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Lifesaving Systems Corp

2105-059N

Environmental Test Report 2105-059N Rev. N/C

Test Standards: SAE AS1354

For

Lifesaving Systems Corp

220 Elseberry Road
Apollo Beach, Florida 33572

On

Dual Chambered Life Vest - Osprey (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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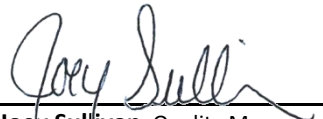
Approved By:  **Date:** 6/1/2021
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Document History

Revision	Issue Date	Description of Modifications	Revised By	Approved By
N/C	6/1/2021	Initial release	N/A	T.M.

Client Information

Purchase Order	4413
Quote Number	2105-059N
EUT Arrival Date	5/17/2021 -- Received in good condition
Company Name	Lifesaving Systems Corp
Address	220 Elseberry Road
City, State Zip	Apollo Beach, Florida 33572
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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 – **May 17, 2021** Extreme Temperature Exposure – **May 18, 2021** Leakage Resistance – **May 19, 2021 to May 25, 2021**

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Introduction

This report documents the results of the Environmental tests performed on the Dual Chambered Life Vest - Osprey (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
Dual Chambered Life Vest - Osprey (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
Dual Chambered Life Vest – Osprey	Lifesaving Systems Corp	N/A	CPLP-001	2191
Dual Chambered Life Vest – Osprey	Lifesaving Systems Corp	N/A	CPLP-001	2066



EUT
Dual Chambered Life Vest - Osprey (QTY 2)

	EUT
	Dual Chambered Life Vest - Osprey (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	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:	**Dual Chambered Life Vest - Osprey (QTY 2)**	Job Number:	**2105-059N**
Customer:	**Lifesaving Systems Corp**	Model Number:	**See Units Tested Table**
Date:	**05/17/2021 – 05/25/2021**	Part Number:	**See Units Tested Table**
Test Engineer:	**M.Hudach**	Serial Number:	**See Units Tested Table**

Date	Time	Description
SAE AS1354 – Temperature Operational		
05/17/2021	0945	Preparing testing chamber and equipment under test
	1031	Begin 4-hour exposure at -40°C, on life preserver S/N: 2191
	1442	4-hour exposure complete, Increased chamber temperature to 21.1°C
	1451	Chamber reached 21.1°C
	1510	Removed preserver from chamber and inflated via manual inflation. Preserver inflated satisfactorily
	1529	Replaced gas cylinders
	1530	Increased chamber temperature to 60°C
	1535	Chamber reached 60°C
	2005	4-hour exposure complete, decreased temperature to 23°C
	2014	Chamber reached 21.1°C
	2035	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		
05/18/2021	0800	Preparing testing chamber and equipment under test
	0854	Begin 4-hour exposure at -51°C, on life preserver S/N: 2066
	1348	4-hour exposure complete, Increased chamber temperature to 21.1°C
	1400	Chamber reached 21.1°C
	1552	Removed preserver from chamber and inflated via manual inflation. Preserver inflated satisfactorily
	1600	Replaced gas cylinders
	1612	Increased chamber temperature to 71°C
	1619	Chamber reached 71°C
	2024	4-hour exposure complete, decreased temperature to 21.1°C
	2040	Chamber reached 21.1°C

Date	Time	Description
	2045	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 Operational		
05/19/2021		Prior to beginning test, cut oral inflation tubes and installed a pressure sensor. Test was performed in a test chamber at 21.1°C
	1208	Filled low port on preserver (S/N: 2191) to 2.25 PSIG
	1325	Topped off preserver with air, starting pressure was 2.68 PSIG. Begin 12-hour leakage test
05/20/2021	0125	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 2.41 PSIG
	0830	Filled high port on preserver (S/N: 2191) to 2.4 PSIG
	0854	Topped off preserver with air, starting pressure was 3.01 PSIG. Begin 12-hour leakage test
	2054	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 2.88 PSIG
SAE AS1354 – Leakage Resistance Extreme		
05/24/2021		Prior to beginning test, cut oral inflation tube and installed a pressure sensor. Test was performed in a test chamber at 23°C
	1152	Filled high port on preserver (S/N: 2066) to 2.57 PSIG
	1210	Topped off preserver with air, starting pressure was 2.50 PSIG. Begin 12-hour leakage test
05/25/2021	0010	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 2.16 PSIG
	0915	Filled low port on preserver (S/N: 2066) to 2.29 PSIG
	0937	Topped off preserver with air, starting pressure was 2.45 PSIG. Begin 12-hour leakage test
	2137	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 2.24 PSIG

3.2 Equipment List

Equipment Log			
EUT:	**Dual Chambered Life Vest - Osprey (QTY 2)**	Job Number:	**2105-059N**
Customer:	**Lifesaving Systems Corp**	Model Number:	**See Units Tested Table**
Date:	**05/17/2021 – 05/25/2021**	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
EH057	**DC POWER SUPPLY**	**QIAOWEI ELECTRONICS**	**QW-MS3010D**	**20180113-USA-300**	**UWCE**
NA001	**HYDRA SERIES 2**	**FLUKE**	**2620A**	**9126016**	**09/21/2021**
NA014	**DATA LOGGER**	**YOKOGAWA**	**GM90PS**	**S5W514504**	**09/02/2021**
NC036	**TEMPERATURE & HUMIDITY CHAMBER**	**ESPEC**	**EPX-3H**	**0141683**	**08/16/2021**
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**
NS009	**DATA LOGGING SOFTWARE LICENSE**	**YOKOGAWA**	**GA10-01/MT**	**LICENSE: 400-0040-2398-P41W**	**UWCE**
NS010	**CLIENT LICENSE FOR GA10 SOFTWARE**	**YOKOGAWA**	**GA10CL-01**	**LICENSE: 402-02193-4725**	**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 Dual Chambered Life Vest - Osprey (QTY 2) are specified in SAE AS1354.

b) The Operational Temperature Range test log for the Dual Chambered Life Vest - Osprey (QTY 2) is located in Paragraph 3.1 of this document.

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

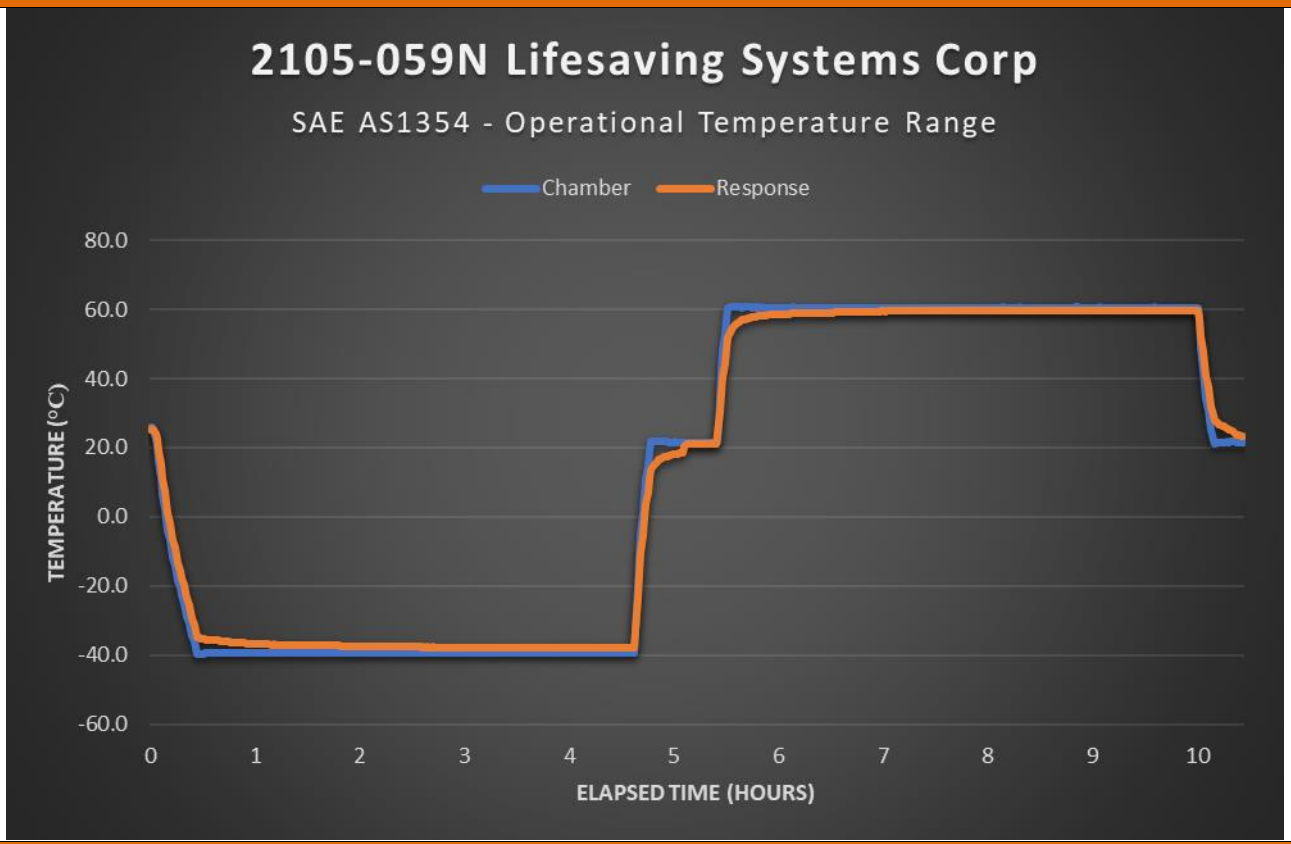
d) All recorded test data for the Operational Temperature Range test on the Dual Chambered Life Vest - Osprey (QTY 2) is located in Paragraph 3.3.1 of this document.

e) The Operational Temperature Range test photographs for the Dual Chambered Life Vest - Osprey (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:	**Dual Chambered Life Vest - Osprey (QTY 1)**	Job Number:	**2105-059N**
Customer:	**Lifesaving Systems Corp**	Model Number:	**See Units Tested Table**
Date:	**05/17/2021**	Part Number:	**See Units Tested Table**
Test Engineer:	**M.Hudach**	Serial Number:	**2191**
Test Specifications			
Test Spec.:	**SAE AS1354**	Para./Sec.:	**Temperature (Operational)**

Test Profile



Environmental Profile Information	
Test Cycle Begins:	**05/17/2021 @ 1031**
Test Cycle Ends:	**05/17/2021 @ 2030**
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

3.4 Extreme Temperature Exposure Test

a) The Extreme Temperature Exposure requirement for the Dual Chambered Life Vest - Osprey (QTY 2) is specified in SAE AS1354.

b) The Extreme Temperature Exposure test log for the Dual Chambered Life Vest - Osprey (QTY 2) is located in Paragraph 3.1 of this document.

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

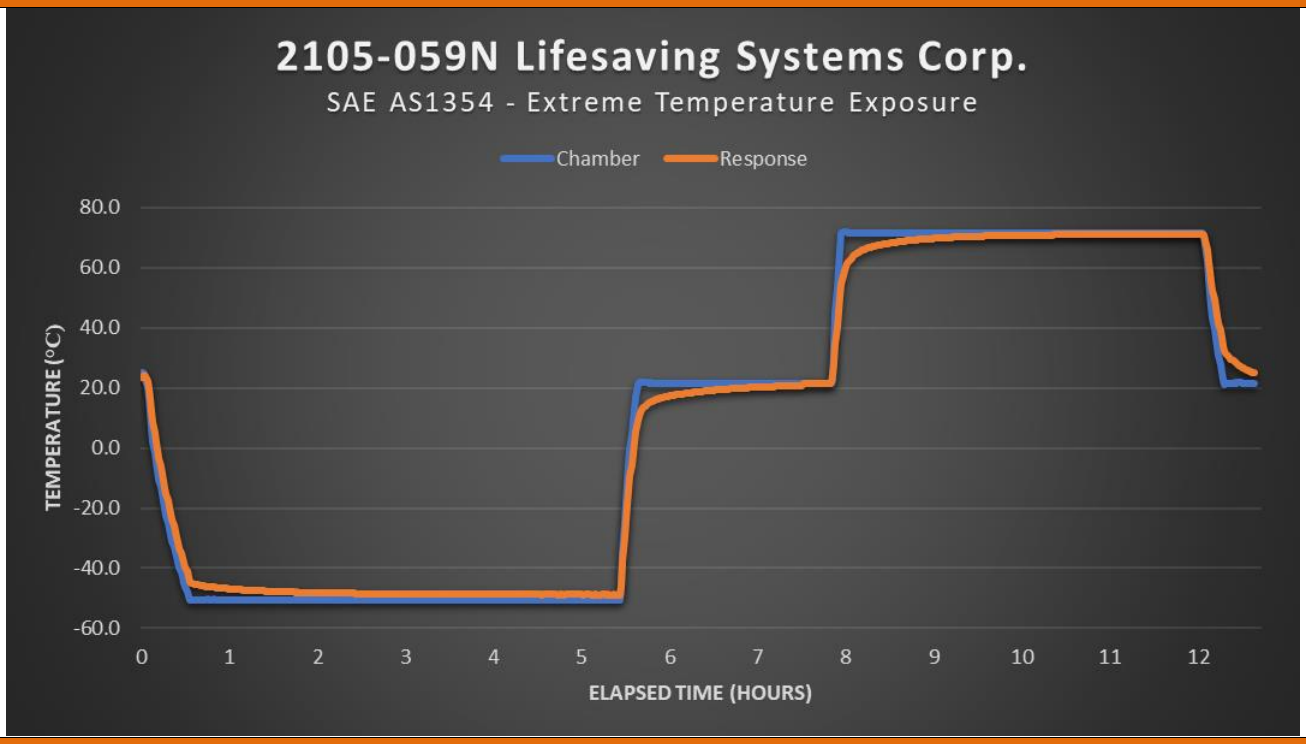
d) All recorded test data for the Extreme Temperature Exposure test on the Dual Chambered Life Vest - Osprey (QTY 2) is located in Paragraph 3.4.1 of this document.

e) The Extreme Temperature Exposure test photograph for the Dual Chambered Life Vest - Osprey (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:	**Dual Chambered Life Vest - Osprey (QTY 1)**	Job Number:	**2105-059N**
Customer:	**Lifesaving Systems Corp**	Model Number:	**See Units Tested Table**
Date:	**05/18/2021**	Part Number:	**See Units Tested Table**
Test Engineer:	**M.Hudach**	Serial Number:	**2066**
Test Specifications			
Test Spec.:	**SAE AS1354**	Para./Sec.:	**Temperature (Extreme)**

Test Profile



Environmental Profile Information	
Test Cycle Begin:	**05/18/2021 @ 0854**
Test Cycle Ends:	**05/18/2021 @ 2100**
Test Duration:	**12-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

3.5 Leakage Resistance Test

a) The Leakage Resistance requirements for the Dual Chambered Life Vest - Osprey (QTY 2) are specified in SAE AS1354**.**

b) The Leakage Resistance Test Log for the Dual Chambered Life Vest - Osprey (QTY 2) is located in Paragraph 3.1 of this document.

c) The Leakage Resistance test equipment used to test the Dual Chambered Life Vest - Osprey (QTY 2) is located in Paragraph 3.2 of this document.

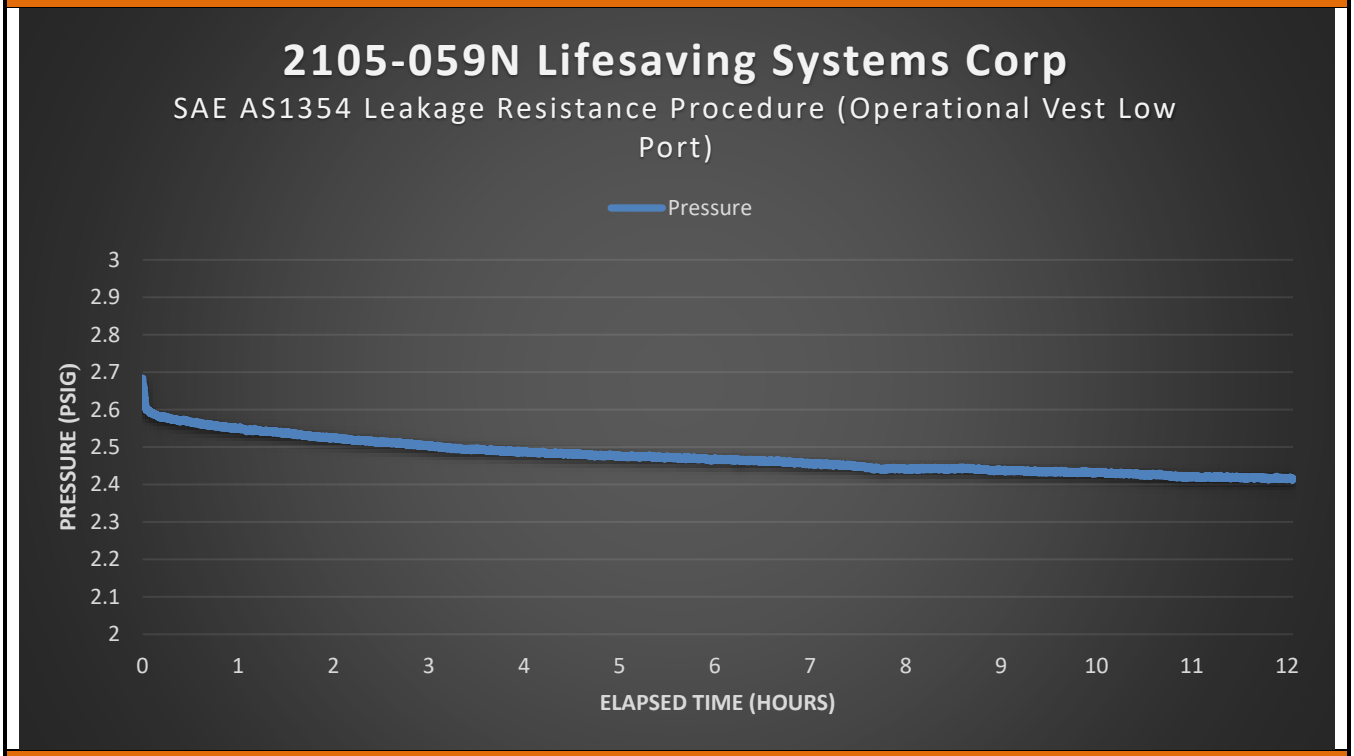
d) All recorded test data for the Leakage Resistance test on the Dual Chambered Life Vest - Osprey (QTY 2) is located in Paragraph 3.5.1 of this document.

e) The Leakage Resistance test photographs for the Dual Chambered Life Vest - Osprey (QTY 2) are located in Paragraph 3.5.2 of this document.

3.5.1 Leakage Resistance Test Data

Leak Test (Operational) Data Sheet			
EUT:	**Dual Chambered Life Vest - Osprey (QTY 1)**	Job Number:	**2105-059N**
Customer:	**Lifesaving Systems Corp**	Model Number:	**See Units Tested Table**
Date:	**05/19/2021 – 05/20/2021**	Part Number:	**See Units Tested Table**
Test Engineer:	**M.Hudach**	Serial Number:	**2191**
Test Specifications			
Test Spec.:	**SAE AS1354**	Para./Sec.:	**Leakage Resistance**

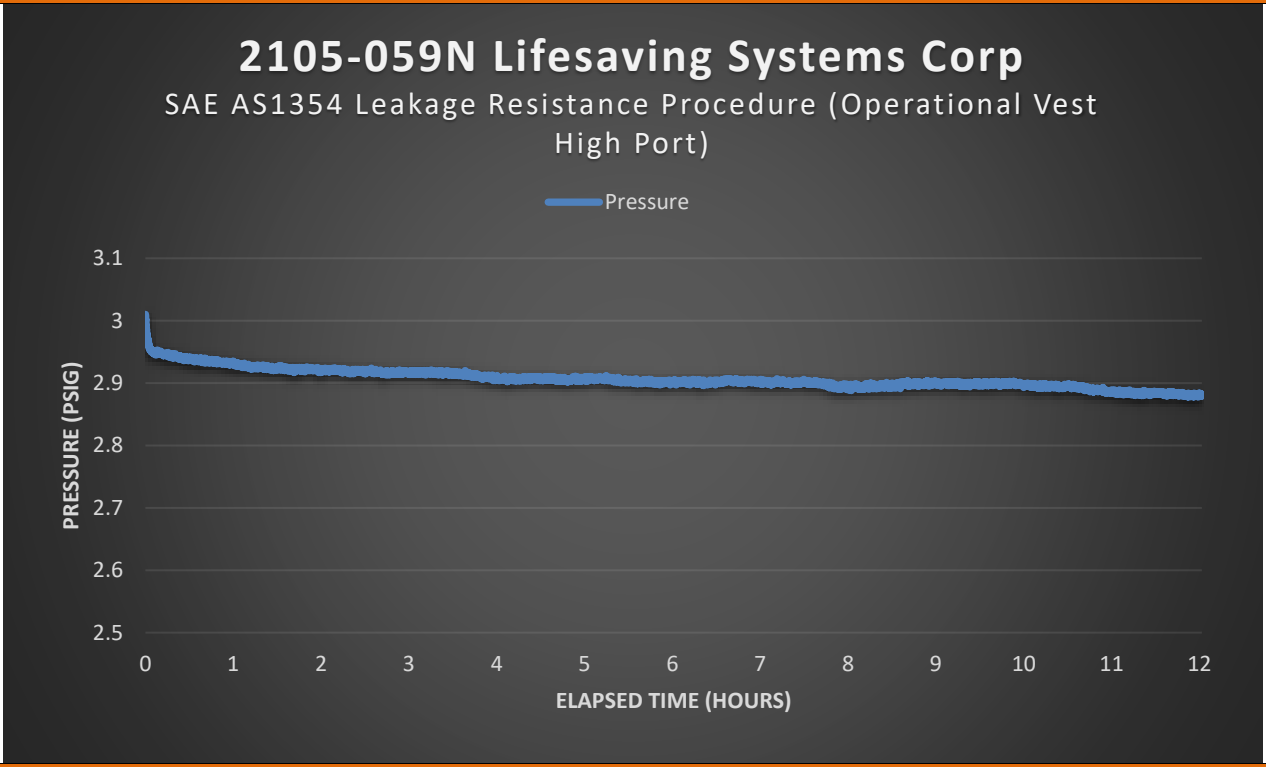
Test Profile (Low Port)



Environmental Profile Information	
Test Cycle Begins At:	**05/19/2021 @ 1325**
Test Cycle Ends At:	**05/20/2021 @ 0125**
Test Duration:	**12-hours**
Starting Pressure:	**2.68 PSIG**
Ending Pressure:	**2.41 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**							

Test Profile (High Port)

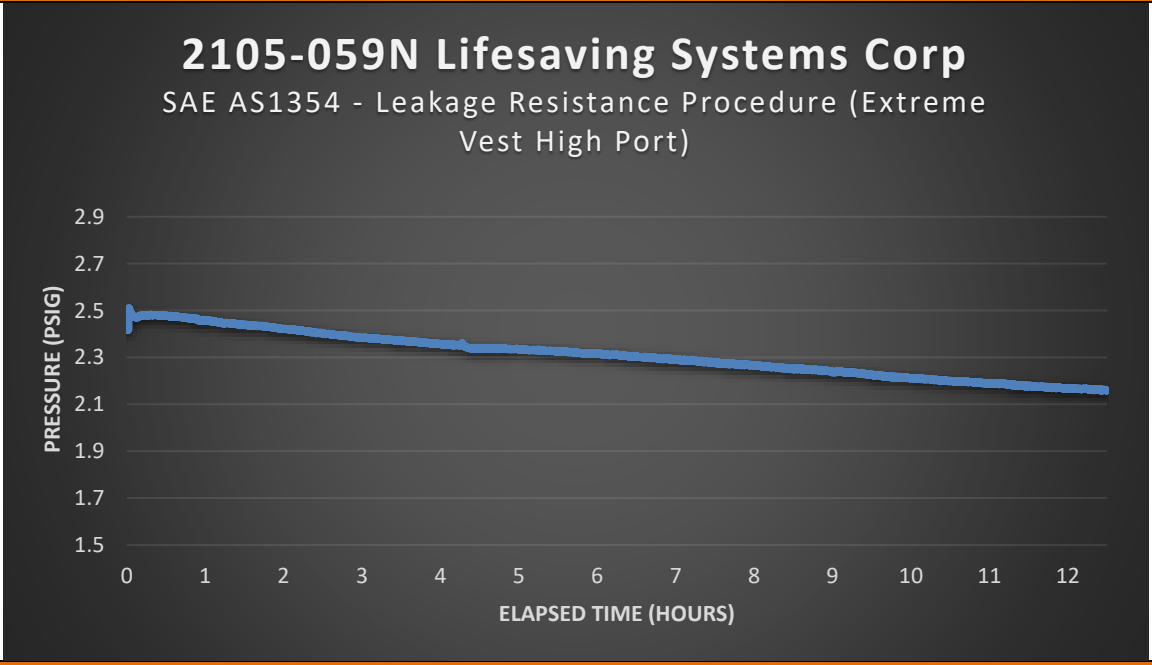


Environmental Profile Information	
Test Cycle Begins At:	**05/20/2021 @ 0854**
Test Cycle Ends At:	**05/20/2021 @ 2054**
Test Duration:	**12-hours**
Starting Pressure:	**3.01 PSIG**
Ending Pressure:	**2.88 PSIG**

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 (Extreme) Data Sheet			
EUT:	**Dual Chambered Life Vest - Osprey (QTY 1)**	Job Number:	**2105-059N**
Customer:	**Lifesaving Systems Corp**	Model Number:	**See Units Tested Table**
Date:	**05/24/2021 – 05/25/2021**	Part Number:	**See Units Tested Table**
Test Engineer:	**M.Hudach**	Serial Number:	**2066**
Test Specifications			
Test Spec.:	**SAE AS1354**	Para./Sec.:	**Leakage Resistance**

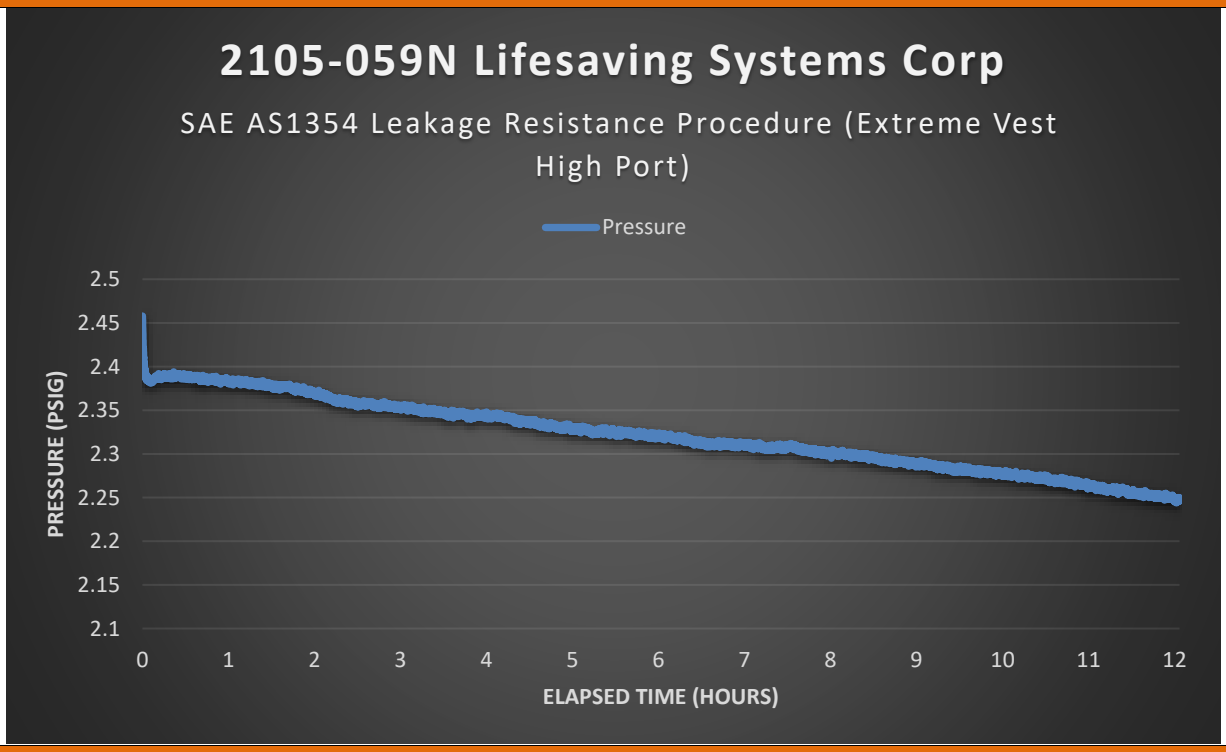
Test Profile (High Port)



Environmental Profile Information	
Test Cycle Begins At:	**05/24/2021 @ 1210**
Test Cycle Ends At:	**05/25/2021 @ 0110**
Test Duration:	**12-hours**
Starting Pressure:	**2.50 PSIG**
Ending Pressure:	**2.15 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**							

Test Profile (Low Port)



Environmental Profile Information	
Test Cycle Begins At:	**05/25/2021 @ 0937**
Test Cycle Ends At:	**05/25/2021 @ 2137**
Test Duration:	**12-hours**
Starting Pressure:	**2.45 PSIG**
Ending Pressure:	**2.25 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 Test Photographs



Leakage Resistance
Test Setup Operational Low Port



Leakage Resistance
Post Test Operational Low Port



Leakage Resistance
Test Setup Operational High Port



Leakage Resistance
Post Test Operational High Port



Leakage Resistance
Post Test Inspection **Operational**



Leakage Resistance
Post Test Inspection **Operational**



Leakage Resistance
Test Setup Extreme Low Port



Leakage Resistance
Post Test Extreme Low Port

	Leakage Resistance **Test Setup** **Extreme** **High Port**

	Leakage Resistance **Post Test** **Extreme** **High Port**

	Leakage Resistance **Post Test Inspection** **Extreme**

	Leakage Resistance **Post Test Inspection** **Extreme**

Section 4 – Conclusion

a) The Dual Chambered Life Vest - Osprey (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	**SAE AS1354**	**No obvious damage discovered to Preservers, due to Leakage Resistance testing. Units did not leak more than 0.5 PSIG.**

b) The Dual Chambered Life Vest - Osprey (QTY 2) were returned to Lifesaving Systems Corp after completion of the Environmental Test.