

**UNITED NATIONS**

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

UN Code : **4G** Fiberboard Boxes                      Packing Group : I                      Overall Package Gross Mass: **2.5 Kg**

**Reference: Gebauer, 12x4.7 ounce Aerosol Cans with  
Accu-Stream spray nozzles, Ethyl Chloride, UN1037**

**Description of outside fiberboard container:**  
Style : Regular Slotted Container (RSC) weight: .6 lbs.  
Box makers certification stamp: A-Kobak Container, Hinckley, OH

Facing Liner Weights : 42.1# / msf   -   41.2# / msf

Medium Weights: 21.2# / msf                      Board Test Grade : 200#                      Flute : C

Carton Dimensions : Length	11.25"	x	Width	9.25"	x	Depth	5.125 "	Inside Dimensions	
	Length	11.375"	x	Width	9.5"	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 18" long strips (one top and one bottom) were positioned onto the major flaps at the center intersection and onto the sides of the outer box.

**Description of inner packaging materials:** The cans were inserted into a A-Kobak, Hinckley, OH 200# C flute 12 cell partition with .6875" & .5" perimeter air-cells. Can cell size: 2.3125" x 2.3125" x 5.125" tall. Total weight of assembled partitions: .4 lbs.

**Description of inside receptacles:** Twelve 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: Twelve (3x4 arrangement)

UN Test Report Number: 61716-B

## 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 = 5.6 lbs. / 2.5 kg**  
**Tare Weight ( packaging, including receptacles ) = 3.4 lb.**  
**Net " product " Weight ( liquid or solid ) = 2.2 lbs.**

The fiberboard outer packaging was conditioned at 73<sup>o</sup>F and 50 % Relative Humidity for 24 hours

Special preparation of plastic inside containers at 0<sup>o</sup>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 **527 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.

Required top load: 475 lbs.

Actual top load applied: 527 lbs.

**Test Results:**

Sample # 1	<b>PASSED</b>	.2 "	Deflection
Sample # 2	<b>PASSED</b>	.2 "	Deflection
Sample # 3	<b>PASSED</b>	.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) 131 **g/m<sup>2</sup>**
- 2) 133 **g/m<sup>2</sup>**
- 3) 131 **g/m<sup>2</sup>**
- 4) 134 **g/m<sup>2</sup>**
- 5) 133 **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

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