ISSN 1041-9489

SAFETY BRIEF

January 2001 Volume 17, No. 4

Triodyne Inc.

Consulting Engineers & Scientists – Safety Philosophy & Technology

5950 West Touhy Avenue Niles, IL 60714-4610 (847) 677-4730

FAX: (847) 647-2047

e-mail: infoserv@triodyne.com

www.triodyne.com

SAFETY POTPOURRI

By Ralph L. Barnett*

CONTENTS

1. Child Resistant Closures

A child resistant closure that passes the Consumer Product Safety Commission Poison Prevention Packaging Act of 1970 may leave as many as 28% of children unprotected. Up to 10% of adults may fail to reclose caps and as many as 20% of five-year olds may open the closures after two five-minute tries, including one attempt after they have been shown how to open it.

Here's the law - try and read it [Ref.1]:

16 CFR Ch.II (1-1-91 Edition)
Subchapter E - Poison Prevention Packaging Act of 1970 Regulations
PART 1700 - Poison Prevention Packaging
§ 1700.1 Definition

§ 1700.1 (b)(4)

"Special packaging" means packaging that is designed or constructed to be significantly difficult for children under 5 years of age to open or obtain a toxic or harmful amount of the substance contained therein within a reasonable time and not difficult for normal adults to use properly, but does not mean packaging which all such children cannot open or obtain a toxic or harmful amount within a reasonable time.

§ 1700.15 Poison prevention packaging standards.

(a) *General requirements.* The special packaging must continue to function with the effectiveness specifications set forth in paragraph (b) of this section when in actual contact with the substance contained therein.

(b) *Effectiveness specifications.* Special packaging, tested by the method described in § 1700.20, shall meet the following specifications:

(1) Child-resistant effectiveness of not less than 85 percent without a demonstration and not less than 80 percent after a demonstration of the proper means of opening such special packaging. In the case of unit packaging, child-resistant effectiveness of not less than 80 percent.

(2) Adult-use effectiveness of not less than 90 percent.

§ 1700.20 Testing procedure for special packaging.

* Professor, Mechanical and Aerospace Engineering, Illinois Institute of Technology, Chicago, IL. and Chairman, Triodyne Inc., Niles, IL

(1) Use 200 children between the ages of 42 and 51 months inclusive, evenly distributed by age and sex, to test the ability of the special packaging to resist opening by children. The even age distribution shall be determined by having 20 children (plus or minus 10 percent) whose nearest age is 42 months, 20 whose nearest age is 43 months, 20 at 44 months etc., up to and including 20 at 51 months of age. There should be no more than a 10 percent preponderance of either sex in each age group. The children selected should be healthy and normal and should have no obvious or overt physical or mental handicap.

(2) The children shall be divided into groups of two each. The testing shall be done in a location that is familiar to the children; for example, their customary nursery school or regular kindergarten. No child shall test more than two special packages, and each package shall be of a different type. For each test, the paired children shall receive the same special packaging simultaneously.

The special packaging, each test unit of which, if appropriate, has previously been opened and properly resecured by the tester, shall be given to each of the two children with a request for them to open it.

Each child shall be allowed up to 5 minutes to open the special packaging. For those children unable to open the special packaging after the first 5 minutes, a single visual demonstration, without verbal explanation, shall be given by the demonstrator. A second 5 minutes shall then be allowed for opening the special packaging.

If a child fails to use his teeth to open the special packaging during the first 5 minutes, the demonstrator shall instruct him, before the start of the second 5-minute period, that he is permitted to use his teeth if he wishes.

(3) Records shall be kept on the number of children who were and are not able to open the special packaging, with and without demonstration.

The percent of child-resistant effectiveness shall be the number of children tested, less the test failures, divided by two. A test failure shall be any child who opens the special packaging or gains access to its contents.

(4) One hundred adults, age 18 to 45 years inclusive, with no overt physical or mental handicaps, and 70 percent of whom are female, shall compromise the test panel for normal adults. The adults shall be tested individually, rather than in groups of two or more. The adults shall receive only such printed instructions on how to open and properly resecure the special packaging as will appear on the package as it is delivered to the consumer. Five minutes shall be allowed to complete the opening and, if appropriate, the resecuring process.

(5) Records shall be kept on the number of adults unable to open and the other adults tested who fail to properly resecure the special packaging. The number of adults who sucessfully open the special packaging and then properly resucure the special packaging (if resecuring is appropriate) is the percent of adult-use effectiveness of the special packaging.

Research bears out the inadequacy of this “protection” act. According to Dr. W. Kip Viscusi, a Duke University researcher, as many as 3,500 children suffer from drug poisoning each year because, “Consumers have been lulled into a less safety-conscious mode of behavior by the existence of safety caps. The presumed effectiveness of the technological solution may have induced increased parental irresponsibility.” [Ref. 2]

2. Poison Lookout Checklist [CPSC Doc. #383]

To reinvigorate personal vigilance with respect to child resistant packaging, the Consumer Product Safety Commission prepared the following checklist in Document # 383 [Ref. 3].

The home areas listed below are the most common sites of accidental poisonings. Follow this checklist to learn how to correct situations that may lead to poisonings. If you answer "No" to any questions, fix the situation quickly. Your goal is to have all your answers "Yes”.

The Kitchen

1. Do all harmful products in the cabinets have child-resistant caps? Products like furniture polishes, drain cleaners and some oven cleaners should have safety packaging to keep little children from accidentally opening the packages.

   Yes _ No _

2. Are all potentially harmful products in their original containers? There are two dangers if products aren't stored in their original containers. Labels on the original containers often give first aid information if someone should swallow the product. And if products are stored in containers like drinking glasses or pop bottles, someone may think it is food and swallow it.

   Yes _ No _

3. Are harmful products stored away from food? If harmful products are placed next to food, someone may accidentally get a food and a poison mixed up and swallow the poison.

   Yes _ No _

4. Have all potentially harmful products been put up high and out of reach of children? The best way to prevent poisoning is making sure that it's impossible to find and get at the poisons. Locking all cabinets that hold dangerous products is the best poison prevention.

   Yes _ No _

The Bathroom

1. Did you ever stop to think that medicines could poison if used improperly? Many children are poisoned each year by overdoses of aspirin. If aspirin can poison, just think of how many other poisons might be in your medicine cabinet.

   Yes _ No _

2. Do your aspirins and other potentially harmful products have child-resistant closures? Aspirins and most prescription drugs come with child-resistant caps. Check to see yours have them, and that they are properly secured. Check your prescriptions before leaving the pharmacy to make sure the medicines are in child-resistant packaging. These caps have been shown to save the lives of children.

   Yes _ No _

3. Have you thrown out all out-of-date prescriptions? As medicines get older, the chemicals inside them can change. So what was once a good medicine may now be a dangerous poison. Flush all old drugs down the toilet. Rinse the container well, then discard it.

   Yes _ No _

4. Are all medicines in their original containers with the original labels? Prescription medicines may or may not list ingredients. The prescription number on the label will, however, allow rapid identification by the pharmacist of the ingredients should they not be listed. Without the original label and container, you can't be sure of what you're taking. After all, aspirin looks a lot like poisonous roach tablets.

   Yes _ No _

5. If your vitamins or vitamin/mineral supplements contain iron, are they in child-resistant packaging? Most people think of vitamins and minerals as foods and, therefore, nontoxic, but a few iron pills can kill a child.

   Yes _ No _

The Garage or Storage Area

1. Did you know that many things in your garage or storage area that can be swallowed are terrible poisons? Death may occur when people swallow such everyday substances as charcoal lighter, paint thinner and remover, antifreeze and turpentine.

   Yes _ No _

2. Do all these poisons have child-resistant caps?

   Yes _ No _

3. Are they stored in the original containers?

   Yes _ No _

4. Are the original labels on the containers?

   Yes _ No _

5. Have you made sure that no poisons are stored in drinking glasses or pop bottles?

   Yes _ No _

6. Are all these harmful products locked up and out of sight and reach?

   Yes _ No _

When all your answers are "Yes," then continue this level of poison protection by making sure that, whenever you buy potentially harmful products, they have child-resistant closures and are kept out of sight and reach. Post the number of the Poison Control Center near your telephone.

3. Railing Height - 42" Rule

If a standing adult is thrust against a fence, he will not flip over if his center of gravity is lower than the top rail height. His tendency to flip under the fence is countered by the standard intermediate rail. The following figure of a standing adult male provides anthropometric data relating to a 97.5 percentile person. The data was taken from sheet A1 of "The Measure of Man" by Henry Dreyfuss [Ref.4]. Dreyfuss also indicates in sheet G1 that the average height of a man's shoe heel is 1.1 inches. When this height is combined with the elevation of the center of gravity, 40.9 inches, one obtains 42" which is the most common specification for railing height. Note that only 2.5% of males are taller than 6"2" and weigh more than 208.9 lbs.

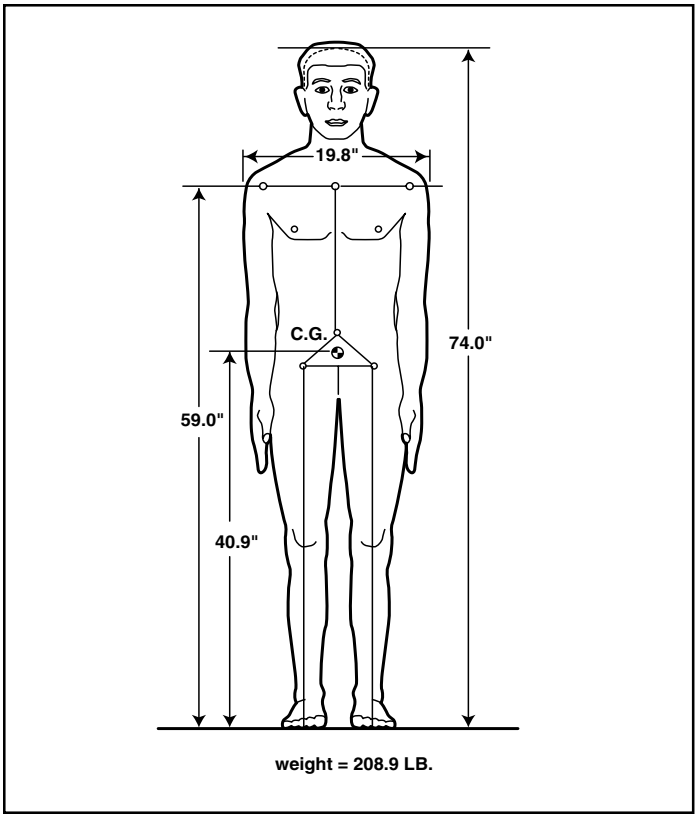

Figure 2 - Anthropometric Data of 97.5 Percentile Standing Adult Male

4. Numbering Rules - Code of Federal Regulations

If you have trouble understanding the numbering system in the OSHA regulations, the following rules may prove enlightening [Ref. 5].

Code of Federal Regulations structure. The basic structure of the CFR consists of a hierarchy of designated CFR units. The CFR numbering system is not based on a decimal numbering system. The following table illustrates the CFR structure.

CFR Unit	CFR Designation	Description
Title	12	Broad area subject to Federal regulation
Chapter	III	Rules of a single issuing agency
Part	303	Unified body of rules concerning a single function or specific subject
Section	§ 303.1	Short presentation of one regulatory function. The section is the basic unit of the CFR. The content of a section is a short, simple presentation of a single regulatory function.

Paragraph structure of a section. If you have more than one paragraph, designate each one as show (sic) in example 38. Indent each designated paragraph within a section.

The paragraph structure within a section allows six levels of designation.

Example 38: Paragraph structure of a section.

level 1	(a), (b), (c), etc.
level 2	(1), (2), (3), etc.
level 3	(i), (ii), (iii), etc.
level 4	(A), (B), (C), etc.
level 5	(1), (2), (3), etc.
level 6	(i), (ii), (iii), etc.

Notation Example: § 303.1 (a)(1)(i)(A)(1)(i)

For practice apply the rules to section one on child resistant closures.

References

1. "Poison Prevention Packaging Act of 1970 Regulations," *16 CFR 1700*. Washington, D.C. Consumer Product Safety Comission, as published in the *Code of Federal Regulations Title 16*, revised as of January 1, 1991.
2. Viscusi, Dr. W. Kip. *"Expert Raps Safety Caps,"* Chicago Sun Times, Feb. 27, 1984.
3. *Consumer Product Safety Comission Poison Lookout Checklist*. CPSC Document #383. As published at http://www.cps.gov/cpscpub/pubs/383.html
4. Dreyfuss, Henry. *The Measure of Man: Human Factors in Design*. New York: Whitney Library of Design, 1967.
5. *Federal Register Document Drafting Handbook*. Washington, D.C. National Archives and Records Administration, Office of the Federal Register, October 1998 Revision.

SAFETY BRIEF

January 2001 – Volume 17, No. 4

Editor: Paula L. Barnett

Illustrated and Produced by

Triodyne Graphic Communications Group