

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-057-23
Requested by: Viking Packing Specialist
Performed by: Viking Packing Specialist
Manufactured by: Viking Packing Specialist
Date: 03/15/2023
Retest Date: 03/15/2025

1. Product Tested:

Packaging Nomenclature: Combination Packaging
Outer Package: 4G Corrugated Box (see Appendix A)
Dimensions: 15" x 15" x 10.5"
Inner Package: See appendix B for approved inners
Maximum gross wt. (kg): 25 kg
Viking Part No.: VPS-F-057

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	278 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

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

Containers	Actual Load	Result
#1	278 kg	PASS
#2	278 kg	PASS
#3	278 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

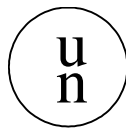
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4. In accordance with 49 CFR §173.22 and §173.27, it is the shipper's responsibility to ensure that the inner packaging materials used for assembly of the package adheres to how the package was tested. If different inner packaging materials are utilized, 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/Y25/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.

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Appendix A – Outer Package Detail

Designated Packaging Code:	4G
Dimensions:	15” x 15” x 10.5”
Board Combination:	42 lb liner 23 lb medium (double wall)
Seam:	Stitched
Bursting Strength:	275 lb double wall
Marked max. gross wt.:	25 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

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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.

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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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) one-gallon round metal cans with welded seams and multiple friction closures. Water and sand were used for testing and to achieve test weight.

MPN.	30WS4U
Style	1-gallon round metal paint type can with welded seam and multiple friction closure (Diameter of can 6.625”, height 7.5”)
Capacity	3.78 Liters
Spec. Gravity	1.6
Closure	Multiple friction plug (Diameter of plug 6.09”, diameter at the curl 6.23”, height 0.365”)
Qty.	4
Net Wt.	6.05 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.

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

NOTE: Package was tested with (4) 1 gal cans at 1.6 specific gravity, outer packaging cannot exceed weight listed in the markings, i.e., can be packaged with two at 1.6 SG and 2 at 1.4 SG

Spec. sheets on file and available upon request.

VPS-A-001 can be substituted with the equivalent, VPS-A-002

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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) one-gallon round metal cans with welded seams and multiple friction closures. Water and sand were used for testing and to achieve test weight.

MPN.	30WS1U
Style	1-gallon round metal paint type can with welded seam and multiple friction closure (Diameter of can 6.625", height 7.5")
Capacity	3.78 Liters
Spec. Gravity	1.3
Closure	Multiple friction plug (Diameter of plug 6.09", diameter at the curl 6.23", height 0.365")
Qty.	4
Net Wt.	5.24 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.

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

Spec. sheets on file and available upon request.

VPS-A-001 can be substituted with the equivalent, VPS-A-002

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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 nine (9) one-quart round metal cans with welded seams and multiple friction closures. Water and sand were used for testing and to achieve test weight.

MPN.	30WS4U
Style	Quart round metal paint type can with welded seam and multiple friction closure (Diameter of can 4.25", height 0.25")
Capacity	0.946 Liters
Spec. Gravity	1.8
Closure	Multiple friction plug (Diameter of plug 3.825", diameter at the curl 3.932", height 0.365")
Qty.	9
Net Wt.	1.84 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 7 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.

VPS-A-001 can be substituted with the equivalent, VPS-A-002

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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 two (2) one-gallon round metal cans with welded seams and multiple friction closures, and two (2) one gallon round HDPE jugs. Water and sand were used for testing and to achieve test weight.

MPN.	30WS1U
Style	1-gallon round metal paint type can with welded seam and multiple friction closure (Diameter of can 6.625", height 7.5")
Capacity	3.78 Liters
Spec. Gravity	1.2
Closure	Multiple friction plug (Diameter of plug 6.09", diameter at the curl 6.23", height 0.365")
Qty.	2
Net Wt.	4.87 kg each

MPN.	68WUN1
Style	Gallon round HDPE jug (Diameter of bottle 6.15", height 11.63")
Capacity	3.78 Liters
Spec. Gravity	1.2
Closure	38-400 Child resistant "Argus Loc" (MPN 68WARG) with F217 foam liner.
Qty.	2
Net Wt.	4.65 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.

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

Spec. sheets on file and available upon request.

VPS-A-001 can be substituted with the equivalent, VPS-A-002

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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) one-gallon metal F-style cans. Water and sand were used for testing and to achieve test weight.

MPN.	30W127
Style	1 Gallon Metal F-Style Can w/nozzle (6.625” Length x 4.125” Width x 9.4375” Height)
Capacity	3.78 Liter
Spec. Gravity	1.3
Closure	1 ¾” Delta Child Resistant Cap with Aluminum Foil Liner (MPN 30W132) and inner seal (MPN 30WSLX) torqued at 40 in-lbs.
Qty.	4
Net Wt.	5.25 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. One can was placed in each corner of the outer package with the remaining can centered. 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.

Spec. sheet on file and available upon request.

VPS-A-001 can be substituted with the equivalent, VPS-A-002

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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 two (2) metal cylinder inner packaging's. Sand was used to achieve test weight.

Style	Metal Cylinder
Size	11 9/16" length x 7 5/16" diameter
Closure	N/A (solid)
Seal	N/A (solid)
Qty.	1
Net Wt.	8.16 kg

Supplemental Each inner package was placed in a corrugated box (8 3/16"x 8 3/16"x14 1/2") within the spec package. All void space within each corrugated package was filled with bubble wrap during testing.

Style	Metal Cylinder
Size	9 1/16" length x 6 3/8" diameter
Closure	N/A (solid)
Seal	N/A (solid)
Qty.	1
Net Wt.	5 kg each

Supplemental Each inner package was placed in a corrugated box (7"x7"x12") within the spec package. All void space within each corrugated package was filled with bubble wrap during testing.

VPS-A-001 can be substituted with the equivalent, VPS-A-002

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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 sixteen (16) one-liter plastic F-Style bottles, (Jerricans). Water and sand were used to simulate product and achieve test weight.

MPN.	S-13505
Style	1 Liter F-Style Plastic Bottle
Capacity	1 Liter
Spec. Gravity	1.2
Closure	33-400 Neck Finish Screw-top
Seal	N/A
Qty.	16
Net Wt.	1.3 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. Vermiculite was used to fill void space, and cushion inner packages.

This configuration has also been tested using 5 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 -20°C (-4°F) prior to testing

VPS-A-001 can be substituted with the equivalent, VPS-A-002

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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) two-liter plastic bottles, (Jerricans). Sand and sawdust were used to simulate product and achieve test weight.

MPN.	150-02-2000 (Savillex)
Style	2 Liter Plastic Bottle
Capacity	2 Liter
Spec. Gravity	N/A (solid)
Closure	Savillex Screw on cap for 150-02-2000
Seal	N/A
Qty.	5
Net Wt.	2.7 kg each

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

Spec. sheets on file and available upon request.

Conditioning Note:

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

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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 one (1) one-gallon round metal cans with welded seams and multiple friction closures, two (2) 8oz glass bottles, one (1) gallon jerrican metal can, one (1) one-quart round metal cans with welded seams and multiple friction closures and one 16oz plastic bottle with cap. Water and lead shot were used for testing and to achieve test weight.

MPN.	30WS1U
Style	1-gallon round metal paint can with welded seam
Capacity	3.78 Liters
Spec. Gravity	1.6
Closure	1 Gallon Metal Paint Can Lid
Qty.	1
Net Wt.	6.3 kg
MPN.	S-23396
Style	8 oz. amber boston round glass bottle 11/16" opening
Capacity	.23 Liters
Spec. Gravity	1.6
Closure	Phenolic screw-on black cap (1-3/16" D x 7/16" H)
Qty.	2
Net Wt.	.63 kg/ea.
MPN.	30W113
Style	1 Gallon F-Style Can with 1-1/4" alpha opening
Capacity	3.78 Liters
Spec. Gravity	1.6
Closure	1-1/4" alpha metal cap with liner (PN: 30WFAF)
Qty.	1
Net Wt.	6.3 kg

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Cont'd

MPN.	30WC4U
Style	1 Quart Metal Paint Can with lid, unlined, 4.85" H
Capacity	.94 Liters
Spec. Gravity	1.6
Closure	1 Quart Metal Paint Can Lid
Qty.	1
Net Wt.	3.4 kg

MPN.	S-22899
Style	16oz White Plastic Bottle
Capacity	.47 Liters
Spec. Gravity	1.6
Closure	1 Screw On 1-3/4" Cap
Qty.	1
Net Wt.	2.1 kg

Supplemental The outer package was lined with a 3mm thickness polyliner, Each inner package was placed into a 3mm polybag closed with a hand-tied knot. The two (2) 8oz glass bottles were placed inside a 1-gallon metal paint can with cushioning/absorbent. Nine absorbent sheets (VPS-A-001) were used to fill void space and cushion inner packages.

A minimum of 9 absorbent sheets (VPS-A-002) are needed to absorb the amount of liquid in this outer package. Each VPS-A-002 is rated for absorbing 37.25 oz of liquid. The total liquid in this outer package is 320 oz.

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

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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 seam where the flaps meet. Place two strips of tape across seam created between the vertical and horizontal sides of the container.
3. Place a polyliner which conforms to this report into the box with the top left open for filling. (when required)
4. Place each inner package into a polybag which conforms to this report, and close each bag with a hand-tied knot. (when required)
5. Place a sufficient amount of absorbent/cushioning material into the polyliner within the container. (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 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 all seams 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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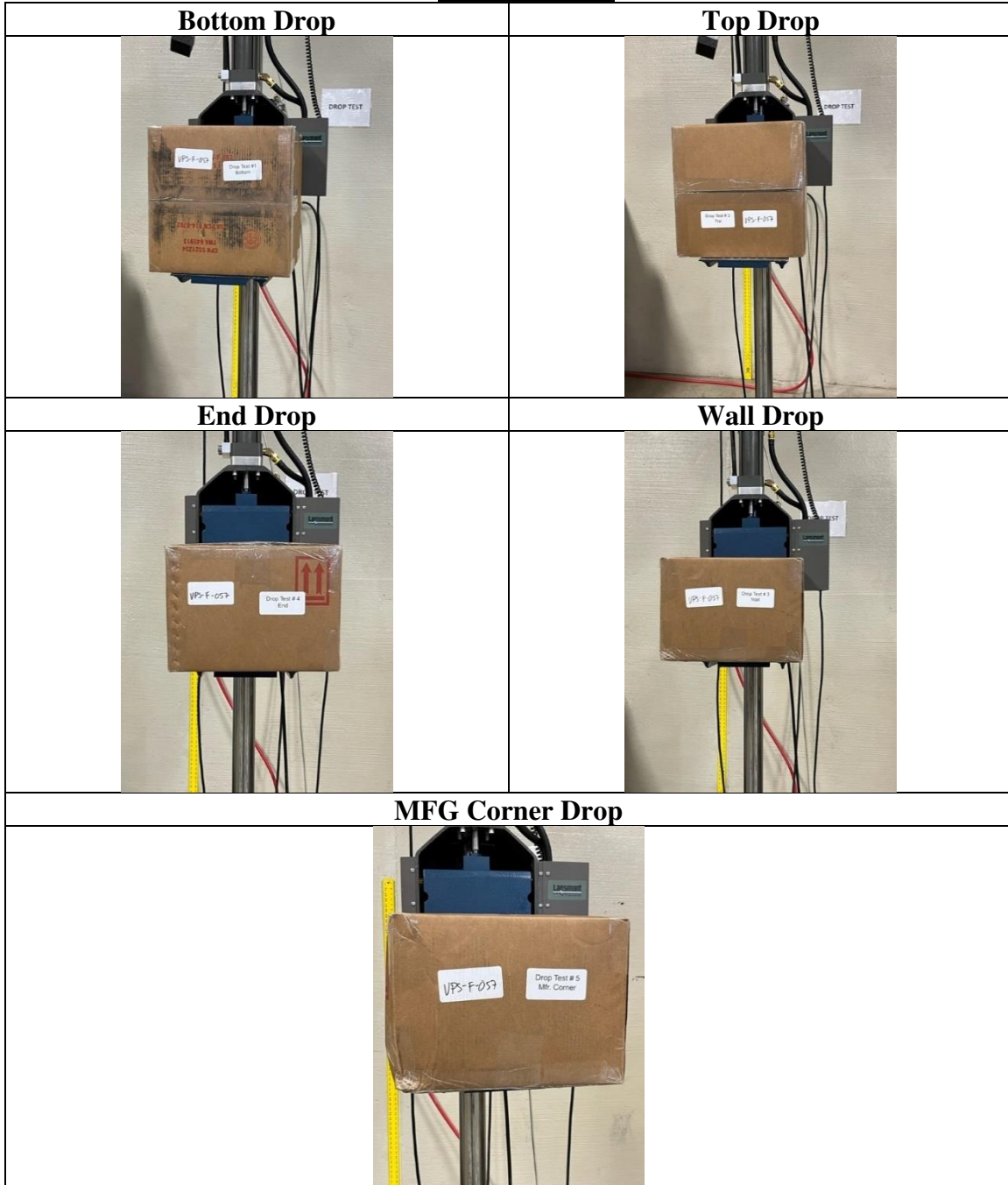
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Testing Photos



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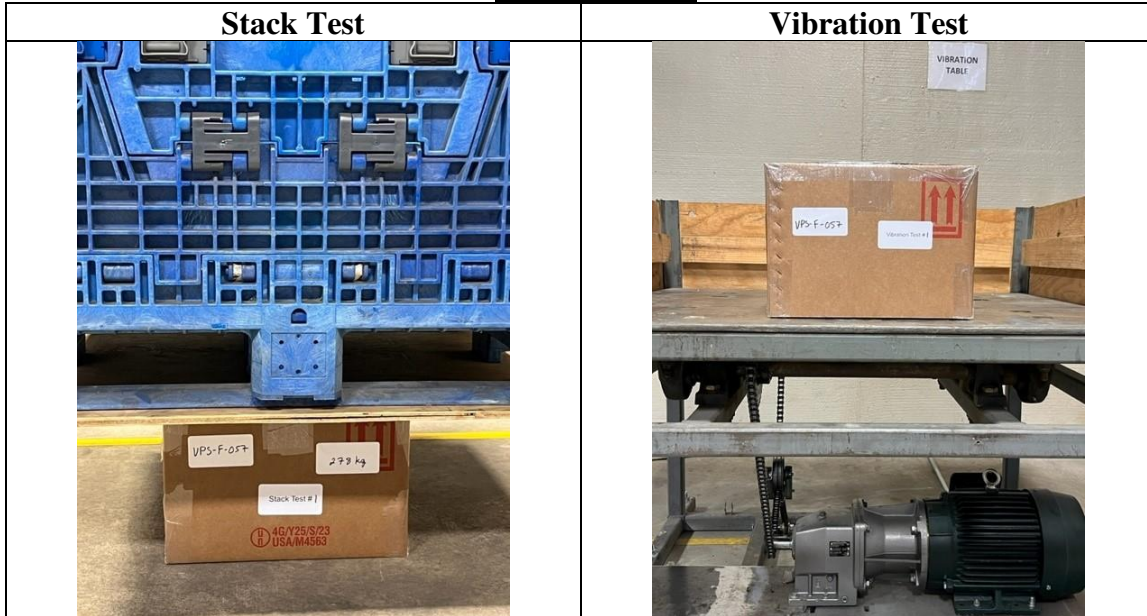
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Testing Photos



Stacking Height = **SH**

Height of Package = **PH**

Number of Packages = ***n***

Max. Gross weight of package = **MGW** (kg)

Stacking Load = $[(SH/PH) = n - 1] \times MGW$

Stacking Load = $[120''/10.5''] = 12 - 1] \times 25 \text{ kg} =$
275 kg (weight tested @ 278 kg = 613 lb)