

UNITED NATIONS

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

UN Code : **4G** Fiberboard Boxes Packing Group : I Overall Package Gross Mass: 14.1 **Kg**

Description of outside fiberboard container : **Reference: Gebauer, 36 - Four Ounce Glass Bottles Ethyl Chloride UN1037**

Style : REGULAR SLOTTED CONTAINER (**RSC**) weight: 2.6 lbs.
Certification stamp: A-Kobak Container, Hinckley, OH

Facing Liner Weights : 40.5 # / msf - 35.7 # / msf - 41.6# / msf

Medium Weights : 22.7 # / msf – 22.4 # / msf Board Test Grade : 275# Flute : CB

Carton Dimensions : Length 19 " x Width 19 " x Depth 7.875 " Outside Dimensions

Manufactures Joint : 3" wide fiberglass reinforced paper tape

Flap Closure : 48 mm - 1.5 mil transparent, pressure sensitive sealing tape.

Quantity of (2) , 1-Top and 1-Bottom , approximately 26" long strips positioned down the center of box flaps and onto the width panels, one top one bottom.

Description of Inner Packaging Materials : Each bottle was packed inside a auto bottom tuck top, kla white die/cut folding carton 2.25" x 2.25" x 5.9375" O.D. (.57mm thick) with inside glue joint. See Nosco specification #931070. Four folding cartons were inserted into each of the nine cells of the CB doublewall 1.5" air-celled partitions, cell size: 4.75" x 4.75" x 6.125" tall, weight:1 lb.. One CB doublewall pad was placed in the bottom of the outer box, size: 18.5" x 18.5", weight: .4 lbs.

Description of inside Receptacles: Thirty-six 4 ounce plastic coated amber round glass bottles, manufactured by Lawson/Mardon-Wheaton 2.15" diameter x 4.84" tall without closure cap. See Kimble Glass specification #DE-386210. Closure cap: 24 mm black twist-on plastic cap (torqued to 20 in. 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 cylinder with a ¼" x 1.625" slot on the side.

Number per Package : Thirty-six

UN Test Report Number : 100410

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 to 98 % of capacity with : Water

Total Gross Mass Weight = 31.02 lbs. / 14.1 kg
Tare Weight (packaging, including receptacles) = 18 lbs.
Net “ product “ Weight (liquid or solid) = 13.02 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 1800 **lbs.** which is equal to or greater than identical packages of the same weight stacked to the height of 3 meters (9.84 feet) X 1.5 OR GREATER FOR DYNAMIC COMPRESSION TESTING.

Test Results :
Sample # 1 **PASSED** .42 " Deflection
Sample # 2 **PASSED** .42 " Deflection
Sample # 3 **PASSED** .42 " Deflection

Comments : No rupture , leaking , or deformation occurred

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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)	126 g/m2
	2)	127 g/m2
	3)	129 g/m2
	4)	128 g/m2
	5)	127 g/m2

Mass increase can not 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 @ 240 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 14.1 **Kg** for a **Quantity of (Thirty-six) 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 compatability 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/X14.1/S/10** ** Last two digits of date of manufacture of fiberboard box, i.e., 10
n **USA/M5787**

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

Date Tested : 10-1 though 10-4-10

UN Test Report Number : 100410

Tested for : Company : A-Kobak Container
 Address : 701 West 130th Street
 City : Hinckley
 State : OH
 Zip : 44233-0490
 Phone : 330.225.7791 Jerry Dolph

Test Performed by : RAK Testing, LLC
 777 3rd NW
 Massillon , Ohio 44648
 Phone : 740-624-1314
 Richard Kovaleski, CPLT