

UNITED NATIONS

Performance Oriented Package Tests
U.S. Department of Transportation 49 CFR, HM - 181
4G Certified Fiberboard Box, Combination Type Packagings
Qualification

UN Code : **4G** Fiberboard Boxes Packing Group : I Overall Package Gross Mass: **1.5 Kg**

Reference: Gebauer, 4x4 ounce Glass Bottles Ethyl Chloride UN1037

Description of outside fiberboard container:

Style : Regular Slotted Container (RSC) weight: .2 lbs.

Certification Stamp: **A-Kobak, Hinckley, OH**

Facing Liner Weights: 40.2# / msf - 31.8# / msf - 38.6# / msf

Medium Weights: 23.2# / msf – 23.3# / msf Board Test Grade: 200# Flute : CB

Carton Dimensions: Length 5.375" x Width 5.25" x Depth 7.125" Outside Dimensions

Manufactures Joint: 1.5" inside glue

Outer box closure instructions: Two pieces (one top and one bottom) of **3M, St. Paul, MN #372-2MC**, 48 mm wide x 11.5" long, 1.5 mil transparent water-proof pressure sensitive sealing tape. The tape was applied at the center intersection of the two major flaps of the outer box and 3" onto the sides of the box.

Description of Inner Packaging Materials: each bottle was inserted into one auto-bottom tuck top die-cut folding carton, size: 2.3125" x 2.3125" x 6" O.D.(.57 mm thick) with inside glue joint, weight 23.51 grams. See **Nosco Gurnee, IL**, specification #931070.

Description of inside receptacles: Four 4 ounce plastic coated amber round glass bottles, manufactured by **O-I Toano, VA**, size: 2.15" diameter x 4.84" tall without closure cap, weight: .2 lbs. See Gebauer SPEC-100170R2, dated 2-28-12. One **Jaco Mfg. Bera, OH** closure cap: 24mm black twist-on plastic cap (torqued to 20 inch/ lbs.) with metal lever, plastic nozzle and rubber nozzle seal. The cap was protected by a 1.25" diameter x 1.75" tall solid fiber tube with a ¼" x 1.625" slot on the side. Solid fiber tube manufactured by **A Precision Products Group Co., Apple Creek OH**

Number per Package: Four (2x2 arrangement)

UN Test Report Number: 42619

TEST PROCEDURES and RESULTS

Preparation of Packagings for Testing
(U.N. Orange Book 9.7.3, HM - 181 178.602)

Each Inner receptacle was filled with: **water**

Total Gross Mass Weight = 3.3 lbs. / 1.5 kg
Tare Weight (packaging, including receptacles) = 2 lb.
Net “ product “ Weight (liquid or solid) = 1.3 lbs.

The fiberboard outer packaging was conditioned at 73 ° F and 50 % Relative Humidity for 24 hours

Special preparation of plastic inside containers at 0 ° F performed? n/a

Drop Test (U.N. Orange Book 9.7.3, HM - 181 178.603)

Number of drops **5**, height of drops **72”**, **Packing Group I, Great Danger Level**

Test Results:

| | |
|-------------------------------|---------------|
| 1st drop , flat on bottom | PASSED |
| 2nd drop , flat on top | PASSED |
| 3rd drop , flat on long side | PASSED |
| 4th drop , flat on short side | PASSED |
| 5th drop , bottom corner | PASSED |

Comments: No leaks occurred from any inner receptacle
The outer fiberboard container did not exhibit any damage liable to affect safety during transit

Stacking Test (U.N. Orange Book 9.7.6 , HM - 181 178.606)

(3 - empty) samples were subjected to a weight of **188 Lbs.** which is equal to or greater than identical packages of the same weight stacked to the height of 3 meters (9.84 feet) for 24 hours testing.
Required compression: 160 lbs.
Actual compression: 188 lbs.

Test Results:

| | | | |
|-----------|---------------|------|------------|
| Sample #1 | PASSED | .2 " | Deflection |
| Sample #2 | PASSED | .2 " | Deflection |
| Sample #3 | PASSED | .2 " | Deflection |

Comments: No rupture, leaking or deformation occurred

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TEST PROCEDURES and RESULTS

Cobb Test (U.N. Orange Book 9.6.11.1, HM -181 178.516)

Quantity of (5) 5" x 5" square samples from outside shipping container

Water absorbed

- 1) 135 g/m²
- 2) 139 g/m²
- 3) 136 g/m²
- 4) 135 g/m²
- 5) 137 g/m²

Mass increase cannot exceed 155 g/m² after a 30 minute testing period

Vibration Test (HM – 181, 178.608)

(3) samples were tested for a **60 minute duration @ 200 Cycles Per Minute** Frequency

Mechanical Rotary Motion with a 1 " peak to peak Amplitude

Comments : Container and contents were not affected by the vibrations , no leakage of contents

TESTING EQUIPMENT used during the Performance Testing

Gaynes-Vibration tester # 1250

Gaynes-Drop tester # DT-125

Testing Machines Inc. Compression tester # 17-37 with a 50,000 lbs. Capacity

Testing Machines Inc. Cobb tester

GBC Temperature and Humidity Chamber

A&D Electronic Balance # EK-120 A

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RAK Testing, LLC certifies that the previously described testing services have been performed in accordance with standard good laboratory practices . The packaging tested has **PASSED** the standards of the United Nations Transport of Dangerous Goods HM - 181 and the Department of Transportation Title 49 CFR in accordance with recommendations for UN packaging , Code 4G , Fiberboard Boxes , Combination Type Packages , **Packing Group I, Great** Danger Level Hazardous Materials with overall gross weight not exceeding **1.5 Kg** for a **Quantity of (four) 4 ounce glass bottles with closures.**

In the event that any changes are made to the use classification assumed as a basis for these test or to any part of this combination package , such as a different inner container , a different closure method or any other variation , these test results will be deemed invalid and are not to be relied upon .

RAK Testing, LLC does not perform Internal Pressure (Hydraulic) test or compatibility test on inside containers. These test if needed should be performed by your inside container supplier .

ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY THAT THE PACKAGING TESTED IS MERCHANTABLE OR FIT FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL RAK Testing, LLC LIABILITY EXCEED THE AMOUNT PAID BY THE CUSTOMER FOR TESTING SERVICES.

The appropriate certification markings to be displayed on the outside of the fiberboard container :
(Lower case "un" letters circled)

u 4G/X1.5/S/19 ** Last two digits of date of manufacture of fiberboard box, i.e., **19**
n USA / A-Kobak Container
Hinckley, OH

Re-Testing **MUST** be scheduled before 24 month anniversary from the last testing date .

Date Tested: 4-25 through 4-26-19

UN Test Report Number: 42619

Tested for:

A-Kobak Container
1701 West 130th St.
Hinckley, OH 44233
330.225.7791 Pat Sullivan

Test Performed by:

RAK Testing, LLC
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Massillon , Ohio 44648
Phone : 740-624-1314
Richard Kovaleski, CPLT