



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

TEST REPORT NO.: 414655-01-04-R15-0615

DAYTON T. BROWN, INC. JOB NO.: 414655-01-000



CUSTOMER: SHANGHAI XINFAN INDUSTRIAL CORPORATION
ROOM 201, NO. 768 CHANG AN ROAD
SHANGHAI
CHINA

SUBJECT: FREIGHT CONTAINER MECHANICAL SEAL CLASSIFICATION TESTING
PER ISO 17712:2013 (E) CLAUSES: 4.1.3 AND 5,
CONDUCTED ON 26 BOLT SEALS, MODEL NO. NEW TSS-BS02,
SERIAL NOS. DTB 1 THROUGH DTB 26

PURCHASE ORDER NO.: 201508001

ATTENTION: FIFI CHEN

SEAL CLASSIFICATION: HIGH SECURITY

| | |
|----------------------|--|
| PREPARED BY |  J. BENINCASA |
| TEST ENGINEER |  T. ZIMOULIS |
| DATE | 18 AUGUST 2015 |

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

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



Cert # 0767.01, 0767.02, 0767.03



REVISION HISTORY

| Revision | Date | Section Affected | Change |
|----------|------------|------------------|--------|
| -- | 08/18/2015 | -- | -- |
| | | | |
| | | | |
| | | | |
| | | | |



TABLE OF CONTENTS

| <u>Subject</u> | <u>Paragraph</u> | <u>Page No.</u> |
|---|------------------|-----------------|
| Abstract | 1.0 | 4 |
| References | 2.0 | 4 |
| Seal Classification | 3.0 | 4 |
| Administrative Information | 4.0 | 5 |
| Test Program Outline | 5.0 | 5 |
| Test Results | 6.0 | 6 |
| | | <u>Page No.</u> |
| Bolt Seal Diameter Qualification Test and Results | | 6 |
| Tensile Test and Results | | 8 |
| Shear Test and Results | | 10 |
| Bending Test and Results | | 12 |
| Impact Test and Results | | 14 |
| Test Equipment List | | 17 |
| Test Item Photo | | 18 |



1.0 ABSTRACT

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

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 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.: 201508001
- (b) Dayton T. Brown, Inc. Job No.: 414655-01-000
- (c) Test Specification: ISO 17712:2013 (E) Clauses: 4.1.3 and 5

3.0 SEAL CLASSIFICATION

ISO 17712:2013 (E): (H)-High Security for Clauses: 4.1.3 and 5



4.0 ADMINISTRATIVE INFORMATION

| | |
|-------------------|--|
| Customer | Shanghai Xinfan Industrial Corporation Room 201, No. 768 Chang An Road Shanghai China |
| Sample Type | Bolt Seal |
| Sample Name | High Security Bolt Seals (as provided by customer) |
| Model No. | NEW TSS-BS02 (as provided by customer) |
| Serial Nos. | DTB 1 through DTB 26 |
| Quantity Received | 30 |
| Quantity Tested | 26 |
| Date Received | 4 August 2015 |
| Dates Tested | 13 and 14 August 2015 |

5.0 TEST PROGRAM OUTLINE

| Test | Test Item Description | Results |
|---|---|----------------------|
| Bolt Seal Diameter Qualification | Model No. NEW TSS-BS02 Bolt Seal, Serial No. DTB 26 | See Page 6. |
| Tensile | Model No. NEW TSS-BS02 Bolt Seals, Serial Nos. DTB 1 through DTB 5 | See Page 8. |
| Shear | Model No. NEW TSS-BS02 Bolt Seals, Serial Nos. DTB 6 through DTB 10 | See Page 10. |
| Bending | Model No. NEW TSS-BS02 Bolt Seals, Serial Nos. DTB 11 through DTB 15 | See Page 12. |
| Impact | Model No. NEW TSS-BS02 Bolt Seals, Serial Nos. DTB 16 through DTB 25 | See Pages 14 and 15. |
| Test Equipment List and Test Item Photo | Model No. NEW TSS-BS02 Bolt Seal | See Pages 17 and 18. |



6.0 TEST RESULTS

4.1.3 - Bolt Seal Diameter Qualification Test and Results

TEST REQUIREMENT

The Bolt Seal Diameter Qualification test shall be conducted in accordance with reference (c).

TEST RESULTS

All testing was performed in accordance with the referenced specification.

TEST DATA

Date: 13 August 2015

| Bolt Seal Diameter Qualification Test at Room Temperature | | | |
|---|------------------|-----------|--------------------|
| Specimen No. | Measurement (mm) | | Remarks |
| | Pin Head | Lock Body | |
| DTB 26 | 18.21 | 18.06 | Meets Requirements |

Tech: JB

Test Requirements

The minimum diameter (or minimum widest cross-dimension) for the metal components of a bolt seal shall be 18mm.



JOB NO. 414655-01-000
414655-01-04-R134615

13 AUGUST 2015
TYPICAL PHOTO OF THE BOLT SEAL DIAMETER QUALIFICATION TEST SETUP
FILE NO. 15-10475



15-0615 Pg 7 of 18
This document is digitally signed and certified to ensure content integrity and author's authenticity.
See cover page for Digital Signature.



5.2 - 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.
 Test room ambient conditions: 20.5°C and 46.7%RH

TEST DATA

Date: 14 August 2015

| Tensile Test at Room Temperature | | | |
|----------------------------------|-----------|--------------|---------|
| Specimen No. | Load (kN) | Class Rating | Remarks |
| DTB 1 | 23.41 | H | * |
| DTB 2 | 22.63 | H | * |
| DTB 3 | 23.01 | H | * |
| DTB 4 | 20.10 | H | * |
| DTB 5 | 21.12 | H | * |

Tech: JB

* A post-test visual inspection of the test item revealed that the bolt pulled out of the lock mechanism 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 |



15-10476

JOB NO. 414655-01-000
414655-01-04-R15-0615

TYPICAL PHOTO OF THE TENSILE TEST SETUP

14 AUGUST 2015
FILE NO. 15-10476



15-0615 Pg 9 of 18

*This document is digitally signed and certified to ensure content integrity and author's authenticity.
See cover page for Digital Signature.*



5.3 - 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.
Test room ambient conditions: 20.5°C and 45.4%RH

TEST DATA

Date: 14 August 2015

| Shear Test at Room Temperature | | | |
|--------------------------------|-----------|--------------|---------|
| Specimen No. | Load (kN) | Class Rating | Remarks |
| DTB 6 | 8.896 | H | * |
| DTB 7 | 8.896 | H | * |
| DTB 8 | 8.896 | H | * |
| DTB 9 | 8.896 | H | * |
| DTB 10 | 8.896 | H | * |

Tech: JB

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

Classification Key

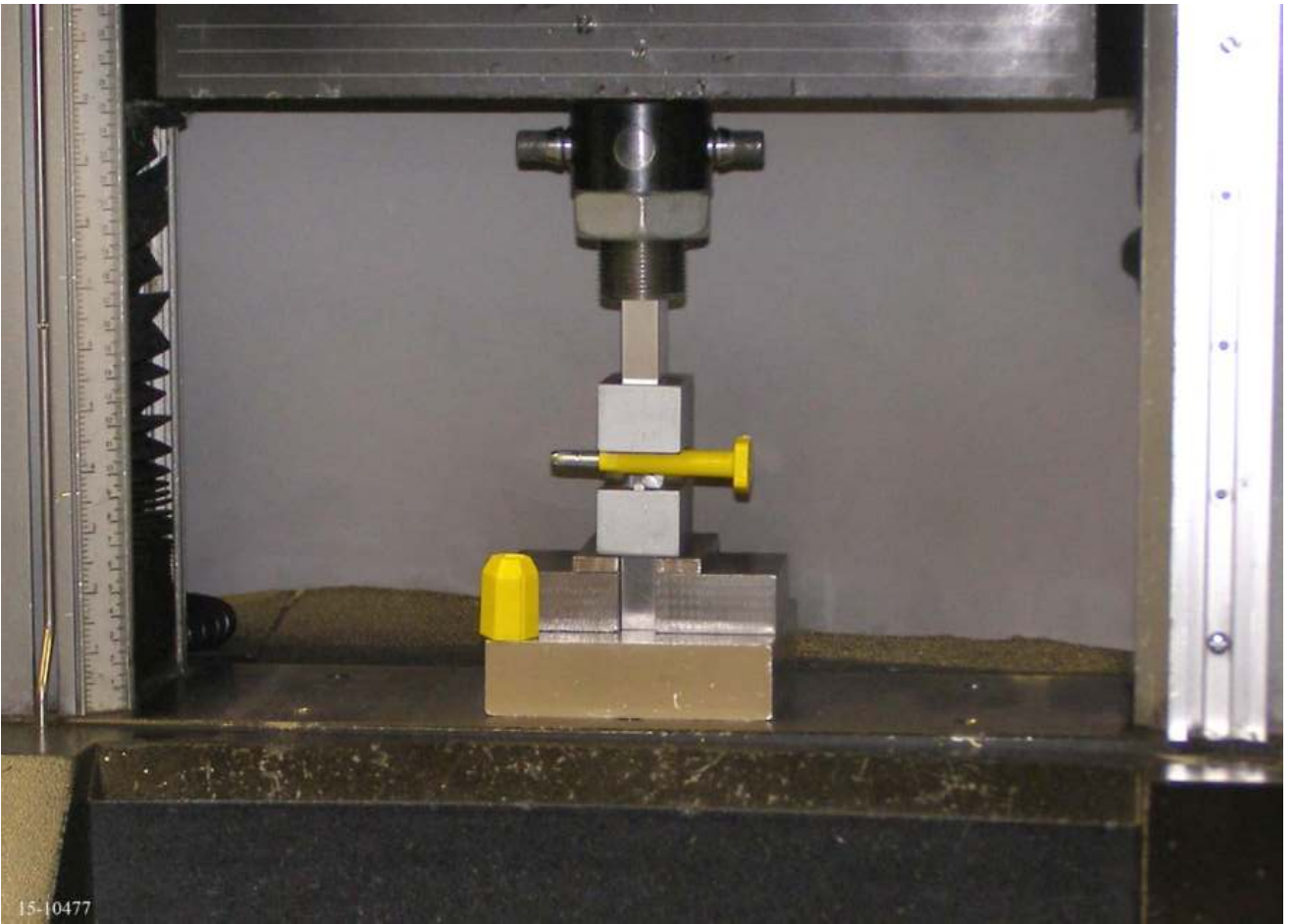
Rating Load to Failure

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.



JOB NO. 414655-01-000
414655-01-04-R15-0615

TYPICAL PHOTO OF THE SHEAR TEST SETUP

14 AUGUST 2015
FILE NO. 15-10477

15-0615 Pg 11 of 18

This document is digitally signed and certified to ensure content integrity and author's authenticity. See cover page for Digital Signature.



15-10477



5.4 - 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.
Test room ambient conditions: 20.5°C and 45.7%RH

TEST DATA

Date: 14 August 2015

| Bending Test at Room Temperature | | | |
|----------------------------------|-----------------|--------------|---------|
| Specimen No. | Load Force (Nm) | Class Rating | Remarks |
| DTB 11 | 59.06 | H | * |
| DTB 12 | 58.97 | H | * |
| DTB 13 | 60.35 | H | * |
| DTB 14 | 57.77 | H | * |
| DTB 15 | 59.14 | H | * |

Tech: JB

* A post-test visual inspection of the test item revealed that the shaft of the seal bent due to testing.

Classification Key

Rating Rigid Seals
 Moment to Failure

High Security (H): 50 Nm
Security (S): 22 Nm
Indicative (I): <22 Nm



JOB NO. 414655-01-000
414655-01-04-R15-0615

TYPICAL PHOTO OF THE BENDING TEST SETUP

14 AUGUST 2015
FILE NO. 15-10478



15-10478



5.5 - 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: 17.9°C and 61.1%RH

TEST DATA

Date: 13 August 2015

| 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 | | |
| DTB 16 | 5 | 5 | 5 | H | * |
| DTB 17 | 5 | 5 | 5 | H | * |
| DTB 18 | 5 | 5 | 5 | H | * |
| DTB 19 | 5 | 5 | 5 | H | * |
| DTB 20 | 5 | 5 | 5 | H | * |

Tech: JB

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

Classification Key

Rating Load to Failure
 (5 impacts at each load)

High Security (H): 40.68 J
 Security (S): 27.12 J
 Indicative (I): <27.12 J



5.5 - Impact Test and Results

Test chamber conditions: -26.7°C and 54.6%RH

TEST DATA – (Continued)

Date: 13 August 2015

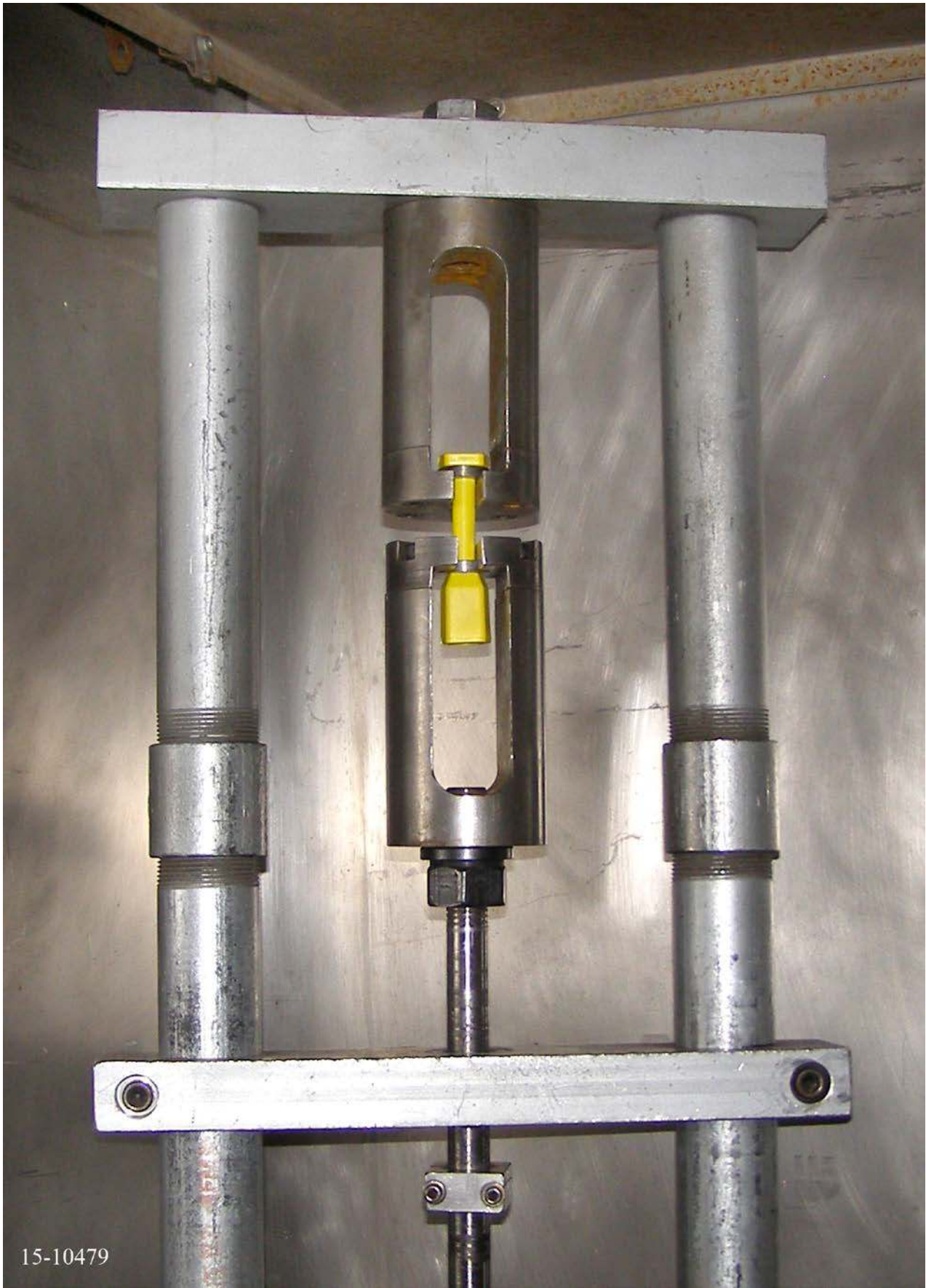
| Impact Test at Reduced Temperature (required $-27 \pm 3^{\circ}\text{C}$) | | | | | |
|--|---|-------|-------|--------------|---------|
| Specimen No. | Number of Successful Impacts Per Load (J) | | | Class Rating | Remarks |
| | 13.56 | 27.12 | 40.68 | | |
| DTB 21 | 5 | 5 | 5 | H | * |
| DTB 22 | 5 | 5 | 5 | H | * |
| DTB 23 | 5 | 5 | 5 | H | * |
| DTB 24 | 5 | 5 | 5 | H | * |
| DTB 25 | 5 | 5 | 5 | H | * |

Tech: JB

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

Classification Key

| Rating | Load to Failure (5 impacts at each load) |
|--------------------|---|
| High Security (H): | 40.68 J |
| Security (S): | 27.12 J |
| Indicative (I): | <27.12 J |



15-10479

JOB NO. 414655-01-000
414655-01-04-R15-0615

TYPICAL PHOTO OF THE IMPACT TEST SETUP

13 AUGUST 2015
FILE NO. 15-10479

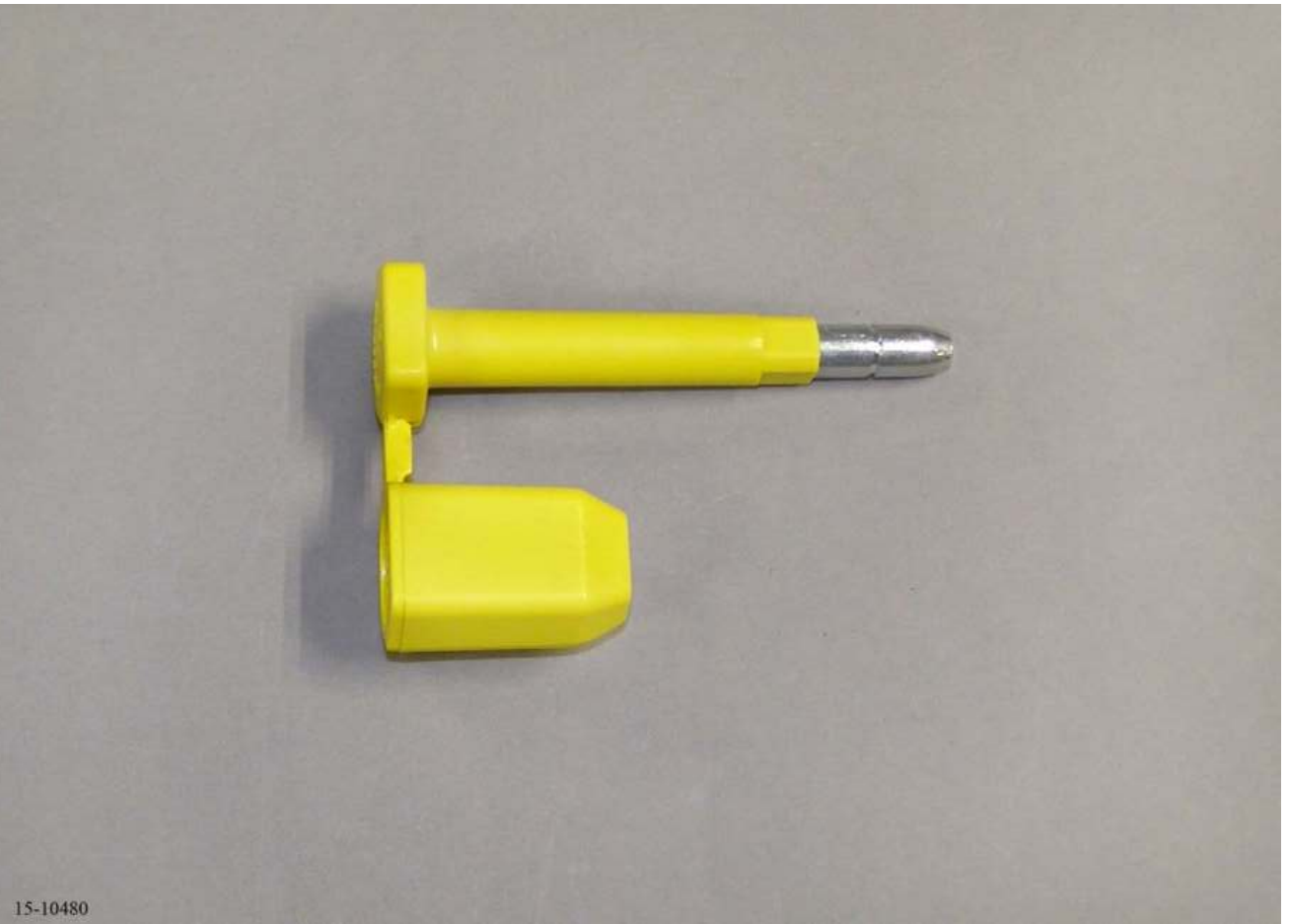


15-0615 Pg 16 of 18

*This document is digitally signed and certified to ensure content integrity and author's authenticity.
See cover page for Digital Signature.*



| TEST: FREIGHT CONTAINER MECHANICAL SEAL CLASSIFICATION TESTING | | | | | | |
|--|-------------------|-----------------|---------|--|---------------|--------------|
| Item | Manufacturer | Model | DTB No. | Accuracy | Last Cal Date | Cal Due Date |
| THERMOTRON, 275 | THERMOTRON | FX-82-CHV-25-25 | 04E-006 | N/A | - | N.C.R. |
| CONDITIONING ROOM | DAYTON T. BROWN | N/A | 04S-001 | N/A | - | N.C.R. |
| RECORDER, CHART TRULINE | HONEYWELL | DR4500 | 12-12 | TYPE T $\pm 0.7^{\circ}\text{F}$ | 09/29/2014 | 09/27/2015 |
| LOGGER, RH AND TEMPERATURE | HART SCIENTIFIC | 1620A | 12-39 | 59 TO 95 $^{\circ}\text{F}$ $\pm 0.75^{\circ}\text{F}$; 10 TO 70% RH $\pm 2\%$ RH | 12/02/2014 | 11/29/2015 |
| CONTROLLER, ENVIRONMENTAL SYSTEM | JC SYSTEMS | 620 | 25-55 | RTD $\pm 1.08^{\circ}\text{F}$, RH $\pm 1\%$ RH | 03/12/2015 | 03/06/2016 |
| TESTER, UNIVERSAL TENSILE W/STATIC LOAD CELLS (2) | INSTRON | 5569 | 29-2 | $\pm 1\%$ OF READING | 07/13/2015 | 07/10/2016 |
| TRANSMITTER, HUMIDITY AND TEMPERATURE | VAISALA | HMP235 | 31-132 | $\pm 2\%$ 10 TO 95% RH | 06/03/2015 | 11/29/2015 |
| WEIGHT, DEAD BLOW | DAYTON T. BROWN | JB-1 | 38-55 | ± 0.01 KGRAMS | 05/30/2014 | 05/29/2016 |
| TIMER, DIGITAL | FISHER SCIENTIFIC | 14-649-17 | 47-55 | ± 8.64 Sec/24 hr | 05/06/2015 | 05/01/2016 |
| IMPACT TESTER, FREIGHT CONTAINER MECHANICAL SEAL | DAYTON T. BROWN | ISO 17712:2013 | 61-10 | N/A | - | N.C.R. |
| GAUGE, DIGITAL FORCE 50 LBS. FULL SCALE | CHATILLON | DFS-050 | 61-8 | $\pm 0.5\%$ OF FULL SCALE | 07/22/2014 | 08/19/2015 |
| FIXTURE, SHACKLE CUTTING AND 2 BLADES | DAYTON T. BROWN | ISO 17712:2013 | 68-318 | MFR | 11/21/2014 | 11/15/2015 |
| CALIPER, DIGITAL 4" | MITUTOYO | 500-195-20 | 68-466 | ± 0.001 " | 02/18/2015 | 02/14/2016 |
| TAPE MEASURE, 16' X 3/4" | LUFKIN | HV1035CME | 68-486 | $\pm 1/16$ " | 12/04/2013 | N.P.C.R. |



JOB NO. 414655 - 01-000
414655-01-04-R15-0615

MODEL NO. NEW TSS-BS02 BOLT SEAL

13 AUGUST 2015
FILE NO. 15-10480



15-0615 Pg 18 of 18
*This document is digitally signed and certified to ensure content integrity and author's authenticity.
See cover page for Digital Signature.*