



ENGINEERING AND TEST DIVISION
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TEST REPORT NO.: 419428-01-04-R24-0285

DAYTON T. BROWN, INC. JOB NO.: 419428-01-000


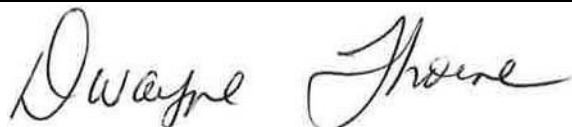
CUSTOMER: NOVAVISION LLC
524 EAST WOODLAND CIRCLE
BOWLING GREEN, OH 43402
USA

SUBJECT: FREIGHT CONTAINER MECHANICAL SEAL CLASSIFICATION TESTING
PER ISO 17712:2013 (E) CLAUSE 5,
CONDUCTED ON 25 CABLE SEALS, MODEL NO. SEALOCK SL-C,
SERIAL NOS. KSM 959371 THROUGH KSM 959395

PURCHASE ORDER NO.: PO-52524

ATTENTION: STEPHANIE BOWE / BILL SCHOENHERR

SEAL CLASSIFICATION: HIGH SECURITY

TEST ADMINISTRATOR	 J. BENINCASA
QUALITY DEPARTMENT	 D. THORNE
DATE	8 APRIL 2024

INFORMATION CONTAINED HEREIN MAY BE SUBJECT TO EXPORT CONTROL LAWS. REFER TO INTERNATIONAL TRAFFIC IN ARMS REGULATION (ITAR) OR THE EXPORT ADMINISTRATION REGULATION (EAR) OF 1979. IT IS THE RESPONSIBILITY OF THE RECIPIENT TO OBTAIN ANY REQUIRED LICENSES TO EXPORT ANY CONTROLLED DATA.

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



REVISION HISTORY

Revision	Date	Section Affected	Change
--	04/08/2024	--	--

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1.0 ABSTRACT

This test report details the results of freight container mechanical seal classification testing conducted on Cable 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.

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-52524
- (b) Dayton T. Brown, Inc. Job No.: 419428-01-000
- (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

<u>Customer</u>	NovaVision LLC 524 East Woodland Circle Bowling Green, OH 43402 USA
Sample Type	Cable Seal
Sample Name	5mm Cable Seal (as provided by customer)
Model No.	Sealock SL-C (as provided by customer)
Part No.	SL-C-MS-5.0-62O (as provided by customer)
Serial Nos.	KSM 959371 through KSM 959395
Quantity Received	30
Quantity Tested	25
Date Received	21 March 2024
Date Tested	2 April 2024

5.0 TEST PROGRAM OUTLINE

Test	Test Item Description	Results
Tensile	Model No. Sealock SL-C Cable Seals, Serial Nos. KSM 959371 through KSM 959375	See Page 6.
Shear	Model No. Sealock SL-C Cable Seals, Serial Nos. KSM 959376 through KSM 959380	See Page 8.
Bending	Model No. Sealock SL-C Cable Seals, Serial Nos. KSM 959381 through KSM 959385	See Page 10.
Impact	Model No. Sealock SL-C Cable Seals, Serial Nos. KSM 959386 through KSM 959395	See Pages 12 and 13.
Test Equipment List and Test Item Photo	Model No. Sealock SL-C Cable 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 50.8 mm/min.
Test room ambient conditions: 19.7° C and 51.4% RH

TEST DATA

Date: 2 April 2024

Tensile Test at Room Temperature			
Specimen No.	Load (kN)	Class Rating	Remarks
KSM 959371	23.87	H	*
KSM 959372	23.27	H	**
KSM 959373	23.93	H	**
KSM 959374	23.11	H	*
KSM 959375	23.29	H	**

Tech: JB

* A post-test visual inspection of the test item revealed that the cable broke near the lock mechanism due to testing.

** A post-test visual inspection of the test item revealed that the cable broke near the lock mechanism and 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

2 APRIL 2024
FILE NO. 24-10232



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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: 20.2° C and 50.4% RH

TEST DATA

Date: 2 April 2024

Shear Test at Room Temperature			
Specimen No.	Load (kN)	Class Rating	Remarks
KSM 959376	8.896	H	*
KSM 959377	8.896	H	**
KSM 959378	8.896	H	**
KSM 959379	8.896	H	**
KSM 959380	8.896	H	*

Tech: JB

* A post-test visual inspection of the test item revealed the cutting blades left an indent on the cable and cut a few strands due to testing.

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

Classification Key

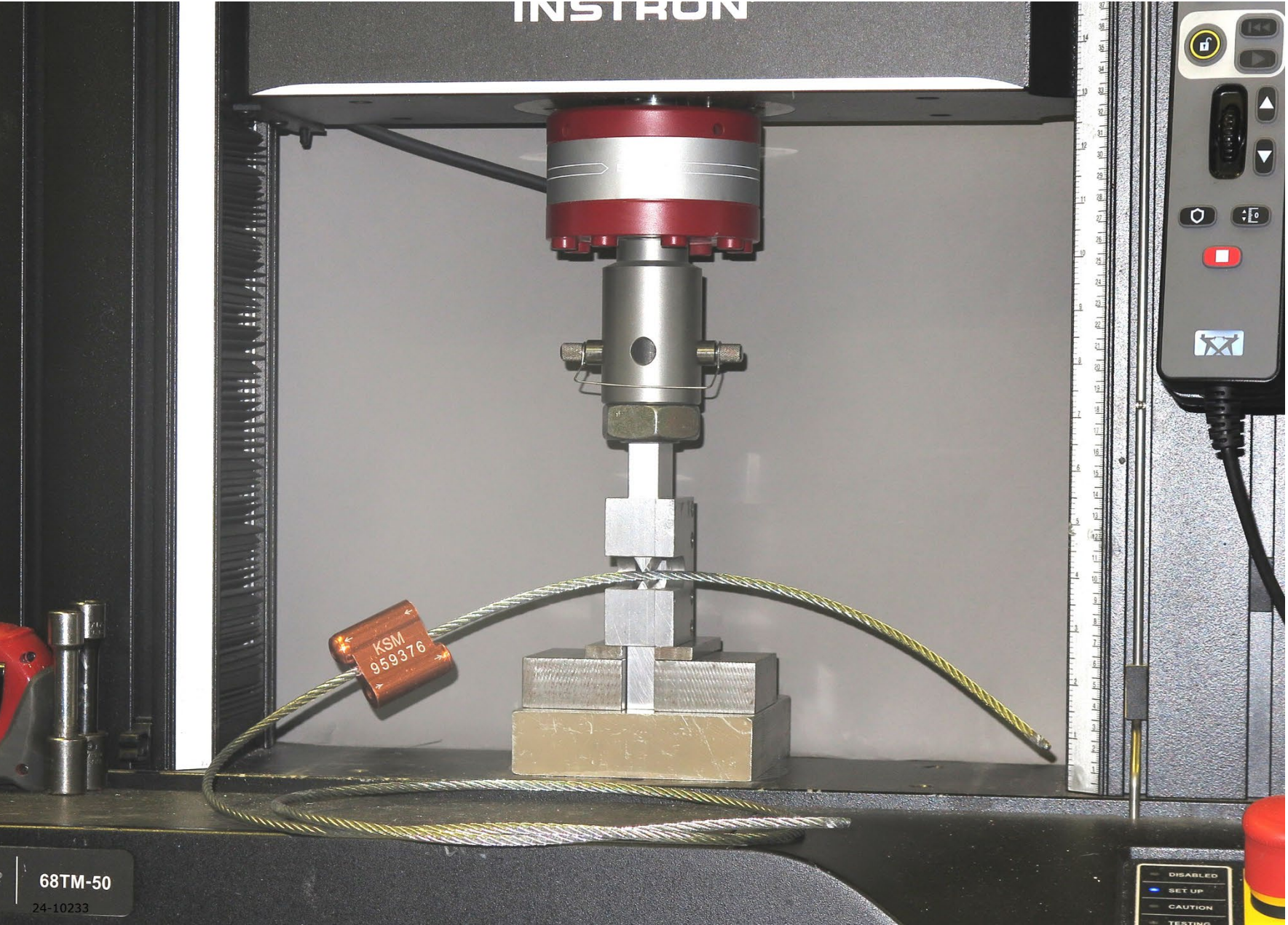
Rating Load to Failure

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 SE UP

2 APRIL 2024

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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 bending time of 3 seconds/cycle.
Test room ambient conditions: 20.0° C and 53.3% RH

TEST DATA

Date: 2 April 2024

Bending Test at Room Temperature			
Specimen No.	Flex Cycles	Class Rating	Remarks
KSM 959381	>501	H	*
KSM 959382	>501	H	*
KSM 959383	>501	H	*
KSM 959384	>501	H	*
KSM 959385	>501	H	*

Tech: JB

* A post-test visual inspection of the test item revealed no anomalies due to testing.

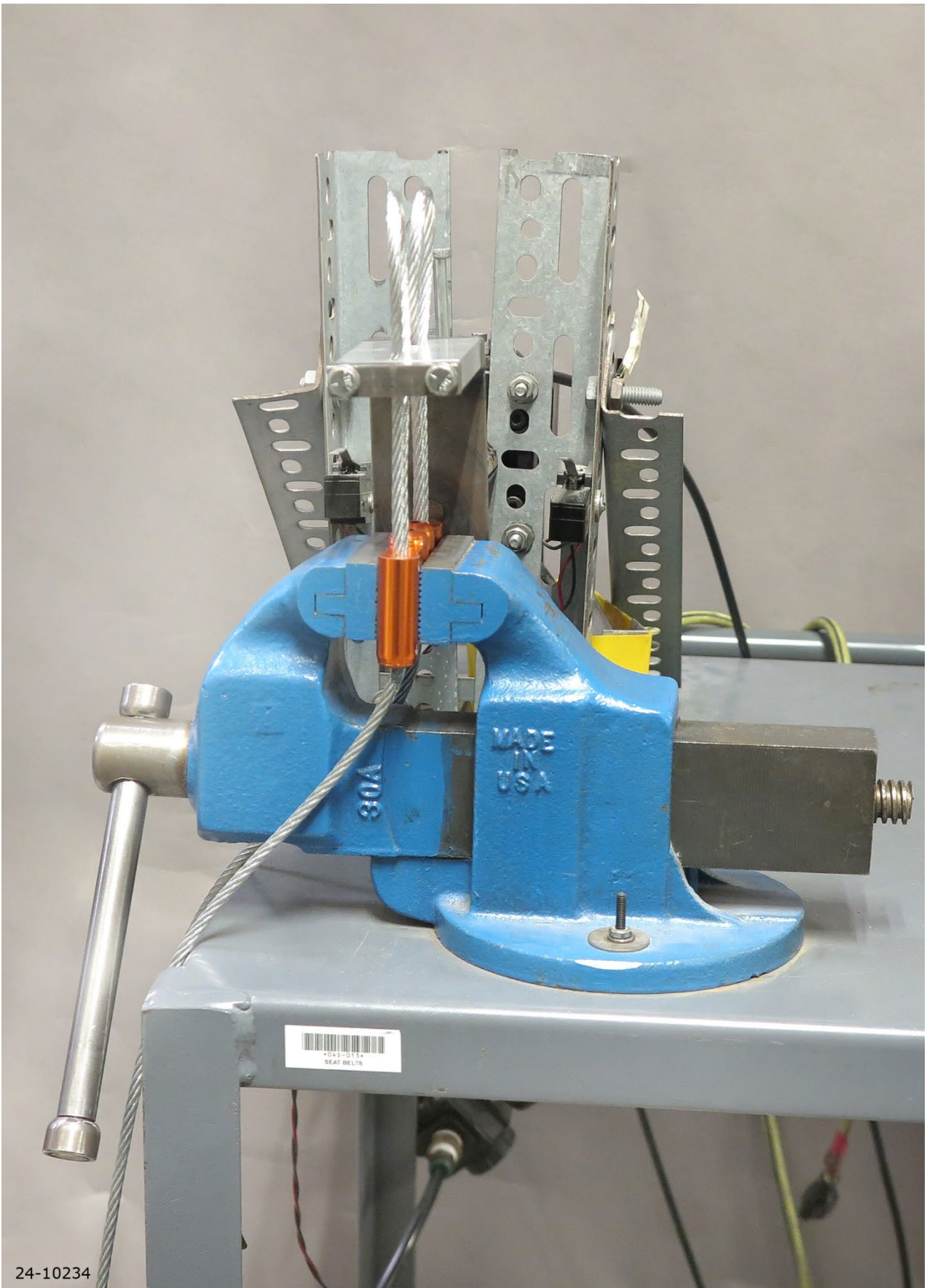
Classification Key

Rating Flexible Seals
 Cycles to Failure

High Security (H): 501

Security (S): 251

Indicative (I): <251



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TYPICAL PHOTO OF THE BENDING TEST SETUP

2 APRIL 2024
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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: 17.8° C and 36.5% RH

TEST DATA

Date: 2 April 2024

Impact Test at Room Temperature (required $18 \pm 3^{\circ}\text{C}$)					
Specimen No.	Number of Successful Impacts Per Load (J)			Class Rating	Remarks
	13.56	27.12	40.68		
KSM 959386	5	5	5	H	*
KSM 959387	5	5	5	H	*
KSM 959388	5	5	5	H	*
KSM 959389	5	5	5	H	*
KSM 959390	5	5	5	H	*

Tech: JB

* A post-test visual inspection of the test item revealed that the support bolt left a slight dent on top of the lock body of the seal due to testing. The cable and 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: -26.8° C and 65.7% RH

TEST DATA – (Continued)

Date: 2 April 2024

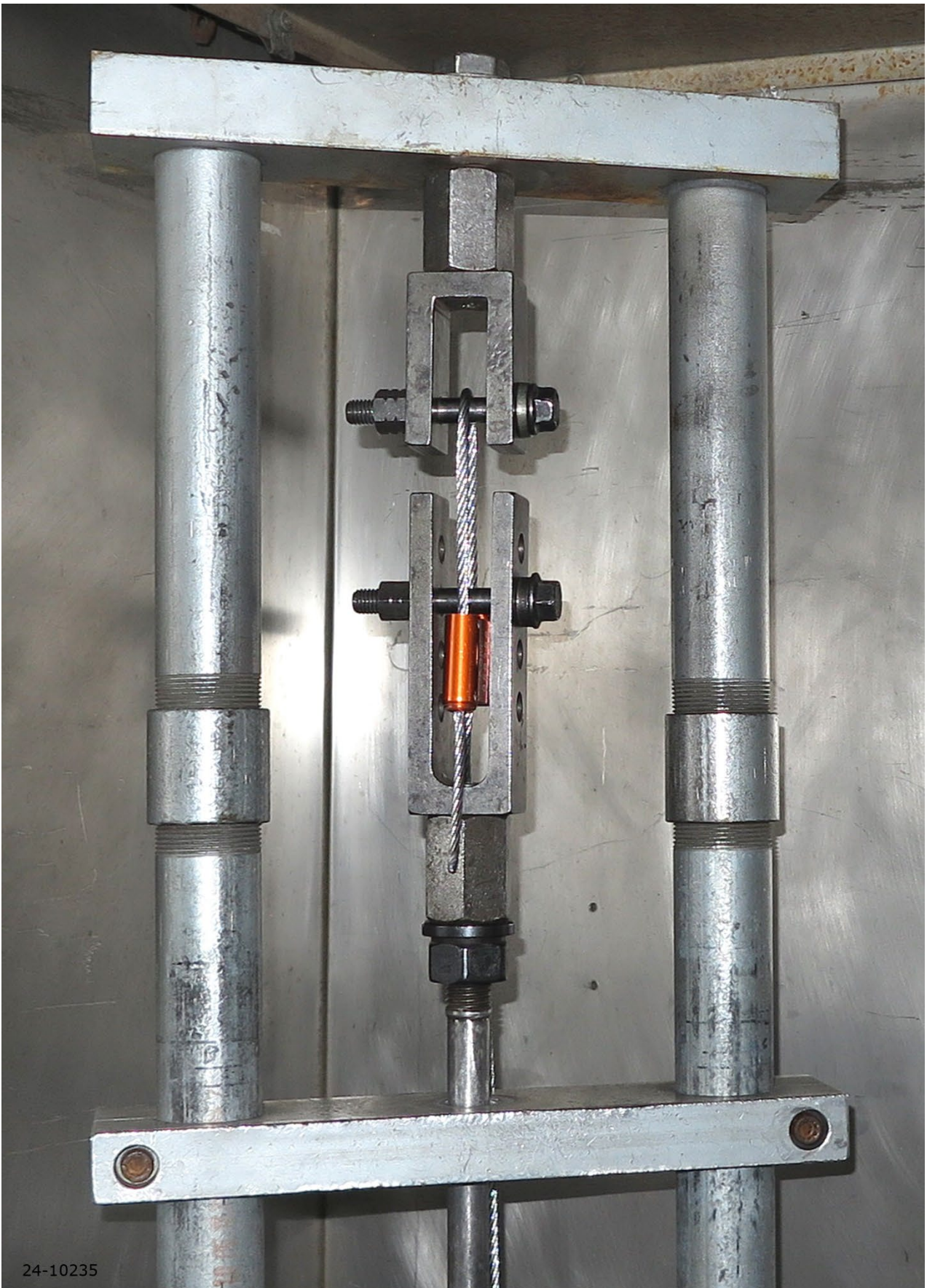
Impact Test at Reduced Temperature (required -27 ± 3°C)					
Specimen No.	Number of Successful Impacts Per Load (J)			Class Rating	Remarks
	13.56	27.12	40.68		
KSM 959391	5	5	5	H	*
KSM 959392	5	5	5	H	*
KSM 959393	5	5	5	H	*
KSM 959394	5	5	5	H	*
KSM 959395	5	5	5	H	*

Tech: JB

* A post-test visual inspection of the test item revealed that the support bolt left a slight dent on top of the lock body of the seal due to testing. The cable and 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 SE UP

2 APRIL 2024

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TEST: FREIGHT CONTAINER MECHANICAL SEAL CLASSIFICATION TESTING

<u>ITEM</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>DTB NO.</u>	<u>ACCURACY</u>	<u>CAL DUE DATE</u>	<u>LAST CAL DATE</u>
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.	-
TEST FIXTURE, CABLE SEAL BEND WITH COUNTER	DAYTON T. BROWN	JB-2	04S-013	-	N.C.R.	-
RECORDER, CHART TRULINE	HONEYWELL	DR4500	12-12	Type T $\pm 0.7^{\circ}\text{F}$	03/16/2025	03/21/2024
LOGGER, RH AND TEMPERATURE	FLUKE	1620A	12-39	59 to 95°F $\pm 0.75^{\circ}\text{F}$; 10 to 70% RH $\pm 2\%$ RH	02/09/2025	02/09/2024
TAPE MEASURE, 26 FEET/8 METERS	STARRETT	TX1-26ME	15-100	± 1 mm	06/02/2024	06/06/2023
CONTROLLER, ENVIRONMENTAL SYSTEM	JC SYSTEMS	620	25-55	RTD $\pm 1.08^{\circ}\text{F}$; RH $\pm 1\%$ RH	03/16/2025	03/21/2024
TEST SYSTEM, DUAL COLUMN TABLE MODEL	INSTRON	68TM-50	29-70	Mfr	08/11/2024	08/17/2023
TRANSMITTER, HUMIDITY AND TEMPERATURE	VAISALA	HMP235	31-90	$\pm 2\%$ 10 to 95% RH	04/14/2024	01/18/2024
WEIGHT, DEAD BLOW	DAYTON T. BROWN	JB-1	38-55	± 0.01 kilograms	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.	-
PROTRACTOR, DIGITAL	PRO PRODUCTS	PRO 3600	68-279	$\pm 0.05^{\circ}$ (0° to 10°) $\pm 0.1^{\circ}$ (80° to 90°) $\pm 0.2^{\circ}$ (10° to 80°)	01/19/2025	01/24/2024
CALIPER, DIGITAL 4"	MITUTOYO	500-195-20	68-466	± 0.001 "	08/25/2024	08/30/2023
FIXTURE, SHACKLE CUTTING AND 2 BLADES	DAYTON T. BROWN	ISO 17712:2013	68-492	Mfr	01/12/2025	01/17/2024
MICROMETER, DIGIMATIC OUTSIDE 1" COOLANT PROOF	MITUTOYO	293-335-30	68-502	± 0.00005 "	11/02/2025	11/06/2023



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MODEL NO. SEALOCK SL-C CABLE SEAL

2 APRIL 2024

FILE NO. 24-10236

