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-250E-24**
Requested by:	**Viking Packing Specialist**
Performed by:	**Viking Packing Specialist**
Manufactured by:	**Viking Packing Specialist**
Date:	**1/23/2024**
Retest Date:	**1/22/2026**

1. **Product Tested:**

Packaging Nomenclature:	Combination Packaging
Outer Package:	4H2 (HSC single wall corrugated plastic box)
Dimensions:	12.625" x 12" x 6.75" (I.D)
Inner Package:	See appendix B for approved inners
Maximum gross wt. (kg):	12 kg
Viking Part No.:	VPS-250E

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 I standards.

3. Tests Performed:

TEST	SPEC	INTENSITY	RESULTS
Drop	49 CFR 178.603	1.8 m	PASS
Stacking	49 CFR 178.606	320 kg	PASS
Vibration	49 CFR 178.608	1 Hour	PASS
Thermal Resistance	49 CFR 178 App D	400° F	PASS
Flame Penetration	49 CFR 178 App E	1700° F	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: Marvin Godfrey
DG Testing Manager
Marvin Godfrey

Approved By:
President
David Weilert

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TEST METHODS & RESULTS

1. DROP TEST- 49 CFR 178.603

Packages were conditioned to -20º C (-4º F) prior to testing. Five (5) filled packages, closed as for shipment, were subjected to a free fall drop from 1.8 meters (5.9 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 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 204 kg, equivalent to a 3-meter-high stack of identical packages, continuously for 24 hours.

Containers	Actual Load	Result
#1	204 kg	PASS
#2	204 kg	PASS
#3	204 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. THERMAL RESISTANCE TEST – 49 CFR 178 APPENDIX D

When exposed to a temperature of 400° F for a period of not less than three hours, the oxygen generator must not actuate.

Container	Temperature (Time)	Result
#1	400° F (3 HOURS)	PASS

5. FLAME PENETRATION RESISTANCE TEST – 49 CFR 178 APPENDIX E

Three (3) specimens of the outer packaging materials must be tested and there must be no flame penetration of any specimen within 5 minutes after application of the flame source and the maximum allowable temperature at a point 4 inches above the test specimen, centered over the burner cone, must not exceed 205 °C (400 °F).

Specimen	No Flame Penetration	Result
#1	5 MINUTES	PASS
#2	5 MINUTES	PASS
#3	5 MINUTES	PASS

The temperature did not exceed 400°F.

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

4H2/X12/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 – Closure Instructions
- Appendix D – Testing Photographs

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Appendix A – Outer Package Detail

Designated Packaging Code:	4H2
Dimensions:	12.625” x 12” x 6.75” I.D.
Style:	HSC Single wall corrugated plastic
Marked max. gross wt. (kg):	12 kg
Closure:	3” hot melt tape. MFG: Shurtape MFG PN: HP-200

*Flaps of outer box are sealed with solid SPVC vinyl tape Mfg.: Preferred Tape. Mfg. P/N: CVT-636

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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.

See the following for inner packages and supplementary packages tested in this outer 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, and movement of inner packages is prevented

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

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Appendix B – Inner Package Detail (continued)

The outer package was tested with configurations of inner package as follows. Please refer to Table 1 (below) for particular parts allowed in this package. Refer to packing/closure instructions for supplemental packaging requirements. Lead shot was used to achieve test weight.

TABLE 1

STYLE	MAX QTY.	Dims (inches)	NET WT. (EA)
PSU	1	9.5” x 10.5” x 4.5”	9 kg
PSU	2	10” x 4.5” x 4.5”	4.5 kg
PBE	1	9.5” x 10.5” x 4”	9 kg
PBE	2	10” x 4.5” x 4.5”	4.5 kg
Oxygen Gen. (unpackaged)	2	10” L x 4” D	3 kg
Oxygen Gen. (within mfg. package)	2	10” x 4” x 4”	3 kg

Intermediate Packaging:

Inner packages are placed within an intermediate container constructed out of 1/8” acrylic coated panel board. Container is assembled using 3” Paper Masking Tape (Mfg.: Shurtape. Mfg. P/N: 104118). Inner seams are sealed using white silicone. Container lid is constructed out of double laminated 1/8” acrylic coated panel board creating a friction fit lid which is secured to container by means of the outer telescoping plastic corrugated container. Container is coated with a latex fire-retardant paint, (Mfg.: Benjamin Moore Mfg. P/N: 220 White P59 01). Cavity dimensions are 11.5” x 10.5” x 5.375”.

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Packing/Closure Instructions – VPS-250E, 253E, 255E

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. Slide top plastic HSC container off bottom half.

3. Remove intermediate package's lid.

4. Place inner package(s) into container. Refer to Table 1 for number of inner packages allowed in each shipping container. When only one inner package is shipped within the outer container, fill all void space with bubble wrap. When shipment is made with more than one inner package. When shipment consists of:

   a. Panels or PBEs: Place inner packages into container and fill all void space with bubble wrap.

   b. Generators contained in manufacturer's individual packaging: Evenly space inner packages into container leaving as much space between inner packages as possible. Fill all void space with bubble wrap.
      SIZE: 1/2"
      Bubble: 1 1/4" diameter
      MATERIAL: Polyethylene and Nylon. Not biodegradable.

   c. Generators with no supplementary means of containment: Wrap each generator with 1: 24" x 10" piece of Superwool (mfg.) insulation material. Evenly space inner packages into container leaving as much space between inner packages as possible. Fill all void space with bubble wrap.

5. Replace intermediate package's lid.

6. Replace top plastic HSC container over bottom half and secure using 3" hot-melt tape, (Mfg.: Shurtape. Mfg. P/N: HP-200), one strip of tape overlapping entire box aligning with flap seams (top and bottom ends).

7. Ensure gross package weight does not exceed that marked on the container.

8. Ensure that all legal requirements for shipment of this material have been met.

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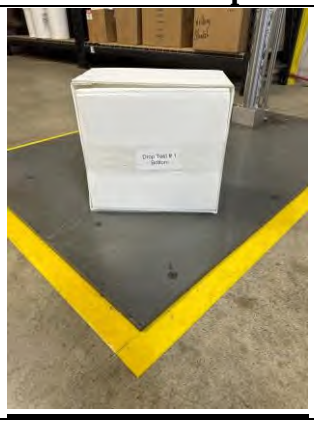
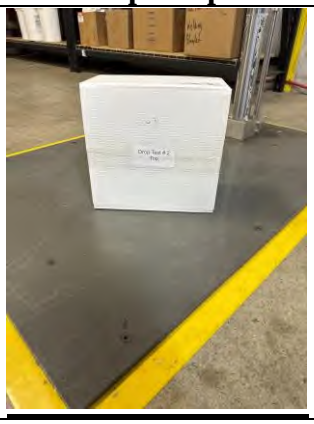
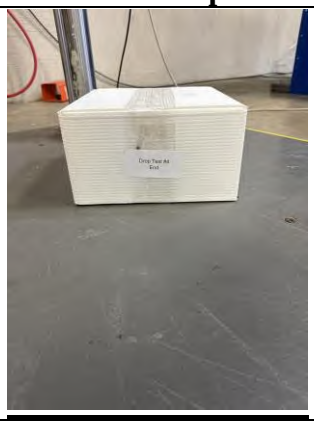
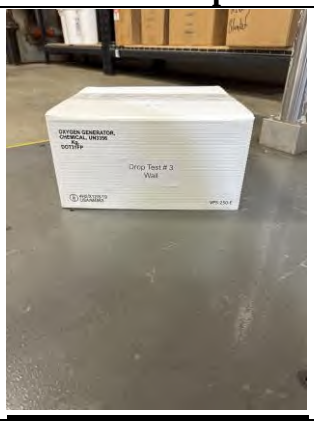
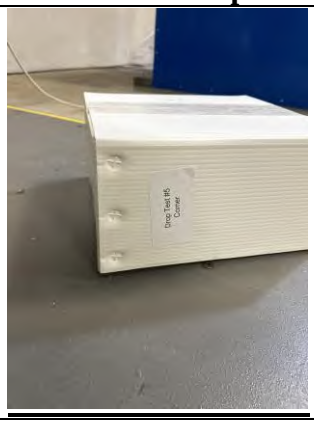
Appendix D -Testing Photographs

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

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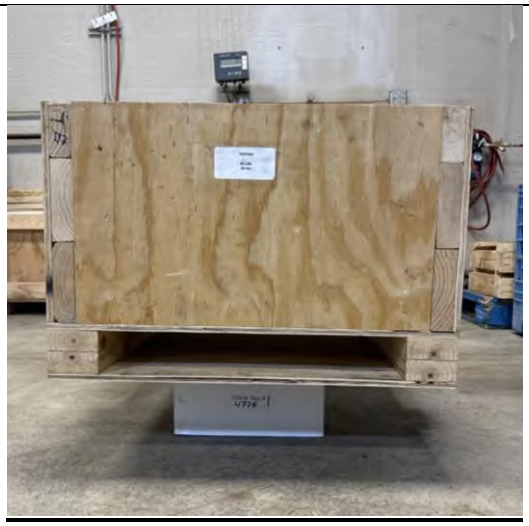
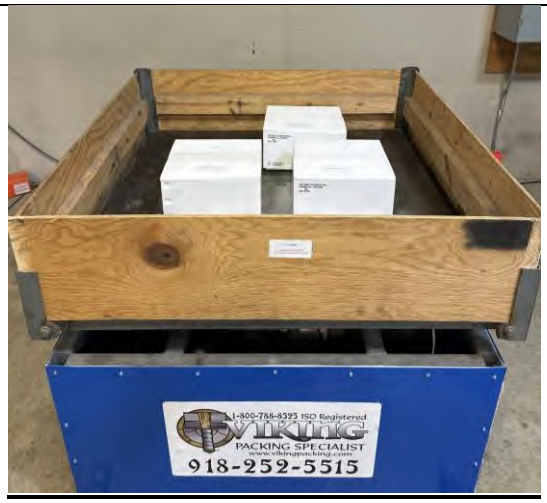
Testing Photos

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

204 kg = [(120/6.75) ≈ 18 – 1] x 12 kg