Comments:



QP1750-A3

Subject: Testing, PCL&NVR (LIGO Only)

Revision: A

Page 5 of 7

Page 1 of 2

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): 2^M A-16, A-17 IPA rinse test

Revision: Serial Number:

Samples

Sample(s) Taken By: Clancy/Rich

Date: 5-10-11

Result Comments

Sample 1 - Bottle Number & Area Sampled:

Supply & rinsed sample bottle

Sample 2 - Bottle Number & Area Sampled:

Filtered supply & rinsed sample bottle

Sample 3 - Bottle Number & Area Sampled:

A-16, View Port w/ collection tool

Sample 4 - Bottle Number & Area Sampled:

A-16 inner wall

Sample 5 - Bottle Number & Area Sampled:

A-16 Flange small

Sample 6 - Bottle Number & Area Sampled:

A-17 small Flange

AstroPak PO Number:

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: pm

Signature: *[Signature]*

Date: 5-15-11

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

Subject: Testing, PCL&NVR (LIGO Only)

Revision: A

Page 5 of 7

Page 2 of 2

GNB - LIGO CLEANLINESS TESTING RECORD

Component (check only 1)

- | | | | |
|--|--|---|---|
| <input checked="" type="radio"/> 114141-00 A16 Adptr | <input checked="" type="radio"/> 114142-00 A17 Adptr | <input type="radio"/> 114143-00 A18 Adptr | <input 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 (pr/description/quantity):
2^{MS} A-16, A-17 IPA Rinse test

Revision: Serial Number:

Samples

Sample(s) Taken By: *Clayton/Rich*

Date: *5-10-11*

Result Comments

Sample 1 - Bottle Number & Area Sampled:

#7 A-17 Inner Wall

Sample 2 - Bottle Number & Area Sampled:

#8 A-17 View Port

Sample 3 - Bottle Number & Area Sampled:

Sample 4 - Bottle Number & Area Sampled:

Sample 5 - Bottle Number & Area Sampled:

Sample 6 - Bottle Number & Area Sampled:

AstroPak PO Number:

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?

Accepted

Title: *PM*

Signature:

[Signature]

Date: *5-15-11*

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.

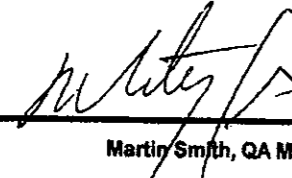
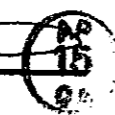
Customer GNB 3200 Dwight Road Suite 100 Elk Grove, CA 95758
P.O. LC-0107-01 Log 93717264 Total Quantity 8 Date 5/13/2011

The process specification or service performed: Particle and NVR Testing

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

Line #	Qty	Part #	Part Description	Extended Description	Serial #s	Job #
1	1	Bottle #1	Supply & Rinsed Sample bottle	Sample Tested at Level 43 A/7.69		
2	1	Bottle #2	Filtered/Supply & Rinsed Sample bottle	Sample Tested at Level 65 A/6.67		
3	1	Bottle #3	A-16, View Port w/collection tool	Delta Tested at Level 69 A/25		
4	1	Bottle #4	A-16 Inner Wall	Delta Tested at Level 27 A/100		
5	1	Bottle #5	A-16 Flange Small	Delta Tested at Level 32 A/25		
6	1	Bottle #6	A-17 Small Flange	Delta Tested at Level 50 A/100		
7	1	Bottle #7	A-17 Inner Wall	Delta Tested at Level 50A/33.3		
8	1	Bottle #8	A-17, View Port	Delta Tested at Level 39 A/50		

Quality Assurance


Martin Smith, QA Manager 

Date MAY 13 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



1 of 1



Certified Test Report

Customer: GNB Corporation

PO: LC-0107-01

Log # 93717264

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	54	15	4	0	0	0.13 mg
2	120	51	17	1	0	0.15 mg
Δ of 3	40	42	4	0	0	0.04 mg
Δ of 4	29	3	0	0	0	0.01 mg
IEST-STD-CC1246D Levels	34	43	41	NA	NA	A/7.69
IEST-STD-CC1246D Levels	45	63	65	50	NA	A/6.67
IEST-STD-CC1246D Levels	31	59	41	NA	NA	A/25
IEST-STD-CC1246D Levels	27	24	NA	NA	NA	A/100

1 = " 95% UCL = 70 particles > 5 μm / 0.1 m² ; LCL = 42 "

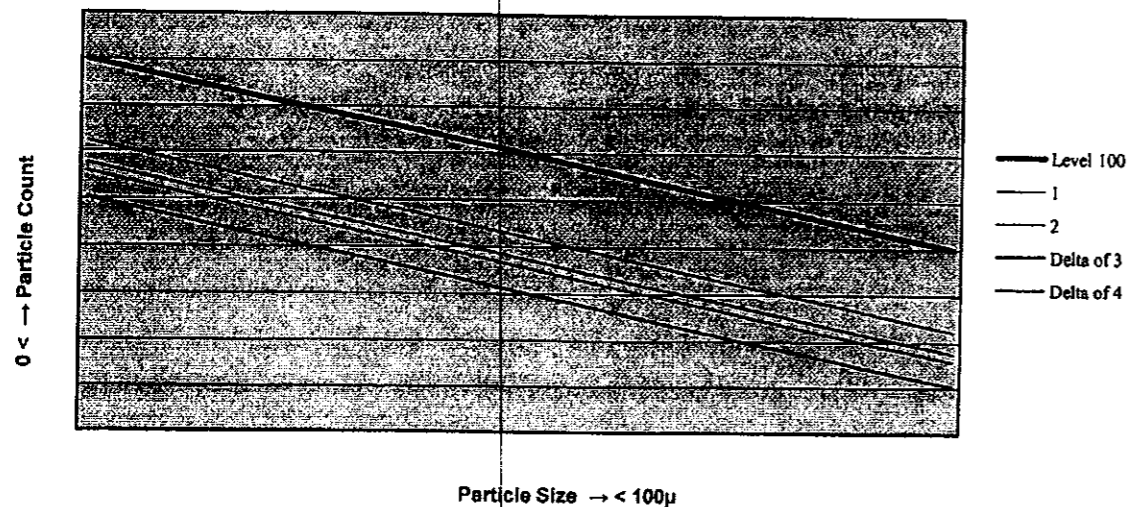
2 = " 95% UCL = 143 particles > 5 μm / 0.1 m² ; LCL = 101 "

Delta of 3 = " 95% UCL = 54 particles > 5 μm / 0.1 m² ; LCL = 30 "

Delta of 4 = " 95% UCL = 41 particles > 5 μm / 0.1 m² ; LCL = 20 "

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: 05/12/11 1100
Relative Humidity: 46%
Temp: 67° F
Sample method: ASTM F303
Test Method: ASTM F311, F312 & F331

THE ABOVE DATA HAS BEEN REVIEWED AND APPROVED

[Signature]
AP 15 08
Astro Pak Quality
MAY 19 2011



Certified Test Report

Customer: GNB Corporation

PO: LC-0107-01

Log # 93717264

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
Δ of 5	15	2	2	0	0	0.04 mg
Δ of 6	0	7	0	1	0	0.01 mg
Δ of 7	24	0	3	1	0	0.03 mg
Δ of 8	22	12	0	0	0	0.02 mg
IEST-STD-CC1246D Levels	21	20	32	NA	NA	A/25
IEST-STD-CC1246D Levels	NA	33	NA	50	NA	A/100
IEST-STD-CC1246D Levels	26	NA	37	50	NA	A/33.3
IEST-STD-CC1246D Levels	25	39	NA	NA	NA	A/50

Delta of 5 = " 95% UCL = 25 particles > 5 μm / 0.1 m²; LCL = 9 "

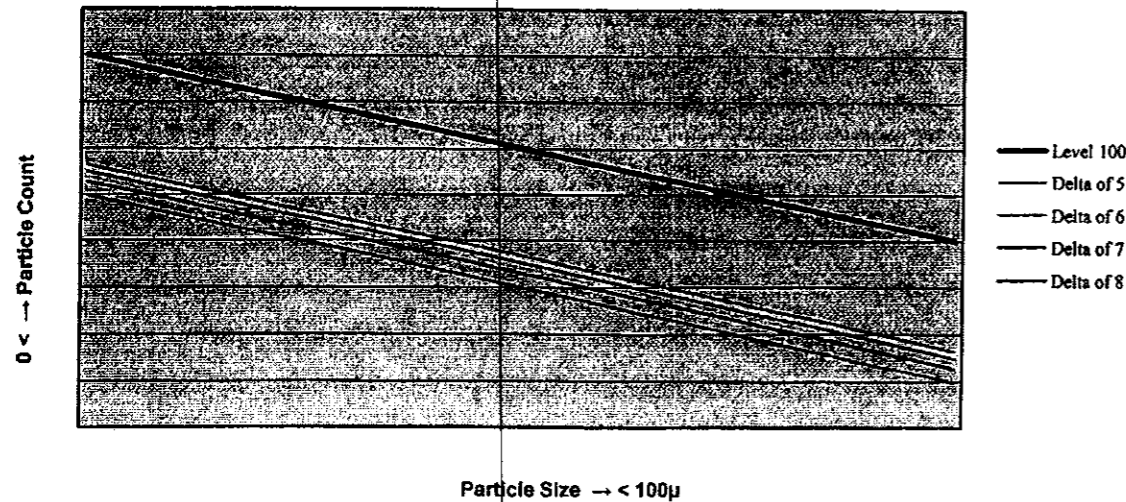
Delta of 6 = " 95% UCL = 4 particles > 5 μm / 0.1 m²; LCL = 0 "

Delta of 7 = " 95% UCL = 36 particles > 5 μm / 0.1 m²; LCL = 16 "

Delta of 8 = " 95% UCL = 33 particles > 5 μm / 0.1 m²; LCL = 15 "

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.

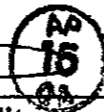
IEST-STD-CC1246D, Level 100



Lab Tech: Carlos Alcalá
Date/Time: 05/12/11 1300
Relative Humidity: 44%
Temp: 65° F
Sample method: ASTM F303
Test Method: ASTM F311, F312 & F331

THE ABOVE DATA HAS BEEN REVIEWED AND APPROVED

[Signature]
Astro Pak Quality



MAY 18 2011