

**UNITED NATIONS**

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

UN Code: **4G** Fiberboard Boxes

Packing Group: I

Overall Package Gross Mass: **1.1 Kg**

**Reference: Gebauer, 4x4.7 ounce Aerosol Cans with  
Accu-Stream spray nozzles, Ethyl Chloride, UN1037**

**Description of outside fiberboard container:**

Style : Regular Slotted Container (RSC) weight: .4 lbs.

Box maker's certification stamp: **A-Kobak Container, Hinckley, OH**

Facing Liner Weights : 41.1# / msf - 41.6# / msf

Medium Weights : 36.5# / msf

Board Test Grade: 200#

Flute: C

Carton Dimensions : Length 7.125" x	Width 7.125" x	Depth 5.25 "	Inside Dimensions
Length 7.5" x	Width 7.375" x	Depth 6"	Outside Dimensions

Manufactures Joint: 1.5" inside glue

**Outer box flap closure instructions:** two pieces of **3M St. Paul MN**, #372-2MC, 48 mm wide, 1.5 mil transparent water-proof pressure sensitive sealing tape. Two 48 mm wide x 12" long strips (one top and one bottom) were positioned onto the major flaps at the center intersection and equally onto the sides of the outer box.

**Description of inner packaging materials:** The cans were inserted into an **A-Kobak Hinckley, OH** .040 chipboard solid fiber 4 cell partition with 1.125" perimeter air-cells. Can cell size: 2.25" x 2.25" x 5.0625" tall. Total weight of assembled partitions: 84.87 grams.

**Description of inside receptacles:** four 4.7 ounce round metal aerosol cans. Can size with plastic Accu-Stream 360 with Sure Lock Technology spray nozzle: 1.77" diameter x 5.125" tall, total weight empty: 51.16 grams. The can was manufactured by **Crown USA Spartanburg, SC**, see specification #100167R1 exhibit 4.1& 4.2 for part #CR-3007706-D dated 7-11-08. The spray nozzle was snapped in place over the top chime of the aerosol can, weight 14.26 grams. The actuators were supplied by **Venture Plastics, Inc. Newton Falls, OH**.

Number per Package: Four (2x2 arrangement)

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## 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 **98%** with: **water**

**Total Gross Mass Weight = 2.42 lbs. / 1.1 kg**  
**Tare Weight ( packaging, including receptacles ) = 1 lb.**  
**Net “ product “ Weight ( liquid or solid ) = 1.42 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	<b>PASSED</b>
2nd drop , flat on top	<b>PASSED</b>
3rd drop , flat on long side	<b>PASSED</b>
4th drop , flat on short side	<b>PASSED</b>
5th drop , bottom corner	<b>PASSED</b>

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 **219 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 for dynamic compression testing. Formula used for compression testing:  $120/6=20-1=19 \times 2.42=45.98 \times 3=137.9 \times 1.5=206.9$  lbs.

Required top load: **206.9** lbs.

Actual top load applied: **219 lbs.**

#### Test Results:

Sample # 1	<b>PASSED</b>	.1 "	Deflection
Sample # 2	<b>PASSED</b>	.1 "	Deflection
Sample # 3	<b>PASSED</b>	.1 "	Deflection

Comments: No rupture , leaking , or deformation occurred

## 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) 150 g/m<sup>2</sup>
- 2) 149 g/m<sup>2</sup>
- 3) 147 g/m<sup>2</sup>
- 4) 151 g/m<sup>2</sup>
- 5) 150 g/m<sup>2</sup>

Mass increase cannot exceed 155 g/m<sup>2</sup> 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

