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Lifesaving Systems Corp.

2104-154N

Environmental Test Report 2104-154N Rev. N/C

Test Standards: SAE AS1354

For

Lifesaving Systems Corp.

220 Elseberry Road
Apollo Beach, FL 33572

On

Life Preserver (QTY 2)

Model Number: See Units Tested Table; Part Number: See Units Tested Table; Serial Number: See Units Tested Table

Performed By: **Keystone Compliance, LLC.**
131 Columbus Inner Belt
New Castle, PA 16101

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Document History

Revision	Issue Date	Description of Modifications	Revised By	Approved By
N/C	4/30/2021	Initial release	N/A	T.M.

Client Information

Purchase Order	4373
Quote Number	2104-154N
EUT Arrival Date	4/22/2021 -- Received in good condition
Company Name	Lifesaving Systems Corp.
Address	220 Elseberry Road
City, State Zip	Apollo Beach, FL 33572
Contact Name	Mario Vittone
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Test Facility Information

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Test Program Information

Test Personnel	**Marc Hudach** -- Environmental Test Technician
Test Title & Test Dates	Operational Temperature Range – **April 23, 2021** Extreme Temperature Exposure – **April 26, 2021** Leakage Resistance Procedure – **April 27, 2021 to April 28, 2021**

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Introduction

This report documents the results of the Environmental tests performed on the Life Preserver (QTY 2), Model Number: See Units Tested Table; Part Number: See Units Tested Table; Serial Number: See Units Tested Table, submitted by Lifesaving Systems Corp.

The Environmental test programs described herein were performed in accordance with the applicable requirements of SAE AS1354.

All test data is included in Section 3 of this document.

All tests performed at Keystone Compliance New Castle, PA Environmental test facility. All tests were performed using the test set-ups of the relevant standard for tests performed in laboratory conditions.

Acronyms and Abbreviations

M/N – Model Number

P/N – Part Number

S/N – Serial Number

UUT – Unit Under Testing

EUT – Equipment Under Testing

Equipment Under Test(s)

EUT		
Description	Manufacturer	
Life Preserver (QTY 2)	**Lifesaving Systems Corp.**	
Model Number	Part Number	Serial Number
See Units Tested Table	**See Units Tested Table**	**See Units Tested Table**

Units Tested Table				
Description	Manufacturer	Model Number	Part Number	Serial Number
Life Preserver	Lifesaving Systems Corp	N/A	497-VOT	4713
Life Preserver	Lifesaving Systems Corp	N/A	497-VOT	4738



EUT
Life Preserver (QTY 2)

	**EUT** **Life Preserver (QTY 2)**

Summary of Tests Performed & Results

Table 1 Tests Performed & Results

Report Paragraph	Test Description	Specification	Results
3.3	Operational Temperature Range	SAE AS1354	No obvious damage discovered to Preserver, due to Temperature Operational testing. Preserver inflated satisfactorily after low temperature and after high temperature exposure.
3.4	Extreme Temperature Exposure	SAE AS1354	No obvious damage discovered to Preserver, due to Temperature Extreme testing. Preserver inflated satisfactorily after low temperature and after high temperature exposure.
3.5	Leakage Resistance Procedure	SAE AS1354	No obvious damage discovered to Preservers, due to Leakage Resistance testing. Units did not leak more than 0.5 PSIG.

Section 1 – Test Conditions and Equipment

1.1 Ambient Environmental Conditions

Unless otherwise specified herein, all tests were performed at an atmospheric pressure of 28 ±2.5 inches of mercury absolute, a temperature of 75 ±15°F, and a relative humidity of 50 ±30%.

1.2 Instrumentation and Equipment

Measuring and test equipment, utilized in the performance of these tests, was calibrated in accordance with ANSI/NCSL Z540-3-2006, by Keystone Compliance, LLC. or a commercial facility, utilizing reference standards (or interim standards) whose calibrations have been certified as being traceable to the National Institute of Standards & Technology (NIST). All reference standards utilized in the above calibration system are supported by certificates, reports, or data sheets attesting to the date, accuracy, and conditions under which the results furnished were obtained. All subordinate standards, measuring and test equipment are supported by like data, when such information is essential to achieve the accuracy control required by the procedure.

Keystone Compliance, LLC. attests that the commercial sources providing calibration services on the above referenced equipment, other than the NIST Standards are in fact capable of performing the required services to the satisfaction of Keystone Compliance, LLC. Quality Assurance. Certifications of all calibrations performed are retained on file in the Keystone Compliance, LLC. Quality Assurance Department, and are available for inspection upon request by customer representatives.

The test equipment utilized during this test program is listed on individual Test Equipment Sheets located in Section 3 of this document.

1.3 Tolerances

All test conditions were maintained within all applicable specified tolerances.

Section 2 – References

2.1 Applicable Specifications

Reference Specification Title	**SAE AS1354** **Individual Inflatable Life Preserver**
Calibration Information	**ANSI/NCSL Z540-3-2006** **Calibration Laboratories and Measuring Test Equipment - General Requirements**

Section 3 – Test Logs, Test Equipment, Test Data, & Test Photographs

3.1 Test Log

Test Log			
EUT:	**Life Preserver (QTY 2)**	Job Number:	**2104-154N**
Customer:	**Lifesaving Systems Corp**	Model Number:	**See Units Tested Table**
Date:	**04/23/2021 – 04/28/2021**	Part Number:	**See Units Tested Table**
Test Engineer:	**M.Hudach**	Serial Number:	**See Units Tested Table**

Date	Time	Description
SAE AS1354 – Temperature Operational		
04/23/2021	0900	Preparing testing chamber and equipment under test
	0900	Begin 4-hour exposure at -40°C, on life preserver S/N: 4713
	1306	Increased chamber temperature to 23°C
	1316	Chamber reached 23°C
	1330	Removed preserver from chamber and inflated via manual inflation. Preserver inflated satisfactorily
	1333	Replaced gas cylinder
	1335	Increased chamber temperature to 60°C
	1342	Chamber reached 60°C
	1800	4-hour exposure complete, decreased temperature to 23°C
	1807	Chamber reached 23°C
	1830	Removed preserver from chamber and inflated via manual inflation. Preserver inflated satisfactorily
		No obvious damage discovered to Preserver, due to Temperature Operational testing. Preserver inflated satisfactorily after low temperature and after high temperature exposure.
SAE AS1354 – Temperature Extreme		
04/26/2021	0800	Preparing testing chamber and equipment under test
	0838	Begin 4-hour exposure at -51.1°C, on life preserver S/N: 4738
	1245	Increased chamber temperature to 23°C
	1258	Chamber reached 23°C
	1320	Removed preserver from chamber and inflated via manual inflation. Preserver inflated satisfactorily
	1322	Replaced gas cylinder
	1325	Increased chamber temperature to 71°C
	1336	Chamber reached 71°C
	1745	4-hour exposure complete, decreased temperature to 23°C
	1757	Chamber reached 21°C

Date	Time	Description
	1815	Removed preserver from chamber and inflated via manual inflation. Preserver inflated satisfactorily
		No obvious damage discovered to Preserver, due to Temperature Extreme testing. Preserver inflated satisfactorily after low temperature and after high temperature exposure.
SAE AS1354 – Leakage Resistance Extreme		
04/27/2021		Prior to beginning test, cut oral inflation tube and installed a pressure sensor. Test was performed in a test chamber at 23°C
	1500	Filled port on preserver (S/N: 4738) to 2 PSIG
	1515	Topped off preserver with air, starting pressure was 3.32 PSIG. Begin 12-hour leakage test
04/28/2021	0315	Leakage test complete
		No obvious damage discovered to Preserver, due to Leakage Resistance testing. Unit did not leak more than 0.5 PSIG. Final pressure was 3.20 PSIG
SAE AS1354 – Leakage Resistance Operational		
04/28/2021		Prior to beginning test, cut oral inflation tube and installed a pressure sensor. Test was performed in a test chamber at 23°C
	0855	Filled port on preserver (S/N: 4713) to 2 PSIG
	0915	Topped off preserver with air, starting pressure was 3.30 PSIG. Begin 12-hour leakage test
	2115	Leakage test complete
		No obvious damage discovered to Preserver, due to Leakage Resistance testing. Unit did not leak more than 0.5 PSIG. Final pressure was 3.15 PSIG

3.2 Equipment List

Equipment Log			
EUT:	**Life Preserver (QTY 2)**	Job Number:	**2104-154N**
Customer:	**Lifesaving Systems Corp**	Model Number:	**See Units Tested Table**
Date:	**04/23/2021 – 04/28/2021**	Part Number:	**See Units Tested Table**
Test Engineer:	**M.Hudach**	Serial Number:	**See Units Tested Table**

Test Equipment					
Asset No.	Description	Manufacturer	Model	Serial No.	Cal. Due
EH056	**DC POWER SUPPLY**	**QIAOWEI ELECTRONICS**	**QW-MS3010D**	**20180519-USA-280**	**UWCE**
NA001	**HYDRA SERIES 2**	**FLUKE**	**2620A**	**9126016**	**09/21/2021**
NC025	**TEMPERATURE/HUMIDITY CHAMBER**	**THERMOTRON**	**SM-16C**	**18095**	**N/A**
NM052	**TEMPERATURE/HUMIDITY METER**	**CONTROL COMPANY**	**4096, 98766-84**	**200403375**	**07/09/2022**
NP030	**PRESSURE TRANSDUCER**	**OMEGA**	**PX309-050G5V**	**0319201055**	**01/25/2022**
NS005	**HYDRA LOGGER MONITORING SOFTWARE**	**FLUKE**	**VERSION 3.0**	**NONE**	**UWCE**
OA045	**LAPTOP**	**DELL**	**D630**	**15916635325**	**UWCE**

UWCE: Used with Calibrated Equipment
REF: Reference Only
IPU: Inspect Prior to Use

3.3 Operational Temperature Range Test

a) The Operational Temperature Range test requirements for the Life Preserver (QTY 2) are specified in SAE AS1354.

b) The Operational Temperature Range test log for the Life Preserver (QTY 2) is located in Paragraph 3.1 of this document.

c) The Operational Temperature Range test equipment used to test the Life Preserver (QTY 2) is located in Paragraph 3.2 of this document.

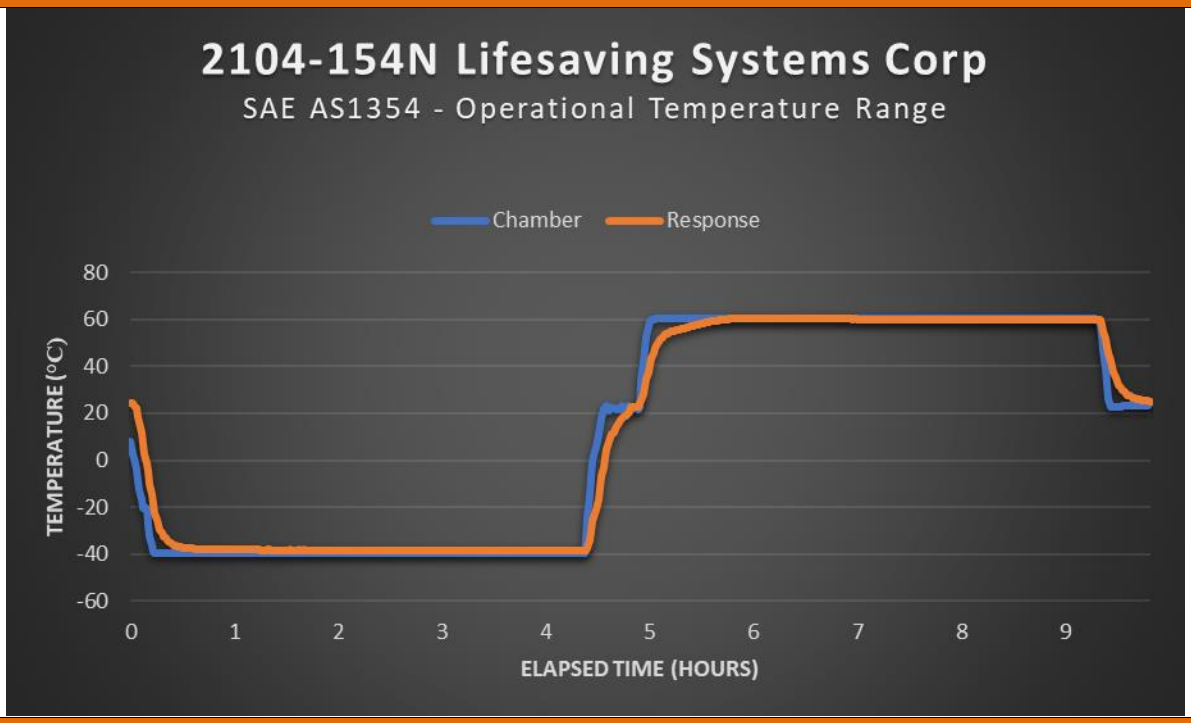
d) All recorded test data for the Operational Temperature Range test on the Life Preserver (QTY 2) is located in Paragraph 3.3.1 of this document.

e) The Operational Temperature Range test photographs for the Life Preserver (QTY 2) are located in Paragraph 3.3.2 of this document.

3.3.1 Operational Temperature Range Test Data

Temperature (Operational) Data Sheet			
EUT:	**Life Preserver (QTY 1)**	Job Number:	**2104-154N**
Customer:	**Lifesaving Systems Corp**	Model Number:	**See Units Tested Table**
Date:	**04/23/2021**	Part Number:	**See Units Tested Table**
Test Engineer:	**M.Hudach**	Serial Number:	**4713**
Test Specifications			
Test Spec.:	**SAE AS1354**	Para./Sec.:	**Temperature (Operational)**

Test Profile



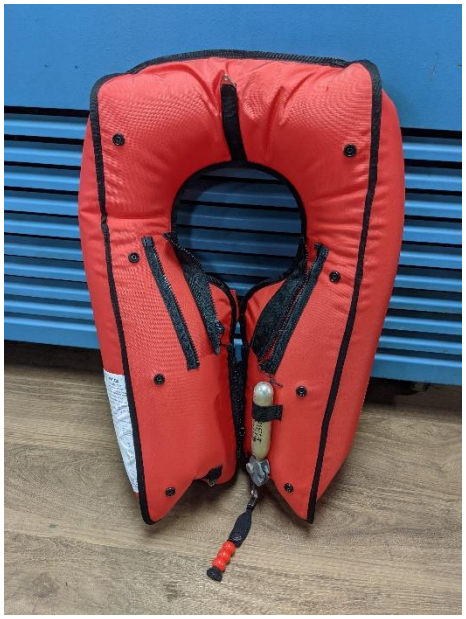
Environmental Profile Information	
Test Cycle Begins At:	**04/23/2021 @ 0900**
Test Cycle Ends At:	**04/23/2021 @ 1830**
Test Duration:	**10-hours**
Test Temperature:	**-40°C/ 60°C**

EUT Test Information	Y	N	N/A	Comments					
Operating During Test:			**X**	Operating Mode:					
Powered During Test:			**X**	V		A		AC/DC	
Physical Damage Noted:		**X**							

3.3.2 Operational Temperature Range Test Photographs



Operational Temperature Range
Test Setup



Operational Temperature Range
Inflation 1

	Operational Temperature Range
	Inflation 1

	Operational Temperature Range
	Inflation 1

	Operational Temperature Range
	Inflation 1

	Operational Temperature Range
	Inflation 2

	Operational Temperature Range
	Inflation 2

	Operational Temperature Range
	Inflation 2



Operational Temperature Range
Inflation 2



Operational Temperature Range
Post Test Inspection

	Operational Temperature Range
	Post Test Inspection

3.4 Extreme Temperature Exposure Test

a) The Extreme Temperature Exposure requirement for the Life Preserver (QTY 2) is specified in SAE AS1354.

b) The Extreme Temperature Exposure test log for the Life Preserver (QTY 2) is located in Paragraph 3.1 of this document.

c) The Extreme Temperature Exposure test equipment used to test the Life Preserver (QTY 2) is located in Paragraph 3.2 of this document.

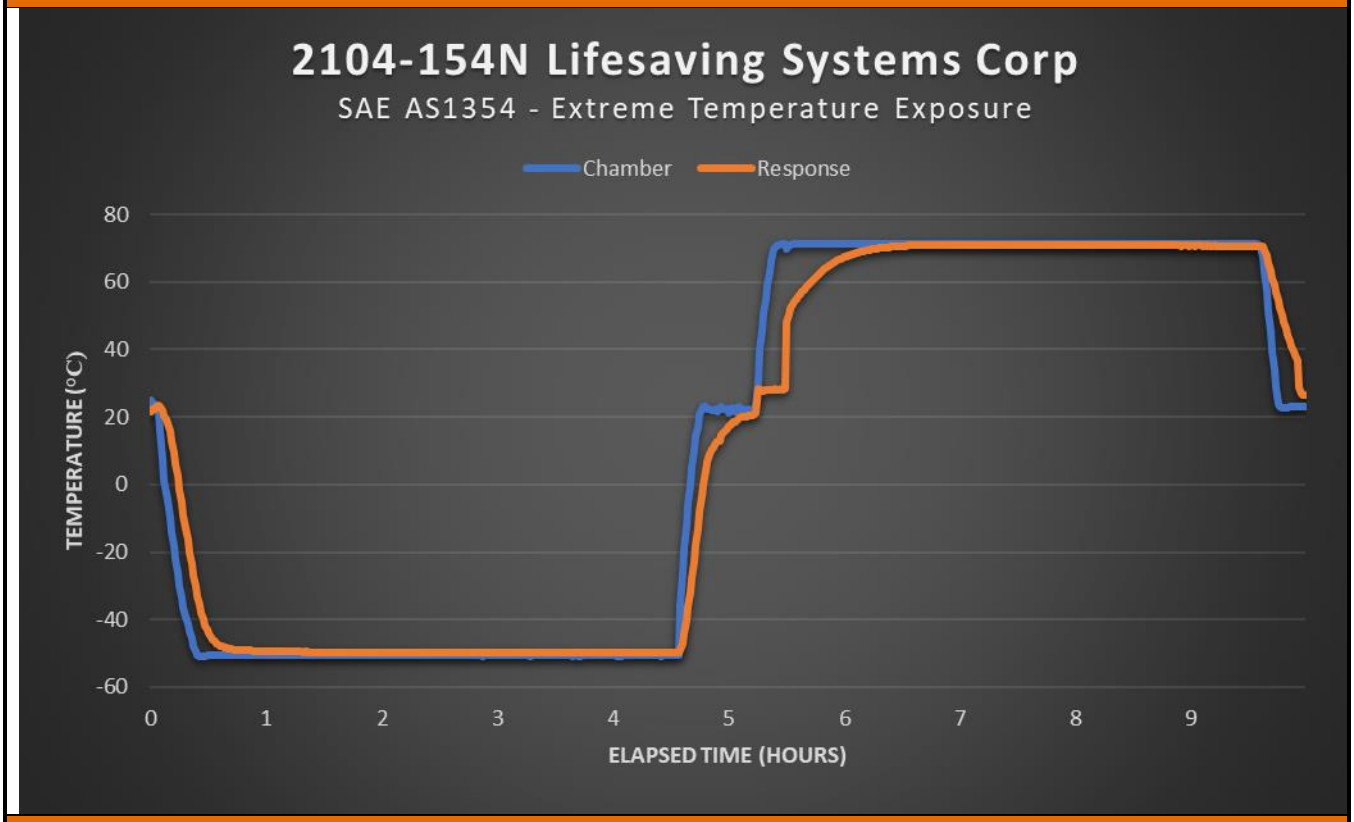
d) All recorded test data for the Extreme Temperature Exposure test on the Life Preserver (QTY 2) is located in Paragraph 3.4.1 of this document.

e) The Extreme Temperature Exposure test photograph for the Life Preserver (QTY 2) is located in Paragraph 3.4.2 of this document.

3.4.1 Extreme Temperature Exposure Test Data

Temperature (Extreme) Data Sheet			
EUT:	**Life Preserver (QTY 1)**	Job Number:	**2104-154N**
Customer:	**Lifesaving Systems Corp**	Model Number:	**See Units Tested Table**
Date:	**04/23/2021**	Part Number:	**See Units Tested Table**
Test Engineer:	**M.Hudach**	Serial Number:	**4738**
Test Specifications			
Test Spec.:	**SAE AS1354**	Para./Sec.:	**Temperature (Extreme)**

Test Profile



Environmental Profile Information	
Test Cycle Begins At:	**04/26/2021 @ 0838**
Test Cycle Ends At:	**04/26/2021 @ 1815**
Test Duration:	**10-hours**
Test Temperature:	**-51.1/71°C**

EUT Test Information	Y	N	N/A	Comments					
Operating During Test:			**X**	Operating Mode:					
Powered During Test:			**X**	V		A		AC/DC	
Physical Damage Noted:		**X**							

3.4.2 Extreme Temperature Exposure Test Photographs



Extreme Temperature Exposure
Test Setup



Extreme Temperature Exposure
Inflation 1

	**Extreme Temperature Exposure** **Inflation 1**

	**Extreme Temperature Exposure** **Inflation 1**

	**Extreme Temperature Exposure** **Inflation 1**

	**Extreme Temperature Exposure** **Inflation 2**

	**Extreme Temperature Exposure** **Inflation 2**

	**Extreme Temperature Exposure** **Inflation 2**



Extreme Temperature Exposure
Inflation 2



Extreme Temperature Exposure
Post Test Inspection

	**Extreme Temperature Exposure** **Post Test Inspection**

3.5 Leakage Resistance Procedure Test

a) The Leakage Resistance Procedure requirements for the Life Preserver (QTY 2) are specified in SAE AS1354**.**

b) The Leakage Resistance Procedure Test Log for the Life Preserver (QTY 2) is located in Paragraph 3.1 of this document.

c) The Leakage Resistance Procedure test equipment used to test the Life Preserver (QTY 2) is located in Paragraph 3.2 of this document.

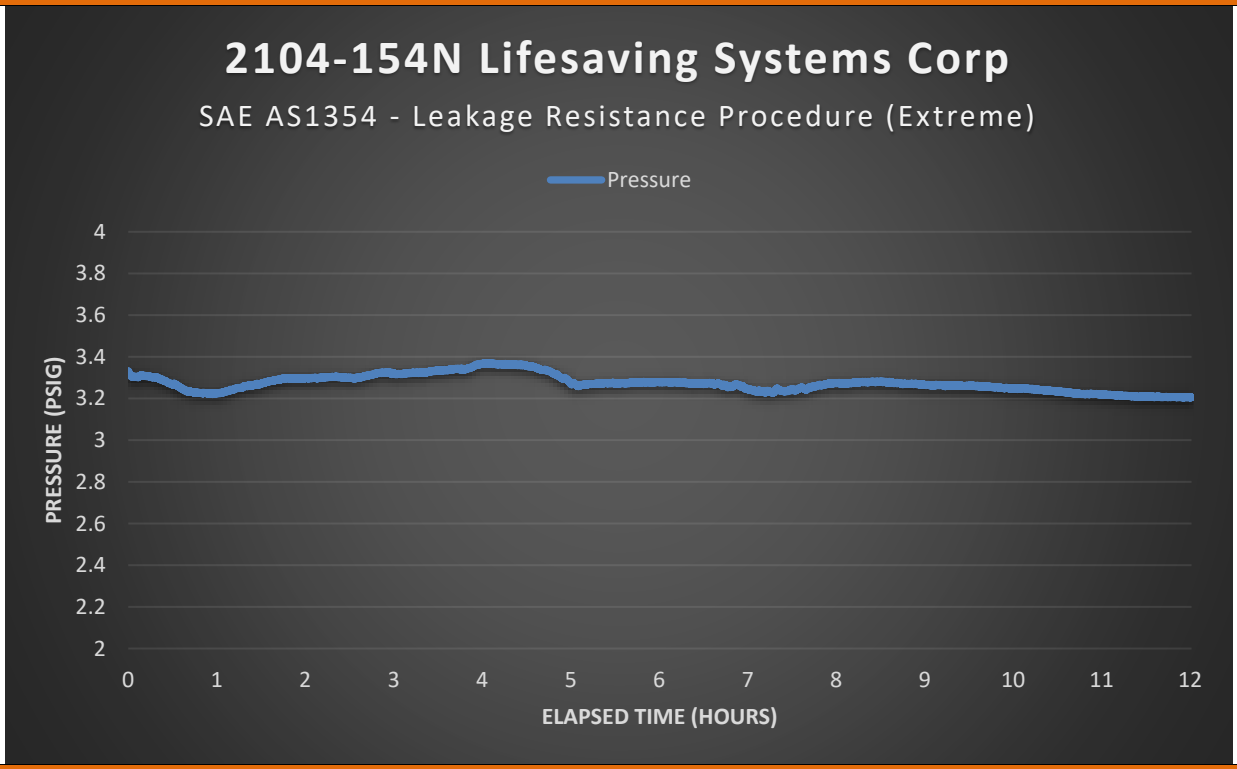
d) All recorded test data for the Leakage Resistance Procedure test on the Life Preserver (QTY 2) is located in Paragraph 3.5.1 of this document.

e) The Leakage Resistance Procedure test photographs for the Life Preserver (QTY 2) are located in Paragraph 3.5.2 of this document.

3.5.1 Leakage Resistance Procedure Test Data

Leak Test (Extreme) Data Sheet			
EUT:	**Life Preserver (QTY 1)**	Job Number:	**2104-154N**
Customer:	**Lifesaving Systems Corp**	Model Number:	**See Units Tested Table**
Date:	**04/27/2021 – 04/28/2021**	Part Number:	**See Units Tested Table**
Test Engineer:	**M.Hudach**	Serial Number:	**4738**
Test Specifications			
Test Spec.:	**SAE AS1354**	Para./Sec.:	**Leakage Resistance**

Test Profile

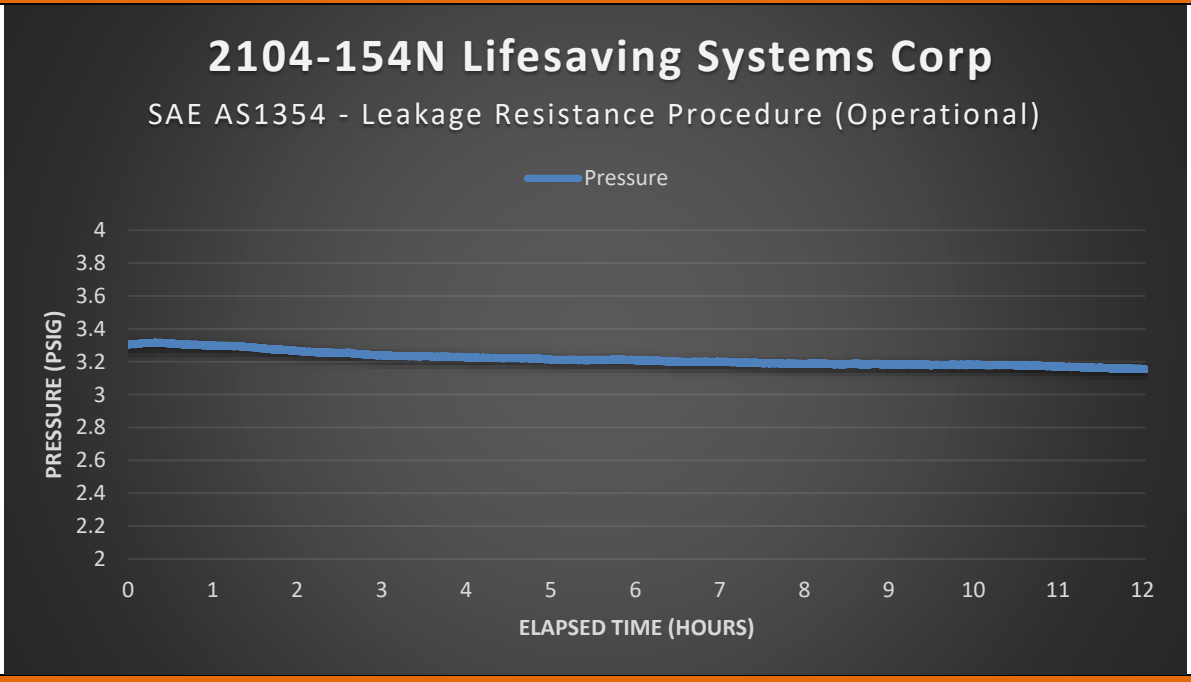


Environmental Profile Information	
Test Cycle Begins At:	**04/27/2021 @ 1515**
Test Cycle Ends At:	**04/28/2021 @ 0315**
Test Duration:	**12-hours**
Starting Pressure:	**3.32 PSIG**
Ending Pressure:	**3.20 PSIG**

EUT Test Information	Y	N	N/A	Comments					
Operating During Test:			**X**	Operating Mode:					
Powered During Test:			**X**	V		A		AC/DC	
Physical Damage Noted:		**X**							

Leak Test (Operational) Data Sheet			
EUT:	**Life Preserver (QTY 1)**	Job Number:	**2104-154N**
Customer:	**Lifesaving Systems Corp**	Model Number:	**See Units Tested Table**
Date:	**04/28/2021**	Part Number:	**See Units Tested Table**
Test Engineer:	**M.Hudach**	Serial Number:	**4713**
Test Specifications			
Test Spec.:	**SAE AS1354**	Para./Sec.:	**Leakage Resistance**

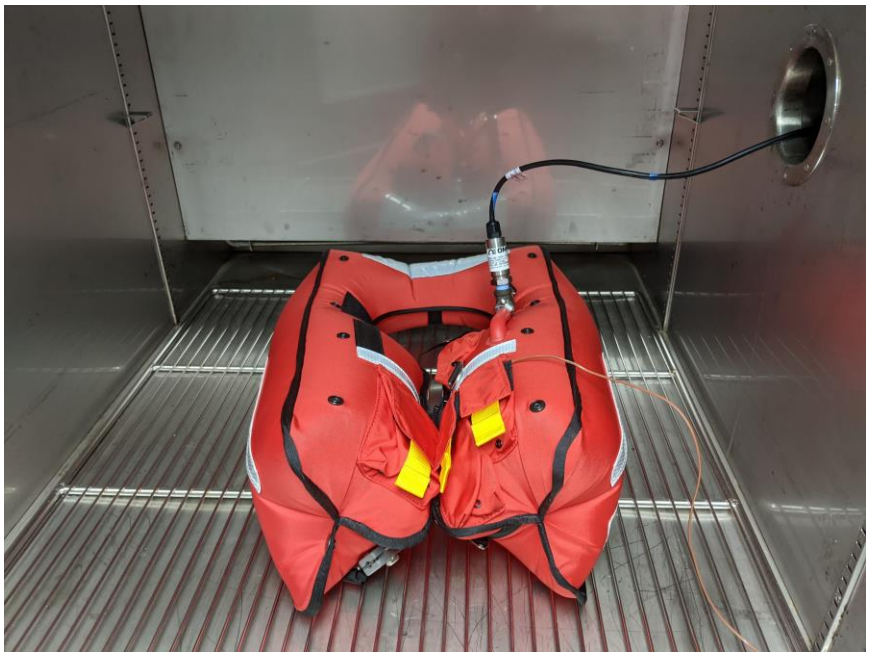
Test Profile



Environmental Profile Information	
Test Cycle Begins At:	**04/28/2021 @ 0915**
Test Cycle Ends At:	**04/28/2021 @ 2115**
Test Duration:	**12-hours**
Starting Pressure:	**3.30 PSIG**
Ending Pressure:	**3.15 PSIG**

EUT Test Information	Y	N	N/A	Comments					
Operating During Test:			**X**	Operating Mode:					
Powered During Test:			**X**	V		A		AC/DC	
Physical Damage Noted:		**X**							

3.5.2 Leakage Resistance Procedure Test Photographs



Leakage Resistance Procedure
Test Setup Extreme



Leakage Resistance Procedure
Test Setup Extreme



Leakage Resistance Procedure

Post Test
Extreme



Leakage Resistance Procedure

Post Test Inspection
Extreme



Leakage Resistance Procedure

Post Test Inspection
Extreme



Leakage Resistance Procedure

Test Setup
Operational



Leakage Resistance Procedure
Post Test Operational



Leakage Resistance Procedure
Post Test Inspection Operational



Leakage Resistance Procedure
Post Test Inspection **Operational**

Section 4 – Conclusion

a) The Life Preserver (QTY 2), Model Number: See Units Tested Table; Part Number: See Units Tested Table; Serial Number: See Units Tested Table, were subjected to the following Environmental Tests in accordance with SAE AS1354 and the specifications as shown in Table 2:

Table 2 Tests Performed & Results

Test Description	Specification	Results
Operational Temperature Range	**SAE AS1354**	**No obvious damage discovered to Preserver, due to Temperature Operational testing. Preserver inflated satisfactorily after low temperature and after high temperature exposure.**
Extreme Temperature Exposure	**SAE AS1354**	**No obvious damage discovered to Preserver, due to Temperature Extreme testing. Preserver inflated satisfactorily after low temperature and after high temperature exposure.**
Leakage Resistance Procedure	**SAE AS1354**	**No obvious damage discovered to Preservers, due to Leakage Resistance testing. Units did not leak more than 0.5 PSIG.**

b) The Life Preserver (QTY 2) were returned to Lifesaving Systems Corp. after completion of the Environmental Test.