DAYTON T. BROWN INC.
Founded 1950

ENGINEERING AND TEST DIVISION
1175 CHURCH STREET, BOHEMIA, LONG ISLAND, NEW YORK 11716 (631) 589-6300

TEST REPORT NO.: 419282-01-04-R24-0123

DAYTON T. BROWN, INC. JOB NO.: 419282-01-000

CUSTOMER: NOVAVISION, LLC
524 EAST WOODLAND CIRCLE
BOWLING GREEN, OH 43402
USA

SUBJECT: FREIGHT CONTAINER MECHANICAL SEAL CLASSIFICATION TESTING PER ISO 17712:2013 (E) CLAUSE 5, CONDUCTED ON 25 BARRIER SEALS, MODEL NO. SEALOCK SL, SERIAL NOS. ISLJ0237801 THROUGH ISLJ0237820, ISLJ0240841 THROUGH ISLJ0240850

PURCHASE ORDER NO.: PO-52175

ATTENTION: STEPHANIE BOWE / BILL SCHOENHERR

SEAL CLASSIFICATION: HIGH SECURITY

TEST ADMINISTRATOR	J. BENINCASA
QUALITY DEPARTMENT	D. THORNE
DATE	13 FEBRUARY 2024

THE DATA CONTAINED IN THIS REPORT WAS OBTAINED BY TESTING IN COMPLIANCE WITH THE APPLIBARRIER TEST SPECIFICATION AS NOTED

James Benincasa
Digitally signed by James Benincasa
Date: 2024.02.13 14:27:40 -05'00'

A2LA ACCREDITED
Testing Lab
Cert # 0767.01, 0767.02, 0767.03

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REVISION HISTORY

Revision	Date	Section Affected	Change
--	02/13/2024	--	--

TABLE OF CONTENTS

1.0 ABSTRACT

This test report details the results of freight container mechanical seal classification testing conducted on Barrier Seals, under reference (a) to the requirements of reference (c).

As per ISO 17712:2013(E) Clause 5.1.2, “Testing is to be done once every two years”. Therefore, this report expires 2 years from the test completion date.

Results of the tests are detailed in the following text.

Exceptions/deviations during tests are as follows: The samples did not meet the High Security rating requirements during the Tensile test. As per the customer’s request the Tensile test was repeated with a back support behind the seal to simulate the shipping container doors when used in that type of installation.

Test data pertinent to this program will remain on file at Dayton T. Brown, Inc. for 90 days.

The testing and results contained in this report are in accordance with the testing requirements called out in ISO 17712:2013 and are only applicable to the samples as received and to the specific units identified in the test report and do not address any individual manufacturer's compliance or non-compliance with all the requirements of ISO 17712:2013 which are the sole responsibility of each manufacturer and not part of the testing performed and recorded in this test report.

Dayton T. Brown, Inc. is not involved in any production quality inspections. All tests are based on the samples that are selected by the manufacturer and provided to Dayton T. Brown, Inc. without any Dayton T. Brown, Inc. involvement in said selection.

Dayton T. Brown, Inc. performs testing to ISO 17712:2013 under laboratory conditions. These tests do not measure and are not intended to measure all possible applications or installations of the seal assembly or components. In that event, the report will describe the particular application tested in detail. Dayton T. Brown, Inc. is not responsible for actual performance of any seal assembly as installed in any application.

This report shall not be reproduced, except in full, without the written approval of Dayton T. Brown, Inc.

2.0 REFERENCES

(a)	Customer Purchase Order No.:	PO-52175
(b)	Dayton T. Brown, Inc. Job No.:	419282-01-000
(c)	Test Specification:	ISO 17712:2013 (E) Clause 5

3.0 SEAL CLASSIFICATION

ISO 17712:2013 (E):	(H)-High Security for Clause 5

4.0 ADMINISTRATIVE INFORMATION

Customer	NovaVision, LLC 524 East Woodland Circle Bowling Green, OH 43402 USA
Sample Type	Barrier Seal
Sample Name	Barrier Seal (as provided by customer)
Model No.	Sealock SL (as provided by customer)
Part No.	SL-J-MS-BAR31 (as provided by customer)
Serial Nos.	ISLJ0237801 through ISLJ0237820, ISLJ0240841 through ISLJ0240850
Quantity Received	30
Quantity Tested	30
Date Received	28 December 2023
Dates Tested	5 January through 9 February 2024

5.0 TEST PROGRAM OUTLINE

Test	Test Item Description	Results
Tensile	Model No. Sealock SL Barrier Seals, Serial Nos. ISLJ0237801 through ISLJ0237805	See Page 6.
Tensile performed with simulated shipping container door fixture	Model No. Sealock SL Barrier Seals, Serial Nos. ISLJ0240846 through ISLJ0240850	See Page 6.
Shear	Model No. Sealock SL Barrier Seals, Serial Nos. ISLJ0237806 through ISLJ0237810	See Page 8.
Bending	Model No. Sealock SL Barrier Seals, Serial Nos. ISLJ0237811 through ISLJ0237815	See Page 10.
Impact	Model No. Sealock SL Barrier Seals, Serial Nos. ISLJ0237816 through ISLJ0237820, ISLJ0240841 through ISLJ0240845	See Pages 12 and 13.
Test Equipment List and Test Item Photo	Model No. Sealock SL Barrier Seal	See Pages 15 and 16.

6.0 TEST RESULTS

Tensile Test and Results

TEST REQUIREMENT

The tensile test shall be conducted in accordance with reference (c).

TEST RESULTS

A pretest visual inspection of the test items revealed no anomalies.
All testing was performed in accordance with the referenced specification.
The pulling speed during the test was 50.8mm/min.
Test room ambient conditions: 20.2º C and 55.9% RH

TEST DATA Date: 10 January 2024

Tensile Test at Room Temperature

Specimen No.	Load (kN)	Class Rating	Remarks
ISLJ0237801	9.21	S	*
ISLJ0237802	9.51	S	*
ISLJ0237803	9.41	S	*
ISLJ0237804	9.66	S	*
ISLJ0237805	9.14	S	*

Tech: JB

* A post-test visual inspection of the test item revealed that the top hook end of the bar bent over the upper support bolt due to testing.

Classification Key

Rating	Load to Failure
High Security (H):	10.0 kN
Security (S):	2.27 kN
Indicative (I):	<2.27 kN

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TYPICAL PHOTO OF THE TENSILE TEST SETUP

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6.0 TEST RESULTS

Tensile Test and Results

TEST REQUIREMENT

The tensile test shall be conducted in accordance with reference (c).

TEST RESULTS

A pretest visual inspection of the test items revealed no anomalies.
All testing was performed in accordance with the referenced specification.
The Tensile Test was conducted with a simulated shipping container door fixture.
The pulling speed during the test was 50.8mm/min.
Test room ambient conditions: 19.9º C and 41.4% RH

TEST DATA Date: 9 February 2024

Tensile Test at Room Temperature

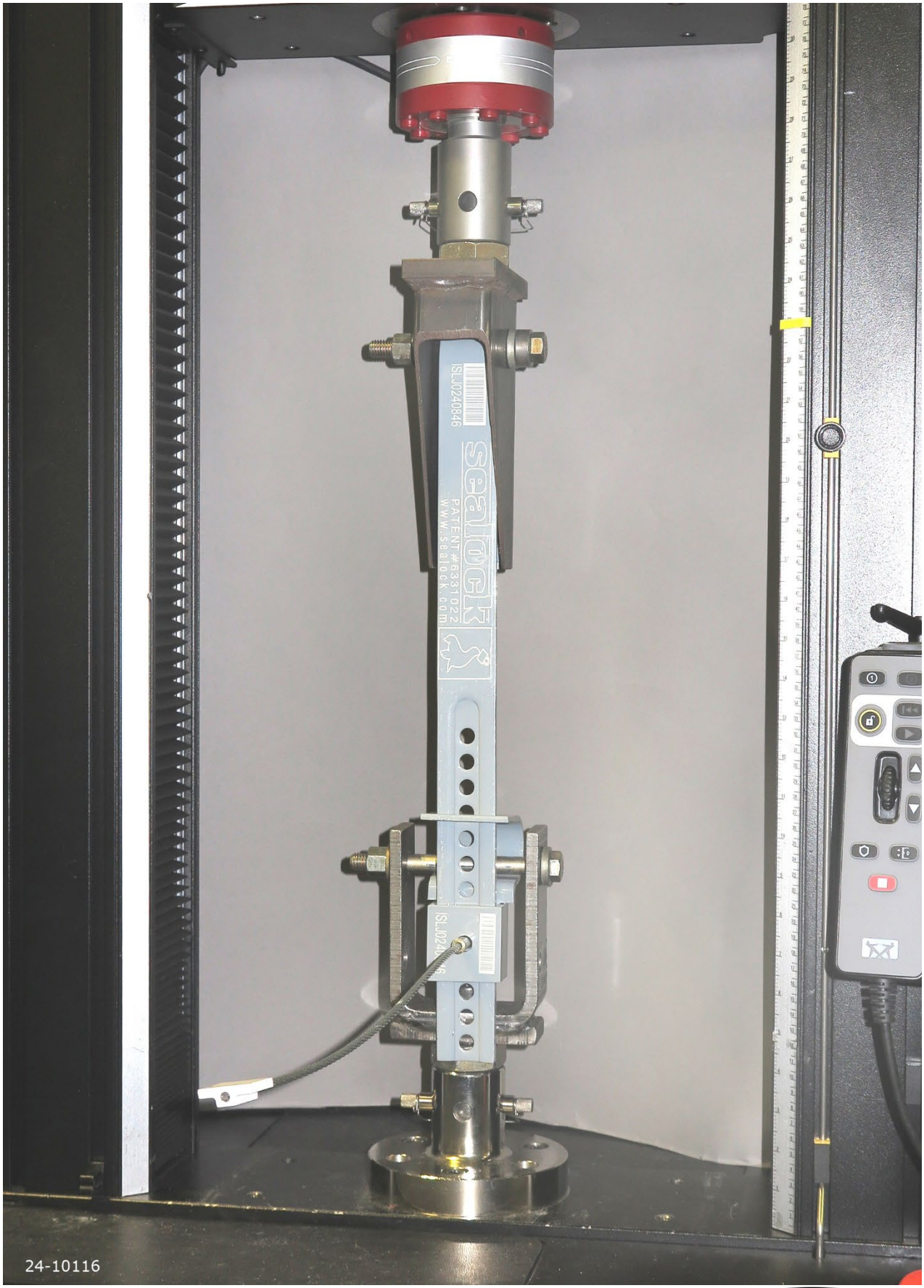
Specimen No.	Load (kN)	Class Rating	Remarks
ISLJ0240846	30.55	H	*
ISLJ0240847	30.47	H	*
ISLJ0240848	29.75	H	*
ISLJ0240849	31.22	H	*
ISLJ0240850	30.66	H	*

Tech: JT

* A post-test visual inspection of the test item revealed that the hook end of the seal partially straightened out over the upper support bolt and the locking end of the seal bent over the lower support bolt then broke due to testing.

Classification Key

Rating	Load to Failure
High Security (H):	10.0 kN
Security (S):	2.27 kN
Indicative (I):	<2.27 kN



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TYPICAL PHOTO OF THE TENSILE TEST SETUP

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Shear Test and Results

TEST REQUIREMENT

The shear test shall be conducted in accordance with reference (c).

TEST RESULTS

A pretest visual inspection of the test items revealed no anomalies.
All testing was performed in accordance with the referenced specification.
The travel rate during the test was 12.5 mm/min.
Test room ambient conditions: 20.9º C and 59.0% RH

TEST DATA Date: 9 January 2024

Shear Test at Room Temperature

Specimen No.	Load (kN)	Class Rating	Remarks
ISLJ0237806	8.896	H	*
ISLJ0237807	8.896	H	*
ISLJ0237808	8.896	H	*
ISLJ0237809	8.896	H	*
ISLJ0237810	8.896	H	*

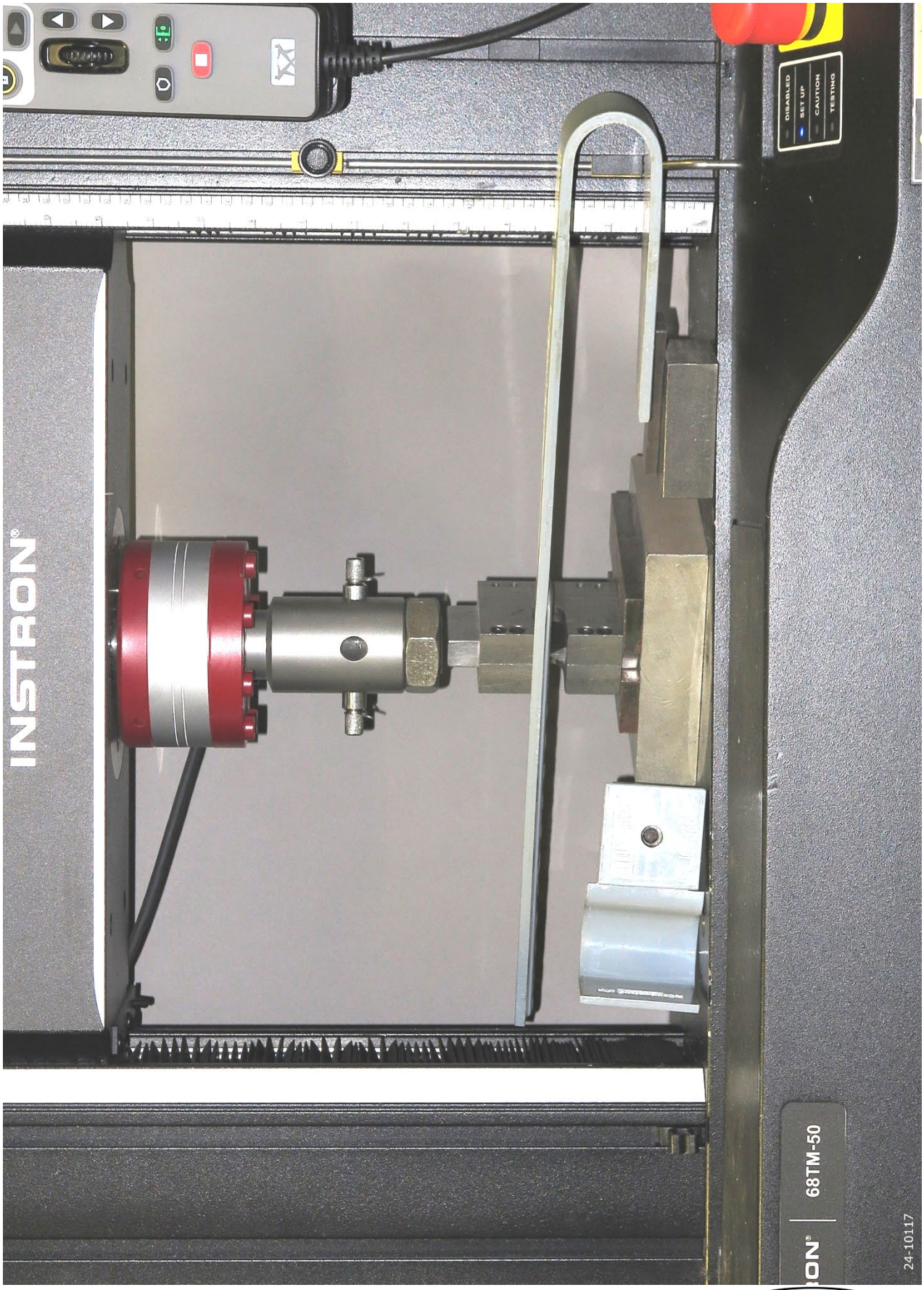
Tech: JB

* A post-test visual inspection of the test item revealed a slight indent on the bar due to testing.

Classification Key

Rating	Load to Failure
High Security: (H):	3.336 kN
Security (S):	2.224 kN
Indicative (I):	<2.224 kN

SAFETY PRECAUTIONS – Do not exceed a shear force greater than 8900 N (2001 lbf). If the specimen has not failed at that force, halt the test and unload the test equipment. Record a shear force of 8896 N (2000 lbf). Sudden and violent rupture of the test specimen can endanger personnel, equipment and property.



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TYPICAL PHOTO OF THE SHEAR TEST SETUP

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Bending Test and Results

TEST REQUIREMENT

The bending test shall be conducted in accordance with reference (c).

TEST RESULTS

A pretest visual inspection of the test items revealed no anomalies.
All testing was performed in accordance with the referenced specification.
The test was performed using a .300 m moment arm with a pull speed of 3 seconds.
Test room ambient conditions: 19.9º C and 40.5% RH

TEST DATA Date: 9 February 2024

Bending Test at Room Temperature

Specimen No.	Bending Moment (Nm)	Load Force (N)	Class Rating	Remarks
ISLJ0237811	300.0	1000.0	H	*
ISLJ0237812	300.0	1000.0	H	*
ISLJ0237813	300.0	1000.0	H	*
ISLJ0237814	300.0	1000.0	H	*
ISLJ0237815	300.0	1000.0	H	*

Tech: JB

* A post-test visual inspection of the test item revealed no anomalies due to testing.
Note: The maximum limit of the pull scale was reached; the test was stopped at that point.

Classification Key

Rating	Rigid Seals Moment to Failure
High Security (H):	50 Nm
Security (S):	22 Nm
Indicative (I):	<22 Nm

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TYPICAL PHOTO OF THE BENDING TEST SETUP

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Impact Test and Results

TEST REQUIREMENT

The impact test shall be conducted in accordance with reference (c).

TEST RESULTS

A pretest visual inspection of the test items revealed no anomalies.
All testing was performed in accordance with the referenced specification.
Test chamber conditions: 18.2º C and 14.5% RH

TEST DATA

Date: 5 January 2024

Impact Test at Room Temperature (required 18 ± 3°C)					
Specimen No.	Number of Successful Impacts Per Load (J)			Class Rating	Remarks
	13.56	27.12	40.68		
ISLJ0237816	5	5	5	H	*
ISLJ0237817	5	5	5	H	*
ISLJ0237818	5	5	5	H	*
ISLJ0237819	5	5	5	H	*
ISLJ0237820	5	5	5	H	*

Tech: JT

* A post-test visual inspection of the test item revealed that portions of the seal deformed due to testing. The lock of the seal remained intact.

Classification Key

Rating	Load to Failure (5 impacts at each load)	Dead Blow Weight (4 kg) Drop Height
High Security (H):	40.68 J	1.037 m
Security (S):	27.12 J	0.691 m
Indicative (I):	<27.12 J	0.346 m

Impact Test and Results

Test chamber conditions: -27.8º C and 65.9% RH

TEST DATA – (Continued) Date: 8 January 2024

Impact Test at Reduced Temperature (required -27 ± 3°C)					
Specimen No.	Number of Successful Impacts Per Load (J)			Class Rating	Remarks
	13.56	27.12	40.68		
ISLJ0240841	5	5	5	H	*
ISLJ0240842	5	5	5	H	*
ISLJ0240843	5	5	5	H	*
ISLJ0240844	5	5	5	H	*
ISLJ0240845	5	5	5	H	*

Tech: JT

* A post-test visual inspection of the test item revealed that portions of the seal deformed due to testing. The lock of the seal remained intact.

Classification Key

Rating	Load to Failure (5 impacts at each load)	Dead Blow Weight (4 kg) Drop Height
High Security (H):	40.68 J	1.037 m
Security (S):	27.12 J	0.691 m
Indicative (I):	<27.12 J	0.346 m

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TYPICAL PHOTO OF THE IMPACT TEST SETUP

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FILE NO. 24-10119

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Test equipment utilized for the program reported herein was within its assigned interval of calibration.
Details are on file at Dayton T. Brown, Inc. and will be made available upon request.

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TEST: FREIGHT CONTAINER MECHANICAL SEAL CLASSIFICATION TESTING

ITEM	MANUFACTURER	MODEL	DTB NO.	ACCURACY	CAL DUE DATE	LAST CAL DATE
THERMOTRON, 275	THERMOTRON	FX-82-CHV-25-25	04E-006	-	N.C.R.	-
CONDITIONING ROOM	DAYTON T. BROWN	N/A	04S-001	-	N.C.R.	-
DATA ACQUISITION SYSTEM, THERMOCOUPLE TYPE "T"	NATIONAL INSTRUMENTS	NI-4351	10-189	Mfr	04/07/2024	04/12/2023
RECORDER, CHART TRULINE	HONEYWELL	DR4500	12-12	Type T ± 0.7°F	03/17/2024	02/07/2023
LOGGER, RH AND TEMPERATURE	FLUKE	1620A	12-39	59 to 95°F ± 0.75°F; 10 to 70% RH ± 2% RH	02/04/2024	02/07/2023
CONTROLLER, ENVIRONMENTAL SYSTEM	JC SYSTEMS	620	25-55	RTD ± 1.08°F; RH ± 1% RH	03/17/2024	03/20/2023
TEST SYSTEM, DUAL COLUMN TABLE MODEL	INSTRON	68TM-50	29-70	Mfr	08/11/2024	08/17/2023
TRANSMITTER, TEMPERATURE & HUMIDITY	VAISALA	HMT335	31-178	± 1% RH (0 to 90 % RH) ± 1.7% RH (90 to 100 % RH)	04/21/2024	10/24/2023
TRANSMITTER, TEMPERATURE & HUMIDITY	VAISALA	HMT337	31-64	Mfr	03/10/2024	09/11/2023
WEIGHT, DEAD BLOW	DAYTON T. BROWN	JB-1	38-55	± 0.01 kgrams	05/26/2024	06/01/2022
TIMER, DIGITAL	FISHER SCIENTIFIC	14-649-17	47-55	± 8.64 Sec/24 hr	01/26/2025	01/31/2024
IMPACT TESTER, FREIGHT CONTAINER MECHANICAL	DAYTON T. BROWN	ISO 17712:2013	61-10	-	N.C.R.	-
GAUGE, DIGITAL FORCE 200 LB	CHATILLON	DFS2-200	61-14	± 0.1% of F.S.	06/16/2024	06/21/2023
PROTRACTOR, DIGITAL	PRO PRODUCTS	PRO 3600	68-279	± 0.05° (0° to 10°) ± 0.1° (80° to 90°) ± 0.2° (10° to 80°)	01/19/2025	01/24/2024
TAPE MEASURE, 16'/5m X 3/4"	LUFKIN	HV1035CME	68-349	± 0.03125"	03/16/2025	03/16/2023
FIXTURE, SHACKLE CUTTING AND 2 BLADES	DAYTON T. BROWN	ISO 17712:2013	68-492	Mfr	01/12/2025	01/17/2024

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MODEL NO. SEALOCK SL BARRIER SEAL

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FILE NO. 24-10120

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