Viking Packing Specialist

5505 Bird Creek Ave. • Tulsa, OK 74015
And/or 1828 North $105^{\text {th }}$ East Avenue - Tulsa, OK 74116
Phone: (800) 788-8525 • Fax: (918) 252-5518

## UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Test Document No.:
Requested by:
Performed by:
Manufactured by:
Date:
Retest Date:

1. Product Tested:

Packaging Nomenclature:
Outer Package:
Dimensions:
Inner Package:
Maximum gross wt. (kg):
Viking Part No.:
Customer Part No.:

VPS-F-003-23
Viking Packing Specialist
Viking Packing Specialist
Viking Packing Specialist
6-23-2023
6-22-2025

Combination Packaging
4G corrugated box (see Appendix A)
$9.5 " \times 7.5 " \times 13 "$ I.D.
See appendix B for approved inners
14 kg
VPS-F-003
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.


President
David Weilert

# Viking Packing Specialist 

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## UNITED NATIONS PERFORMANCE ORIENTED PACKAGING <br> TEST RESULTS

## TEST METHODS \& RESULTS

The packages were conditioned at $23^{\circ} \mathrm{C}\left( \pm 2^{\circ} \mathrm{C}\right)$ and $50 \%( \pm 2 \%)$ RH for 24 hours immediately prior to testing, per 49 CFR $178.602(\mathrm{~d})(1)$.

## 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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## UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

## 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 ( $\leq$ ) $155 \mathrm{~g} / \mathrm{sq} \mathrm{m}$ 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: $\quad 9.5 " \times 7.5 " \times 13 "$ 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 <br> 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 |
| Qty. | 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 |
| Qty. | 3 |
| Net Wt. | 0.43 kg each |

Supplemental The outer package was lined with a 2 mm thickness poly liner, taped closed. Each inner package was placed into a 3 mm 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 2 mm thickness poly liner, taped closed. Each inner package was placed into a 3 mm 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 |
| Qty. | 2 |
| Net Wt. | 5.66 kg each |

Supplemental The outer package was lined with a 2 mm thickness poly liner, taped closed. Each inner package was placed into a 3 mm 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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## 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 | $3.5 " \times 2.25 " \times 10.75 "$ |
| Closure | N/A |
| Seal | N/A |
| Qty. | 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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## 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 thirty-two (32) simulation pressure cartridges. Steel weights were used to achieve test weight.

| Style | Pressure Cartridge |
| :--- | :--- |
| Size | $3.5 "$ length $\times 1.5 "$ 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
## 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) 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
## Appendix B - Inner Package Detail (continued)

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 | $10.5 " \times 9 " \times 4.5 "$ |
| 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 2 mm thickness polyliner, taped closed. Each inner package was placed into a 3 mm 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 $-20^{\circ} \mathrm{C}\left(-4^{\circ} \mathrm{F}\right)$ prior to testing

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## UNITED NATIONS PERFORMANCE ORIENTED PACKAGING

 TEST RESULTS
## Appendix B - Inner Package Detail (continued)

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 | $8 " \times 5 " \times 9 "$ |
| 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 |
| Qty. | 3 |
| Net Wt. | 1.34 kg each |

Supplemental The outer package was lined with a 2 mm thickness polyliner, taped closed. Each inner package was placed into a 3 mm 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 |
| Qty. | 4 |
| Net Wt. | .67 kg each |

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

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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 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 |
| Qty. | 5 |
| Net Wt. | .78 kg each |

Supplemental The outer package was lined with a 2 mm thickness polyliner, taped closed. Each inner package was placed into a 3 mm 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 |
| Qty. | 3 |
| Net Wt. | 1.56 kg each |

Supplemental The outer package was lined with a 2 mm thickness polyliner, taped closed. Each inner package was placed into a 3 mm 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 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 |
| Qty. | 6 |
| Net Wt. | 1.33 kg each |

Supplemental The outer package was lined with a 2 mm thickness polyliner, taped closed. Each inner package was placed into a 3 mm 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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## 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) 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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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Testing Photos


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UNITED NATIONS PERFORMANCE ORIENTED PACKAGING
TEST RESULTS
Testing Photos


Stacking Height $=\mathbf{S H}$
Height of Package $=\mathbf{P H}$
Number of Packages $=\boldsymbol{n}$
Max. Gross weight of package $=\mathbf{M G W}(\mathrm{kg})$
Stacking Load $=[(120 " / 13.75)=9-1] \times 14$
kg
Stacking Load $=112 \mathrm{~kg}$

