Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING
TEST RESULTS

Test Document No.:	**VPS-F-028-23**
Requested by:	**Viking Packing Specialist**
Performed by:	**Viking Packing Specialist**
Manufactured by:	**Viking Packing Specialist**
Date:	**03/27/2023**
Retest Date:	**03/27/2025**

1. **Product Tested:**

Packaging Nomenclature:	Combination Packaging
Outer Package:	4G Corrugated Box (see Appendix A)
Dimensions:	16” x 16” x 18”
Inner Package:	See appendix B for approved inners
Maximum gross wt. (kg):	31 kg
Viking Part No.:	VPS-F-028

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	1.2 m	PASS
Stacking	49 CFR 178.606	190 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

Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING
TEST RESULTS

TEST METHODS & RESULTS

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 190 kg, equivalent to a 3-meter-high stack of identical packages, continuously for 24 hours.

Containers	Actual Load	Result
#1	190 kg	PASS
#2	190 kg	PASS
#3	190 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

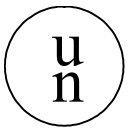
Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

4. In accordance with 49 CFR §173.22 and §173.27, it is the shipper's responsibility to ensure that the inner packaging materials used for assembly of the package adheres to how the package was tested. If different inner packaging materials are utilized, the responsibility lies with the shipper to determine if the packaging or container is authorized.

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



4G/Y31/S/**

USA/M4563

**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.

Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix A – Outer Package Detail

Designated Packaging Code:	4G
Dimensions:	16” x 16” x 18”
Board Combination:	42 lb liner 23 lb medium (double wall)
Seam:	Stitched
Bursting Strength:	275 lb double wall
Marked max. gross wt.:	31 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 or equivalent

Viking Packing Specialist

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

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 (3/4" bubble wrap), 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.

Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING
TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with an outer package as listed in this report. The package was tested with four (4) five-quart cans. Water and sand were used to simulate product.

Style	5 Quart Round Metal Paint Type Can
Capacity	4.73 Liters
Spec. Gravity	1.2
Closure	Friction Fit Lid
Qty.	4
Net Wt.	5.5 kg each

Note The cans tested are to be utilized as an intermediate package for items that do not meet the pressure testing requirements of 49 CFR 173.27(c) and must not exceed either the specific gravity or the net weight listed above.

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

This configuration has also been tested using 15 absorbent sheets (VPS-A-001) and bubble wrap to fill all void space.

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

Spec. sheets on file and available upon request.

Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING
TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with an outer package as listed in this report. The package was tested with four (4) five and a half liter cans. Water and sand were used to simulate product.

Style	5.5 Liter Round Metal Paint Type Can
Capacity	5.5 Liters
Spec. Gravity	1.2
Closure	Friction Fit Lid
Qty.	4
Net Wt.	6.96 kg each

Note The cans tested are to be utilized as an intermediate package for items that do not meet the pressure testing requirements of 49 CFR 173.27(c) and must not exceed either the specific gravity or the net weight listed above.

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

This configuration has also been tested using 15 absorbent sheets (VPS-A-001) and bubble wrap to fill all void space.

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

Spec. sheets on file and available upon request.

Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING
TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with an outer package as listed in this report. The package was tested with twenty (20) one-quart cans. Water and sand were used to simulate product.

Style	Quart Round Metal Paint Type Can
Capacity	0.946 Liters
Spec. Gravity	1.2
Closure	Friction Fit Lid
Qty.	20
Net Wt.	1.2 kg each

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

This configuration has also been tested using 15 absorbent sheets (VPS-A-001) 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.

Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING
TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with an outer package as listed in this report. The package was tested with sixteen (16) one-liter round plastic bottles. Water and sand were used to simulate product.

Style	1 Liter Round Plastic Bottle
Capacity	1 Liter
Spec. Gravity	1.4
Closure	Tape on Screw Lid
Seal	N/A
Qty.	16
Net Wt.	1.4 kg each

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

This configuration has also been tested using 12 absorbent sheets (VPS-A-001) and bubble wrap to fill all void space.

Spec. sheets on file and available upon request.

Conditioning Note:
This configuration was conditioned to -20ºC (-4ºF) prior to testing

Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING
TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with an outer package as listed in this report. The package was tested with four (4) one-gallon, plastic, bleach type bottles. Water and sand were used to simulate product.

Style	1 Gallon, plastic, bleach type bottle.
Capacity	3.78 Liter
Spec. Gravity	1.45
Closure	Screw-top
Seal	N/A
Qty.	4
Net Wt.	5.5 kg each

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

This configuration has also been tested using 12 absorbent sheets (VPS-A-001) and bubble wrap to fill all void space.

Spec. sheets on file and available upon request.

Conditioning Note:
This configuration was conditioned to -20ºC (-4ºF) prior to testing

Viking Packing Specialist

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

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 bagged granular solid (sand) to simulate actual material and achieve test weight.

Style	N/A (solid)
Size	12x12x14 bag
Closure	N/A (solid)
Seal	N/A (solid)
Qty.	5
Net Wt.	5 kg each

Supplemental Solid material was placed into a liner closed with a hand tied knot. Bubble wrap was used to cushion and fill void space (approximately 2" all sides)

Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING
TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package being tested is a Combination Packaging, comprising sixteen (16) air bag inflators,13" L x 1.5" D, secured inside a regular slotted fiberboard box outer packaging with two (2) fiberboard inserts or (8) foam inserts containing sixteen (16) holes for individual placement of inflators. One placed on bottom to position inflators, the second on top to secure them in place. Lead shot was used to achieve package test weight.

Style	Air Bag Inflators
Size	13" L x 1.5" D
Closure	N/A
Seal	N/A
Qty.	16
Net Wt.	1 kg each

Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING
TEST RESULTS

Appendix B – Inner Package Detail (continued)

The package tested is a combination package with an outer package as listed in this report. The package was tested with eighty (80) half pint round metal utility cans with a screw on brush lid. Water and sand were used to simulate product.

Style	Half Pint Round Metal Utility Can with Screw with Brush Lid
Capacity	0.237 Liters
Spec. Gravity	1.2
Closure	Screw cap with attached brush and tape place on the screw top lid.
Qty.	80
Net Wt.	0.3 kg each

Supplemental The outer package was lined with a 3mm thickness polyliner, taped closed. Each inner package was placed into a 3mm polybag closed with a hand-tied knot. Absorbent pads were used to fill void space, and cushion inner packages. Cans were lined up in four rows of twenty cans and a small layer of absorbent pads separating rows.

Spec. sheets on file and available upon request.

Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING TEST RESULTS

Appendix C – Packing/Closure Instructions

The package tested is a combination package with outer packages as listed in this report. The package was tested with (1) metal cylinder inner packaging. Sand was used to achieve test weight.

Style	Metal Cylinder
Size	11 11/16" length x 10 5/16" diameter
Closure	N/A (solid)
Seal	N/A (solid)
Qty.	1
Net Wt.	20 kg

Supplemental Inner package was placed in a corrugated box (11"x11"x14 3/8") within the spec package. All void space within each corrugated package was filled with bubble wrap during testing.

Viking Packing Specialist

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

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 (2) plastic boxes filled with sand used to simulate a chemical/ first aid kit. Steel weights used for additional test weight.

Style	Plastic box
Size	11.5”x 11.5” x 6”
Spec. Gravity	N/A
Closure	N/A
Seal	N/A
Qty.	2
Net Wt.	3 kg

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

Viking Packing Specialist

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

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 (2) plastic boxes filled with sand used to simulate a chemical/ first aid kit. Steel weights used for additional test weight.

Style	Plastic box
Size	11.5”x 11.5” x 6”
Spec. Gravity	N/A
Closure	N/A
Seal	N/A
Qty.	2
Net Wt.	3 kg

Supplemental Bubble wrap and/or Vermiculite may be used to fill void space and cushion inner package.

Viking Packing Specialist

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

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 (4) metal boxes filled with sand used to simulate a chemical/ first aid kit. Steel weights used for additional test weight.

Style	Metal box
Size	10”x 7” x 6”
Spec. Gravity	N/A
Closure	N/A
Seal	N/A
Qty.	4
Net Wt.	1.2 kg

Supplemental Bubble wrap and/or Vermiculite may be used to fill void space and cushion inner package.

Viking Packing Specialist

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

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 (4) plastic boxes filled with sand used to simulate a chemical/ first aid kit. Steel weights used for additional test weight.

Style	Plastic box
Size	10”x 7” x 6”
Spec. Gravity	N/A
Closure	N/A
Seal	N/A
Qty.	4
Net Wt.	1.2 kg

Supplemental Bubble wrap and/or Vermiculite may be used to fill void space and cushion inner package.

Viking Packing Specialist

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

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) 5-gallon plastic bottles, (Jerricans). Water and sand were used to simulate product and achieve test weight simulating UN1760.

MPN.	M-HP-2
Style	5 Gallon Plastic Bottle
Capacity	5 Gallons
Spec. Gravity	1.1
Closure	Tape on Screw Lid for M-HP-2.
Seal	N/A
Qty.	1
Net Wt.	20.83 kg

Supplemental Bubble wrap was used to fill void space, and cushion inner packages, 20 absorbent sheets.

Specs. Tested as a Class 8, PG III but at PG II standards, UN1760, Mfr is The ArmaKleen Company

Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING
TEST RESULTS

Appendix C – Packing/Closure Instructions

1. Inspect container, and all components for damage. If the container is found to be free from damage proceed to step 2. If the 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 center seam where the flaps meet extending down the side at least two inches.

3. Place a polyliner or insert (when required)which conforms to this report into the box with the top left open for filling.

4. Place each inner package into a polybag (when required) which conforms to this report, and close each bag with a hand-tied knot.

5. Place a sufficient amount of absorbent/cushioning material (3/4 bubble wrap) into the polyliner within the container.

6. Place inner packages into container (or insert when required) 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 polyliner (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 polyliner.

9. Fold top flaps to center of container and double tape the seam as specified in step 2.

10. Ensure gross package weight does not exceed that marked on the package and in this report.

Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING
TEST RESULTS

Testing Photos

Bottom Drop	Top Drop
	
End Drop	**Wall Drop**
	
MFG Corner Drop	
	

Viking Packing Specialist

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

UNITED NATIONS PERFORMANCE ORIENTED PACKAGING
TEST RESULTS

Testing Photos

Stack Test	Vibration Test
	

Stacking Height = **SH**
Height of Package = **PH**
Number of Packages = ***n***
Max. Gross weight of package = **MGW** (kg)

Stacking Load = [(SH/PH) = n – 1] x MGW
Stacking Load = [120”/18”) = 7 – 1] x 31 kg =
186 kg (weight tested @ 190 kg = 419 lb)