



UNITED STATES  
 CONSUMER PRODUCT SAFETY COMMISSION  
 WASHINGTON, DC 20207

CPSC/OFFICE OF  
 THE SECRETARY

1999 NOV 23 P 3:40

**Vote Sheet**

Date: November 19, 1999

TO : The Commission  
 Sadye E. Dunn  
 Secretary

FROM : Jeffrey S. Bromme, General Counsel  
 Stephen Lemberg, Asst. General Counsel  
 Harleigh Ewell, Attorney, GCRA (ext. 2217)

*JB*  
*SL*  
*HE*

SUBJECT : Regulating Child-Play Risks of Multi-Purpose  
 Lighters: Final Rule -- Vote Sheet

Attached is the staff's briefing package recommending that the Commission issue a final rule for multi-purpose lighter to require child-resistant features. A draft Federal Register notice to issue a rule is attached at Tab L of the briefing package.

Also, a draft final rule to determine, pursuant to Section 30(d) of the Consumer Product Safety Act (CPSA), that it is in the public interest to regulate this risk under the CPSA is at Tab M of the briefing package. 15 U.S.C. § 2079(d).

Please indicate your vote on the following options:

I. ISSUE A FINAL RULE TO REGULATE THE CHILD RESISTANCE OF MULTI-PURPOSE LIGHTERS. Please check the relevant option below.

- 1. PUBLISH THE DRAFT FEDERAL REGISTER NOTICE AT TAB L OF THE BRIEFING PACKAGE WITHOUT CHANGE.
- 2. PUBLISH THE DRAFT FEDERAL REGISTER NOTICE WITH CHANGES (please specify).

(Option I continued on page 2.)

\_\_\_\_\_ 3. DO NOT ISSUE A FINAL RULE FOR MULTI-PURPOSE LIGHTERS.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Date)

II. ISSUE A FINAL RULE TO REGULATE THE CHILD RESISTANCE OF MULTI-PURPOSE LIGHTERS UNDER THE CPSA. Please check the relevant option below.

\_\_\_\_\_ 1. PUBLISH THE DRAFT FEDERAL REGISTER NOTICE AT TAB M OF THE BRIEFING PACKAGE WITHOUT CHANGE.

\_\_\_\_\_ 2. PUBLISH THE DRAFT FEDERAL REGISTER NOTICE WITH CHANGES (please specify).

\_\_\_\_\_ 3. DO NOT ISSUE A FINAL RULE TO REGULATE THE CHILD RESISTANCE OF MULTI-PURPOSE LIGHTERS UNDER THE CPSA.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Date)

Comments/Instructions:

**BRIEFING PACKAGE**  
**FINAL STANDARD FOR**  
**MULTI-PURPOSE LIGHTERS**

**For Further Information Contact:**

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NOTE: This document has been reviewed by the...

...has not been submitted.

CPSA 6 (b)(1) Cleared  
11/17/99  
No Mfrs/PrvtLbrs or Products Identified  
Excepted *for public*  
Firms Notified, Comments Processed.  
WITH PART OF TAB REMOVED  
1 PAGE ON.



<b>TABS</b>	<b>Page</b>
TAB F	Memorandum from Suad Nakamura, Ph.D., HS, "Severity of burns. . . . . 68 resulting from flash fire," August 11, 1999.
TAB G	Memorandum from Eleanor F. Perry and Caroleene Paul, ESME, . . . . . 71 "Multi-Purpose Lighter Ignition Tests," July 7, 1999.
TAB H	Memorandum from Linda E. Smith, EPHA, "Burn Hazard Associated . . . . 74 with Lighting Gas-Fueled Products," June 17, 1999.
TAB I	Memorandum from Robert Franklin, EC, "Response to Economic . . . . . 80 Issues Raised in Public Comments," November 3, 1999.
TAB J	Memorandum from Robert Franklin, EC, "Final Regulatory . . . . . 83 Analysis and Final Regulatory Flexibility Analysis," November 18, 1999.
TAB K	Memorandum from Catherine A. Sedney, HF, "Effect of the Rule on . . . . 121 Elderly and Handicapped Persons," October 29, 1999.
TAB L	Draft <u>Federal Register</u> Notice: 30(d) Rule . . . . . 123
TAB M	Draft <u>Federal Register</u> Notice: Safety Standard for . . . . . 135 Multi-Purpose Lighters.

## EXECUTIVE SUMMARY

The U.S. Consumer Product Safety Commission (CPSC) staff recommends that the Commission publish a final rule, under the Consumer Product Safety Act (CPSA), to require multi-purpose lighters to be child-resistant. The staff believes that a rule as drafted is the least burdensome requirement that adequately addresses the risk of injury and death associated with fires started by children under the age of 5 playing with multi-purpose lighters.

Multi-purpose lighters subject to the draft final rule are also known as grill lighters, fireplace lighters, utility lighters, micro-torches, or gas matches. Excluded from the scope of the draft final rule are lighters that are intended primarily for igniting smoking materials, whether or not they are subject to the requirements of the Safety Standard for Cigarette Lighters. Also excluded are matches and large torches.

The staff has identified a total of 237 fires that were reportedly started by children under age 5 playing with multi-purpose lighters for the period January 1, 1988, through October 15, 1999. These fires resulted in a total of 45 deaths and 103 injuries. Twenty-eight of the 45 fatalities were children younger than age 5. Because the incident data are frequency counts of incidents reported to CPSC rather than national estimates, the staff considers them to be a conservative indication of the true extent of the problem.

The results of baseline testing conducted by the staff indicate that multi-purpose lighters have a low level of child resistance (4 to 41 per cent) compared to the minimum level of child-resistance (85 per cent) required for most cigarette lighters by the Commission's safety standard for that product. The staff believes that a standard requiring improved child-resistance for multi-purpose lighters would have net societal benefits exceeding \$17.2 million annually.



United States  
**CONSUMER PRODUCT SAFETY COMMISSION**  
 Washington, D.C. 20207

NOV 19 1999

**MEMORANDUM**

**TO :** The Commission  
 Sadye E. Dunn, Secretary

**THROUGH :** Jeffrey S. Bromme, General Counsel *JK*  
 Pamela Gilbert, Executive Director *PG*

**FROM :** Ronald Medford, Assistant Executive Director *RM*  
 for Hazard Identification and Reduction  
 Barbara J. Jacobson, Project Manager for *BJJ*  
 Multi-Purpose Lighters, Directorate for Health Sciences  
 (301) 504-0477 ext. 1206

**SUBJECT :** Draft Final Standard for Multi-Purpose Lighters

**I. Introduction**

The U.S. Consumer Product Safety Commission (CPSC) staff recommends that the Commission publish a final rule, under the Consumer Product Safety Act (CPSA), to require multi-purpose lighters to be child-resistant. The staff believes that such a rule would substantially reduce the risk of injury and death associated with fires started by children under age 5 playing with multi-purpose lighters.

Multi-purpose lighters subject to the draft final rule at TAB M are also known as grill lighters, fireplace lighters, utility lighters, micro-torches, or gas matches. These products are used by consumers to ignite items such as candles, fuel for fireplaces, charcoal or gas-fired grills, campfires, camp stoves, lanterns, fuel-fired appliances, and pilot lights. Some micro-torches used by consumers for soldering or brazing have a feature that allows for hands-free operation. All refillable and non-refillable multi-purpose lighters are covered, regardless of their cost or the type of fuel they use.

Excluded from the scope of the draft final rule are lighters that are intended primarily for igniting smoking materials, whether or not they are subject to the requirements of the Safety Standard for Cigarette Lighters. Also excluded are matches and large torches that contain more than 10 ounces of fuel.

NOTE: This document has not been reviewed or accepted by the Commission.

Initial *RM* Date *11/19/99*

CPSA 6 (b)(1) Cleared

*11/19/99*  
 No Mfrs/Prvtlbrs or Products Identified with Part of Part  
 Received *Barlow*  
 Firm's Notified  
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To meet the requirements of the draft final rule, a multi-purpose lighter must have a child-resistance of at least 85 percent, the same level of child-resistance required in the Safety Standard for Cigarette Lighters (16 CFR Part 1210).

The child-resistant mechanism of a multi-purpose lighter subject to the draft final rule must operate safely, must function for the expected life of the lighter, and must not be easy to deactivate. The child-resistant mechanism must also automatically reset when or before the user lets go of the lighter. The child-resistant mechanism that meets this requirement could reset after one or more attempts to operate the lighter.

Lighters that allow hands-free operation must have an additional feature (e.g., lock) that must be operated in order to maintain the flame. When the hands-free feature is used, the child-resistant mechanism must automatically reset when or before the user lets go of the lighter after extinguishing the flame.

The draft final rule has record keeping and reporting requirements that will help ensure that lighters comply with the standard. The draft standard also requires manufacturers and importers to provide a certificate of compliance to any distributor or retailer to whom the lighters are delivered.

The draft final rule contains anti-stockpiling provisions to prohibit excessive production or importation of non-complying lighters during the 12-month period between the publication date and the effective date of the final rule. This provision limits the production or importation of non-complying products to 120 percent of the amount produced or imported in the most recent calendar year before the publication date of the rule. To help assure compliance, manufacturers or importers must provide supporting information to CPSC to establish the number of lighters made or imported during the base period. They must also report shipments of non-child-resistant lighters to CPSC within ten days of the end of each calendar month during the anti-stockpiling period.

The draft final rule includes a 12-month effective date. Based on the experience with the Safety Standard for Cigarette Lighters, this will provide firms with sufficient time to design, test, and produce child-resistant multi-purpose lighters. The staff is aware of one such multi-purpose lighter already on the market and a number of other such multi-purpose lighters in the final stages of development and testing.



This briefing package provides the following information for the Commission's consideration:

1. Updated data on incidents involving multi-purpose lighters.
2. An analysis of comments received in response to the September 30, 1998, proposed rule (NPR) and the August 4, 1999, Supplemental Notice of Proposed Rulemaking, and comments received in connection with the January 20, 1999, meeting held for oral presentation of comments to the Commission.
3. A draft Final Regulatory Analysis.
4. A draft Final Regulatory Flexibility Analysis.
5. A draft Federal Register notice for a rule under sec. 30 (d) of the CPSA finding that it is in the public interest to regulate this risk under the CPSA.
6. A draft Federal Register notice for a final rule.

Attachments

## **II. Background**

On September 30, 1998, the Commission proposed a safety standard to address the risk of death and injury associated with multi-purpose lighters. This action resulted from a petition filed by Judy L. Carr.

On October 29, 1998, the staff sent a copy of the proposed safety standard, with a cover letter outlining the Commission's action, to small importers and manufacturers who could be subject to the standard. The letter invited interested parties to submit comments during the comment period.

On January 20, 1999, the Commission held a meeting for interested parties to present oral comments. Three individuals made presentations at that meeting: Mr. Don Cooke, Attorney at Law; Dr. Carol Pollack-Nelson, President, Independent Safety Consulting; and Mr. David Baker, General Counsel of the Lighter Association, Inc.

On August 4, 1999, the Commission published a Federal Register notice proposing that the child-panel tests be conducted with the lighter on/off switch in the "on," or unlocked, position, instead of in the "off," or locked, position as originally proposed. The notice provided an opportunity for presentation of oral comments on the proposed change on September 15, 1999.

## **III. Discussion**

### **A. Updated Incident Data**

The memorandum at TAB A provides updated information about fire incidents involving multi-purpose lighters. Data sources included consumer complaints, newspaper clippings, hospital emergency room-treated injury reports, fire department reports, CPSC investigation reports, and incidents submitted with public comments during the multi-purpose lighter rulemaking proceeding.

The staff has identified a total of 340 fires that were reportedly started by children playing with multi-purpose lighters for the period January 1, 1988, through October 15, 1999. These fires resulted in a total of 65 deaths and 138 injuries. For the incidents where the age of the fire starter was known, children under age 5 ignited 237 fires, which resulted in 45 deaths and 103 injuries. Twenty-eight of the 45 fatalities were children younger than age 5.

In addition to the fatalities, these fires resulted in severe injuries. Among the fires caused by children younger than age 5, four surviving children received burns over 70 percent or more of their bodies, burns that will require extensive long-term treatment.

The high proportion of fatalities that were children younger than age 5, and the severity of the injuries, illustrate the hazard associated with children playing with multi-purpose lighters. Because the data are known incidents reported to CPSC rather than national estimates, the full extent of the problem may be greater.

## **B. Discussion of Comments on the Proposed Standard**

The Commission received 23 comments on the proposed standard published on September 30, 1998. Three individuals presented oral comments to the Commission on January 20, 1999. The major issues raised in the comments and the staff responses are discussed in this section. Copies of all comments and a transcript of the January 20, 1999, public hearing are available from the Office of the Secretary.

The American Academy of Pediatrics wrote in support of the Commission's action to require multi-purpose lighters to be child-resistant, stating that in addition to the quantitative benefits, the rule will reduce the pain and heartache that results from the deaths and injuries caused by children playing with multi-purpose lighters.

The Executive Director of the National Fire Protection Association Center for High-Risk Outreach wrote in support of CPSC's efforts to reduce the number of deaths and injuries associated with children playing with fires. She stated that preschool age children are at more than twice the risk of fire death than the population at large. She also commented on the August 4, 1999, Federal Register notice that proposed a change to the test protocol.

Douglas Lant, Chairman of the British Standards Institute Technical Committee on Matches and Lighters, wrote in support of the Commission's action and said the European Standards Organization (CEN) was considering improvements to the Lighter Standard for Europe, including requirements for child-resistance.

The Chairman of the Coalition for Consumer Health & Safety wrote to urge the Commission to publish a final rule on multi-purpose lighters. This organization is a partnership of consumer, health, and insurer groups working to educate the public and to identify and promote policy solutions to a broad range of health and safety threats.

The Lighter Association, Inc. (Lighter Association), and several member firms, BIC Corporation (BIC), The Colibri Group, Scripto-Tokai Corporation (Scripto), Swedish Match, and Zippo Manufacturing Company (Zippo), wrote in general support of child-resistance for multi-purpose lighters but requested that the Commission address certain concerns about the definition and requirements for multi-purpose lighters (discussed below).

Several small firms, Donel, Inc. (Donel), SNC Group, and Zelco Industries, Inc. (Zelco), commented that a standard for multi-purpose lighters would have adverse impacts on small businesses because of the expense of developing and certifying a child-resistant design and because some manufacturers have already applied for patents, which would limit the number of design options. These firms asked the Commission for relief, either in the form of funding to offset their development and testing expenses or in the form of an extension on the effective date of the rule.

Blazer Corporation, a company that specializes in the distribution of micro-torches, wrote that it agrees in principle that lighters likely to be handled by children should be child-resistant. It also expressed concern that the definition of multi-purpose lighters would include micro-torches for professional use.

Vinson & Elkins, the law firm that filed the original petition on behalf of Judy L. Carr, and four other law firms, Joseph P. Moschetta and Associates, McDermott and Hansen, Don Cooke, and Sugarman and Sugarman, P.C., provided information on incidents involving multi-purpose lighters. Mr. Cooke appeared before the Commission at the January 20, 1999, meeting to present information about a fire started by a 2-year-old boy with a multi-purpose lighter that resulted in the death of the child and his mother. Another 4-year-old child was severely injured in the fire.

Independent Safety Consulting presented comments about children's fire knowledge and their attraction to fire and lighters, parental perceptions regarding the hazard and storage of lighters, parental supervision, and the appropriateness of a warning label as a hazard avoidance strategy.

Ms. Lorraine Daly, and Ms. Eve Mallett, both consumers, questioned the need for child-resistance on products in homes without young children.

Milford Consulting Associates, a testing agency with experience testing child-resistant packaging, cigarette lighters, and multi-purpose lighters, requested certain changes to the procedures for evaluating the child-resistance of multi-purpose lighters.

The staff responses to the issues raised by the commenters are discussed below.

## **1. Issue: Effectiveness of the Cigarette Lighter Standard**

Scripto stated that there are insufficient data to conclude that the Cigarette Lighter Standard is effective in reducing the number of child-play fire losses associated with lighters.

**Response:**

National fire loss estimates show a reduction in the number of estimated residential structure fires caused by children playing with all types of lighters. This reduction is occurring in spite of the fact that these estimates include fires started with multi-purpose lighters (which are not subject to a standard) and fires started by children 5 years old and older (who are older than the children addressed by child-resistant features). Based on data from the National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association (NFPA), the estimated number of lighter child-play fires decreased from 10,600 in 1994, the year the cigarette lighter standard took effect, to 7,200 in 1996. During the same period, estimated deaths decreased from 230 to 130 and estimated injuries decreased from 1,560 to 1,090. Comparing 1996 to 1994, there was a greater percentage reduction in child-play lighter fires (32 percent) than the reduction in residential structure fires overall (5 percent). The staff believes this reduction indicates that child-resistant cigarette lighters are preventing child-play fires. Because there was also a reduction in child-play fires started with matches, other factors, such as fire safety education or general improvements in fire safety (e.g., use of smoke detectors), have also likely contributed to the decrease. However, the reduction for child-play lighter fires (32 percent) is greater than the reduction for child-play match fires (21 percent) (TAB A). The staff believes that the available information supports the conclusion that the Safety Standard for Cigarette Lighters is effective in reducing child-play fires started by children under age 5 with lighters. The staff expects child-play lighter fires to continue to decline.

**2. Issue: Relative Risk of Injury**

Swedish Match commented that the Commission provided no data to show relative risk rates between matches and non-child-resistant multi-purpose lighters. Zelco commented that the number of fires resulting from matches is surely higher than the number of fires from multi-purpose lighters, yet matches are specifically excluded from the rule. Scripto recommended that the CPSC vigorously pursue regulatory action on matches. They stated that the societal benefits of regulating matches would far exceed those of regulating multi-purpose lighters.

**Response:**  
(TAB B)

Comparisons between child-play fires with matches and with multi-purpose lighters are not valid because they largely involve children of different age groups. A study of 551 juvenile firesetters conducted in Portland, Oregon, found that use of matches by children younger than age 5 was rare, but was relatively common among children of ages 6 to 11. This is consistent with the differences in motor development for the two age groups. Using a match requires two-hand coordination, and a combination of force and precision, as well as the control to maintain a flame long enough to light something. These factors make it a

challenging task for a three- or four-year-old child, but much less so for older children. In short, regulating matches would have little impact on child-play fires involving children under 5. Further, the overlap in the abilities of elementary school children and adults makes it impractical to modify the design of matches so they resist operation by older children but, at the same time, are easy for adults to use.

In contrast, based on CPSC incident data for the period January 1, 1988, through October 15, 1999, about 70 percent of the fires started with multi-purpose lighters were started by children under 5. These fires could be effectively reduced by a requirement that multi-purpose lighters be child-resistant. In baseline testing with children 42 to 51 months of age, the child-resistance of current multi-purpose lighters ranged from 4 to 41 percent. The standard would increase the level of child-resistance to a minimum of 85 percent. Based on experience with the cigarette lighter safety standard, the feasibility of making lighters child-resistant, yet acceptable to adults, has been demonstrated.

### **3. Issue: Definition of Multi-Purpose Lighters**

#### **a. Exclude high-end multi-purpose lighters.**

Zelco commented that the scope should be narrowed to exclude higher end multi-purpose lighters.

**Response:**  
(TAB C)

The staff does not support excluding the more expensive multi-purpose lighters. The staff believes that excluding the more expensive models from the scope would reduce the benefits of a standard for multi-purpose lighters. The Safety Standard for Cigarette Lighters excluded luxury lighters (customs or ex-factory value greater than \$2.00) because they differed from disposable cigarette lighters in certain characteristics affecting risk. The staff stated that because of their cost, consumers would be less likely to leave luxury cigarette lighters in household locations accessible to young children.

Unlike luxury cigarette lighters, the staff believes that the more expensive multi-purpose lighters are as likely to be involved in child-play fires as the less expensive models because they are stored and used in the same manner. In fact, some of the more expensive multi-purpose lighters are relatively large and may be more difficult to store out of the reach of children. At least one expensive multi-purpose lighter is appropriate for display near the fireplace.

In addition, luxury cigarette lighters often have unusual ignition mechanisms that may be difficult for young children to operate. In the case of multi-purpose lighters, most ignition mechanisms are similar and easy for young children to operate. Multi-purpose lighters are activated by applying pressure to a trigger or button mechanism, which initiates fuel flow and causes a spark. Baseline testing of one expensive multi-purpose lighter demonstrates that it is as easy for children to operate as the less expensive models.

**b. Exclude micro-torch lighters.**

Both the Lighter Association and Swedish Match question the inclusion of micro-torch lighters within the scope of the rule because they do not consider them comparable to the grill-type or "utility" multi-purpose lighters. The commenters argued that micro-torches are more suited for use in activities such as soldering, welding, heat shrinking, and household repairs.

The Lighter Association, Swedish Match, and The Colibri Group suggested that the term "micro-torch" be deleted in order to prevent lighters primarily intended for igniting smoking materials from being incorrectly identified as multi-purpose lighters.

Blazer Corporation, a company that specializes in the distribution of micro-torches, expressed concerns that the broad definition of multi-purpose lighter in the proposed rule may be interpreted to apply to micro-torch products used by professional tradesmen or in industrial settings.

**Response:**  
(TABS B & C)

The staff considers micro-torches to be comparable to other types of multi-purpose lighters. As stated in the proposal, "micro-torches" are marketed for multiple purposes that overlap those of "grill" or "utility" lighters (e.g., lighting fireplaces, camp fires, barbecues, camp stoves, etc.) All types of multi-purpose lighters are likely to be used and stored in the home in locations accessible to young children. For example, there is an incident where a child under the age of 5 started a fire with a micro-torch lighter. It appears the child found the lighter near a gas furnace where it was used to light the pilot light.

The staff clarified the definition of multi-purpose lighters to specifically exclude devices intended primarily for igniting smoking materials, whether or not they are subject to the requirements of the Safety Standard for Cigarette Lighters.

Products intended and sold only for professional or industrial use would not be subject to a rule promulgated under the CPSA. If, however, a particular micro-torch model was advertised in general circulation media (e.g., consumer magazines, catalogs, newspapers, television programs, consumer oriented Internet web sites, etc.), or was sold in hardware or other stores open to the general public, it would be considered a consumer product subject to the standard.

**c. Define multi-purpose lighters on the basis of length.**

The Lighter Association recommended alternative language that would define multi-purpose lighters as "a hand-held, flame producing device, . . . four inches or greater in length when in the fully extended position . . ." It maintained that the obvious distinguishing characteristic of a grill lighter is the length of the product that is designed to "reach over fire or into inaccessible places." Zippo also supported the use of a dimensional limitation.

**Response:**  
(TAB B)

The staff does not support the use of length to define multi-purpose lighters. There are micro-torch designs that are less than 4 inches long. The hotter, directional flame of a micro-torch compensates to an extent for its shorter nozzle, making it useful for many of the same purposes as "grill" lighters. Staff members found a micro-torch convenient to use for lighting a gas grill, a gas stove burner, candles, and a water heater pilot light. Other types of multi-purpose lighters could also be designed to be under 4 inches in length and still be functionally equivalent to longer lighters.

**d. Specify the type of fuel used by multi-purpose lighters.**

The Lighter Association and Zippo supported including only those lighters that use a gaseous fuel. Both indicated that it is not technologically or commercially feasible to create a utility lighter that uses liquid fuel. The Lighter Association stated that they believe no liquid-fuel utility lighters are produced anywhere in the world and questioned the Commission's authority to regulate products that do not exist.

**Response:**  
(TAB C)

As proposed, a multi-purpose lighter was defined as a "flame-producing product that operates on fuel." There is no reference to any specific type of fuel, liquid fuel or otherwise. The staff believes that any lighter that is used by consumers to ignite items such as candles, fuel for fireplaces, charcoal or gas-fired grills, etc. should be required to be child-resistant, regardless of the type of fuel, since these lighters would all present the same risk.



**e. Change the words "self-igniting" to "manually operated."**

The Lighter Association recommended changing "self-igniting" in the definition of multi-purpose lighter to "manually operated ignition mechanism" since the term "self-igniting" is not accurate because some action is required to ignite a lighter.

**Response:**

The staff agrees that the term "self-igniting" is imprecise. The staff revised the definition of multi-purpose lighters in the draft final rule to read, "A hand-held, flame-producing product that operates on fuel, **incorporates an ignition mechanism . . . ,** and is used by consumers . . . ."

**f. Delete the exclusion for lighters with more than 10 ounces of fuel.**

The Lighter Association, BIC, and Scripto objected to the exclusion of multi-purpose lighters that contain more than 10 ounces of fuel. They question the basis for this exclusion and express concern that an arbitrary cut-off invites the introduction of products that will fall outside of the scope of the rule. The Lighter Association and BIC state that there should be no limit on the amount of fuel in light of the fact that there are lighter attachments sold without any fuel or fuel reservoir that work with any quantity of fuel. In support of this argument, they provided a lighter attachment with an ignition mechanism labeled "soldering & utility torch" that accommodates a 14.1 ounce propane cylinder.

**Response:**

(TAB C)

The staff continues to support the exclusion of multi-purpose lighters that contain more than 10 ounces of fuel. As the Lighter Association recognized in its comments, the purpose of this provision is to distinguish multi-purpose lighters from large propane torches, which are also used for soldering and brazing. Most multi-purpose lighters contain less than 2 ounces of fuel. A lighter with a fuel capacity of 10 ounces would be quite large — on the order of 3 inches in diameter by 7 inches high. Such a lighter would not be convenient for the typical everyday uses of the lighters within the scope of the draft final rule. Therefore, such lighters would not likely be stored in the same locations as the smaller lighters that have been involved in child-play fires, and thus may not present the same risks.

A lighter attachment designed to accommodate a fuel cylinder with a capacity of 10 ounces or less would clearly be subject to the requirements of the draft final rule. The attachment cannot function as a multi-purpose lighter without a fuel source being attached.

This is true whether the attachment is sold with or without a fuel cylinder. For example, there are currently micro-torch multi-purpose lighters that utilize disposable butane cigarette lighters as the fuel source. Some of these micro-torches are sold with the cigarette lighter, and some are sold without the cigarette lighter. Both products would be subject to the requirements for child-resistance.

Accordingly, the draft final rule defines multi-purpose lighter as follows:

#### §1212.2 Definitions.

As used in this part 1212:

(a)(1) *Multi-purpose lighter*, (also known as grill lighter, fireplace lighter, utility lighter, micro-torch, or gas match, etc.) means: A hand-held, flame-producing product that operates on fuel, incorporates an ignition mechanism, and is used by consumers to ignite items such as candles, fuel for fireplaces, charcoal or gas-fired grills, camp fires, camp stoves, lanterns, fuel-fired appliances or devices, or pilot lights, or for uses such as soldering or brazing.

(2) The following products are not multi-purpose lighters:

(i) Devices intended primarily for igniting cigarettes, cigars, and pipes, whether or not such devices are subject to the requirements of the Safety Standard for Cigarette Lighters (16 CFR 1210).

(ii) Devices containing more than 10 oz. of fuel.

(iii) Matches.

#### **4. Issue: The proposal to require multiple operation capability is design-restrictive.**

The Lighter Association, BIC, Scripto, Zippo, Swedish Match, and SNC Group strongly opposed the proposed requirement that a multi-purpose lighter must allow multiple operations of the ignition mechanism (§ 1212.3 (b)). They characterize this provision as a design requirement that would reduce competition by narrowing the scope of complying designs and would result in wasteful patent disputes. The Lighter Association and SNC Group indicate that, as proposed, this requirement essentially mandates a design that is currently marketed by a single company. BIC reported that it has patent applications pending in the United States and in countries around the world for a multi-purpose lighter that allows for multiple operations of the ignition mechanism.

BIC commented that finalizing the requirement as proposed would invite multiple patent infringement suits and severely hinder the design and implementation of creative child-resistant mechanisms. Scripto provided a test method for evaluating the lighting reliability of a lighter. The Lighter Association proposed alternative language that they believe would not limit design options.

**Response:**

(TABS D, E, F, G, & H)

Clearly, the staff does not wish to unnecessarily limit design options or make it difficult for any firm to compete in the marketplace. The proposed rule specified that multi-purpose lighters must allow multiple operation attempts before the child-resistant mechanism resets. With such designs, the lighting efficiency of a child-resistant multi-purpose lighter should be essentially the same as that of the non-child-resistant multi-purpose lighters currently in use. This requirement was proposed in response to a concern raised by Scripto and the Lighter Association that adding a child-resistant feature that resets after each operation of the ignition mechanism would create the potential for flashback in situations such as igniting a gas grill.

The staff acknowledges that the multiple-operation requirement is design restrictive to the extent that it precludes use of a child-resistant feature design that resets after every operation. Such a design may be appropriate for micro-torches and other multi-purpose lighters with a high degree of lighting efficiency.

Scripto's suggested lighting reliability test was rejected by the staff because of insufficient data to show that the test represented the conditions under which consumers would use the lighters.

The central issues concerning this risk of flashback are:

1. Would a child-resistant mechanism that resets after each operation delay successful ignition of a gas appliance to the extent that a flashback would result when the lighter finally ignites?
2. And if so, would the flashback have the potential to produce a serious burn injury?

To answer the questions related to flashback, the staff conducted a three-part study. The staff also analyzed the available incident data for various gas appliances to determine if problems in operating multi-purpose lighters contributed to a hazardous flashback condition.

### Delayed Ignition Time Testing

The Directorate for Laboratory Sciences, Division of Engineering (LSE), conducted a number of tests using gas-fired grills. The testing was conducted to determine the duration of "delayed ignition" that could be permitted without resulting in a "flashback" that could cause a serious burn injury. A report on the testing is provided at TAB E.

Preliminary tests were conducted with three sizes of grills. The lab found that the smallest grill presented the worst-case condition. When the accumulated propane gas was ignited in the shallow well of the smallest grill, the resulting flashback reached the highest level above the cooking surface. The lab used cheesecloth sleeves to determine whether clothing would ignite as a result of the flashback. The lab found that allowing the propane gas to accumulate for 20 seconds could result in a flashback that would ignite the cheesecloth sleeve. The sleeve did not ignite with a 15-second accumulation of gas.

The lab conducted 15 additional tests using the smallest grill. The gas was turned on and allowed to accumulate for 15 seconds before ignition. The tests were conducted with the cheesecloth sleeves touching the cooking surface of the grill directly above the ignition point. The cheesecloth sleeves did not ignite. Videotapes of the testing showed that the duration of the flashback events ranged from 0.6 to 1.1 seconds.

### Evaluation of the Potential for Serious Burn Injury

The Directorate for Health Sciences used the laboratory test results and information from the published literature on flash fires to evaluate the potential for serious burn injury. Health Sciences concluded that exposure to a very short duration flashback from propane fuel is unlikely to cause serious injury (i.e., second- or third-degree burns) (TAB F). Furthermore, the Division of Human Factors concluded that the actual exposure to the flashback would be even shorter than the measured duration because of the user's normal reflex to withdraw from the flashback. A shorter period of exposure would further reduce the potential for injury (TAB D).

### Would a Child-Resistant Feature Delay Operation of a Multi-Purpose Lighter?

To answer this question, the staff conducted some additional testing. The Directorate for Engineering Sciences, Division of Mechanical Engineering (ESME), tested six brands of non-child-resistant multi-purpose lighters to determine the number of times a consumer might need to operate the ignition mechanism to produce a flame (TAB G). In 50 of 53 trials, a flame was obtained in 5 or fewer attempts and, in 47 of 53 trials, in 3 or fewer attempts. The number of attempts averaged less than 3 for all brands of lighters.

The Division of Human Factors conducted a study to determine if users are capable of operating child-resistant lighters that reset after each operation at least 5 times within 15 seconds (TAB D). Disposable child-resistant cigarette lighters were used for this study because, at that time, the staff was not aware of any multi-purpose lighters with child-resistant mechanisms that reset after each operation attempt. For the seven lighters tested, the minimum number of operations achieved in 15 seconds ranged from 4 to 8. The maximum ranged from 14 to 24 operations. In most of the trials (195/209), the subjects operated the lighters 6 or more times.

### Injury Data

The Directorate for Epidemiology, Division of Hazard Analysis, reviewed the incident data on flashback incidents associated with igniting gas appliances such as ranges, grills, and water heaters (TAB H). The NEISS data from 1996-1998 indicated that, of the estimated 1,500 victims treated each year for burn injuries related to flashback, the majority were treated and released. About 8 percent of the injuries required hospitalization. Malfunction of the products being ignited, fuel leaks, and user error appeared to be contributing factors in incidents that resulted in serious injury. Although delays in ignition apparently caused several incidents, the available data provide no evidence that delay caused by difficulty operating multi-purpose lighters results in flashback that causes serious injury.

### Summary and Conclusions

The staff found that a flashback resulting from a 15-second accumulation of propane gas is unlikely to ignite clothing or cause a serious burn injury. In spite of their inherent unreliability, a flame can be produced with most non-child-resistant multi-purpose lighters in 5 or fewer operations. Cigarette lighters with child-resistant features that reset after every operation were operated at least 6 times within 15 seconds in most of the trials. Therefore, the staff concluded that a child-resistant mechanism that resets after each operation of a multi-purpose lighter would not prevent a user from successfully producing a flame and igniting a gas appliance before a hazardous flashback condition could occur.

The staff found insufficient evidence to conclude that current multi-purpose lighters pose a risk of injury due to flashback, or that the addition of a child-resistant mechanism that resets after each operation would pose such a risk. Therefore, the staff is unable to support a requirement in the final rule that multi-purpose lighters must allow multiple operation attempts before the child-resistant mechanism resets. The staff revised the requirement for multi-purpose lighters in the draft final rule to allow a child-resistant feature to reset after one or more operations of the ignition mechanism.

For the reasons given above, the requirements for multi-purpose lighters in §1212.3 of the draft final rule read as follows:

### §1212.3 Requirements for multi-purpose lighters.

(a) A multi-purpose lighter subject to this part 1212 shall be resistant to successful operation by at least 85 percent of the child-test panel when tested in the manner prescribed by §1212.4.

(b) The child-resistant mechanism of a multi-purpose lighter subject to this Part 1212 must:

- (1) Operate safely when used in a normal and convenient manner,
- (2) Comply with this §1212.3 for the reasonably expected life of the lighter,
- (3) Not be easy to deactivate or prevent from complying with this §1212.3.
- (4) Except as provided in subparagraph (b)(5) of this section, automatically reset when or before the user lets go of the lighter.

(5) The child-resistant mechanism of a multi-purpose lighter subject to this Part 1212 that allows hands-free operation must:

- (i) Require operation of an additional feature (e.g., lock, switch, etc.) after a flame is achieved before hands-free operation can occur;
- (ii) Have a manual mechanism for turning off the flame when the hands-free function is used; and either
- (iii) Automatically reset when or before the user lets go of the lighter when the hands-free function is not used, or
- (iv) Automatically reset when or before the user lets go of the lighter after turning off the flame when the hands-free feature is used.

## 5. Discussion of "easily deactivated"

The Lighter Association, BIC, and Scripto objected to language in the preamble of the proposal that states that the Commission considers an "easily deactivated" child-resistant mechanism to be one that can be easily disabled with a common household tool. The Lighter Association stated that this is a very significant issue because no lighter is designed to this standard and such a requirement would mean that a lighter must be tamper-proof. BIC stated that this interpretation is unreasonable and unworkable. Scripto commented that no standard can prevent a consumer's intentional destruction or alteration of a product's safety features, and that a "tamper-proof" requirement is unreasonable and impractical. Scripto suggested establishment of performance criteria to determine what would constitute "easily deactivated."

**Response:**  
(TAB C)

The staff acknowledges the challenge of designing a product that would withstand a consumer's intentional destruction. Disabling or removing the child-resistant mechanism was a common problem in the first 2 or 3 years after the effective date of the Safety Standard for Cigarette Lighters. In part, this was due to general consumer resistance to something new and less convenient. In addition, some of the early child-resistant cigarette lighter designs were difficult to operate. Effective enforcement of the standard, including pursuit of firms who purposely disabled child-resistant mechanisms on cigarette lighters offered for sale, and design changes by manufacturers to make mechanisms easier for consumers to use, appear to have reduced this problem for cigarette lighters.

The staff expects that manufacturers will use their experience with cigarette lighters to design child-resistant mechanisms for multi-purpose lighters that will be easy for consumers to operate. In addition, many consumers have had experience with child-resistant mechanisms on other types of lighters.

The draft final rule does not include an interpretation of the term "easily deactivated." If the staff identifies either a cigarette lighter or a multi-purpose lighter model with a child-resistant mechanism that can be deactivated with minimal effort, the Office of Compliance would consider taking appropriate action.

**6. Issue: Impact of a Rule on Small Companies**

Donel, a small U.S. manufacturer of more expensive multi-purpose lighters, wrote that the cost and time to redesign and certify a lighter will make it difficult for it to continue in the marketplace. It requested an additional 2-year grace period to comply with the regulations. It stated that once pending patents are issued they would be able to proceed with redesigning or licensing to comply with the requirements.

SNC Group, a small U.S. firm, commented that patents filed by some companies may restrict competition, create hardship on small companies, and ultimately raise the cost to consumers. SNC Group suggested a number of possible ways to reduce the burden of a rule on small firms, including CPSC-mandated design standards in which no one manufacturer or importer has intellectual property rights, free legal counsel and testing for small businesses with proprietary designs, and providing loans to small businesses to lessen the financial hardship associated with legal advice and retooling.

**Response:**  
(TABS C & I)

**a. Effective date:**

The costs of developing and testing lighters that would meet the rule's requirements may have a significant impact on some small firms that have proprietary or exclusive rights to a non-child-resistant multi-purpose lighter design. However, the staff does not believe that providing an additional 2-year grace period for one or more small firms is appropriate.

In order to issue a rule with an effective date of more than 180 days or less than 30 days, the Commission has to find that the longer or shorter date is in the public interest. The draft final rule provides an effective date of 12 months from the date of publication in the Federal Register.

Based on experience with the Safety Standard for Cigarette Lighters, the staff estimates that it takes an average of 12 months to develop, test, retool for production, perform production tests, and manufacture and ship the product. In addition, the time required for importing complying lighters into the United States will be a significant consideration for many firms. Some manufacturers, especially those that have been following this rulemaking proceeding, may have already begun developing child-resistant models. Manufacturers who have had experience with developing child-resistant cigarette lighters may be able to take advantage of their experience with the cigarette lighter standard and manufacture and market child-resistant lighters sooner than 12 months. In fact, at least one model is already on the market and we are aware of other manufacturers that are working on child-resistant designs.

Manufacturers who have not followed, or only very recently started following, this rulemaking proceeding may not have begun any development work. Additionally, manufacturers that do not also produce cigarette lighters, such as some micro-torch manufacturers, do not have prior experience developing child-resistant designs. These manufacturers may be adversely affected by an effective date shorter than 12 months.

Based on the staff's experience with the Safety Standard for Cigarette Lighters, firms will continue to file new patents for child-resistant designs. New firms will enter the market, and others will continue working on technology for new or improved child-resistant designs. For these reasons, the staff does not believe that granting an additional 2-year grace period would assist on patent issues.



Existing or pending patents may make entry into the market more difficult. However, any negative impact regarding patent infringement issues will be minimized because the standard is a performance standard rather than a design standard. Revising the requirements in the draft final rule to allow the child-resistant mechanism to reset either after one or more operations should also reduce some patent infringement concerns by allowing a wider variety of designs to comply with the standard.

For the reasons stated above, the staff believes that a 12-month effective date is in the public interest.

**b. Mandating a single design:**

The Consumer Product Safety Act requires that consumer product safety standards be expressed in terms of performance requirements. This may prevent the Commission from mandating a single design. Also, mandating a single design would stifle the creativity of individual manufacturers and preclude future design improvements.

**c. Providing funding to small firms:**

The Commission does not have the authority or the funding to provide loans or subsidies for legal counsel, retooling, or testing.

**7. Costs of Testing and Certifying**

Zelco commented that the Commission has failed to make allowances for small business. Zelco stated that the cost of testing and certification is exorbitant and an unnecessary burden on small companies. Zelco requested that the testing requirements be reduced or that the Commission subsidize the costs for small businesses.

Donel commented that there are enormous costs involved in redesigning and certifying a child-resistant lighter.

**Response:**  
(Tab I)

The staff did consider the impact of testing and certifying on small businesses. The Preliminary Regulatory Analysis in the proposal estimated the average cost of testing at about \$25,000 per model. However, testing and certification are necessary to ensure that all multi-purpose lighters on the market are child-resistant. Furthermore, the cost of testing could be less than the costs that a manufacturer may incur if a lighter is not tested and is later found not to be child-resistant. In that case a manufacturer could incur the costs of a recall and may be subject to liability if the lighter is involved in a fire.

## **8. Issue: Supervision**

Zelco commented that lighters are adult products and that, if children were supervised and taught to respect them, there would be no need for these regulations. Scripto stated that child-resistant mechanisms are not a substitute for proper adult supervision. Scripto stated that, in their experience, most instances of serious injury associated with child play fires involved gross parental neglect.

Independent Safety Consulting commented that incidents involving multi-purpose lighters demonstrate the normal and expected range of parental behavior when it comes to supervision; accidents happen even when children are appropriately supervised. The American Academy of Pediatrics commented that adult supervision can never be perfect.

### **Response: (TAB B)**

In the proposed rule, the Commission recognized that proper adult supervision is very important. Teaching children to "respect" adult items, and otherwise avoid hazards, is a necessary component of child rearing. It is, however, an unreliable strategy for injury prevention. Three- and 4-year-old children are fully capable of verbalizing rules repeated to them by adult caretakers. This is simple mimicry to a large extent, and does not imply either that children have a full understanding of the potential consequences of their behavior, or that they have developed sufficient control of their impulses to obey the rules consistently. Congress addressed the general issue of adult responsibility in its passage of the Poison Prevention Packaging Act. The Report of the Senate Committee on Commerce (1970) stated that negligence is not the principal cause of poisoning incidents, and that too many potential hazards exist to expect that children will be adequately protected from all of them solely through adult intervention.

After reviewing the fire incident reports, the staff concluded that children were under reasonable levels of supervision at the time they started the fires. While child-resistant mechanisms do not substitute for parental supervision, they can provide a valuable measure of safety.

## **9. Issue: Labeling**

Zelco commented that labeling requirements would be sufficient. The American Academy of Pediatrics stated that product labeling is very important, but that it will not be as effective as making the lighters child-resistant. Independent Safety Consulting commented that a label is not likely to significantly reduce these fires. Warning labels cannot affect behavior nearly as well as a technical design change.

**Response:**  
(TAB B)

As stated in the proposed rule, the staff does not believe that warning labels alone can effectively address the risks associated with multi-purpose lighters. Labeling of multi-purpose lighters (including "Keep out of reach of children") has always been required under the Federal Hazardous Substances Act and this has clearly been insufficient to prevent child-play fires. Since most caregivers are fully aware of the dangers of young children playing with lighters, and since incident information shows that children access these lighters in spite of attempts to store them out of reach, the staff concludes that additional or different warning statements would not reduce the incidence of child-play fires with multi-purpose lighters.

**10. Issue: Education**

Zelco stated that the aim of these regulations could be accomplished just as easily through education. Scripto commented that the Commission must consider the need for concomitant education efforts. Swedish Match recommended that the Commission fund a strong education program to "address consumer behavior in leaving their lighters and their young children unattended."

The American Academy of Pediatrics commented that consumer education is very important but that it will not be as effective as making the lighters child-resistant. Independent Safety Consulting stated that an education campaign is not likely to significantly reduce these fires. There is a need to couple child-resistant mechanisms with information and education so that parents can be aware of the limitations of a child-resistant feature.

The Lighter Association provided information about education programs they developed with the Learn Not to Burn Foundation and the NFPA. The programs warn preschoolers and adults of the risk of lighters and matches. The Lighter Association also cited an article in the January/February 1999 NFPA Journal reporting that the Portland, Oregon program showed a 36 percent decline in juvenile fire setting as a result of use of the Youth Education Program.

BIC submitted a copy of their "play safe! be safe!"® safety program, which was developed in 1994 in cooperation with Fireproof Children of Pittsford, New York. This program teaches young children the basics of fire prevention and shows them how to respond to specific situations in case of fire. The program is being utilized in hundreds of pre-school classrooms in the U.S. and Canada.

**Response:**  
(TAB B)

The staff does not believe that education alone can effectively address the risks associated with multi-purpose lighters. As an injury prevention strategy, education is less effective than product modifications, which do not rely on behavior change. Education serves to provide the public with accurate information. For example it may be appropriate to advise consumers that child-resistant does not mean child-proof, and that child-resistant mechanisms are intended to prevent lighter use by most children under 5.

The incident data, however, show little need for an education program to “address consumer behavior in leaving their lighters and their young children attended.” The data show that, in general, children were not “unattended,” and that in many cases, lighters were placed “out of reach.”

The effectiveness of the Youth Education Program is unsubstantiated because there are important confounding factors that preclude a valid inference of a direct cause-effect relationship between the program and any statistically significant change in the number of fires set by juveniles. Furthermore, it is not clear that the Youth Education Program addressed the age group targeted by a standard for child-resistance.

The Safety Standard for Cigarette Lighters was issued in 1993 and became effective in 1994. It is possible that the use of child-resistant cigarette lighters contributed to the drop in the proportion of fires attributable to juveniles over the 4-year period (1993/1994 to 1996/1997) cited in the NFPA Journal article.

Given the lack of consistent evidence of their effectiveness, the staff concludes that education programs are an inadequate substitute for a standard that requires multi-purpose lighters to be child-resistant.

## **11. Issue: Provisions of Test Protocol**

### **a. Position of on/off switch**

BIC contended that multi-purpose lighters with on/off switches should be tested with the switch in the unlocked position rather than in the locked position, as proposed. BIC stated that many consumers would leave the lighter in the unlocked position. Further, BIC pointed out that a manufacturer could design a lighter with an on/off switch that is very difficult for a child to unlock, and with a very simple child-resistance mechanism which, in itself, would not meet the 85 percent child-resistance requirement.

**Response:**  
(TAB B)

The staff agrees with BIC's recommended modification to the test protocol because on/off switches are not adequate to serve as part of the child-resistance mechanism. First, as the Commission's baseline testing demonstrated, most children in the panel age group (42 to 51 months old) can operate the switches, which are similar to those used on many types of toys. Second, when practical, safety devices should function automatically. When in the locked position, the switch may help delay or deter some proportion of children. This protection, however, is not reliable. To provide this protection, intended users must return the switch to the locked position every time the lighter is used. For a variety of reasons, even careful adults may fail to do so. Thus, as BIC points out, test results for lighters tested with the switch in the locked position may not reflect the true child-resistance of the product as actually used by consumers.

Therefore, on August 4, 1999, the Commission published a notice in the Federal Register to propose that the test protocol should require that lighters with on/off switches that do not automatically reset to the locked position be tested with the switch in the on, or unlocked, position. The Commission also provided an opportunity for interested parties to present oral comments on this issue on September 15, 1999. There were no requests to present oral comments. The Executive Director of the National Fire Protection Association Center for High-Risk Outreach commented that conducting the protocol test with the lighter on/off switch in the unlocked position would add an important element of realism to the test.

The staff revised the test procedure at §1212.4 (f)(1) in the draft final rule as follows:

Note: For multi-purpose lighters with an "on/off" switch that does not automatically reset to the locked position, the surrogate lighter shall be given to the child with the switch in the "on," or unlocked, position.

**b. Participation of children in multiple tests**

Milford Consulting Associates endorses the provision that allows the same children to test child-resistant packaging, cigarette lighters, and multi-purpose lighters, so long as the children participate in each test on a different day. It stated that the cross learning from test-to-test would be negligible, but that the children's familiarity with the test setting would be facilitated by multiple tests, making the test less intimidating to the children.

**Response:**

The staff agrees that the cross learning from one type of test to another would be negligible. The test procedure in §1212.4(a)(7) of both the proposal and the draft final rule allows the participation of children in tests of different products, so long as the tests are conducted on different days.

**c. Tester quotas and lighter quotas**

Milford Consulting Associates requested changes to the requirements for the number of children who are tested by each tester and for the number of tests conducted with each surrogate lighter. They requested that when two central location test sites are used and a tester or a surrogate lighter drops out, the remaining tests be allocated equally to the remaining testers at that one test site.

**Response:**

Currently, the test procedure has very specific requirements for the number of children who can be tested by each tester and the number of times each surrogate lighter can be used in testing. The reason for these requirements is to minimize the impact of any one tester or any one lighter on the final test results. Based on the staff's experience with the standard for cigarette lighters, tester variability can influence the test results. In addition, surrogate lighters may vary in operation forces. For these reasons, the staff does not support changes that would make it possible to exceed the specified quotas. The staff did not make any changes to the tester or lighter quotas in the draft final rule.

**d. Participation**

Milford Consulting Associates requested that children who refuse to attempt to operate the surrogate multi-purpose lighter throughout the entire test period be counted in the test results, so long as they are not disruptive. They stated that in a real-life situation some children would refuse to touch a lighter even while a companion is doing so.

**Response:**

The staff believes that refusing children should be eliminated from the test results because it provides a more appropriate test for the lighter. A child's refusal in a test may be related to the circumstances of the test and does not necessarily mean that the child would not attempt to operate a lighter in the home. The staff believes that the 85 percent acceptance criterion should be based on the number of children who attempt to operate the lighter and are unable to so. This is the procedure used in the Safety Standard for Cigarette Lighters.

**e. Issue: Orientation of lighters during demonstration**

BIC Corporation and Milford Consulting Associates requested a clarification to §1212.4(f)(3) of the test protocol. In the proposal, during the demonstration of lighter operation to the children, the tester was instructed to hold the surrogate multi-purpose lighter in a vertical position in one hand with the child-resistant feature exposed. BIC pointed out that the normal operating position of multi-purpose lighters for many purposes is horizontal.

**Response:**

The staff agrees that this requirement should be changed, because some multi-purpose lighters are operated in a vertical position and some are operated in a horizontal position. The draft final rule eliminates reference to any specific orientation. Instead, the rule provides that the tester should hold the lighter in a comfortable operating position in one hand so both children can see the operation of the child-resistant mechanism and the ignition mechanism during each demonstration. The purpose of this provision is to assure that the children are able to clearly see the operation of the lighter. As long as the children can see the operation, there is no need to hold the lighter in any particular position.

**12. Issue: Certification Requirements**

**a. Anti-Stockpiling Reporting**

Scripto recommends a change to the anti-stockpiling provision in the certification requirements. This change would require information used to establish the number of lighters made or imported during the year following publication of the final rule to be filed with CPSC at the end of each calendar month instead of within 10 days of shipment. Scripto states that this would reduce the reporting requirements and provide the CPSC staff with better visibility and control of these shipments.

**Response:**  
(TAB C)

Because industry members reported that there were abuses of the similar anti-stockpiling requirement in the Safety Standard for Cigarette Lighters, the Commission proposed a reporting requirement for this rule. The staff agrees with Scripto's recommendation in the interest of reducing the paperwork burden on manufacturers and the staff without compromising the ability of the Commission to effectively enforce the anti-stockpiling provision. The draft final rule require reporting within 10 days of the end of each calendar month instead of within 10 days of lighter shipment.

## **b. In-bond Shipments**

Scripto reported that they have experienced seizures by customs and delays at foreign ports of shipments of non-child-resistant lighters that are imported into the U.S. In-bond for export to other nations. It requested CPSC to review this transit and export process in order to reduce unnecessary delays and paperwork in the future.

**Response:**  
(TAB C)

Scripto refers to the process of moving non-complying cigarette lighters manufactured in Mexico through the United States, in bond, for export to foreign countries that do not require the lighters to be child-resistant. This process is a program of the U.S. Customs Service. If contacted in advance of such shipments, the Office of Compliance is able to work with manufacturers and importers to facilitate the smooth movement of in-bond shipments.

## **13. Issue: Households without young children**

Ms. Lorraine Daly, a consumer, wrote that there is a very large percentage of older citizens in the country who don't have children in their homes and therefore don't need the protection of child-resistance on medicines or lighters. Similarly, Ms. Eve Mallett wrote, "We can't child proof the world at the expense of childless or older people."

**Response:**

Available data indicate that both lighter child-play fires and accidental ingestions of medicines have occurred in the homes of older consumers. These incidents commonly occur while grandparents are babysitting or during family visits. Like child-resistant cigarette lighters, there will be a number of different multi-purpose lighter designs to choose from. The staff believes that older consumers who can operate a current multi-purpose lighter will find a child-resistant multi-purpose lighter that they are able to operate with little or no difficulty.

## **C. Final Regulatory Analysis** (TAB J)

A final regulatory analysis is required by section 9(f)(2) of the Consumer Product Safety Act. The regulatory analysis estimates the potential costs and benefits of the rule and alternatives. Consideration is given to the effect of the rule on both consumers and on businesses.



## **1. Potential Net Benefits**

Based on available data, the societal costs of fires (deaths, injuries and property damage) resulting from children under the age of 5 playing with multi-purpose lighters (including micro-torches) is about \$48.6 million annually, or approximately \$2.43 for each multi-purpose lighter in use. A rule is expected to reduce such fires by at least 75 percent, resulting in a gross benefit (reduction of societal costs) of \$1.82 per multi-purpose lighter per year.

Manufacturers would incur costs to comply with the requirements of the rule. The costs to manufacturers of designing, testing, retooling, and producing child-resistant multi-purpose lighters is expected to be about \$0.48 per unit for most types of multi-purpose lighters. In total, the retail prices of most multi-purpose lighters may increase by about \$0.96 per unit as a result of a rule. The per-unit costs will likely be higher for other types of multi-purpose lighters, such as micro-torches.

The rule is expected to produce a net societal benefit (total societal benefits less total societal costs) of \$0.86 per lighter. Based on an estimate of 20 million lighters in use annually, this should provide an annual net benefit of at least \$17.2 million. This estimate may underestimate the actual benefits because it is based only upon fire incidents known to the CPSC rather than on national fire estimates.

## **2. Impact on Consumers**

Aside from increased safety, a rule is likely to affect consumers in two ways. First, the increased cost of producing the child-resistant models will result in higher retail prices for multi-purpose lighters. Second, it is also possible that the utility of the product will be decreased if the child-resistant features make the lighters difficult to operate. Based on our experience with the Safety Standard for Cigarette Lighters, the staff believes that manufacturers are capable of designing child-resistant multi-purpose lighters that offer minimal inconvenience to consumers. Some manufacturers of micro-torches may respond to the rule by no longer offering micro-torches that have internal ignition mechanisms. The consumer would, therefore, have to use an external ignition source to light the micro-torch. Although this option may lower manufacturing costs, it could also reduce the convenience and utility of the lighters.

## **D. Environmental Assessment** (TAB J)

Pursuant to the National Environmental Policy Act, the Commission is required to consider the potential effects of a rule on the environment. Less than one percent of non-child-resistant multi-purpose lighters sold in this country are manufactured domestically.

The staff does not expect a rule to cause manufacturers to shift production locations. A rule is not expected to significantly alter the amount of materials, energy, or waste generated during production of child-resistant multi-purpose lighters. There are no disposal issues, since a rule would not result in a recall of existing, non-child-resistant lighters.

The staff concludes that a rule would not affect raw material usage, air or water quality, manufacturing processes, or disposal practices in a way that would significantly affect the environment.

## **E. Final Regulatory Flexibility Analysis**

(TAB J)

TAB J provides the final regulatory flexibility analysis required by the Regulatory Flexibility Act. This analysis discusses the potential economic impact of the rule on small firms and various alternatives that would reduce any adverse impact on small firms.

The small businesses that are most likely to be affected by the rule are those that have proprietary or exclusive rights to market one or more multi-purpose lighter designs. The staff knows of seven such firms. One is already marketing a multi-purpose lighter that it believes to be child-resistant, although it has not been tested to verify that it meets the requirements. Two other small firms are actively developing child-resistant models.

A few firms may decide not to make the financial investment necessary to develop a child-resistant design. However, in spite of the costs, many small firms will be able to compete successfully in the market.

Alternatives considered by the staff include not taking any action and relying on voluntary efforts, issuing additional labeling requirements instead of performance requirements, and narrowing the scope of the rule. As discussed in detail in a previous section, the staff also considered alternative effective dates. The staff believes a final standard as drafted minimizes the adverse impact on small firms while maximizing the potential net benefits to society.

## **F. Effect of Proposed Rule on Elderly and Handicapped Persons**

(TAB K)

Section 9(e) of the Consumer Product Safety Act requires the Commission to consider the special needs of elderly and handicapped persons when issuing a consumer product safety rule. This section also requires the Commission to determine the extent to which such persons may be adversely affected by a consumer product safety rule.

Staff has reviewed two multi-purpose designs that have met the proposed child-resistance test requirements. Provided clear instructions are included on the packaging, both types should be usable by handicapped and elderly persons who can operate current

non-child-resistant designs. As with cigarette lighters, there initially may be child-resistant multi-purpose lighters that are too difficult or too inconvenient for many consumers. However, it is expected that competitive forces will ensure that elderly and handicapped consumers will find one or more products they are able to use.

#### **IV. Options**

##### **A. Publish a Final Rule to Require Multi-Purpose Lighters to be Child-Resistant**

If the Commission determines that multi-purpose lighters present an unreasonable risk of injury because children under the age of 5 can use them to start fires, and that mandatory action is required to address this risk, the Commission may issue a final rule.

##### **B. Terminate the Mandatory Rulemaking Proceeding**

If the Commission determines that multi-purpose lighters do not present an unreasonable risk of injury, or that mandatory action is not required to address any identified risk, the Commission may terminate the rulemaking proceeding.

#### **V. Conclusions and Recommendation**

The staff recommends that the Commission publish a safety standard, under the Consumer Product Safety Act, to require multi-purpose lighters to be child-resistant. The staff believes that the final rule as drafted is the least burdensome requirement that adequately addresses the risk of injury.

The staff believes that available data support the finding that multi-purpose lighters covered by the standard pose an unreasonable risk of death and injury to consumers. Based on known fire incidents alone, there have been reports of 237 fires between January 1, 1988, and October 15, 1999, that were started by children under age 5 playing with multi-purpose lighters. These fires resulted in a total of 45 deaths and 103 injuries.

The results of baseline testing conducted by the staff indicate that multi-purpose lighters have a low level of child resistance (4 to 41 per cent) compared to the minimum level of child-resistance (85 per cent) required for most cigarette lighters. The staff believes that a standard requiring improved child-resistance for multi-purpose lighters would have net societal benefits exceeding \$17.2 million annually.

**TAB A**



United States  
**CONSUMER PRODUCT SAFETY COMMISSION**  
Washington, D.C. 20207

MEMORANDUM

DATE: NOV 3 1999

TO : Barbara Jacobson, HS  
Project Manager, Multi-Purpose Lighter Petition

Through: Susan Ahmed, Ph.D., AED, Directorate for Epidemiology *SA*

FROM : Linda E. Smith, EPHA *LES*

SUBJECT: Fire Incidents Involving Multi-Purpose Lighters

This memorandum provides updated information on fires caused by children playing with multi-purpose lighters, lighters which are commonly used for lighting fuel in fireplaces, grills, and other products. These data are provided in support of the staff evaluation of a child-resistant standard for multi-purpose lighters.

**Background**

The Safety Standard for Cigarette Lighters required child-resistant features for cigarette lighters manufactured or imported after July 12, 1994. This standard is expected to be effective in reducing cigarette lighter fires started by young children, primarily those younger than age 5.

Based on data from the National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association, CPSC estimates that in 1996, the most recent year for which national fire loss estimates are available, there were an estimated 7,200 residential structure fires caused by children, of all ages, playing with all types of lighters (Table 1). These fires resulted in an estimated 130 deaths, 1,090 injuries, and \$117 million estimated property loss in 1996. Estimated fires, deaths, and injuries were lower for 1996 than for any of the four preceding years. Since 1994, when the lighter standard became effective, estimated residential fires caused by children playing with lighters decreased by 32 percent. This may indicate a reduction attributable, in part, to the lighter standard. However, other factors, such as fire prevention education, also could be involved. During the same period, 1994 to 1996, estimated fires caused by children playing with matches decreased by 21 percent, while total residential structure

fires decreased by 5 percent.<sup>1</sup>

**Table 1**  
**Estimated Residential Structure Fires, Deaths, and Injuries Caused by Children Playing with Lighters, 1992-1996.<sup>2</sup>**

Year	Fires	Deaths	Injuries	Estimated Property Loss (millions)
1992	9,300	200	1,530	\$105.8
1993	9,900	170	1,600	\$144.5
1994	10,600	230	1,560	\$147.8
1995	8,200	180	1,220	\$115.7
1996	7,200	130	1,090	\$117.0

Based on data from the National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association.<sup>3</sup>

Source: U.S. Consumer Product Safety Commission/EPHA.

National Fire Incident Reporting System (NFIRS) data, upon which national fire loss estimates are based, do not specify the age of the child who started the fire or the type of lighter involved, e.g. cigarette or multi-purpose. The U.S. Consumer Product Safety Commission (CPSC) conducted a Cigarette Lighter Evaluation Study that will identify both the age of the child and the lighter type in NFIRS fires that were reported as being caused by children playing with lighters. Data collection for this study, based on reports from participating fire departments, began in November 1997 and ended in February 1999. Fire estimates covering the study period will require 1998 NFIRS data, which are not expected to be available until 2000 due to the time lag involved in local jurisdictions forwarding data to the U.S. Fire Administration.

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<sup>1</sup> Kimberly Ault, et al., "1996 Residential Fire Loss Estimates," U. S. Consumer Product Safety Commission.

<sup>2</sup> These data include child play fires started by children of all ages and using all types of lighters.

<sup>3</sup> Estimates were derived by computing the percentages of NFIRS residential structure fires, deaths, injuries, and property loss that involved children playing with lighters as a percentage of fire losses that reported the form of heat involved. These percentages were then multiplied by the total number of U.S. residential structure fires, deaths, injuries, and property loss estimated from the National Fire Protection Association annual surveys. Fire estimates were rounded to the nearest hundred, death and injury estimates to the nearest ten, and property loss to the nearest tenth of a million. NFIRS data are provided by the U.S. Fire Administration.

## Methodology

Lacking national fire loss estimates specific to multi-purpose lighters, staff searched CPSC data bases for the period from January 1985 to the present, to identify fires caused by children playing with multi-purpose lighters. Data sources included consumer complaints, newspaper clippings, hospital emergency room-treated injury reports, fire department reports, and CPSC investigation reports. Also included are incidents reported for the Cigarette Lighter Evaluation Study and incidents submitted with public comments on the Multi-Purpose Lighter Advance Notice of Proposed Rulemaking, published January 16, 1997 (62 Fed. Reg. 2327).

## Results

EPHA identified a total of 340 fires reportedly started by children playing with multi-purpose lighters from January 1988<sup>4</sup> to the present (Table 2). These fires resulted in a total of 65 deaths and 138 injuries. Of these incidents, children younger than age 5 ignited 237 fires (74 percent of those where age of the fire starter was known). These 237 fires resulted in 45 deaths and 103 injuries (70 percent and 79 percent of deaths and injuries, respectively, where age of the fire starter was known). Children ages 5 and older ignited 84 fires that resulted in 19 deaths and 28 injuries. An additional 19 fires that resulted in 1 death and 7 injuries were described as being caused by child play, but the ages of the children who ignited the fires were not cited.

These data reflect frequency counts of incidents reported to CPSC. Therefore, they are considered a conservative indication of the extent of the multi-purpose lighter child play fire hazard.

**Table 2**  
**Fires, Deaths, and Injuries Caused by Children**  
**Playing with Multi-Purpose Lighters, by Age Group of the**  
**Children Who Ignited the Fires, 1/1/88 - 10/15/99**

Loss Measure	Total	Age (Years) of Fire Starter		
		<5	5+	Unknown
Fires	340	237	84	19
Deaths	65	45	19	1
Injuries	138	103	28	7

Based on consumer complaints, newspaper clippings, hospital emergency room-treated injuries, fire department reports, and investigation reports received as of 10/15/99.

Source: U.S. Consumer Product Safety Commission/ EPHA.

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<sup>4</sup> No fire incidents involving multi-purpose lighters were identified for the period 1985 - 1987.

Since the regulatory action being considered is directed primarily at fires ignited by children younger than age 5, the characteristics associated with the two age groups, fire starters younger than age 5 versus ages 5 and older, will be discussed separately.

### A) Fires Caused by Children Younger Than Age 5

#### Number of Incidents by Year

Among the 237 fires started by children younger than age 5 playing with multi-purpose lighters, 193 fires occurred since 1996 (Table 3). Part of the increase observed in recent years is believed to be related to CPSC's increased efforts to obtain detailed information on fires caused by children playing with all kinds of lighters, to monitor and evaluate the effectiveness of the 1994 Cigarette Lighter Standard. Multi-purpose lighter fires often are reported as "lighter" fires in newspaper clippings, but then are identified as incidents involving multi-purpose lighters after further documentation is obtained. An increase in sales of multi-purpose lighters also occurred in recent years.<sup>5</sup>

**Table 3**  
**Fires, Deaths, and Injuries Caused by Children**  
**Younger Than Age 5 Playing with Multi-Purpose Lighters,**  
**by Year, 1/1/88 - 10/15/99**

Year	Fires	Deaths	Injuries
<b>Total</b>	<b>237</b>	<b>45</b>	<b>103</b>
1988	3	-	-
1989	1	-	2
1990	2	-	1
1991	2	-	-
1992	4	1	1
1993	7	3	4
1994	8	-	1
1995	17	6	8
1996	57	8	32
1997	49	4	8
1998	73	17	33
1999	14	6	13

Based on consumer complaints, newspaper clippings, hospital emergency room-treated injuries, fire department reports, and investigation reports received as of 10/15/99.

Source: U.S. Consumer Product Safety Commission/ EPA.

<sup>5</sup> Robert Franklin, EC, Multi-Purpose Lighters: Preliminary Regulatory Analysis, June 1998.



## Fatalities, Injuries, and Property Loss

Among the 45 fatalities that occurred in fires started by children younger than age 5, 35 fatalities were children younger than age 15 (Table 4). Twenty-eight were younger than age 5; seven were between the ages of 5 and 14. Among the 35 children, 17 had started the fires themselves, and 13 were siblings of the fire starters. Among the ten adults who died, four were mothers of the children who started the fires. The 11 remaining fatalities were other relatives, friends, elderly housing residents, and a child in a home child-care setting.

At least 23 of the 103 people who were injured required hospitalization. Several of the 23 were treated for extensive second and third-degree burns requiring long-term treatment (Attachment A). One 10-month-old child, burned over 80-90 percent of his body, lost all of his toes and most of his fingers. One 18-month-old child received burns over 98 percent of his body. Most of the non-hospitalized persons who were injured received burns, smoke inhalation, or lacerations, for which they were treated and released.

**Table 4**  
**Fatalities in Multi-Purpose Lighter Fires Caused**  
**by a Child Younger Than Age 5, by Age Group and Relationship**  
**to the Child Who Ignited the Fire, 1/1/88 -10/15/99**

Relationship to Fire Starter	Age Group (Years) of Fatalities			
	Total	< 5	5-14	15+
<b>Total</b>	<b>45</b>	<b>28</b>	<b>7</b>	<b>10</b>
Self	17	17	-	-
Sibling	13	9	4	-
Mother	4	-	-	4
Other	11	2	3	6

Based on consumer complaints, newspaper clippings, hospital emergency room-treated injuries, fire department reports, and investigation reports received as of 10/15/99.

Source: U.S. Consumer Product Safety Commission/ EPHA.

In addition to the fatalities and injuries that occurred, most fires also resulted in property damage. Many reports did not specify the amount of property loss; other reports cited relatively minor property loss. However, 43 of the 237 reports cited property damage of \$50,000 or more. In an additional five incidents, the dwelling was reported to be destroyed.

## Ages of the Children Who Ignited the Fires

Among the 237 multi-purpose lighter fires started by children younger than age 5, 195 (82%) of the children were either age 3 or age 4 (Table 5). Four children were younger than age 2, indicating that even some very young children were able to operate these products.

Most reports did not specify the child's age in terms of both years and months. Among the 89 fires ignited by 4-year-olds, only 23 incidents cited their ages in terms of months. Eleven children were ages 4 years and 3 months, or younger. Twelve children were ages 4 years and 4 months, or older.<sup>6</sup>

**Table 5**  
**Age Distribution of Children Younger Than Age 5 Who Ignited a Fire While Playing with a Multi-Purpose Lighter, 1/1/88 - 10/15/99**

Total	Age Group (Years) of Fire Starter				
	< 2	2	3	4	< 5*
237	4	33	106	89	5

\* Children were younger than age 5 but exact ages were unreported.

Based on consumer complaints, newspaper clippings, hospital emergency room-treated injuries, fire department reports, and investigation reports received as of 10/15/99.

Source: U.S. Consumer Product Safety Commission/ EPHA

## Product Brand Names

Review of the 237 fire incident reports indicated that a product brand name was cited in 117 reports. Of these, 104 (89 percent) involved one manufacturer. The other 13 reports that cited a brand name involved ten other manufacturers. Several reports cited the color of the product, but gave no information on brand name. About half the reports stated only that multi-purpose lighters were involved. Two reports stated that small self-igniting torches were involved; one of these cited a brand name (included in the 13 above), the other did not.

## B. Fires Caused by Children Ages 5 and Older

### Number of Incidents by Year

Among the 84 reported fires caused by children age 5 and older since 1988, 67 occurred since January 1996 (Table 6). As discussed earlier, the observed increase in

<sup>6</sup> The test protocol in the Safety Standard for Cigarette Lighters uses panels of children between the ages of 3 years and 6 months through 4 years and 3 months to establish the child resistance of the lighters.

recent years is thought to be related, in part, to CPSC's increased efforts to obtain more information about lighter child play fires.

**Table 6  
Fires, Deaths, and Injuries Caused by Children  
Ages 5 and Older Playing with Multi-Purpose Lighters,  
by Year, 1/1/88 - 10/15/99**

<b>Year</b>	<b>Fires</b>	<b>Deaths</b>	<b>Injuries</b>
<b>Total</b>	<b>84</b>	<b>19</b>	<b>28</b>
1988	1	-	1
1989	-	-	-
1990	-	-	-
1991	1	-	1
1992	3	1	1
1993	1	-	1
1994	3	3	4
1995	8	4	2
1996	10	1	-
1997	22	5	9
1998	30	5	8
1999	5	-	1

Based on consumer complaints, newspaper clippings, hospital emergency room-treated injuries, fire department reports, and investigation reports received as of 10/15/99.

Source: U.S. Consumer Product Safety Commission/ EPHA.

### **Fatalities, Injuries, and Property Loss**

Among fires started by children ages 5 and older, 13 of the 19 fatalities were children; 5 were younger than age 5, and 8 were between the ages of 5 and 14 (Table 7). Six fatalities were the children who caused the fire. The remaining fatalities were mostly other family members, among those for whom the relationship to the fire starter was reported.

**Table 7**  
**Age Distribution of Fatalities That Occurred**  
**In Multi-Purpose Lighter Fires Caused by Children**  
**Ages 5 or Older, 1/1/88 - 10/15/99**

Total	Age Group (Years) of Fatalities			
	< 5	5-14	15+	Unknown
19	5	8	4	2

Based on consumer complaints, newspaper clippings, hospital Emergency room-treated injuries, fire department reports, and investigation reports received as of 10/15/99.

Source: U.S. Consumer Product Safety Commission/ EHHA

Among the 28 reported injuries, at least eight involved burns serious enough to be hospitalized. Five fires resulted in property damage of \$50,000 or more. Many reports did not indicate the amount of property loss.

**Ages of the Children Who Started the Fires**

Among the 84 children age 5 and older who ignited a multi-purpose lighter fire, about two-thirds (55) were ages 5 or 6 (Table 8). The oldest age reported was 14. There is no uniform definition in the fire community of the maximum age at which a fire caused by a child can be considered child play. However, a child play fire commonly is defined as a situation involving a child playing without knowledge that a fire can cause damage.

**Table 8**  
**Age Distribution of Children Ages 5 and Older**  
**Who Ignited a Fire While Playing with a Multi-Purpose**  
**Lighter, 1/1/88 - 10/15/99**

Total	Age(Years) of Fire Starter						
	5	6	7	8	9	10+	Unk.*
84	34	21	9	5	2	12	1

\* Several children, ages 7 - 10, were playing together. It is not certain which one started the fire.

Based on consumer complaints, newspaper clippings, hospital emergency room-treated injuries, fire department reports, and investigation reports received as of 10/15/99.

Source: U.S. Consumer Product Safety Commission/ EHHA .

## **Summary**

CPSC data indicate that children playing with multi-purpose lighters have caused a minimum of 340 fires that resulted in 65 deaths and 138 injuries, from 1988 to the present. Of these, children younger than age 5 caused 237 fires that resulted in 45 deaths and 103 injuries. Twenty-eight of the 45 fatalities were children younger than age 5. Due to the nature of the incident identification process discussed earlier, these data are considered a conservative indication of the extent of the hazard.

A distinctive characteristic of these fires is the severity of the injuries. Among the fires caused by children younger than age 5, four children received burns over 70% or more of their bodies, burns that will require extensive long-term treatment. Several others received burns that were less extensive, but serious enough to require hospitalization.

The high proportion of fatalities that were children younger than age 5, and the severity of the non-fatal injuries, illustrate the hazard associated with children playing with multi-purpose lighters. Nationally, 38 percent of the estimated 750 children younger than age 5 who died in home fires annually between 1992 and 1996 were in fires started by a child playing, usually with lighters or matches.<sup>7</sup> The data presented in this memorandum indicate that children playing with multi-purpose lighters have become a part of this problem.

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<sup>7</sup> John R. Hall, Jr., "Patterns of Fire Casualties in Home Fires by Age and Sex, 1992-1996," National Fire Protection Association, June 1999, January 1998, p. 13.

**Attachment A**  
**Description of Hospitalized Injuries in Fires Caused by**  
**Children Younger Than Age 5 Playing with Multi-Purpose Lighters**

No.	Date	Age of Victim	Injury/Treatment Description
1	2/2/89	1 year	Hospitalized in fair condition.
2	2/2/89	3 years	Hospitalized in critical condition.
3	3/5/92	2 years	Burns to back & upper right thigh. Hospitalized, seen later for treatment of scarring.
4	1/22/95	12 months	Hospitalized 1 month for 2nd & 3rd degree burns to arms, chin, chest. Will require skin grafts until about age 15.
5	1/27/95	2 years	10 days in hospital.
6	4/4/96	15 months	3rd degree burns to 70% of body. Will need several surgeries & skin grafts.
7	5/26/96	18 months	3rd degree burns to 70% of body.
8	6/13/96	49 years	Burns to 10% of body.
9	6/14/96	4 years	3rd degree burn to 50% of upper body.
10	11/9/96	3 years	2nd degree burn to 50% of back, burns to arm & hand.
11	12/21/96	4 months	2nd & 3rd degree burns to hand & arm. Lost tips of 2 fingers.
12	12/24/96	18 years	Lacerations & burns.
13	1/6/97	6 years	2nd degree burns, knee to armpit.
14	1/16/97	adult	Burns to arms & smoke inhalation.
15	1/20/97	10 months	Burns to 80-90% of body. Lost all fingers & thumb on one hand, 2 fingers & thumb on other hand, all toes on both feet and one ear. Bones growing through skin.
16	1/16/98	4 years	Hospitalized several days for smoke inhalation.
17	4/5/98	3 years	1st or 2nd degree burns to 20% of body. Possible 3rd degree burns to small areas.
18	5/3/98	32 years	Hospitalized in critical condition, on ventilator
19	6/19/98	3 years	2nd and 3rd degree burns.
20	4/1/99	86 years	Hospitalized, recovered
21	6/3/99	3 years	Hospitalized, burns over 15% of body
22	6/3/99	18 months	Hospitalized, burns over 98% of body
23	6/3/99	32 years	Hospitalized, burns over 15% of body

Source: CPSC Investigation Reports

**TAB B**



UNITED STATES  
CONSUMER PRODUCT SAFETY COMMISSION  
WASHINGTON, DC 20207

Memorandum

Date: November 18, 1999

TO: Barbara Jacobson, HS  
Project Manager, Multi-Purpose Lighters

Through: Jacqueline Elder, Deputy Assistant Executive Director  
Office of Hazard Identification and Reduction

Robert B. Ochsman, Ph.D., Director, Division of Human Factors *RB*

FROM: Catherine A. Sedney, HF (x1282) *CS for K3*

SUBJECT: Response to Comments on Notice of Proposed Rulemaking for Multi-Purpose Lighters

This memorandum presents the response of the Division of Human Factors (HF) to comments received regarding the Proposed Safety Standard for Multi-Purpose Lighters published in the Federal Register on September 30, 1998. The proposed standard would establish performance requirements for child-resistance and details the associated test protocol for certification. Comments received from interested parties address the scope of the standard, the proposed definition of multi-purpose lighters, the relative risk of injury of multi-purpose lighters versus matches, the estimated net benefits of the proposed rule, and labeling, education and supervision as alternatives or adjuncts to the proposed standard.

**Issue: Scope and Definition**

This section addresses the following points raised in comments on the proposed standard:

- (1) Include a minimum length as a defining characteristic of multi-purpose lighters; and
- (2) Exclude micro-torches or separate them from "utility" lighters within the definition.

(1) Use a minimum length to define multi-purpose lighters.

**Comment:** "Multi-purpose lighter means: (i) a utility lighter . . . four inches or greater in length when in the fully extended position . . . The purpose of this alternative language is to define the utility lighter by highlighting the one key aspect of the lighter — its unusual length . . . the Commission's proposed definition goes to usage. However, as a practical matter, almost any lighter can be used to light a fireplace or a grill. The obvious distinguishing characteristic of a grill or utility lighter is the length of the product . . . If someone marketed a three and three quarter inch grill lighter, it would not meet the intended need because it would not reach over fire<sup>1</sup> or into inaccessible places . . ." (Lighter Association, p. 5)

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<sup>1</sup>The commenter claims that this is the reason consumers buy grill lighters. The use scenarios which would require the consumer to ignite something by reaching over existing flames, and how frequently such scenarios occur, are not discussed in the text of the comment.



**Comment:** “Zippo embraces the Lighter Association’s comments regarding the use of a dimensional definition that follows the design purposes of the lighters in this area . . . A utility lighter [is] . . . five inches or greater in length when in the fully extended position . . .” (Zippo Manufacturing Company, pp. 4-5)

**Response:** HF disagrees with the commenters’ position. The Commission’s definition attempts to capture, through examples of usage, the functional characteristic of a group of products that makes them more appropriate for a variety of lighting tasks than are conventional lighters. Ordinary lighters are adequately designed for the primary function of lighting cigarettes and cigars. Although they can be, and are, used to light charcoal grills, fireplaces, etc., they are less practical for these purposes. For many such tasks one has to turn them sideways or nearly upside-down, and hold down the gas release to maintain the flame. Because the user’s fingers are close to the lighter ignition point, doing so creates the risk of burns.

So-called grill or utility lighters overcome this problem through length, thereby separating the user’s hand from the lighter ignition point. It is not at all clear, however, what minimum length would suffice for most of the tasks performed with multi-purpose lighters. Among the products examined by HF which are marketed for lighting grills, pilot lights, fireplaces, and so on, the overall length, and the length of the handle and nozzle components, varies widely. One, for example, has a 3 7/8-inch handle and a 3 3/8-inch nozzle. Lighters of this size could be designed with the nozzle perpendicular to the handle, and be shorter than the recommended 4- or 5-inch minimum. This configuration would not position the hand appreciably closer to the ignition source than does the current design. Rather, it would align all four fingers with the position of the forefinger on the current horizontally aligned model. Thus, it would retain the functional quality of multi-purpose lighters, but would not be subject to a standard that uses a 4- to 5-inch length to define covered products.

Micro-torches avoid the problems inherent in the use of ordinary lighters to light a fire by virtue of a hotter directed flame, rather than length. This high-temperature directional flame makes micro-torches practical as a multi-purpose lighter for two reasons. First, it is not affected by the orientation in which the lighter is held. Second, it allows one to hold the nozzle further from the combustibles one is igniting than with cigarette lighters or grill lighters. Of the micro-torches collected during the course of the project, all are less than 5 inches long, and most are less than 4 inches long. They typically have a 1/2-inch nozzle, and a 1300-degree (C) flame measuring an inch or longer. One, for example, measures 3 1/2 inch long, and has a flame that is adjustable from 1 3/4 to 3 inches long. Staff members found it convenient to light gas grills, a gas stove burner, candles, and a water heater pilot light. Because this alternative design fulfills largely the same function as a longer lighter, HF does not support use of length to define multi-purpose lighters.

**(2) Exclude micro-torches or separate them from “utility” lighters within the definition.**

**Comment:** “We believe that micro-torches should be removed from the rulemaking requirement. This group of lighters operate (sic) at a much higher flame temperature than what is usually considered to be a multi purpose (sic) lighter, which is used by the consumer to light candles, gas fired grills, camp fires etc. Micro-torches are used primarily by hobbyists for soldering and brazing . . . We suggest . . . a separate standard that is tailored and sufficient to address the unique qualities of the micro-torch lighter.” (Swedish Match, pp. 1-2)

**Comment:** “The Association does not consider micro-torch lighters to be in any way competitive with grill or utility lighters. Simply looking at the product, it is obvious that micro-torch lighters

have a different purpose than grill lighters . . . . the Association proposes the following revised definition of multi-purpose lighter, which separates utility and micro-torch lighters . . . . (ii) a micro-torch lighter . . . is used by consumers primarily for hobby or maintenance applications, e.g., to solder or braze materials.” (Lighter Association, pp. 3-4)

Comment: “. . . We hereby request that the proposed regulations for multi-purpose lighters be revised to exclude industrial micro torches (sic). (Blazer Corporation, p. 2)

Response: The commenters provided no evidence to support their statement regarding consumers’ primary use of micro-torches. A number of lighters sold as “micro-torches” are marketed for multiple purposes that overlap those of “grill” lighters (e.g., lighting fireplaces, camp fires, barbecues, camp stoves etc.), in addition to use for hobby and maintenance tasks. As discussed above, the hotter, directional flame of a micro-torch compensates to an extent for its smaller size, making it functional for a variety of purposes, as is a “grill” lighter because of its longer nozzle. Both are multi-purpose, are used for many of the same tasks, and are likely to be used and stored in accessible locations in the home. As noted in a previous response on this topic, micro-torches and other multi-purpose lighters are the same in their appeal to children and in the hazard they present (C. Meiers; memorandum dated 8/6/98). Based on the equivalence of “grill” lighters and micro-torches in terms of function, expected usage based on marketing, and hazard potential, HF finds no basis to exclude micro-torches, or to create a subcategory for them within the definition of multi-purpose lighters.

#### **Issue: Relative Risk of Injury of Multi-Purpose Lighters versus Matches**

Comment: “. . . the Commission has provided no data to show relative risk rates between matches and non child resistant (sic) multi purpose (sic) lighters.” (Swedish Match, p. 3)

Comment: “Given that the societal benefits in regulating matches would far exceed those in similarly regulating multi-purpose lighters, it is recommended that the CPSC vigorously pursue this course . . . .” (Scripto-Tokai Corporation, p. 3)

Comment: “The number of fires resulting from matches is surely higher than those for multi-purpose lighters, and yet matches are specifically excluded from the proposed regulation.” (Zelco Industries Inc.; October 9, 1998 submission, p. 1)

Response: Comparisons between child-play fires with matches and with multi-purpose lighters are not valid because they largely involve children of different age groups. A study of 551 juvenile firesetters conducted in Portland, OR, found that use of matches by children younger than five was rare, but was relatively common among children six to eleven (Porth, 1999). This is consistent with the differences in motor development for the two age groups. Using a match requires two-hand coordination, and a combination of force and precision, as well as the control to maintain a flame long enough to light something. These factors make it a challenging task for a three- or four-year-old child, but much less so for older children. In short, regulating matches would have little impact on child-play fires involving children under five. Further, the overlap in the abilities of elementary school children and adults makes it impractical to modify the design of matches.

In contrast, based on CPSC incident data for the period January 1, 1988, through October 15, 1999, about 70% of the fires started with multi-purpose lighters were started by children under five (L.E. Smith; memorandum dated 11/3/99). These fires could be effectively reduced by a requirement that multi-purpose lighters be child-resistant. In baseline testing with children 42 to

51 months of age, the child-resistance of current multi-purpose lighters ranged from 4% to 41%. The standard would increase the CR level to a minimum of 85%. Based on experience with the Cigarette Lighter Safety Standard, the feasibility of making lighters child-resistant, yet acceptable to adults, has been demonstrated.

#### **Issue: Estimated Net Benefits of the Proposed Rule**

Comment: "The commentary in *Estimated net benefits of the proposed rule* states that the proposed rule is expected to reduce the costs associated with child-play fires involving multi-purpose lighters by 75 to 84 percent. Scripto considers this assertion to be flawed. The CPSC appears to assume that child-resistant devices will prevent most child-play fires. Based upon our experience in testing children with child-resistant lighters, this is not valid. Child-resistant mechanisms do not prevent children from starting fires: they merely slow down the process, providing an extra 5-10 minutes of delay, depending on the design . . ." (Emphasis added; Scripto-Tokai Corporation, p. 2)

Response: The firm provided no test data or other evidence to support this statement. In response to a request for additional information, Michael Forsys, Vice President of Scripto-Tokai Corporation, responded that the statement is based on observations during testing that a lot of kids seemed to be very close to operating the lighter toward the end of the 10-minute test period.

The firm's reported observations contradict staff's testing experience. Most children who are unsuccessful at operating a surrogate lighter lose interest quickly, and testers must repeatedly encourage them to keep trying. It is questionable if, in a realistic setting (i.e., when not confined with a tester in a room in which no other activities are available), three- and four-year-old children will typically persist for extended periods without the reinforcement of successful operation. The firm's reported observations, although of interest, cannot be considered as evidence as it is based on undocumented perceptions of what could have occurred, rather than on actual events.

Even if the firm's comment regarding delay were correct, there is protective value in a mechanism that delays lighter operation. Minutes can be critical in a fire, and delay increases the opportunity for an adult to intervene and prevent a fire.

#### **Issue: Education**

Comment: "The aim of these regulations could be accomplished just as easily through education." (Zelco Industries, Inc.; October 9, 1998 submission, p. 2)

Comment: ". . . the need for concomitant education efforts must be considered." (Scripto-Tokai Corporation, p. 2)

Comment: "Cricket® Lighters further believes that whatever action is taken by the Commission a strong education program must be instituted by the Commission, with appropriate budget funding, to address consumer behavior in leaving their lighters and their young children unattended." (Swedish Match; p. 3)

Comment: "We . . . agree that . . . consumer education [is] very important, but that [it] will not be as effective as making the lighters child-resistant . . ." (American Academy of Pediatrics, p. 2) .

Comment: “. . . an education campaign is not likely to significantly reduce these fires . . .” (Independent Safety Consulting; p. 6)

Comment: “And we also need to couple [child-resistance mechanisms] with information and education so that [parents] can be aware of the limitations of a child-resistant feature.” (Independent Safety Consulting; transcript of oral comments to the Commission, pp. 36-37)

Response: Education serves to provide the public with accurate information. For example, through the agency’s ongoing efforts to inform the public, it may be appropriate to advise consumers that “child-resistant” does not mean “child-proof,” and that child-resistant mechanisms are intended to prevent lighter use by most children under five, rather than by children in general. Given the incident data, however, HF questions the proposal of Commission funding for an education program to “address consumer behavior in leaving their lighters and their young children unattended.” The incident data show that, in general, children were not “unattended,” and that in many cases, the lighters were placed “out of reach” (C. Meiers; memorandum dated 4/28/98).

As an injury prevention strategy, education is far less effective than product modifications, which do not rely on behavior change. The educational approach assumes that if only people are made aware of a hazard they can and will behave safely. Unfortunately, research indicates that this is not necessarily the case. The results of outcome evaluations of education programs targeting safety behavior have been mixed at best, with the programs often having little or no effect either on behavior or on injury rates, despite measurable increases in knowledge. Paradoxically, education may create an unwarranted confidence: People exposed to educational interventions may believe they and their homes and children are safer, but objective measures indicate no change has occurred (Dershewitz & Williamson, 1977).

Safety education with preschool children poses particular challenges, although targeted behavioral interventions can have some effect. Preschoolers may learn the appropriate verbal responses, and when asked, can imitate the appropriate behaviors, however, they may lack the requisite cognitive skills and internal controls to implement what they have been taught. For example, in a study of a firearms safety program for children four to six years of age, most parents reported that they had taught their children about gun safety (Hardy, Armstrong, Martin, & Strawn, 1996). The children invariably said they were not allowed to play with guns. Yet when exposed to a gun when adults were absent, almost all of the children played with it. These results did not change significantly following an educational program, presented by police officers, which emphasized to the children that they should never touch a gun, and should tell an adult if they ever saw a gun.

The specific issue of fire safety education for preschool children was raised during oral testimony before the Commission. Dr. Carol Pollack-Nelson of Independent Safety Consulting was questioned by Commissioner Moore regarding such programs. Her response was that, based on her review of the research, most fire education programs target school-age children, rather than preschoolers (transcript of oral comments to the Commission, pp. 41-42). In supplemental comments, Mr. Thomas M. Kelleher of BIC Corporation identified “play safe! be safe!”® (sic) as a successful program for this age group, but stated that there is no study documenting its effectiveness (Supplemental Comments of BIC Corporation, 2/12/99; p. 2). In both oral and supplemental written comments, Mr. David Baker responded that the Lighter Association, Inc. has worked with the National Fire Protection Association (NFPA) and the Learn Not to Burn Foundation to create and distribute fire safety programs targeting both

preschool children and adults (transcript of oral comments to the Commission, pp. 41-42; Supplemental Comments of Lighter Association, Inc., 2/12/99; p. 3). When questioned by Commissioner Moore regarding the effectiveness of the programs, Mr. Baker cited an article published in the *NFPA Journal* (Porth, 1999) which reports “. . . a 36% decline in juvenile firesetting as a result of this curriculum.”

The NFPA article reports the results of a descriptive study of 551 firesetters drawn from the database of juveniles (i.e., preschool through high school age) referred to the Portland Fire Bureau's Juvenile Firesetter Program. The subjects, drawn from fiscal years 1992/93 through 1995/96, were “interviewed, assessed, and categorized” as firesetters of Little, Definite, or Extreme Concern following juvenile firesetter assessment definitions developed by the U.S. Fire Administration. The characteristic recidivism of each group, after an undescribed educational intervention, is given as follows: Children in the Little Concern group “rarely repeat”; “about 16%” of those in the Definite Concern group set fires again; and for children in the Extreme Concern category, “approximately 50% . . . can be expected to repeat their firesetting behavior.” The author postulates that because firesetters of Little Concern (63% of the sample) set fires out of curiosity or lack of knowledge, that they “would probably have never have engaged in firesetting behavior” if they had been given appropriate and accurate information.

The report of this descriptive study is followed by a discussion of an education program designed as a preventive strategy (as opposed to an intervention for identified firesetters). In fiscal year 1995/96, the Portland Fire Bureau developed and implemented the Youth Education Program. It consisted of (1) increased presence of firefighters in the schools; (2) NFPA's *Learn Not to Burn*® (*LNTB*) Curriculum; and (3) additional unspecified programs in high-risk communities. The NFPA website<sup>2</sup> describes *LNTB* components for kindergartners (The *LNTB* Resource Books, “. . . a grade-based alternative to the *LNTB* Curriculum . . . [for] children in kindergarten through grade three . . .”), and children three to five years of age (The *LNTB* Preschool Program). The *LNTB* Curriculum specified as part of the Youth Education Program is described as follows: “. . . first released in 1979, [it] teaches 22 key fire safety behaviors and is organized in three learning levels. The curriculum is intended for use by individual classroom teachers in planning classroom activities and can be re-used from year to year.” Based on the information provided in the article it is not clear that the Youth Education Program addressed the three- to four-year-old age group targeted by the proposed standard.

The author reports that the program was effective because the proportion of fires attributable to juveniles decreased 4.3 percentage points, from 11.9% in 1993/94 (i.e., two years before the program) to 7.6% in 1996/97, or, in the words of the report, a 36% decline. The report does not break down the change in proportion by the age groups identified in the descriptive study<sup>3</sup>. That is, it does not specify that there were declines in the proportion of fires set by preschool-age children. No statistical analyses indicating whether the change for the juvenile group as a whole exceeded the variations expected due to chance were reported.

Time-series studies, such as this one, are subject to a variety of confounds that preclude a valid inference of a cause-effect relationship between the intervention and any statistically significant change which may occur (cf. Campbell & Stanley, 1963). Prominent among them are historical factors, that is, other events which co-occurred with the intervention that could have caused the observed change. One example of such an event is the issuance of the Cigarette Lighter Safety Standard, which became effective in July, 1994, the year in which juveniles started 11.9% of the

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<sup>2</sup> [http://www.nfpa.org/education/Professional\\_Educators/Learn\\_Not\\_To\\_BurnR/learn\\_not\\_to\\_burnr.html](http://www.nfpa.org/education/Professional_Educators/Learn_Not_To_BurnR/learn_not_to_burnr.html)

<sup>3</sup> Preschool, Age 1-5; Elementary, Age 6-11; Middle, Age 12-14; and High, Age 15-17.

fires in the Portland area. The requirement that cigarette lighters be child-resistant could have contributed to the 4.3 percentage-point drop cited in the report. Neither the effects of the standard, nor the effects of the Youth Education Program, are established by this NFPA article.

Educational efforts to address any hazard can be quite costly, as they must be maintained indefinitely, both to reinforce the message and to reach new members of the targeted population. Given the inconsistent evidence of their effectiveness, HF concludes that education programs are an inadequate substitute for product modification. Given both the costs and the evidence on effectiveness, HF cannot concur with the proposal that, in addition to requirements for product modification, the Commission institute and fund an education program to address lighters and supervision.

### **Issue: Labeling**

Comment: "Labeling requirements would be sufficient." (Zelco Industries, Inc.; October 9, 1998 submission, p. 2)

Comment: "We . . . agree that product labeling [is] very important, but that [it] will not be as effective as making the lighters child-resistant . . ." (American Academy of Pediatrics, p. 2)

Comment: ". . . a label . . . is not likely to significantly reduce these fires . . . warning labels cannot affect behavior nearly as well as can a technical design change . . ." (Independent Safety Consulting; pp. 6-7)

Response: Labeling of multi-purpose lighters (including "Keep out of reach of children") has always been required under the Federal Hazardous Substances Act (16 CFR, Ch.II, Part 1500), and has clearly been insufficient to prevent child-play fires.

### **Issue: Supervision**

Comment: "These items are adult products, and if children were supervised and taught to respect these items, there would be no need for these regulations." (Zelco Industries, Inc.; October 9, 1998 submission, p. 2)

Comment: Child-resistant mechanisms ". . . are not a substitute for proper adult supervision . . . in most instances of serious injury due to child play fires that Scripto has knowledge (sic), the common denominator has been gross parental neglect as was the case in the Carr petition." (Scripto, p. 2)

Comment: "The incidents involving utility lighters demonstrate the normal and expected range of parent behavior when it comes to supervision . . . accidents happen even when children are appropriately supervised." (Independent Safety Consulting; pp. 5)

Comment: "Adult supervision will never be (indeed, can never be) perfect . . ." (American Academy of Pediatrics, p. 2)

Response: Congress addressed the general issue of adult responsibility in its passage of the Poison Prevention Packaging Act. To paraphrase, the Report of the Senate Committee on Commerce (1970) stated its belief that negligence is not the principal cause of poisoning

incidents, and that too many potential hazards exist to expect that children will be adequately protected from all of them solely through adult intervention.

As was noted in a previous HF memo (C. Meiers, memorandum dated 4/28/98), the level of supervision reported in the child-play incidents with multi-purpose lighters was reasonable. The Carr incident to which the commenter refers, is a case in point: The lighter used by the child was placed on a kitchen shelf above the refrigerator. The following morning while the parents were still asleep, the victim reached the lighter by using a chair to climb up on the counter. It is not clear how the lighter could be more "out of reach" than in this case. Nor is there a better example demonstrating that "constant" parental vigilance is physiologically impossible. Although the need for quality supervision is unquestionable, it is equally unquestionable that it frequently fails. In contrast, mechanical devices are consistently more reliable than are people, and are an appropriate supplement to supervision.

Teaching children to "respect" adult items, and otherwise avoid hazards, is a necessary component of child rearing. It is, however, an unreliable strategy for injury prevention. Three- and four-year-old children are fully capable of verbalizing rules repeated to them by adult caretakers. This is simple mimicry to a large extent, and does not imply either that children have a full understanding of the potential consequences of their behavior, or that they have developed sufficient control of their impulses to obey the rules with 100% consistency.

### References

- Campbell, D. T. & Stanley, J. C. (1963). *Experimental and Quasi-experimental Designs for Research*. Boston: Houghton Mifflin Company
- Dershewitz, R. A., & Williamson, J. W. (1977). Prevention of childhood household injuries: A controlled clinical trial. *American Journal of Public Health*, 67, 1148-1153.
- Hardy, M. S., Armstrong, F. D., Martin, B. L. & Strawn, K. N. (1996). A firearm safety program for children: They just can't say no. *Developmental and Behavioral Pediatrics*. 17(4), 216-221.
- Meiers, C. (April 28, 1998). Response to Public Comments on Advance Notice of Proposed Rulemaking (ANPR) Requiring Multi-Purpose Lighters to be Child-Resistant (Petition CP 96-1). Memorandum to Barbara J. Jacobson. Division of Human Factors, U. S. Consumer Product Safety Commission.
- Meiers, C. (August 6, 1998). Micro-torches. Memorandum to Barbara J. Jacobson. Division of Human Factors, U. S. Consumer Product Safety Commission.
- Porth, D. (January/February, 1999). Playing with fire. *NFPA Journal*. 55-58.
- Smith, L.E. (November 3, 1999). Fire Incidents Involving Multi-Purpose Lighters. Memorandum to Barbara J. Jacobson. Directorate for Epidemiology, U.S. Consumer Product Safety Commission.

**TAB C**





UNITED STATES  
CONSUMER PRODUCT SAFETY COMMISSION  
WASHINGTON, DC 20207

Memorandum

~~1998~~

Date: November 4,  
~~September 24,~~ 1999

TO : Barbara J. Jacobson, EH  
Project Manager, Multi-purpose Lighter Project

THROUGH: Alan Schoem, EXC *AS*  
Assistant Executive Director

Carlos L. Perez, CRC *CLP*  
Associate Director

FROM : Michael T. Bogumill, CRC *MTB*  
Senior Compliance Officer

SUBJECT : Response to Comments on NPR for Multi-Purpose Lighters

This memorandum presents the response of the Office of Compliance (EXC) to comments received regarding the Notice of Proposed Rulemaking for Multi-Purpose Lighters published in the Federal Register on September 20, 1998. The proposed safety standard would establish performance requirements for child resistance and details the associated test protocol for certification. Comments received from interested parties raised several issues relating to the scope of the standard including, the definition of multi-purpose lighters, the requirement that the child-resistant (CR) mechanism must allow for multiple operations before resetting, "easily deactivating" the CR mechanism, the anti-stockpiling provisions, and the effective date of the standard.

**Issue: Multiple Operation Capability**

Several commentators, including the Lighter Association, BIC Corporation, Script-Tokai, Swedish Match, SNC Group, and Zippo strongly opposed the requirement in the proposed rule at § 1212.3(b)(1) that a multi-purpose lighter **must** allow multiple operations of the ignition mechanism (with fuel flow) without further operation of the CR mechanism, unless the lighter requires only one motion to both: (i) overcome the CR mechanism and (ii) ignite the fuel. They stated that this requirement is design restrictive and limits the possibility of new safe and creative designs to be produced that would allow the CR mechanism to reset itself after each activation attempt.

**Response:**

The Office of Compliance agrees with the commentators on this issue. Putting in a requirement that the CR mechanism of a multi-purpose lighter (including micro torches) **must** allow for multiple operations of the ignition mechanism without resetting is design restrictive, not merely a

performance requirement. Two different importers have recently filed reports with the Office of Compliance for micro-torch lighters equipped with CR mechanisms that reset automatically after each activation of the lighter's ignition system. These lighters were tested for compliance with the requirements of the Safety Standard for Cigarette Lighters (16 C.F.R. Part 1210). The micro-torch models tested by these importers are similar in design and operation to many of the micro torches that would be covered by the multi-purpose lighter standard because they are not intended primarily for igniting smoking materials.

**Issue: Child-Resistant Mechanism that are "Easily Deactivated"**

Several commentators objected to the paragraph in the response on page 52409 of the Federal Register notice of September 30, 1998, which stated:

"The proposed rule requires that multi-purpose lighters must not be capable of having its child-resistant mechanism easily deactivated. The Commission interprets this as requiring that the child-resistant mechanism cannot easily be disabled with a common household tool, such as a knife or pliers, and still remain operable."

The comments claim that this statement would place an unreasonable burden on the industry by requiring that the lighters be tamper proof. The commentators believe that such a "tamper-proof" requirement is unreasonable and impractical.

**Response:**

Disabling or removing the CR mechanism on early versions of CR cigarette lighters was a common problem in the first two or three years after the effective date of the Safety Standard for Cigarette Lighters. Effective enforcement of the standard, including prosecution of persons who purposely disabled CR mechanisms on cigarette lighters offered for sale, and design changes by manufacturers to make the CR mechanisms on lighters more adult friendly appear to have reduced the deactivation problem to a low level. Because there are lighter designs that minimize the likelihood that the CR mechanism would be easily disabled, we believe the Federal Register statement is appropriate. If Compliance identifies lighter models with a CR mechanism that is easily deactivated, we will consider taking appropriate action.

**Issue: Impact of a One Year Effective Date on Small Companies**

One manufacturer of multi-purpose lighters requested an additional 2-year grace period to comply with the regulation, if it is published as a final rule, because of the difficulty of finding a CR mechanism that does not infringe on patents being filed by foreign manufacturers.

**Response:**

If the Commission adopts a final rule this calendar year (1999) and publishes it in the Federal Register with a 1-year effective date, the requirement for manufacturing and importing only CR multi-purpose lighters would not go into effect until near the end of the year 2000.

Manufacturers and importers would still be allowed to distribute and sell non-CR lighters manufactured or imported before the effective date until current stocks are used up. The Compliance staff's experience with the Safety Standard for Cigarette Lighters is that small businesses were able to produce complying CR lighters within the time period allowed by the standard, and many new manufacturers and importers have produced complying CR lighter models since the standard went into effect in 1994 with minimal burden on their ability to do business. Based on the Commission's experience with the cigarette lighter standard, a one-year effective date should be sufficient time for firms to make complying multi-purpose lighter models and to get them tested for child resistance effectiveness.

**Issue: Stockpiling**

Scripto-Tokai recommended that the reporting requirement in the proposed § 1212.20(d)(2) be changed from requiring that the information be submitted 10 days after the lighters are shipped to submitting the information at the end of each calendar month.

**Response:**

The Office of Compliance has no objection to this change, as it is likely to reduce the paperwork burden on both the importer and on CPSC staff. This change would be beneficial to firms who import several shipments of lighters each month, and it would not adversely affect importers who only bring in one shipment or less each month.

**Issue: In-bond Shipments**

Scripto-Tokai commented on problems the firm has had with the Customs Service in getting permission to move noncomplying cigarette lighters manufactured in Mexico through the United States, in-bond, for export to foreign countries. They requested that CPSC review the procedure for allowing Transportation & Exportation (T&E) entries to reduce unnecessary delays and paperwork.

**Response:**

The issue of T&E entries of noncomplying consumer products is not a subject to be dealt with in the rulemaking for multi-purpose lighters. It is a general program of the U.S. Customs Service and applies to many different categories of products for which the United States may have mandatory standards but not other countries. The Office of Compliance works closely with manufacturers and importers to facilitate the smooth movement of consumer products that may not comply with a CPSC mandatory standard, but that are merely in transit from one port in the United States to another port on their way to another country.

**Issue: Exclude high-end multi-purpose lighters from definition of multi-purpose lighters.**

Zelco commented that the scope should be narrowed to exclude higher end multi-purpose lighters.

**Response:**

Compliance does not support the exclusion of so-called high end multi-purpose lighters, because of our experience with the exemption in the cigarette lighter rule (16 C.F.R. Part 1210). The definition of disposable lighters at 16 C.F.R. § 1210.2(b)(2)(ii) established a cutoff amount of \$2.00 Customs Valuation or ex-factory price for refillable gas-fueled to be included under the requirements for disposable lighters in the safety standard. Immediately after the effective date of the rule, several manufacturers and importers began inflating the declared price of refillable, gas-fueled cigarette lighters that prior to the effective date had invoice values ranging from approximately \$0.20 to \$0.80 per unit to Customs presented invoice values in the \$2.01 to \$2.50 range. The lighters had not changed in quality or in any other way to warrant the large price jump, except to try to circumvent the letter and intent of the new safety standard. Many of these falsely invoiced lighters were then sold to distributors and retailers at less than \$2.00 per lighter. There is no evidence to suggest that if a similar exemption is granted for high-end multi-purpose lighters unscrupulous manufacturers and/or importers would not employ the same price inflation tactics to avoid compliance with the child resistance requirements of the new standard. Further, there is no reason to believe that so-called “high end” lighters don’t pose the same risks to consumers as other multi-purpose lighters.

**Issue: Exclude micro-torch lighters.**

Both the Lighter Association and Swedish Match question the inclusion of micro-torch lighters within the scope of the rule because they do not consider them comparable to the grill-type or “utility” multi-purpose lighters.

Blazer Corporation, a company that specializes in the distribution of micro-torches, expressed concerns that the broad definition of multi-purpose lighter in the proposed rule may be interpreted to apply to micro-torch products used by professional tradesmen or in industrial settings.

**Response:**

Compliance does not support the idea of excluding micro-torches from the definition of multi-purpose lighter. Many firms manufacturing, importing, or distributing various styles and sizes of micro-torch lighters, including the “pocket” torches and those that use disposable butane-fueled cigarette lighters as the fuel source advertise and promote the micro-torch lighters for many of the same uses that the grill-type lighters are promoted for. Micro-torches promoted for sale and use around the household are just as likely to be accessible to children under the age of 5 years as are the long nozzle grill lighters that the Lighter Association and Swedish Match consider “utility” multi-purpose lighters.

Blazer Corporation’s concern about the application of the proposed safety standard to micro-torch lighters that are used by professional tradesmen or in industrial settings is unwarranted, because such lighters (if not also promoted to consumers or sold in stores accessible to general consumers) would not be “consumer products” and as such would not be subject to a rule promulgated under the Consumer Product Safety Act (CPSA). Products intended and sold for

professional or industrial use, and not customarily produced or distributed for sale to, or use or consumption by, or enjoyment of, consumers do not fall under the jurisdiction of the CPSC, and would not be regulated as consumer products [15 U.S.C. § 2052(a)(1)(ii)(A)]. If, however, the micro-torches were advertised in general circulation media (such as consumer magazines, catalogs, newspapers, television programs, or consumer oriented internet web sites) or were sold in stores open to the general public (such as hardware stores or home repair outlets like Home Depot or Builders Square) then the micro-torches would be considered consumer products subject to the safety requirements of the CPSA and any standards issued pursuant to that Act.

**Issue: Delete the exclusion for lighters with more than 10 ounces of fuel.**

The Lighter Association, BIC, and Scripto objected to the exclusion of multi-purpose lighters that contain more than 10 ounces of fuel. They question the basis for this exclusion and express concern that an arbitrary cut-off invites the introduction of products that will fall outside of the scope of the rule. The Lighter Association and BIC state that there should be no limit on the amount of fuel in light of the fact that there are lighter attachments sold without any fuel or fuel reservoir that work with any quantity of fuel. In support of this argument, they provided a Bernz-O-Matic lighter attachment labeled “soldering & utility torch” that accommodates a 14.1 ounce propane cylinder.

**Response:**

Compliance agrees that the purpose of the proposed standard to require child-resistant mechanisms on multi-purpose lighters does not include requiring such mechanisms on larger torches used primarily for soldering and other utility uses which are not typical everyday uses of the lighters within the scope of the draft final rule. Fuel containers with a capacity of more than 10 ounces would be fairly large and bulky, making them difficult for a child under 5 years to manipulate and play with, and lighters utilizing these containers are not likely to be stored in the same locations as the smaller capacity lighters that have been involved in child-play fires.

The Bernz-O-Matic lighter attachment provided by the industry is clearly designed for large-size propane tanks, and a fuel container holding less than 10 ounces of fuel would not fit this attachment. However, lighter attachments designed for use with fuel cylinders holding less than 10 ounces of fuel would clearly be subject to the child resistance requirements of the proposed safety standard, in that the attachment cannot function as a multi-purpose lighter without a fuel source being attached. This is true whether the attachment is sold with or without a fuel cylinder. In fact, Compliance staff have seen micro-torch utility lighters that utilize disposable butane cigarette lighters as the fuel source being sold both with and without the fuel cell (or lighter) in the same shelf package as the torch holder.

**TAB D**



UNITED STATES  
CONSUMER PRODUCT SAFETY COMMISSION  
WASHINGTON, DC 20207

Memorandum

Date: October 29, 1999

**TO:** Barbara Jacobson, Project Manager, HS  
Multi-Purpose Lighters

**Through:** Jacqueline Elder<sup>JE</sup>, Deputy Assistant Executive Director  
Office of Hazard Identification and Reduction

Robert B. Ochsman, Ph.D., Director, <sup>BO</sup>  
Division of Human Factors

**FROM:** Catherine A. Sedney, HF (1282)<sup>CS</sup>

**SUBJECT:** Child-Resistant Lighter Mechanisms and the Risk of Flashback Injuries

This memorandum reports on a study of the capability of users to perform repeated operations of cigarette lighters that have child-resistant (CR) mechanisms which automatically reset after each use. The study was conducted in support of the Multi-Purpose Lighter Project. The following sections summarize the relevant history of the project and explain the purpose of the study.

### Background

In January 1997, the Commission published an advance notice of proposed rulemaking (ANPR) for a safety standard requiring that multi-purpose lighters be child-resistant (CR). The provisions of the standard were modeled after those of the Safety Standard for Cigarette Lighters, and thus required that CR mechanisms for multi-purpose lighters reset automatically after each operation (single-operation CR mechanisms). The requirement for an automatic reset is necessary because it ensures that lighters return to the "safe" mode when they are not being used by an adult.

In response to the proposed rule, industry representatives raised concerns related to the unreliability of grill-type multi-purpose lighters, which have long nozzles. Because the fuel must travel from the reservoir in the handle to the tip of the nozzle where a spark is generated, repeated operations of the ignition mechanism are often required to produce a flame with lighters of this type. This characteristic could lead to "flashback" when the user opens the fuel valve for a gas-fueled product, such as a gas grill or water heater, before trying to light the lighter. Flashback, as defined for the purposes of this report, occurs when excess gas, accumulated while the user attempts to produce a flame with the lighter, is ignited. Industry argued that the addition of single-operation CR mechanisms would result in longer ignition delays, and increase the risk of injury due to flashback.

Only a few child-resistant grill-style lighters are produced at present. These have CR mechanisms that can be held in the open position so that multiple attempts at ignition can be accomplished without interference, and yet return automatically to the child-resistant condition when they are released (multiple-operation CR mechanisms). As no additional delay is incurred

with a mechanism of this type, it has little, if any, effect on the potential for flashback. At the notice of proposed rulemaking (NPR) stage, the CPSC thus proposed a requirement that, to avoid increasing the risk of flashback injuries, lighters must allow multiple operations of the ignition mechanism without further operation of the CR mechanism. Industry in turn responded that such a requirement is a design standard that will interfere with the development of new CR devices, and will invite patent infringement lawsuits. In summary, industry has raised objections to two proposals for child-resistant multi-purpose lighters: (1) a requirement for single-operation CR designs; and (2) a requirement for multiple-operation CR designs.

Staff considered a third approach that would permit the use of either type CR mechanism. This would address industry's concerns regarding patent infringement and new design developments, but not those based on increased flashback potential due to delay caused by single-operation CR mechanisms. Resolution of this issue required that staff assess the injury risk related to flashback caused by delayed ignition of multi-purpose lighters, and attempt to determine whether single-operation CR mechanisms would increase that risk.

To answer these questions, staff analyzed the available incident data, and conducted a three-part research study to (1) define a safe ignition-delay time; (2) estimate the number of times currently marketed multi-purpose lighters must be operated to produce a flame; and (3) determine if consumers can operate lighters with single-operation CR mechanisms a sufficient number of times to obtain a flame within that "safe" period of delay. Summaries of the work of other technical staff, and a full description of the Human Factors (HF) study of CR lighter operation, are presented in the following sections.

### Review of Incident Data

The Directorate for Epidemiology, Division of Hazard Analysis (EPA) searched the Commission's databases for reported incidents of flashback and explosions, and reviewed incident reports of flashback provided by a lighter manufacturer (L.E. Smith; Memorandum dated June 17, 1999). Based on reports contained in the NEISS database, EPA estimates that each year from 1996 to 1998, approximately 1500 consumers were treated in hospital emergency rooms for injuries which occurred when they attempted to light gas-fueled products. About 1400 were treated and released. Additional sources revealed 10 deaths and numerous injuries serious enough to require hospitalization during that timeframe. The majority of the reports, however, included no information regarding the source of ignition (e.g., a multi-purpose lighter, cigarette lighter, or matches) and other important aspects of the events.

Greater detail was provided in reports of incidents investigated by CPSC staff, and in those submitted by the manufacturer. Of the 21 in-depth investigation reports in the CPSC database, seven cited matches, two, the grill's electronic igniter, and one, a cigarette lighter, as the source of ignition; ten did not specify the source. One cited the use of a multi-purpose lighter, but the incident was unrelated to a delay in ignition of the lighter. Sixteen reports cited product malfunctions, fuel leaks, or faulty connections. User errors (e.g., a gas burner valve left in the open position resulted in an explosion when a homeowner attempted to light a water heater pilot light) contributed to a number of incidents.



Of the seven incidents reported by the manufacturer of one brand of multi-purpose lighter, one clearly involved failure of the lighter to ignite as expected. The claimant reported that he made several failed attempts to use the lighter to light his grill. As he looked over the grill to determine the source of the problem, the lighter apparently operated and ignited the gas. The resulting 12-inch flashback caused burns, described by the complainant as similar to a severe sunburn, to his face, ear, neck, and arm. No medical treatment was required. In five other incidents, consumers reported that the lighters they were using exploded, or used words (e.g., the lighter “went boom”) suggesting such an event. Credence is lent to this characterization by the details of some of the incidents, such as reports of damaged lighters, and an account of fluid ejected from the lighter. These incidents resulted in minor or no injury. In the final incident, the lighter operated on the first try, but the flame extinguished. It operated on the second try and gas from the victim’s water heater exploded and threw her against a wall. She sustained no injury. As in the CPSC investigation reports, user errors, such as lighting a grill with the lid closed, appear to have played a role in some of the incidents reported by the firm.

In summary, available data document the risk of injury related to flashback. Under some circumstances such incidents can present a risk of serious injury, and in extreme cases, death. However, the majority of consumers treated in emergency rooms for injuries associated with flashback were treated and released. In addition to product malfunctions and fuel leaks, user error<sup>1</sup> may contribute to flashback events. Although delays in ignition were the apparent cause of several incidents, the data provide little evidence that delay due to the unreliability of multi-purpose lighters is a significant source of flashback injuries.

#### Delayed Ignition and Flashback Testing

Laboratory Sciences, Division of Engineering (LSE) conducted testing with three sizes of gas-fired grills to identify an ignition delay time frame that poses a minimal risk of serious flashback burn injuries (W. Rowe; Memorandum dated August 12, 1999). A conservative methodology, that is, one which favored the demonstration of potentially dangerous flashback events, was used. Preliminary testing indicated that of the three grills, the smallest represented the worst case because, when accumulated gas ignited in the shallow well of the grill, the resulting flash fire reached the highest level (10 or more inches) above the cooking surface. Delayed ignition tests were conducted with sleeves of cheesecloth, a flammable material used in standard tests of heating appliances, touching the grill surface near the ignition point. The results indicate that a flashback caused by ignition of a 15-second flow of propane is unlikely to ignite clothing.

Frame-by-frame imaging of the ignition tests was used to determine that, over 15 trials (with a 15-second flow of propane), the duration of the flashback events varied from .6 to 1.1 seconds. A literature survey conducted by the Directorate for Health Sciences (HS) confirmed that propane flash fires of this duration are unlikely to cause burn injuries serious enough to require hospitalization (S. Nakamura; Memorandum dated August 11, 1999). The flashback duration as measured by LSE does not necessarily equal users’ actual exposure time to the flash. The time to react (a combination of the time required to perceive the event and the time required to initiate movement) to the flame would vary based on several factors, but can be estimated conservatively to be generally less than a second (cf. Woodson, Tillman & Tillman, 1992;

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<sup>1</sup>Excluding the basic error of opening the gas valve before obtaining a flame.

Sanders & McCormick, 1993). Thus, exposure time would typically be reduced by the user's normal reflexive response, further lowering the likelihood of injury.

### Multi-Purpose Lighter Testing

The Directorate for Engineering Sciences, Division of Mechanical Engineering (ESME) tested six brands of multi-purpose lighters to determine the number of times a consumer might have to operate the ignition mechanism before the lighter produces a flame (E. Perry & C. Paul; Memorandum dated July 7, 1999). In 50 of 53 trials a flame was obtained in five or fewer attempts, and in 47 of 53 trials, in three or fewer attempts (Mean across trials = 2.41 attempts; Range = 14).

### Human Subject Testing

Baseline data were needed to determine if users are capable of repeating the actions required for ignition of a single-operation CR multi-purpose lighter a sufficient number of times to achieve ignition before a potentially hazardous flashback condition is reached. At present, only multi-purpose lighters with multiple-operation CR mechanisms are available. Disposable cigarette lighters served as a reasonable proxy for the purpose of this study because, by regulation, they must have CR mechanisms that reset after each attempt at operation. Details of the study are presented below.

## Method

### Subjects

The study protocol was reviewed and approved by the Chair of the Human Subjects Committee (L.E. Saltzman; Memorandum dated April 1, 1999). A sample of 30 subjects recruited from among agency staff was used. Project team members and other staff familiar with the Multi-Purpose Lighter Project were excluded. Descriptive statistics for the sample (age, sex, and frequency of lighter use) are presented in Table 1 (a-c). The subjects ranged from 20 to 62 years of age (mean = 41, SD =12.16), and included 13 males and 17 females. Few subjects reported that they use lighters on a daily basis, and the majority indicated that they use a lighter only occasionally (10), or never use one at all (13). Four subjects were left-handed (roughly the same proportion as in the general population), and one had a mild arthritic condition.

**Table 1**  
SUBJECT CHARACTERISTICS (N = 30)

a. Age in years			b. Sex (n)		c. Frequency of lighter use (n)			
Min-Max	Mean	SD	M	F	Never	Occasionally	Frequently	Daily
20 – 62	41	12.16	13	17	13	10	2	5

## Test Lighters

Seven types of cigarette lighters with CR mechanisms that automatically reset between each operation were tested. The lighters to be tested were drawn from among Compliance samples. Selection was intended to reflect the variety of types produced since the effective date of the Safety Standard for Cigarette Lighters, but was limited somewhat by the availability of samples, and by the consistency and reliability of the CR mechanism. Three of the lighters had spark wheel ("roll and press") operating mechanisms, and four had piezoelectric operating mechanisms.

Test samples were empty of fuel, both to eliminate the risk of burn injuries, and to simulate the requirement for multiple attempts. The complexity and/or operating force varied across the types. To minimize order and fatigue effects, the order of lighter presentation for each subject was predetermined by selection from a random number table.

## Procedure

Testing was conducted in a quiet office setting during normal work hours. Subjects read and signed an informed consent record prior to the start of the test. Subjects' lack of knowledge of the relationship of the study to the Multi-Purpose Lighter Project was confirmed by direct questioning. To minimize the demand characteristics<sup>2</sup> of the study situation, the instructions emphasized (1) testing of the lighters, rather than the subjects; and (2) that subjects should operate the lighters at a comfortable pace, rather than as quickly as possible. The tester demonstrated the operation of the first test sample, then asked the subject to try operating it. Coaching was provided as necessary. When the subject indicated he or she was comfortable with the operation of the lighter, testing commenced. The tester suggested a scenario in which the subject needed to light something, such as a candle, and indicated that if the lighter used did not work at first, that the subject would probably try it several times in succession. The subject then was asked to duplicate that situation, and instructed to begin operating the lighter when signaled and continue doing so until asked to stop. This process was repeated until the subject tested each of the seven types of lighters. Trials were timed with a stopwatch. Visual and auditory feedback from the CR mechanisms and the piezoelectric operating mechanisms were used to determine a successful operation. The number of times the subject operated each lighter within a 15-second trial was recorded.

## Results

Results for the seven lighters are presented in Table 2. Across the lighters tested the minimum number of operations in the 15-second trial period ranged from 4 to 8, and the maximum, from 14 to 24 operations. The mean number of operations per lighter type ranged from a low of 8 to a high of 14. The frequency distribution of the number of operations over all trials is presented in Figure 1. In most of the trials (195/209) the subjects operated the lighters six or more times.

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<sup>2</sup>Those features of an experiment or of an experimenter's behavior that suggest to participants the desired outcome of an experiment.