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Laboratory #: 320011-03
REVISED
Report Date: March 12, 2013
Received Date: November 5, 2002
Customer P.O. #: P002617

Attention: Sergio Garza
Specimen: Portable Gasoline Containers

TEST REPORT

RE: TESTING OF CHILD RESISTANT CLOSURE ON PORTABLE NON-METALLIC FLAMMABLE LIQUID CONTAINERS

1.0 INTRODUCTION

On November 5th, 2002, TSL Professional Services received thirty (30) empty portable gasoline containers with new safety child-resistant closures to evaluate children and senior adults performance in opening and resealing the closures, in accordance with the Code of Federal Regulations for Poison Prevention Packaging.

Note: The components and mechanisms for the child-resistant closures are now manufactured at Scepter Manufacturing, LLC, 404 26th Avenue N.W., Miami, OK, 74534.

Code of Federal Regulations
Title 16, Volume 2, Revised as of January 1st, 1999,
Chapter 2 – Consumer Product Safety Commission
Part 1700 – Poison Prevention Packaging
Section 1700.15 – Poison Prevention Packaging Standards
Section 1700.20 – Testing Procedure for Special Packaging

The testing program involved the sourcing of fifty (50) children and one-hundred (100) senior adults from a minimum of five (5) different locations for each age group.

Observations and times were recorded from every participant that took part in the child resistant closure testing.

Statistical evaluation and tabulation of the results were then assembled and reported.

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Cambridge Materials Testing Limited

Per Stephen Brown
STEPHEN BROWN, QUALITY ASSURANCE
Per Derek Wild
DEREK WILD, TECHNICIAN



2.0 IDENTIFICATION OF GASOLINE CONTAINER AND CLOSURE



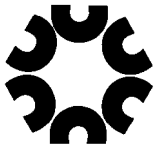
Photograph #1: Portable Gasoline Container and the New Safety Child Resistant Closure

Scepter Corporation manufactured the gasoline container and child resistant closures.

The closure model was a “fuel tank vent safety closure” with a black closure cap, yellow seal lid and yellow dispensing nozzle with elastomeric seal. The cap, lid and nozzle were High-Density Polyethylene (HDPE).

Opening instructions were not identified on the gasoline container or on the child resistant closures.

The seal lid had the following identification: “Scepter, PAT. 87712 JS 710” and the dispensing nozzle had the following identification: “USE ONLY WITH VENTED CAN, FS910, MADE IN CANADA”.



2.0 IDENTIFICATION OF GASOLINE CONTAINER AND CLOSURE (Cont'd)



Photograph #2: Dimensions of Closure

The distances labeled on Photograph #2 identified the dimensions of the closure. The “A” dimension was between 54.0 and 54.3 mm. The “B” dimension was approximately 32.7 mm.

The model number on the gasoline container was AB205S and the material was High-Density Polyethylene. The colour of the gasoline container was red. The container was classified under UL[®] as 774X and CSA[®] ASTM PS 91-00.

The identification on the bottom of the container was as follows:

Non-Metallic Flammable Liquid Container

In Accordance With the Standard Specification for
Portable Gasoline Containers for Consumer Use
ASTM F-852-99 + ASTM F-839-83



3.0 EVALUATION PROCEDURES

All child resistant closures were torqued onto the empty portable gasoline containers at 50 in-lbs. at least 72 hours prior to evaluating the performance of the children and senior adults.

The containers were stored within a laboratory atmosphere that was maintained at approximately $23 \pm 2^{\circ}\text{C}$.

3.1 Testing of Children's Performance

The evaluation of the children's performance to open and resecure the child resistant closures was performed on three different age groups.

The age groups were identified as follows:

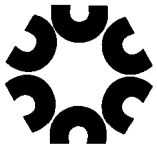
Group #1 – Fifteen (15) Children Between 42 and 44 Months,
Group #2 – Twenty (20) Children Between 45 and 48 Months, and
Group #3 – Fifteen (15) Children Between 49 and 51 Months.

Twenty (20) percent of the children from each age group were selected from different locations.

The children required parental consent prior to participation in the testing of the child resistant closures.

The testing procedures and instructions for the children were as follows:

- 1) The testing took place in a well-lighted location.
- 2) Two children were escorted to the test area at a time.



3.1.1 First Five (5) Minutes

- 3) The tester asked each child to “PLEASE TRY TO OPEN THIS FOR ME” on a closure within five (5) minutes. The tester encouraged the child to keep trying if the child wished to stop. Gifts were not offered to the children.
- 4) The children were allowed to talk to each other, watch each other, but not open each other’s containers.
- 5) If the child was able to open the packages within the first five minutes the tester said “THANK-YOU” and took the container away. The child was not asked to open the package a second time.

3.1.2 Demonstration

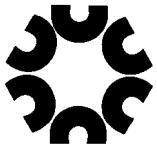
- 6) The tester demonstrated to the children how to open and resecure the closures and said, “WATCH ME OPEN MY CONTAINER”.

3.1.3 Second (5) Minutes

- 7) The tester took a new container and said, “NOW YOU TRY TO OPEN YOUR CONTAINERS”.
- 8) At the end of the test period or when the child was able to open the container, the tester said “THANK-YOU FOR HELPING”.
- 9) The tester or another adult then escorted the children back to their supervised area.

A failure was considered to be a child that was able to release the closure and presumably gain access to the contents. A pass was considered to be a child that was not able to release the closure and not gain access to the contents.

An additional fifty children for testing was deemed necessary if the child-resistant effectiveness was less than 85 percent without a demonstration and not less than 80 percent after a demonstration, as per Section 1700.15 (b)(1) of the Code of Federal Regulations.



3.2 Testing of Senior-Adults Performance

The evaluation of the senior's performance to open and resecure the child resistant closures was performed on three different age groups.

The age groups were identified as follows:

- Group #4 – Twenty-Five (25) Seniors Between 50 and 54 Years,
- Group #5 – Twenty-Five (25) Seniors Between 55 and 59 Years, and
- Group #6 – Fifty (50) Seniors Between 60 and 70 Years.

Seventy (70) percent were required to be female and thirty (30) percent to be male participants. Twenty (20) percent of the senior adults from each age group were selected from different locations.

The seniors were required to sign a consent form prior to participation in the testing of the child resistant closures.

The testing procedure and instructions for the seniors were as follows:

3.2.1 First Five (5) Minutes

- 1) Five minutes were allowed for each senior to completely open and resecure the child-resistant closures.
- 2) The first package was handed to the senior by the tester who said "PLEASE OPEN THIS CONTAINER".

Only seniors who were not able to open the gasoline container within the first five (5) minutes participated in opening and closing of two non-child resistant screening packages. The screening packages were a "SNAP" and "CT" closure.



3.2.2 Screening

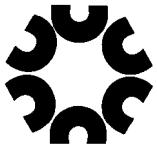
- 3) The tester allowed the seniors one-minute to open and resecure each of the two screening packages.
- 4) The tester said "PLEASE OPEN AND PROPERLY CLOSE THESE CONTAINERS".

NOTE: Seniors who could not open and resecure the non-child resistant screening packages were not counted as part of the 100 seniors.

3.2.3 Second (1) Minute

- 5) One minute was allowed for each senior to completely open and resecure the child-resistant closures.
- 6) The second package was handed to the senior by the tester, who said "THIS IS AN IDENTICAL PACKAGE, PLEASE OPEN THIS CONTAINER".

NOTE: The senior adult use effectiveness should not have been less than 90 percent, as per Section 1700.15 (b)(2)(ii) of the Code of Federal Regulations.



4.0 RESULTS OF EVALUATION TESTING

Refer to the attached Appendix for individual results of each group tested.

4.1 Results of Children’s Performance Between the Ages of 42 and 44 Months

Table #1: Children Between 42 and 44 Months (Group #1)

<u>First 5 Minutes</u>	
# Openings	0
Total Openings for Males	0
Total Openings for Females	0
Mean Opening Time (seconds)	N/A
Standard Deviation	N/A
Child-Resistant Effectiveness	100%
<u>Second 5 Minutes</u>	
# Openings	0
Total Openings for Males	0
Total Openings for Females	0
Mean Opening Time (seconds)	N/A
Standard Deviation	N/A
Child-Resistant Effectiveness	100%
<u>Tested Packages</u>	
Total Packages	30
Packages Tested at Each Site	6
NOTE: 5 Tested Sites	-
Packages Tested by Each Tester	2
NOTE: 5 Testers / Site	-
% Packages Tested at Each Site	20%
% Packages Tested by Each Tester	6.7%

REMARKS:

The children between the ages of 42 and 44 months PASSED the child-resistant effectiveness of 85 percent within the first five (5) minutes and the child-resistant effectiveness of 80 percent within the second (5) minutes.



4.2 Results of Children’s Performance Between the Ages of 45 and 48 Months

Table #2: Children Between 45 and 48 Months (Group #2)

<u>First 5 Minutes</u>	
# Openings	0
Total Openings for Males	0
Total Openings for Females	0
Mean Opening Time (seconds)	N/A
Standard Deviation	N/A
Child-Resistant Effectiveness	100%
<u>Second 5 Minutes</u>	
# Openings	1
Total Openings for Males	1
Total Openings for Females	0
Mean Opening Time (seconds)	200
Standard Deviation	N/A
Child-Resistant Effectiveness	95%
<u>Tested Packages</u>	
Total Packages	30
Packages Tested at Each Site	8
NOTE: 5 Tested Sites	-
Packages Tested by Each Tester	2
NOTE: 5 Testers / Site	-
% Packages Tested at Each Site	27%
% Packages Tested by Each Tester	6.7%

REMARKS:

The children between the ages of 45 and 48 months PASSED the child-resistant effectiveness of 85 percent within the first five (5) minutes and the child-resistant effectiveness of 80 percent within the second (5) minutes.



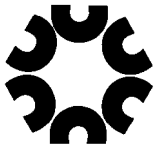
4.3 Results of Children's Performance Between the Ages of 49 and 51 Months

Table #3: Children Between 49 and 51 Months (Group #3)

<u>First 5 Minutes</u>	
# Openings	0
Total Openings for Males	0
Total Openings for Females	0
Mean Opening Time (seconds)	N/A
Standard Deviation (seconds)	N/A
Child-Resistant Effectiveness	100%
<u>Second 5 Minutes</u>	
# Openings	1
Total Openings for Males	1
Total Openings for Females	0
Mean Opening Time (seconds)	63
Standard Deviation (seconds)	N/A
Child-Resistant Effectiveness	93%
<u>Tested Packages</u>	
Total Packages	30
Packages Tested at Each Site	6
NOTE: 5 Tested Sites	-
Packages Tested by Each Tester	2
NOTE: 5 Testers / Site	-
% Packages Tested at Each Site	20%
% Packages Tested by Each Tester	6.7%

REMARKS:

The children between the ages of 49 and 51 months PASSED the child-resistant effectiveness of 85 percent within the first five (5) minutes and the child-resistant effectiveness of 80 percent within the second (5) minutes.



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Scepter Corporation

4.4 Results of Seniors Performance Between the Ages of 50 and 54 Years

Table #4: Seniors Between the Ages of 50 and 54 Years (Group #4)

<u>Packages Opened and Resecured</u>		<u>Tested Packages</u>	
Total Packages Opened	50	Total Packages	30
Total Packages Opened by Males	16	Packages Tested at Each Site	10
Total Packages Opened by Females	34	NOTE: 5 Tested Sites	
		Packages Tested by Each Tester	2
Total Packages Resecured	50	NOTE: 5 Testers / Site	
Total Packages Resecured by Males	16	Senior Adult Use Effectiveness	100%
Total Packages Resecured by Females	34	% Packages Tested at Each Site	33%
		% Packages Tested by Each Tester	7%
<u>First 5 Minutes</u>			
Mean Opening Times (seconds)	28	Mean Resecuring Times (seconds)	8
Standard Deviation	27	Standard Deviation	4
Mean Opening Times by Males (seconds)	16	Mean Resecuring Times by Males (seconds)	6
Standard Deviation	17	Standard Deviation	3
Mean Opening Times by Females (seconds)	33	Mean Resecuring Times by Females (seconds)	9
Standard Deviation	30	Standard Deviation	4
<u>Last 1 Minute</u>			
Mean Opening Times (seconds)	9	Mean Resecuring Times (seconds)	6
Standard Deviation	4	Standard Deviation	3
Mean Opening Times by Males (seconds)	7	Mean Resecuring Times by Males (seconds)	5
Standard Deviation	3	Standard Deviation	3
Mean Opening Times by Females (seconds)	10	Mean Resecuring Times by Females (seconds)	7
Standard Deviation	4	Standard Deviation	3
<u>Screening of Males</u>			
Mean Opening Times for Snap Closure	N/A	Mean Opening Times for CT Closure	N/A
Standard Deviation	N/A	Standard Deviation	N/A
Mean Closing Times for Snap Closure	N/A	Mean Closing Times for CT Closure	N/A
Standard Deviation	N/A	Standard Deviation	N/A
<u>Screening of Females</u>			
Mean Opening Times for Snap Closure	N/A	Mean Opening Times for CT Closure	N/A
Standard Deviation	N/A	Standard Deviation	N/A
Mean Closing Times for Snap Closure	N/A	Mean Closing Times for CT Closure	N/A
Standard Deviation	N/A	Standard Deviation	N/A



4.5 Results of Seniors Performance Between the Ages of 55 and 59 Years

Table #5: Seniors Between the Ages of 55 and 59 Years (Group #5)

<u>Packages Opened and Resecured</u>		<u>Tested Packages</u>	
Total Packages Opened	42	Total Packages	30
Total Packages Opened by Males	16	Packages Tested at Each Site	10
Total Packages Opened by Females	26	NOTE: 5 Tested Sites	
		Packages Tested by Each Tester	2
Total Packages Resecured	42	NOTE: 5 Testers / Site	
Total Packages Resecured by Males	16	Senior Adult Use Effectiveness	84%
Total Packages Resecured by Females	26	% Packages Tested at Each Site	33%
		% Packages Tested by Each Tester	7%
<u>First 5 Minutes</u>			
Mean Opening Times (seconds)	24	Mean Resecuring Times (seconds)	9
Standard Deviation	14	Standard Deviation	5
Mean Opening Times by Males (seconds)	12	Mean Resecuring Times by Males (seconds)	5
Standard Deviation	12	Standard Deviation	2
Mean Opening Times by Females (seconds)	31	Mean Resecuring Times by Females (seconds)	12
Standard Deviation	11	Standard Deviation	5
<u>Last 1 Minute</u>			
Mean Opening Times (seconds)	11	Mean Resecuring Times (seconds)	7
Standard Deviation	6	Standard Deviation	4
Mean Opening Times by Males (seconds)	6	Mean Resecuring Times by Males (seconds)	5
Standard Deviation	3	Standard Deviation	2
Mean Opening Times by Females (seconds)	13	Mean Resecuring Times by Females (seconds)	9
Standard Deviation	5	Standard Deviation	4
<u>Screening of Males</u>			
Mean Opening Times for Snap Closure	N/A	Mean Opening Times for CT Closure	N/A
Standard Deviation	N/A	Standard Deviation	N/A
Mean Closing Times for Snap Closure	N/A	Mean Closing Times for CT Closure	N/A
Standard Deviation	N/A	Standard Deviation	N/A
<u>Screening of Females</u>			
Mean Opening Times for Snap Closure	10	Mean Opening Times for CT Closure	4
Standard Deviation	1	Standard Deviation	1
Mean Closing Times for Snap Closure	6	Mean Closing Times for CT Closure	1
Standard Deviation	1	Standard Deviation	1



4.6 Results of Seniors Performance Between the Ages of 60 and 70 Years

Table #6: Seniors Between the Ages of 60 and 70 Years (Group #6)

<u>Packages Opened and Resecured</u>		<u>Tested Packages</u>	
Total Packages Opened	82	Total Packages	30
Total Packages Opened by Males	30	Packages Tested at Each Site	20
Total Packages Opened by Females	52	NOTE: 5 Tested Sites	
		Packages Tested by Each Tester	2
Total Packages Resecured	82	NOTE: 5 Testers / Site	
Total Packages Resecured by Males	30	Senior Adult Use Effectiveness	82%
Total Packages Resecured by Females	52	% Packages Tested at Each Site	67%
		% Packages Tested by Each Tester	7%
<u>First 5 Minutes</u>			
Mean Opening Times (seconds)	31	Mean Resecuring Times (seconds)	12
Standard Deviation	37	Standard Deviation	11
Mean Opening Times by Males (seconds)	12	Mean Resecuring Times by Males (seconds)	9
Standard Deviation	11	Standard Deviation	12
Mean Opening Times by Females (seconds)	43	Mean Resecuring Times by Females (seconds)	14
Standard Deviation	41	Standard Deviation	10
<u>Last 1 Minute</u>			
Mean Opening Times (seconds)	17	Mean Resecuring Times (seconds)	9
Standard Deviation	16	Standard Deviation	7
Mean Opening Times by Males (seconds)	9	Mean Resecuring Times by Males (seconds)	6
Standard Deviation	5	Standard Deviation	3
Mean Opening Times by Females (seconds)	21	Mean Resecuring Times by Females (seconds)	11
Standard Deviation	18	Standard Deviation	8
<u>Screening of Males</u>			
Mean Opening Times for Snap Closure	N/A	Mean Opening Times for CT Closure	N/A
Standard Deviation	N/A	Standard Deviation	N/A
Mean Closing Times for Snap Closure	N/A	Mean Closing Times for CT Closure	N/A
Standard Deviation	N/A	Standard Deviation	N/A
<u>Screening of Females</u>			
Mean Opening Times for Snap Closure	27	Mean Opening Times for CT Closure	3
Standard Deviation	13	Standard Deviation	1
Mean Closing Times for Snap Closure	11	Mean Closing Times for CT Closure	3
Standard Deviation	5	Standard Deviation	1



5.0 CONCLUSIONS

The children between the ages of 42 and 51 months had a child-resistant effectiveness that exceeded the allowable criteria for the Consumer Product Safety Commission, as per Section 1700.15 (b)(1) of the Code of Federal Regulations.

The primary type of difficulty experienced by the senior adults was the inability to release the locking mechanism prior to turning of the cap. The resecuring torque by the senior adults was equal to or greater than the 50 in-lb application torque.

The senior adults between the ages of 50 and 54 years had an effectiveness well above the allowable criteria for the Consumer Product Safety Commission, as per Section 1700.15 (b)(2)(ii) of the Code of Federal Regulations.

The senior adults between the ages of 55 and 59 years had an effectiveness six (6) percent below the allowable criteria for the Consumer Product Safety Commission, as per Section 1700.15 (b)(2)(ii) of the Code of Federal Regulations.

The senior adults between the ages of 60 and 70 years had an effectiveness eight (8) percent below the allowable criteria for the Consumer Product Safety Commission, as per Section 1700.15 (b)(2)(ii) of the Code of Federal Regulations.

APPENDIX:

Individual Results for Children and Seniors Performances
(6 Pages)