

**PRESSURE DIFFERENTIAL AND
THERMAL SHOCK/PRESSURE DIFFERENTIAL
EVALUATION**



**WB902-10 90 mL Container
(Mfg Date: 01/09/2012; Lot # 2A05-TN)**

TEST REPORT #: 12-1378

TESTING PERFORMED FOR:

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TESTING PERFORMED BY:

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November 1, 2012

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OBJECTIVE

To conduct Pressure Differential and Thermal Shock/Pressure Differential Testing on the follow design(s):

- **WB902-10 90 mL Container (Mfg Date: 01/09/2012; Lot # 2A05-TN)**

REGULATORY REFERENCES

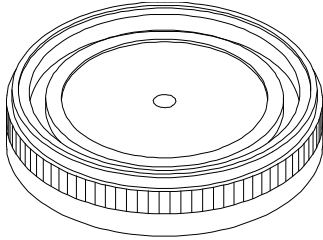
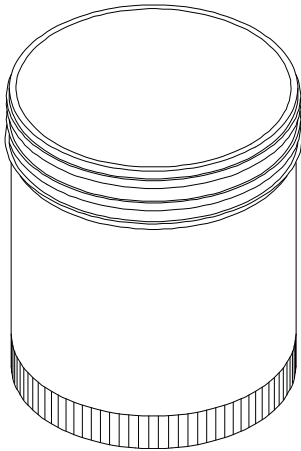
TEST	49 CFR ^①	UN ^②	IMDG ^③	ICAO ^④	IATA ^⑤
	October 2011 Edition	17 th Edition	2010 Edition	2011-2012 Edition	53 rd Edition
Pressure:	173.196(a)(6)	P 620(3)	P 620(3)	PI 620(e)	PI 620
Thermal Shock:	173.196(a)(7)	P 620(3)	P 620(3)	PI 620(e)	PI 620
Thermal Shock with Pressure:	---	---	---	---	PI 650

- ① United States Department of Transportation Code of Federal Regulations (CFR) Title 49, Transportation, Parts 100-185
 ② The United Nations Recommendations on the Transport of Dangerous Goods – Model Regulations (UN – Orange Book)
 ③ International Maritime Dangerous Goods Code (IMDG)
 ④ Technical Instructions for the Safe Transport of Dangerous Good by Air (ICAO)
 ⑤ International Air Transport Association (IATA) Dangerous Goods Regulations

EQUIPMENT

All inspection, measuring and test equipment that can affect product quality is calibrated and adjusted at prescribed intervals, or prior to use, and is traceable to NIST, using ANSI Z540 as an overall guide for calibration certification.

COMPONENT INFORMATION (TEN-E Packaging Services Quality Control Audit)


CLOSURE		DRAWING	
Description:	56 mm Threaded Closure with Valve Seal		
Material:	High Density Polyethylene, Orange		
Tare Weight:	6.003 Grams		
Overall Dimensions:			
• Height	0.512"		
• Diameter	2.293"		
Finish Dimensions:			
• T	2.195"		
• E	2.137"		
Markings (QC Audit):	1 SPI "2" HDPE Recycling Symbol		
CONTAINER			
Description:	90 mL Round Threaded Container		
Material:	Polypropylene, Natural		
Method of Manufacture:	Injection Molded		
Tare Weight:	10.575 Grams		
Capacity:			
• Rated	90 mL		
• Overflow	121 mL		
Overall Dimensions:			
• Height	2.482"		
• Diameter	2.053"		
Thread Dimensions:			
• T	2.166"		
• E	2.106"		
Markings (QC Audit):	14 MFG 01/09/2012 C 23:08 SPI "5" PP Recycling Symbol		

TEST PROCEDURES AND RESULTS

TEST NO. 1 - PRESSURE DIFFERENTIAL TEST

TEST INFORMATION		TEST CRITERIA
SAMPLE SIZE:	3	<ul style="list-style-type: none"> The primary receptacle or secondary packaging used for infectious substances must be capable of withstanding, without leakage, an internal pressure producing a pressure differential of not less than 95 kPa (0.95 bar, 14 psi). (§173.196(a)(6))
TEST CONTENTS:	Water	
FILL CAPACITY:	Maximum Capacity	
CLOSURE APPLICATION:	25 In-Lbs. ± 1 In-Lb.	
CONDITIONING:	Laboratory Ambient	
TEST PRESSURE:	28 inHg	
TEST DURATION:	30 Minutes	
TEST DATE:	October 25, 2012	
TEST EQUIPMENT:	Tenney 6S Vacuum Chamber Vacuum Pressure Gauge Torque Meter	

VACUUM TEST SET-UP AND RESULTS

	Sample #	Results	Comments/Observations
	1	PASS	All three samples maintained the 28 inHg test pressure for 30 minutes without leakage.
	2	PASS	
	3	PASS	

TEST PROCEDURES AND RESULTS

TEST #2 - THERMAL SHOCK AND PRESSURE DIFFERENTIAL (VACUUM) TESTS

TEST INFORMATION		TEST CRITERIA
SAMPLE SIZE:	3 Samples	<ul style="list-style-type: none"> The primary receptacle or the secondary packaging must be capable of withstanding, without leakage, an internal pressure of 95 kPa in the range of -40°C to 55°C (-40°F to 131°F) (IATA PI 650)
TEST CONTENTS:	Anti-freeze Solution	
FILL CAPACITY:	Maximum Capacity	
CLOSURE APPLICATION:	25 In-Lbs. ± 1 In-Lb.	
CONDITIONING:	-40°C (-40°F) to +55°C (+131°F)	
TEST PRESSURE:	28 In-Hg (95 kPa)	
TEST DATE:	November 1, 2012	
DURATION:	<p>Thermal Shock: 2 Hours at -40°C (-40°F) 2 Hours at +55°C (+131°F)</p> <p>Pressure Differential: 28 In-Hg (95 kPa) 30 minutes at each condition</p>	
TEST EQUIPMENT:		
<ul style="list-style-type: none"> Environmental Chamber #242 <p><i>Refer to the following page for temperature recordings.</i></p>	<ul style="list-style-type: none"> Welch Vacuum Pump #628 Ashcroft Vacuum Pressure Gauge #629 TEN-E Vacuum Chamber #630 	<ul style="list-style-type: none"> Acculab AL-204 Analytical Balance #174 SecurePak Torque Tester #741

TEST PROCEDURES:

Test #1: (-40°C) Thermal Shock/Pressure Differential

Samples were placed on their sides on a piece of blotting paper in the (-40°C) chamber for 2 hours. If after 2 hours no leakage was evident, a 28 In-Hg vacuum test was performed at (-40°C) for 30 minutes. Following the 30 minute vacuum test samples are evaluated for leakage.

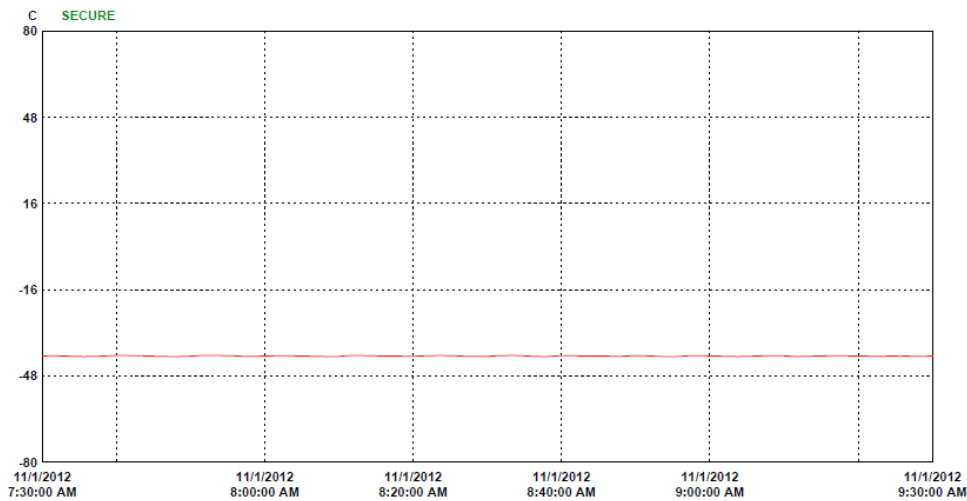
Test #2: (+55°C) Thermal Shock/Pressure Differential

Immediately following thermal shock/pressure differential tests at (-40°C), samples were placed on their sides on a piece of blotting paper in the (+55°C) chamber for 2 hours. If after 2 hours no leakage was evident, a 28 In-Hg vacuum test was performed at (+55°C) for 30 minutes. Following the 30 minute vacuum test samples are evaluated for leakage.

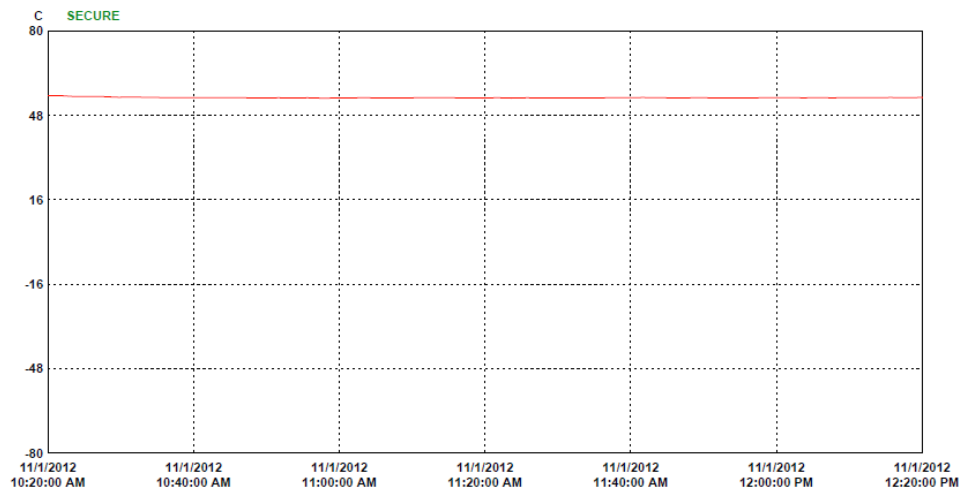
THERMAL SHOCK AND PRESSURE DIFFERENTIAL (VACUUM) TESTS CONTINUED

Test	Chamber ID	Temperature C	Minimum Duration	Start (Date & Time)	Stop (Date & Time)
1	242	-40°C	2 Hours	11/1/12 @ 730	11/1/12 @ 930
2	242	+55°C	2 Hours	11/1/12 @ 1020	11/1/12 @ 1220

-40°C (-40°F) TEMPERATURE DATA

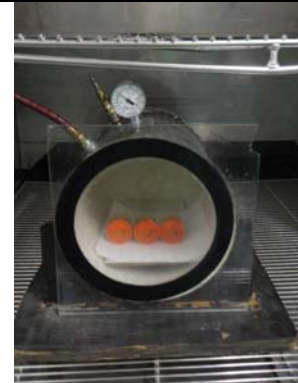


+55°C (+131°F) TEMPERATURE DATA



TEST #2 - THERMAL SHOCK AND PRESSURE DIFFERENTIAL (VACUUM) TESTS CONTINUED

THERMAL SHOCK/PRESSURE DIFFERENTIAL TEST SETUP



THERMAL SHOCK/PRESSURE DIFFERENTIAL TEST

Sample ID	-40°C		+55°C	
	Thermal Shock Test (2 Hours)	28 In-Hg Pressure Differential Test (30 Minutes)	Thermal Shock Test (2 Hours)	28 In-Hg Pressure Differential Test (30 Minutes)
1	Pass	Pass	Pass	Pass
2	Pass	Pass	Pass	Pass
3	Pass	Pass	Pass	Pass

Observation

No leakage of contents following thermal shock/pressure differential test in the temperature range of -40°C to +55°C.

DISCLAIMER OF WARRANTIES

TEN-E PACKAGING SERVICES, INC. certifies that the previously described testing services have been performed in accordance with standard good laboratory practices and the Department of Transportation's Title 49 CFR; 173.196, the International Civil Aviation Organization (ICAO); Technical Instructions for the Safe Transport of Dangerous Goods By Air; PI 620 and 650 and the International Air Transport Association (IATA); Dangerous Goods Regulations; PI 620 and 650. The results included within this test report relate only to the items tested. **ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY THAT THE PACKAGING TESTED IS MERCHANTABLE OR FIT FOR A PARTICULAR PURPOSE, ARE DISCLAIMED.** In no event shall TEN-E Packaging Services, Inc. liability exceed the total amount paid by **Starplex Scientific, Inc.** for services rendered.

In the event of future changes to the above referenced test standard, it is the responsibility of **Starplex Scientific, Inc.** to determine whether additional testing or updating of past testing is necessary to verify that the packaging we have tested remains in compliance with those standards.


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