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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Test Document No.: VPS-F-003-23

Requested by: Viking Packing Specialist
Performed by: Viking Packing Specialist
Manufactured by: Viking Packing Specialist

Date: 6-23-2023 Retest Date: 6-22-2025

1. Product Tested:

Packaging Nomenclature: Combination Packaging

Outer Package: 4G corrugated box (see Appendix A)

Dimensions: 9.5" x 7.5" x 13" I.D.

Inner Package: See appendix B for approved inners

Maximum gross wt. (kg): 14 kg Viking Part No.: VPS-F-003

Customer Part No.: N/A

2. Object of Test:

Determine performance of package design according to PASS/FAIL criteria set forth by the United States Code of Federal Regulations Title 49 sections 178.603, 178.606, 178.608, and 178.516 to Packing Group II standards.

3. Tests Performed:

TEST	SPEC	INTENSITY	RESULTS
Drop	49 CFR 178.603	14 kg	PASS
Stacking	49 CFR 178.606	112 kg	PASS
Vibration	49 CFR 178.608	1 Hour	PASS

Viking Packing Specialist certifies that samples of the package described in this report were tested as described above and met all testing requirements. This package is also certified under IMDG, ICAO, IATA, and the UN Recommendations on the Transport of Dangerous Goods. It is the responsibility of the end user to determine authorization of use under these regulations. The use of other packaging methods or components other than those documented in this report may render this certification invalid.

Certified By:

Special Projects & DG Manager
Eric Curtis

Approved By:
President
David Weilert

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TEST METHODS & RESULTS

The packages were conditioned at 23° C (\pm 2° C) and 50% (\pm 2%) RH for 24 hours immediately prior to testing, per 49 CFR 178.602(d)(1).

1. DROP TEST- 49 CFR 178.603

Five (5) filled packages, closed as for shipment, were subjected to a free fall drop from 1.2 meters (3.9 feet) as required.

Containers	Point of Impact	Result
#1	Flat onto the bottom panel	PASS
#2	Flat onto the top panel	PASS
#3	Flat onto the long side panel	PASS
#4	Flat onto the short side panel	PASS
#5	Onto the bottom manufacturer's joint corner	PASS

2. STACKING TEST- 49 CFR 178.606

Three (3) filled containers were closed as for shipment and subjected to a static compression load of 112 kg, equivalent to a 3-meter-high stack of identical packages, continuously for 24 hours.

Containers	Actual Load	Result
#1	112 kg	PASS
#2	112 kg	PASS
#3	112 kg	PASS

3. VIBRATION STANDARD- 49 CFR 178.608

Three (3) filled samples, closed as for shipment, were placed on a vibration platform having 25.4 mm peak-to-peak displacement and vibrated in normal shipping orientation for one (1) hour such that a 1.6 mm thick piece of material could be passed between the bottom of the samples and the platform. Immediately thereafter, the packages were removed from the platform, turned over and examined for leakage.

Containers	Vibration	Result
#1	1 HOUR	PASS
#2	1 HOUR	PASS
#3	1 HOUR	PASS

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4. 4G STANDARD- 49 CFR 178.516

The outer fiberboard box was tested for water resistance at the paper manufacturer's facility, in accordance with ISO International Standard 535. The increase in mass as determined over a thirty (30) minute period by the Cobb method was determined to be less than or equal to (\le) 155 g/sq m as follows:

Container Outer	Water Absorption	Result
Surface	Available upon request	PASS

5. Packaging tested, certified, and provided by Viking Packing Specialist bear the marking:



**Denotes two-digit year of manufacture

See appendices for additional information regarding this report. Information is included as follows.

- Appendix A Specific outer package detail.
- Appendix B Inner and supplementary packaging/configurations tested in this outer package.
- Appendix C Packing/Closure Instructions.
- Appendix D Testing Photographs.

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix A – Outer Package Detail

Designated Packaging Code: 4G

Inner Dimensions: 9.5" x 7.5" x 13" I.D

Board Combination: 42 lb. liner 23 lb. medium (double wall)

Seam: Stitched

Bursting Strength: 275 lb. Double wall

Marked max. gross wt. (kg): 14 kg

Closure: 3" hot melt tape.

Mfg: Shurtape Mfg P/N: HP-200

Alternative Closure: 2" cellulose tape.

Mfg: Cantech Mfg P/N: 206-00

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix B – Inner Package Detail

NOTES

- 1. Inner packages of equal or smaller size than those listed may be used in this combination package without further testing if:
 - They are of similar design to those originally tested.
 - The material of construction is equivalent to or stronger than the material originally tested.
 - The closures are of similar design and are no larger than those used for testing.
 - Additional cushioning material is used and the inner packages are secure.
 - Inner packages are oriented in the same way as tested.
 - The gross package weight does not exceed that of the tested package.
- 2. Fewer inner packages than listed may be used in this combination package without further testing if:
 - Additional cushioning is used to fill void space.
 - Movement of inner packages is prevented.

See the following for inner packages and supplementary packages tested in this outer package.

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with outer packages as listed in this report. The package was tested with three (3) one pint cans, and three (3) half pint glass jars. Water and sand were used to simulate product and achieve test weight.

Style Pint Round Metal Paint Type Can

Capacity 0.473 Liters

Spec. Gravity 1.4

Closure Friction Fit Lid

Seal Ringlock Safety Closure

Otv. 3

Net Wt. 0.74 kg each

Style Half Pint Glass Jar

Capacity 0.237 Liters

Spec. Gravity 1.4

Closure Screw on Cap

Seal Ringlock Safety Closure

Otv. 3

Net Wt. 0.43 kg each

Supplemental The outer package was lined with a 2mm thickness poly liner, taped closed. Each inner package was placed into a 3mm polybag closed with a hand-tied knot.

This configuration has also been tested using 3 absorbent sheets (VPS-A-002) and bubble wrap to fill all void space.

When shipping via aircraft, these cans must be sealed with a Ringlock Safety Seal.

Spec. sheets on file and available upon request.

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with outer packages as listed in this report. The package was tested with one (1) five-quart round metal paint type can.

Style 5 Quart Round Metal Paint Type Can

Capacity 4.73 Liter

Spec. Gravity 1.4

Closure Friction Fit Lid

Seal Ringlock Safety Closure

Qty. 1 **Net Wt.** 7.1 kg

Supplemental The outer package was lined with a 2mm thickness poly liner, taped closed. Each inner package was placed into a 3mm polybag closed with a hand-tied knot.

This configuration has also been tested using 4 absorbent sheets (VPS-A-002) and bubble wrap to fill all void space.

When shipping via aircraft, these cans must be sealed with a Ringlock Safety Seal.

Spec. sheets on file and available upon request.

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with outer packages as listed in this report. The package was tested with two (2) one-gallon metal jerricans. Water and sand were used to simulate product and achieve test weight.

Style 1 Gallon Metal Jerrican

Capacity 3.78 Liter

Spec. Gravity 1.4

Closure Screw-top Seal N/A Otv. 2

Net Wt. 5.66 kg each

Supplemental The outer package was lined with a 2mm thickness poly liner, taped closed. Each inner package was placed into a 3mm polybag closed with a hand-tied knot.

This configuration has also been tested using 6 absorbent sheets (VPS-A-002) and bubble wrap to fill all void space.

Spec. sheets on file and available upon request.

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix B - Inner Package Detail (continued)

The package tested is a combination package with outer packages as listed in this report. The package was tested with four (4) simulation batteries.

Style Battery

Size 3.5"x 2.25"x 10.75"

Closure N/A Seal N/A Oty. 4

Net Wt. 3.25 kg each

Supplemental Bubble wrap may be used to fill void space and cushion inner

package.

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<u>Appendix B – Inner Package Detail (continued)</u>

The package tested is a combination package with outer packages as listed in this report. The package was tested with thirty-two (32) simulation pressure cartridges. Steel weights were used to achieve test weight.

Style Pressure Cartridge

Size 3.5" length x 1.5" diameter

Closure N/A Seal N/A Qty. 32

Net Wt. 0.25 kg Each

Supplemental Bubble wrap may be used to fill void space and cushion inner

package.

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

<u>Appendix B – Inner Package Detail (continued)</u>

The package tested is a combination package with outer packages as listed in this report. The package was tested with twelve (12) simulation pressure cartridges. Steel weights were used to achieve test weight.

Style Pressure Cartridge

Size 2" length x 1.5" diameter

Closure N/A Seal N/A Qty. 8

Net Wt. 1.5 kg Each

Supplemental Bubble wrap may be used to fill void space and cushion inner

package.

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

<u>Appendix B – Inner Package Detail (continued)</u>

The package being tested is a combination packaging comprising one (1) defibrillator with lithium battery, inserted into a regular slotted fiberboard box outer packaging. Bubble wrap may be used to fill void space and cushion inner package. Steel weights were used to achieve test weight.

Style Defibrillator Size 10.5" x 9" x 4.5"

Closure N/A Seal N/A Qty. 1

Net Wt. 2.73 kg

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with outer packages as listed in this report. The package was tested with one (1) one-gallon, plastic, bleach type bottle. Water and lead shot were used to simulate product and achieve test weight.

Style 1 Gallon, plastic, bleach type bottle.

Capacity 3.78 Liter

Spec. Gravity 1.7

Closure Screw-top Seal N/A

Qty. 1

Net Wt. 6.8 kg

Supplemental The outer package was lined with a 2mm thickness polyliner, taped closed. Each inner package was placed into a 3mm polybag closed with a hand-tied knot.

This configuration has also been tested using 3 absorbent sheets (VPS-A-002) and bubble wrap to fill all void space.

Conditioning Note:

This configuration was conditioned to -20°C (-4°F) prior to testing

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

<u>Appendix B – Inner Package Detail (continued)</u>

The package being tested is a combination packaging comprising of one (1) defibrillator with lithium battery, inserted into a regular slotted fiberboard box outer packaging. Bubble wrap was used to fill void space. Lead shot was used to achieve package test weight.

Style Defibrillator Size 8" x 5" x 9"

 Closure
 N/A

 Seal
 N/A

 Qty.
 1

 Net Wt.
 2 kg

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with outer packages as listed in this report. The package was tested with three (3) 32 oz plastic F-Style bottles, (Jerricans). Water and sand were used to simulate product and achieve test weight.

Style 32 oz F-Style Plastic Bottle

Capacity 32 oz
Spec. Gravity 1.25
Closure Screw-top

Seal N/A **Otv.** 3

Net Wt. 1.34 kg each

Supplemental The outer package was lined with a 2mm thickness polyliner, taped closed. Each inner package was placed into a 3mm polybag closed with a hand-tied knot. Bubble wrap was used to fill void space, and cushion inner packages.

This configuration has also been tested using 6 absorbent sheets (VPS-A-002) and bubble wrap to fill all void space.

Spec. sheets on file and available upon request.

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with outer packages as listed in this report. The package was tested with four (4) 16 oz plastic F-Style bottles, (Jerricans). Water and sand were used to simulate product and achieve test weight.

Style 16 oz F-Style Plastic Bottle

Capacity 16 oz
Spec. Gravity 1.25
Closure Screw-top
Seal N/A

Seal N/A Otv. 4

Net Wt. .67 kg each

Supplemental The outer package was lined with a 2mm thickness polyliner, taped closed. Each inner package was placed into a 3mm polybag closed with a hand-tied knot. Bubble wrap was used to fill void space, and cushion inner packages.

This configuration has also been tested using 2 absorbent sheets (VPS-A-002) and bubble wrap to fill all void space.

Spec. sheets on file and available upon request.

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with outer packages as listed in this report. The package was tested with twelve (12) 8 oz round plastic bottles. Water and sand were used to simulate product and achieve test weight.

Style 8 oz Round Plastic Bottle

Capacity 8 oz Spec. Gravity 1.5

Closure Screw-top Seal N/A Qty. 12

Net Wt. .39 kg each

Supplemental The outer package was lined with a 2mm thickness polyliner, taped closed. Each inner package was placed into a 3mm polybag closed with a hand-tied knot. Bubble wrap was used to fill void space, and cushion inner packages.

This configuration has also been tested using 3 absorbent sheets (VPS-A-002) and bubble wrap to fill all void space.

Spec. sheets on file and available upon request.

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Appendix B – Inner Package Detail (continued)

The package tested is a combination package with outer packages as listed in this report. The package was tested with five (5) 16 oz round plastic bottles. Water and sand were used to simulate product and achieve test weight.

Style 16 oz Round Plastic Bottle

Capacity 16 oz Spec. Gravity 1.5

Closure Screw-top Seal N/A Otv. 5

Net Wt. .78 kg each

Supplemental The outer package was lined with a 2mm thickness polyliner, taped closed. Each inner package was placed into a 3mm polybag closed with a hand-tied knot. Bubble wrap was used to fill void space, and cushion inner packages.

This configuration has also been tested using 3 absorbent sheets (VPS-A-002) and bubble wrap to fill all void space.

Spec. sheets on file and available upon request.

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with outer packages as listed in this report. The package was tested with three (3) 32 oz round plastic bottles. Water and sand were used to simulate product and achieve test weight.

Style 32 oz Round Plastic Bottle

Capacity 32 oz Spec. Gravity 1.5

Closure Screw-top Seal N/A Otv. 3

Net Wt. 1.56 kg each

Supplemental The outer package was lined with a 2mm thickness polyliner, taped closed. Each inner package was placed into a 3mm polybag closed with a hand-tied knot. Bubble wrap was used to fill void space, and cushion inner packages.

This configuration has also been tested using 6 absorbent sheets (VPS-A-002) and bubble wrap to fill all void space.

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with outer packages as listed in this report. The package was tested with six (6) one-liter metal F-Style cans, (Jerricans). Water and sand were used to simulate product and achieve test weight.

Style 1 Liter F-Style Metal Can

Capacity 1 Liter Spec. Gravity 1.2

Closure Screw-top with inner metal friction seal

Seal N/A Otv. 6

Net Wt. 1.33 kg each

Supplemental The outer package was lined with a 2mm thickness polyliner, taped closed. Each inner package was placed into a 3mm polybag closed with a hand-tied knot. Bubble wrap was used to fill void space, and cushion inner packages.

This configuration has also been tested using 12 absorbent sheets (VPS-A-002) and bubble wrap to fill all void space.

Spec. sheets on file and available upon request.

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

<u>Appendix B – Inner Package Detail (continued)</u>

The package tested is a combination package with outer packages as listed in this report. The package was tested with five (5) aerosol cans with lead shot used for additional weight.

Style Aerosol Can

Size 8" length x 2.75" diameter

Spec. Gravity N/A
Closure N/A
Seal N/A
Qty. 5
Net Wt. 8 kg

Supplemental Outer package is lined with a 2 mm minimum thickness polybag. Fill excess area with bubble wrap or other cushioning material.

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with outer packages as listed in this report. The package was tested with six (6) simulation (squib) cartridges.

Style Squib

Capacity 0.9 kg. (net hazmat unknown)

Spec. Gravity N/A Closure N/A Seal N/A Qty. 6

Net Wt. 0.9 kg each

Supplemental Each squib is individually placed inside a corrugated box secondary package (4"x 4"x4") Viking part number VPS-F-4x4. All void space within each secondary package and void space within outer package is filled with cushioning material. Bubble wrap was used for testing.

This configuration has also been tested with each squib individually placed within an anti-static, sealable bag. This bag is then wrapped in bubble wrap. All void space must be filled with cushioning material.

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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix C – Packing/Closure Instructions

- 1. Inspect container, and all components for damage. If container is found to be free from damage proceed to step 2. If container is damaged; procure a different container and inspect.
- 2. Fold bottom flaps of container to meet in the center. Place two strips of tape across the seam where the flaps meet, extending down the side at least two inches.
- 3. When required; place a poly-liner which conforms to this report into the box with the top left open for filling.
- 4. When required; place each inner package into a polybag that conforms to this report and close each bag with a hand-tied knot.
- 5. Place a sufficient amount of absorbent/cushioning material into the container. (Inside the liner when used.) (1-2 inches)
- 6. Place inner packages into container spacing all inner packages as evenly as possible from one another, and upright sides of container.
- 7. Fill all void space with absorbent/cushioning material.
- 8. Close poly liner (when applicable) and seal with tape. Wrap liner 3-4 times to insure a proper closure. Alternatively, a zip tie may be used to seal poly liner.
- 9. Fold top flaps to center of container and double tape seam as specified in step 2.
- 10. Ensure gross package weight does not exceed that marked on the package and in this report.

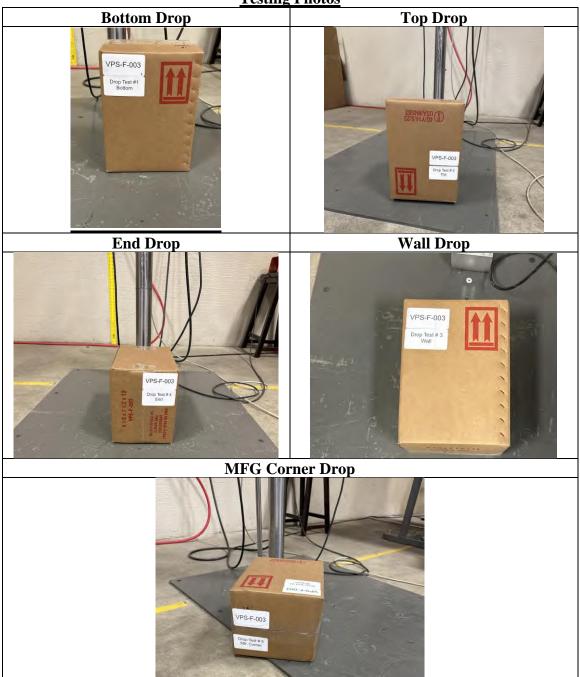
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Testing Photos



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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Testing Photos





Stacking Height = **SH** Height of Package = **PH** Number of Packages = *n*

Max. Gross weight of package = MGW (kg)

Stacking Load =
$$[(120"/13.75) = 9 - 1] \times 14$$
 kg

Stacking Load = 112 kg