

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



**B902-10 90 mL Container  
(Mfg. Date 1210151, Lot # 2K15)**

**TEST REPORT #: 12-1381**

**TESTING PERFORMED FOR:**

**STARPLEX SCIENTIFIC, INC.**

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Etobicoke, ON M9W 6Y3

**ATTN: Shirley Walker**

**TESTING PERFORMED BY:**

**TEN-E PACKAGING SERVICES, INC.**

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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):

- **B902-10 90 mL Container (Mfg. Date 1210151, Lot # 2K15)**

## REGULATORY REFERENCES

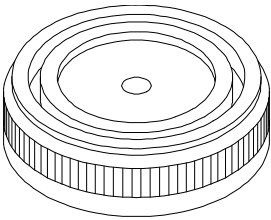
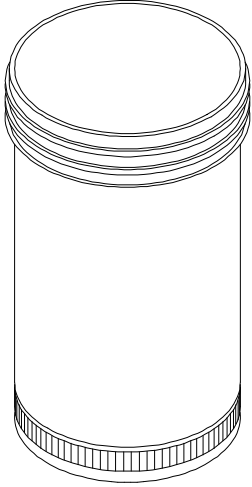
TEST	49 CFR <sup>①</sup>	UN <sup>②</sup>	IMDG <sup>③</sup>	ICAO <sup>④</sup>	IATA <sup>⑤</sup>
	October 2011 Edition	17 <sup>th</sup> Edition	2010 Edition	2011-2012 Edition	53 <sup>rd</sup> Edition
<b>Pressure:</b>	173.196(a)(6)	P 620(3)	P 620(3)	PI 620(e)	PI 620
<b>Thermal Shock:</b>	173.196(a)(7)	P 620(3)	P 620(3)	PI 620(e)	PI 620
<b>Thermal Shock with Pressure:</b>	---	---	---	---	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	
<b>Description:</b>	48 mm Threaded Closure with Valve Seal		
<b>Material:</b>	Polyethylene, Orange		
<b>Tare Weight:</b>	4.837 Grams		
<b>Overall Dimensions:</b>			
• <b>Height</b>	0.536"		
• <b>Diameter</b>	1.998"		
<b>Finish Dimensions:</b>			
• <b>T</b>	1.882"		
• <b>E</b>	1.807"		
<b>Markings (QC Audit):</b>	2		
CONTAINER			
<b>Description:</b>	90 mL Round Threaded Container		
<b>Material:</b>	Polypropylene, Natural		
<b>Method of Manufacture:</b>	Injection Molded		
<b>Tare Weight:</b>	9.708 Grams		
<b>Capacity:</b>			
• <b>Rated</b>	90 mL		
• <b>Overflow</b>	99 mL		
<b>Overall Dimensions:</b>			
• <b>Height</b>	2.938"		
• <b>Diameter</b>	1.689"		
<b>Thread Dimensions:</b>			
• <b>T</b>	1.849"		
• <b>E</b>	1.763"		
<b>Markings (QC Audit):</b>	43 MFG 1210151 SPI "5" PP Recycling Symbol		

**TEST PROCEDURES AND RESULTS**

**TEST NO. 1 - PRESSURE DIFFERENTIAL TEST**

TEST INFORMATION		TEST CRITERIA
<b>SAMPLE SIZE:</b>	3	<ul style="list-style-type: none"> <li>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))</li> </ul>
<b>TEST CONTENTS:</b>	Water	
<b>FILL CAPACITY:</b>	Maximum Capacity	
<b>CLOSURE APPLICATION:</b>	22 In-Lbs. ± 1 In-Lb.	
<b>CONDITIONING:</b>	Laboratory Ambient	
<b>TEST PRESSURE:</b>	28 inHg	
<b>TEST DURATION:</b>	30 Minutes	
<b>TEST DATE:</b>	October 25, 2012	
<b>TEST EQUIPMENT:</b>	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
<b>SAMPLE SIZE:</b>	3 Samples	<ul style="list-style-type: none"> <li>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)</li> </ul>
<b>TEST CONTENTS:</b>	Anti-freeze Solution	
<b>FILL CAPACITY:</b>	Maximum Capacity	
<b>CLOSURE APPLICATION:</b>	22 In-Lbs. ± 1 In-Lb.	
<b>CONDITIONING:</b>	-40°C (-40°F) to +55°C (+131°F)	
<b>TEST PRESSURE:</b>	28 In-Hg (95 kPa)	
<b>TEST DATE:</b>	November 1, 2012	
<b>DURATION:</b>	<p><b>Thermal Shock:</b> 2 Hours at -40°C (-40°F) 2 Hours at +55°C (+131°F)</p> <p><b>Pressure Differential:</b> 28 In-Hg (95 kPa) 30 minutes at each condition</p>	
<b>TEST EQUIPMENT:</b>		
<ul style="list-style-type: none"> <li>Environmental Chamber #242</li> </ul> <p><i>Refer to the following page for temperature recordings.</i></p>	<ul style="list-style-type: none"> <li>Welch Vacuum Pump #628</li> <li>Ashcroft Vacuum Pressure Gauge #629</li> <li>TEN-E Vacuum Chamber #630</li> </ul>	<ul style="list-style-type: none"> <li>Acculab AL-204 Analytical Balance #174</li> <li>SecurePak Torque Tester #741</li> </ul>

### 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.

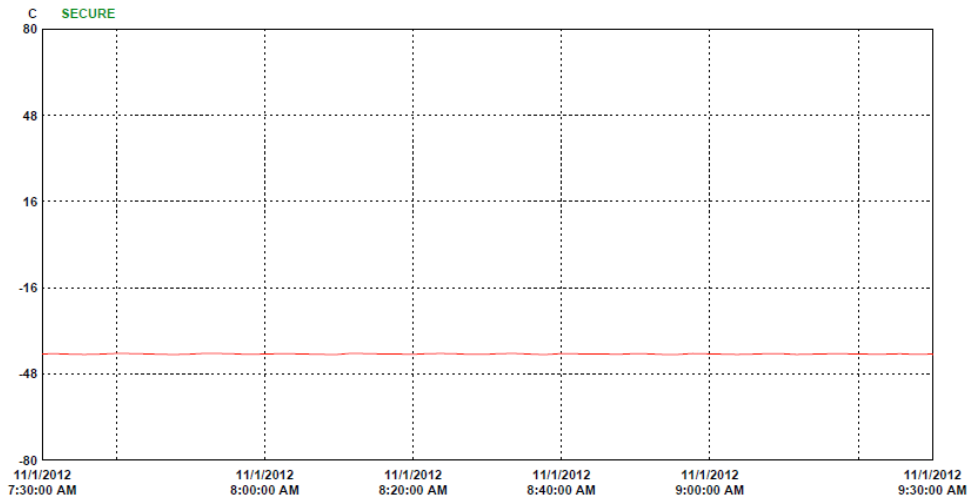
#### Test #2: (+55°C) Thermal Shock/Pressure Differential

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.

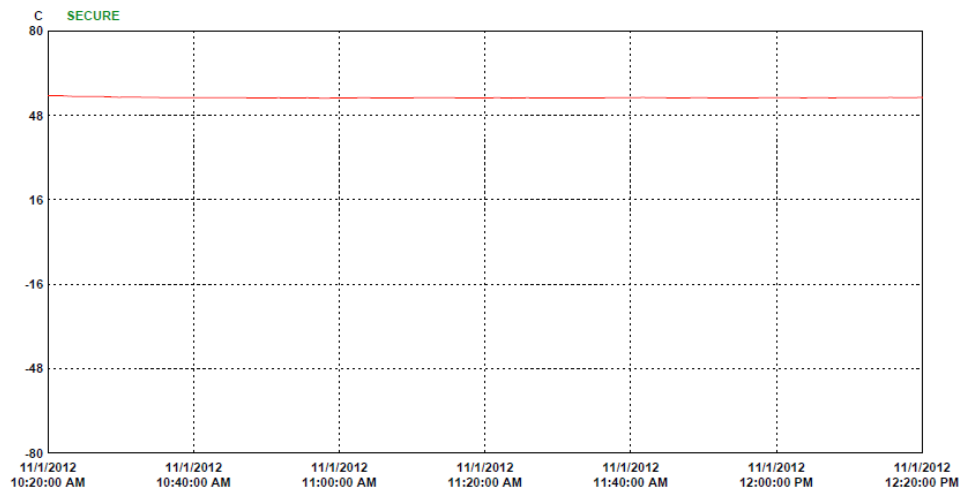
**THERMAL SHOCK AND PRESSURE DIFFERENTIAL (VACUUM) TESTS CONTINUED**

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**



**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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