UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MD 20814

VOTE SHEET

DATE: JUL 10 2006

TO: The Commission
Todd A. Stevenson, Secretary

THROUGH: Patricia M. Semple, Executive Director

FROM: Page C. Faulk, General Counsel
Jeffrey R. Williams, Assistant General Counsel for Compliance and Information
Hyun S. Kim, Attorney

SUBJECT: Petition CP 04-1/HP 04-1 Requesting Mandatory Fire Standards for Candles and Candle Accessories

BALLOT VOTE due: JUL 14 2006

Attached is a briefing package from the staff concerning a petition submitted by the National Association of State Fire Marshals (NASFM) requesting that the Commission issue mandatory fire safety standards for candles and candle accessories. The staff recommends that the Commission defer decision on the petition (Option I.).

Please indicate your vote on the following options.

I. Defer decision on Petition CP 04-1/HP 04-1.

_____ _____
Signature Date

II. Grant Petition CP 04-1/HP 04-1.

_____ _____
Signature Date

7/10/06
NO [illegible] PRODUCTS IDENTIFIED
EXCEPTED BY: PETITION & RULEMAKING ADMIN, PRODS
WITH PORTIONS REMOVED:

NOTE: This document has not been reviewed or accepted by the Commission.
Initial [illegible] Date 7/10/06

III. Deny Petition CP 04-1/HP 04-1.

_____ _____

Signature Date

IV. Take other action (please specify):

_____

_____

_____

_____ _____

Signature Date

Attachment: Staff Briefing Package, *Options to Address Petition From National Association of State Fire Marshals (NASFM) Requesting Mandatory Candle Standards, Petition CP 04-1/HP 04-1*, July 2006.

BRIEFING PACKAGE

OPTIONS TO ADDRESS PETITION FROM NATIONAL ASSOCIATION OF STATE FIRE MARSHALS (NASFM) REQUESTING MANDATORY CANDLE STANDARDS

For further information contact:
Allyson Tenney, Project Manager
Directorate for Engineering Sciences
301-504-7567

TABLE OF CONTENTS

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3

EXECUTIVE SUMMARY

The U.S. Consumer Product Safety Commission (CPSC) received a request from the National Association of State Fire Marshals (NASFM) to issue mandatory fire safety standards for candles and candle accessories. NASFM asserts that mandatory standards for candles and candle accessories are needed because residential fires and associated fire losses caused by candles have increased from 1989 to 1999, candles can be designed and produced to reduce fire losses, and making standards mandatory will ensure compliance. The request was docketed as a petition on March 10, 2004, under both the Consumer Product Safety Act and the Federal Hazardous Substances Act, and was designated as CP 04-1/HP 04-1.

A request for comment on the petition was published in the *Federal Register* on April 6, 2004 with the comment period ending on June 7, 2004. The Commission received comments supporting and objecting to issuing mandatory standards for candles. Comments from the National Fire Protection Association (NFPA) support the petitioner's request for mandatory candle standards. The candle industry, represented by the National Candle Association (NCA) and Consumer Specialty Products Association (CSPA), objects to mandatory standards for candles and requests CPSC to deny the petition.

The petition from NASFM requests mandatory fire safety standards for candle products based, as a minimum, upon the requirements contained within ASTM International *Provisional Specifications for Fire Safety for Candles* (PS59-02). The petition also requests that the mandatory standards include several additional provisions not included in the provisional standard. PS59-02 was published by ASTM in 2002. The current standard, F2417-04, *Standard Specification for Fire Safety for Candles,* supersedes the provisional standard. While the standard includes requirements not included in the earlier provisional standard, other provisions are still being developed.

CPSC staff is aware of the increasing fire hazards and societal costs associated with candle products. In 1997, CPSC staff requested ASTM to develop voluntary performance standards for candles to reduce fire hazards associated with candle products. CPSC staff has maintained direct involvement in the ASTM subcommittee and has actively and consistently participated in many of the task groups by providing incident data and technical support.

While the standards developed by ASTM appear to be the most comprehensive published standards for addressing candle fire safety issues, there is no single published standard providing comprehensive performance requirements to adequately address all aspects of candle fire safety or the characteristics identified by the petitioner. The voluntary standards appear to be adequate in addressing some of the identified hazards, but more time is needed for standards development to be completed before a more definite assessment can be made. Additional performance requirements are being developed by ASTM and are expected to be finalized reasonably soon. The additional performance provisions are expected to address some of the remaining fire safety characteristics.

4

The staff recommends that the Commission defer a decision on the petition from NASFM, CP 04-1/HP 04-1, so that staff has additional time to continue to work with the ASTM subcommittee and to assess the impact of the ASTM voluntary standards.

5

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, DC 20207

Memorandum

Date: JUL 10 2006

TO : The Commission
Todd A. Stevenson, Secretary

THROUGH: Page C. Faulk, General Counsel
Patricia M. Semple, Executive Director

FROM : Jacqueline Elder, Assistant Executive Director
Office of Hazard Identification and Reduction
Allyson Tenney, Project Manager
Directorate for Engineering Sciences

SUBJECT : Petition from National Association of State Fire Marshals (NASFM) requesting Mandatory Candle Standards

I. Introduction

The U.S. Consumer Product Safety Commission (CPSC) received a request from the National Association of State Fire Marshals (NASFM) to issue mandatory fire safety standards for candles and candle accessories. The request to the Commission was docketed as a petition, CP 04-1/HP 04-1, on March 10, 2004. A request for comment on the petition was published in the *Federal Register* on April 6, 2004 with the comment period ending on June 7, 2004. CPSC staff has prepared this package in response to the petition. The package provides the Commission with currently available information relevant to the petition and a discussion of possible options.

II. Issue

The petition from NASFM specifically requests mandatory fire safety standards for candle products based, as a minimum, upon the requirements contained within ASTM International[1] *Provisional Specifications for Fire Safety for Candles* (PS59-02).[2] In addition, NASFM requests that the mandatory standards include the following provisions:

- Flammability performance requirements for candle accessories, including candleholders;
- End of useful life requirements for freestanding, tealight, taper, and votive candles;

[1] In accordance with 16 CFR § 1031.11(b), the Commission is advised that Allyson Tenney, principal author of this memorandum, attended ASTM Subcommittee F15.45 (Candle Products) and Fire Safety Task Group meetings, participated in discussions regarding the development of candle standards, and provided supporting data.
[2] PS59-02 is superseded by ASTM F2417-04-*Standard Specification for Fire Safety for Candles*

- Stability requirements for votive candles and taper candles mounted in appropriate candleholders; and
- Miscibility and flash point requirements for gel candles.

NASFM asserts that mandatory standards for candles and candle accessories are needed because residential fires and associated fire losses caused by candles have increased from 1989 to 1999, candles can be designed and produced to reduce fire losses, and making standards mandatory will ensure compliance. The request was docketed as a petition on March 10, 2004, under both the Consumer Product Safety Act and the Federal Hazardous Substances Act, and was designated as CP 04-1/HP 04-1 (TAB A).

A request for comment on the petition was published in the *Federal Register* on April 6, 2004 (69 FR 18059) and invited comments for a 60-day period ending on June 7, 2004. During the comment period, the Commission received three separate comments from the National Candle Association (NCA), National Fire Protection Association (NFPA), and Consumer Specialty Products Association (CSPA) (TAB A). These comments will be discussed in further detail in a separate section of this package.

III. Incident Data (TAB B)

Although residential fires have been decreasing in recent years, residential fires involving candles and candle products have been increasing. The increase in incidents involving candle products is likely due to an expanding market and increase in frequency of consumer candle use. Data from the National Candle Association show that the use of candles and candle products in the home has increased dramatically over the last fifteen years. Candles are reportedly used for a number of reasons including decoration, aesthetics, ornamentation, ambiance, aromatherapy, relaxation, meditation, religion/spiritual and as fragrance disseminators.

Based on national fire loss estimates, the four-year average (1999-2002) of total fire department attended candle fires were an estimated 15,300 fires resulting in 130 deaths, 1,500 injuries, and $303.3 million in property loss annually.

The total number of residential fires caused by candles is likely much higher because many candle fires are not attended by the fire department. An initial study of emergency room treated injuries between July 1, 2002 and June 30, 2003 estimates 1,165 fire department attended injuries due to fires caused by candles. The estimate for injuries from candle fires not attended by the fire department was 2,247. This means that an estimated 66% of candle fire injuries seen in emergency rooms were from candle fires that were **not** attended by the fire department.

Based on national fire loss estimates, the four-year average (1999-2002) of "potentially addressable," fire department attended candle fires were an estimated 12,500 fires resulting in 110 deaths, 1,110 injuries, and $248.6 million (unadjusted for changes in price levels) in property loss annually. (These estimates were analyzed using different variables to identify candle fires that would be "potentially addressable" or "not addressable." Addressability is discussed in section IX.)

7

IV. Market Information (TAB C)

Candles are manufactured from fuels such as paraffin wax, beeswax, vegetable wax, or gelled mineral oil to which a wick is added. Frequently added ingredients include fragrance and color. There are two major types of candles: *container* and *freestanding*. Candles which are fabricated and burned in vessels made of non-flammable materials are referred to as *container (or filled)* candles. Candles that are rigid and generally placed on a candleholder for burning are called *freestanding* candles.

The Reference USA database of businesses identifies 189 candle manufacturers in the United States. Most of these are small businesses. All but two firms have fewer than 500 employees, the U.S. Small Business Administration's threshold for defining a candle manufacturing business as small. Most firms were much smaller than the threshold limit. The majority of firms, 103 firms or 54 percent, have fewer than five employees. Since start-up expenses are generally small, producers of candles may enter and exit the market easily and frequently.

Candle accessories are objects designed, intended or marketed for use with a candle. They include candleholders or candle containers which provide a functional purpose (i.e., holding a candle upright) during candle burning, decorative trim rings, and potpourri burners/warmers. The industries supplying candle accessory products are wide ranging and are often located outside of the United States. Many candle manufacturers market candle accessories in conjunction with candle sales. However, no definitive estimate of the number of firms supplying product to the candle accessories market is available.

The National Candle Association (NCA) is the major trade association for the U.S. candle industry, representing candle manufacturers and their suppliers. NCA members account for more than 90 percent of the candles manufactured in the United States. Other trade associations representing candle manufacturers include the Consumer Specialty Products Association (CSPA), the International Guild of Candle Artisans (IGCA), and the Association of European Candle Manufacturers (AECM). The varied trade associations whose members supply candle accessories represent a wide range of manufactured products. Some suppliers of candle accessories are members of the NCA and the American Floral Industry Association (AFIA).

Candles and candle accessories are marketed to consumers and commercial and institutional establishments and are sold through a variety of retail methods, including grocery, discount, and department stores, mass merchandise retailers, specialty and gift shops, catalogs, and the Internet, and through direct sales at in-home shows and several chains of candle stores. The NCA estimates that retail sales of candles are about $2 billion per year. Domestic factory shipments increased from $403.3 million in 1992 to $998.0 million in 2002 (in 2004 dollars).

In 2005, imports amounted to $435 million (in 2004 dollars). Of these imports, more than 60 percent originated from Pacific Rim countries. The People's Republic of China (China) has been the largest single source of imported candles since 1990, when it accounted for 19 percent of all imports. In 2004, China was the source of close to half (48 percent) of all imported

candles. Candle imports have fallen dramatically since the second quarter of 2005, likely a result of a pending ruling by the Department of Commerce (DOC) which expanded the scope of candles covered under an antidumping duty order. Imports from the Americas, mostly Canada and Mexico, accounted for about one quarter of imports, while imports from European countries and the U.K. accounted for less than eight percent of imports.

U.S. consumption of candles was about $1.4 billion (wholesale) in 2002, triple the consumption level of 1992, when consumption was about $440 million worth of candles. Imports represent an increasing share of consumption, representing 32.7 percent of 2002 consumption, more than double the 14.5 percent share they held in 1992. Imports from China represent an increasing share of imports and of U.S. consumption, rising from about 4.6 percent of U.S. consumption in 1992 to 13.2 percent in 2002.

V. Societal Cost Estimates (TAB B & TAB C)

The societal costs associated with candle fires are significant. Over the period 1999 to 2002, the average number of candle fire deaths per year has been about 130. Assuming a statistical value of life of $5 million, the societal costs associated with these deaths would amount to about $650 million. Additionally, based on estimates of about 1,500 injuries treated annually, the injury costs associated with candle fires amount to about $123 million per year in 2004 dollars. Property losses due to candle fires sustained over this same period resulted in an estimated $345 million in costs per year (in 2004 dollars), on average. Considering the combined costs of deaths, injuries, and property losses, the total costs to society per year of candle fires are estimated to be about $1.12 billion per year (in 2004 dollars).

VI. Recall History (TAB E)

According to the Office of Compliance, there were 118 recalls for fire safety problems, involving 12.7 million (12,748,627) candle and accessory products between 1993 and May 2006. Of the 118 candle related recalls, 81 involved imported products, 56 of the 81 involved imports from China, and 16 involved products made in the United States. There are 21 recalls where the country of origin is unknown since that information was not captured prior to 1999. The most common issues involved secondary ignition (ignition of embedded items or flashovers), high flame height, and ignition or overheating of candleholders (55 of the 118 recalls involved candleholders) (TAB E).

VII. Review of Existing Standards (TAB D)

CPSC staff reviewed standards and regulations for candles and candle products from ASTM International, IKEA of Sweden AB, Health Canada, Finnish Consumer Agency and Ombudsman Agency, the Federal Republic of Germany Quality Association for Candles, CEN (Comite European de Normalisation), Singapore, and United Kingdom. Public, educational, and private organization regulations were also reviewed (TAB D).

Based on the risk of illness from exposure to lead, CPSC banned the manufacture and sale of lead-cored wicks and candles with lead-cored wicks (wicks containing more than 0.06

percent lead by weight are banned), Final Rule, 16 CFR §1500.12, §1500.17, effective October 15, 2003. However, there are no mandatory standards for candles and candle products that comprehensively address fire safety issues in the United States or internationally.

In November 2003, Health Canada proposed mandatory requirements for candles that would require warning labels to be placed on candles or their packaging as sold. A schedule for establishing final requirements has not been published. Since 1977, Health Canada has prohibited the sale of candles that spontaneously re-light when extinguished. Health Canada also prohibits the use of lead-cored candle wicks.

Several of the reviewed standards and regulations outline manufacturing and quality specifications, while others restrict the usage of burning candles in certain situations (for example, some universities prohibit burning candles in student housing or dormitories). IKEA of Sweden AB (IKEA) offers one of the more comprehensive standards. IKEA requires their suppliers to comply with a list of guidelines and specifications, including testing and reporting, to assure candle quality. Requirements for candleholders are also included. While some of IKEA's specifications include performance requirements, others specify manufacturing techniques and methods.

Other voluntary standards address aspects of fire safety by providing performance or design guidelines for flame height, burning duration, wick construction, and sooting. CEN has recently drafted standards that consider requirements for labeling, fire safety, and soot indexing. The draft provisions are similar to those in the standards developed by ASTM International.

ASTM International (ASTM), Subcommittee F15.45 for Candle and Candle Products, has published several standards for candles and candle products. In addition to ASTM F-1972-05—*Standard Guide for Terminology Relating to Candles & Associated Accessory Items* (originally published in 1999) and ASTM F-2326-04—*Standard Test Method for Collection and Analysis of Visible Emissions from Candles as They Burn*, several published standards address the fire safety of candles and soda-lime-silicate glass containers produced for use as candle containers. These standards include ASTM F2179-02—*Standard Specification for Annealed Soda-Lime-Silicate Glass Containers That Are Produced for Use as Candle Containers* which specifies performance requirements to prevent glass candle containers from shattering; ASTM F2058-00—*Standard Specification for Cautionary Labeling for Candles Burned in a Home* which specifies certain cautionary labeling for candles; and ASTM F-2417-04—*Standard Specification for Fire Safety for Candles,* discussed in more detail below. ASTM is developing a separate standard for candle accessories, also discussed below. The staff considers these standards relevant to the petition as they address candle fire safety and because the petitioner requested that the agency consider the ASTM standards *as a minimum.*

The standards developed by ASTM appear to be the most comprehensive published standards for addressing candle fire safety issues. Many of the various reviewed standards identify candle performance characteristics and requirements that are similar to those found in the ASTM standards. While many of the reviewed standards appear to provide some useful information for addressing candle fire safety, there is not one published standard providing

comprehensive performance requirements to adequately address all aspects of candle fire safety or the characteristics identified by the petitioner.

VIII. Voluntary Standards Development (TAB B & TAB D)

In 1997, CPSC staff requested ASTM to develop voluntary performance standards for candles to reduce fire hazards associated with candle products. Several task groups were formed within ASTM Subcommittee F15.45—*Candles and Candle Products* to develop new voluntary standards. The task groups were assigned to specifically address Terminology, Labeling, Data Evaluation, Glass Containers, Smoking, Wicks, and Fire Safety. To date, there are five published standards and one draft standard relating to candles and candle products (TAB D).

In-Depth Investigations: To support the voluntary standards efforts and identify typical fire scenarios involving candle products, CPSC staff has continuously collected candle fire incident data and analyzed in-depth investigations (IDIs) prepared by CPSC field staff to document selected fire incidents. An initial study of IDIs was completed in 2001 summarizing data obtained from 79 in-depth investigations collected between August 2000 and March 2001. The purpose of the study was to assess the level of detail that could be obtained using the *Candle Fire and Fire Hazard Investigation Guideline* (S. Hiser, Directorate for Epidemiology, September 19, 2001).

Further insight into typical candle fire scenarios was provided by the Candle In-Depth Investigations Report (S. Kyle, Directorate for Epidemiology, January 14, 2002), a study of 593 in-depth investigations assigned to field staff from January 1998 through September 2001. The analysis identified a number of hazard patterns, several of which were considered to be potentially addressable by a voluntary standard. The potentially addressable hazards included candle flared up, candle exploded, wax was low, container shattered, container caught on fire, candle re-ignited, and candle tipped over (not involving a pet). The most common scenario involved candle flare-ups. The report identified a variety of candle types involved in incidents. Although many of the incidents involved wax candles, the report identified two particular types of gel candles that were involved in flare-ups.

Another study of candle incidents and IDIs was completed in May 2003 (D. Miller, Directorate for Epidemiology, May 20, 2003), summarizing investigations of candle incidents from September 2001 through February 2003. The incident types included flare-ups; containers that ignited, broke, or shattered; candle holders that ignited or broke; low wax in container; tipovers; and injuries from extinguishing the flame. CPSC staff has continued to assign and analyze candle incident investigations and provide periodic updates of the hazard patterns to ASTM Subcommittee F15.45. Additional information and photographs are available in Tab B.

ASTM Voluntary Standards Development: ASTM Subcommittee F15.45—*Candles and Candle Products* formed several task groups on Terminology, Labeling, Data Evaluation, Glass Containers, Smoking, Wicks, and Fire Safety to focus on specific issues and develop voluntary standards. The Fire Safety Task Group was formed in April 2001 to develop standards specifically for candle performance and fire safety. CPSC staff has maintained direct involvement in the Subcommittee and has actively and consistently participated in many of the

task groups, including the Fire Safety Task Group, by providing incident data and technical support. The potentially addressable hazards cited in the reports provided by CPSC staff identified performance characteristics that provided a basis for the candle related standards being developed by ASTM.

PS59-02, *Provisional Specification for Fire Safety for Candles*, was first published by ASTM in 2002. The current standard, F2417-04, *Standard Specification for Fire Safety for Candles,* supersedes the provisional standard and was finalized and published in 2004, after receipt of the petition. This newer standard includes provisions for stability for freestanding candles, container candles, tealight candles, and candle/accessory ensembles, but not candles needing holders (such as taper candles), votive candles without holders, or certain religious candles; performance requirements for flame height for all candles except candles intended to be burned outdoors; secondary ignition provisions for all candles except certain religious candles; and end-of-useful life provisions for votive candles, freestanding candles, container candles, and tealight candles but not taper, birthday or floating candles. A separate, extended burn cycle for gel candles is specified.

The ASTM candle fire safety standard establishes performance requirements for candle characteristics identified as contributing factors to candle fires. The rationale for developing the specific fire safety requirements was largely obtained from CPSC recall history and in-depth investigations. Intended product use, technical feasibility, and test data were also considered. Some of the performance requirements are different from the requirements requested by the petitioner.

The ASTM candle fire safety standard incorporates the end-of-useful life requirements for freestanding, tealight, and votive candles that were requested by the petitioner. Not included in the latest standard, but requested by the petitioner, are specifications for end-of-useful life for taper candles. Tapers are excluded from the end-of-useful life requirements because of the methods used to produce taper candles. According to the NCA, *the inclusion of tapers is not technically possible or economically feasible at this time* (TAB A).

The petitioner requests stability requirements for votive candles and taper candles mounted in appropriate holders. Votive candles and taper candles, unless sold as part of an ensemble, are excluded from the ASTM stability requirements because both require holders to be used as intended and are not manufactured to be freestanding candles. Although both candle types are manufactured within a size range, the ASTM task group was not able to identify an appropriate *one size fits all* holder. Additionally, the stability of candleholders for taper candles and votive candles is expected to be within the scope of the standard being developed for candle accessories.

Specific flashpoint and miscibility requirements for gel candles are also requested by the petitioner. There is an eight-hour burn test specified for gel candles in the finalized standard, intended to address some flammability issues associated with gel candles, although the test does not require specific measures of flashpoint and miscibility as requested by the petitioner. Additional requirements for gel candles, based on recently completed testing of gel candles initiated by ASTM task group members, are being considered. Depending on the test data,

additional provisions may be added. Provisions for flashpoint and miscibility may or may not be identified as contributing factors requiring additional provisions.

Flammability specifications for candle accessories, requested by the petitioner, are also not addressed by current ASTM standards. A separate standard for candle accessories is being developed by the ASTM Fire Safety Task Group. A draft was released in 2005 for comments. A revised draft and final standard are expected in 2006. The draft accessories standard addresses stability of candle accessories and ensembles and the flammability of candle/potpourri (tealight) burners and trim rings. Performance requirements for candleholders are still under development.

IX. Conformance to Voluntary Standards

According to the National Candle Association, its members formally pledge to produce candles and candle products "in accordance with recognized industry standards and practices." Since its members represent 90 percent of candles manufactured in the U.S., the NCA argues that the industry is in substantial compliance with the current ASTM standards. The Consumer Specialty Products Association (CSPA) also asserts that its members, who include "most of the major candle manufacturers and marketers in the United States," pledge full "compliance with the current ASTM standards."

Based on industry commitments asserted by the NCA and CSPA, a substantial portion of U.S. producers of candles may be in conformance to the latest voluntary standards. It is not known, however, to what extent the rest of the domestic industry or imports conforms. Some U.S. producers are also importers and, thus, it is expected that some portion of imports will also conform by design. It is similarly not known how well current candle and candle accessory production meet those additional petitioner requests not incorporated into existing standards. CPSC incident data include many incidents where candles and their accessories have performed improperly resulting in fires. In fact, many candles and accessories have been the subject of recall action by the Commission.

According to the Directorate for Economic Analysis (TAB C), the U.S. consumed about 1.4 billion dollars (wholesale) worth of candles in 2002 (in 2004 dollars). Imports represent about one-third of this amount. Consumption of domestically produced candles was about $937 million (domestic factory shipments minus exports.) Accepting NCA's assertion that 90 percent of domestic production is largely in compliance with the latest voluntary standards, then about $843 million in candle shipments or perhaps 61 percent of candles in commerce in the U.S. comply. Compliance levels for the remaining 39 percent, or $548 million in candles consumed in this country, are unknown.

Using data supplied by the Office of Compliance, there were 118 recalls for fire safety problems, involving 12.7 million candle and accessory products between January 1, 1993 and May 18, 2006. The country of origin is known for 12.0 million units or 94.5 percent. Of these, imported units constituted 7.6 million or 64.6 percent of the total units recalled while the remaining 4.4 million or 36.4 percent of the recalled products were domestically produced. Imports from China represented 2.5 million units or 20.6 percent of the recalled items.

In summary, while we may be able to assume, based on industry comments, that a majority of candle products consumed in the U.S. conform to the latest voluntary standards, there still remains a relatively large percentage where we do not know conformance levels. Moreover, given that a considerable number of candles consumed in the U.S. are imported from foreign producers that are not members of the NCA, there remains the substantial likelihood of nonconforming product continuing to enter the U.S. This likelihood is demonstrated by the disproportionately large share of recalls which occur among imports. Although the proportion varies each year, in 2002, imports accounted for about 93 percent of recalls while accounting for 32.7 percent of U.S. consumption of candles (TAB B and TAB E).

X. Addressability

Although a portion of the fire hazards associated with candles could be addressed by adoption of candle fire safety regulations similar to those proposed by the petitioner, it is not known how effective such a rule would be in preventing deaths and injuries, or whether a mandatory rule would be more effective than the voluntary standards being developed. Even if all candles conformed to mandatory safety standards, candle fires would not be eliminated. Fires that result from consumer acts that are unrelated to candle safety features are unlikely to be affected. For example, fires started by child play or acts of nature would not be addressed through the adoption of candle safety regulations.

Fires associated with candles that already meet the existing voluntary safety standards would likely not be affected by mandatory candle safety regulations. We do not know the proportion of candle fires started by non-conforming versus conforming candles and cannot estimate the number of fires due to non-conformance. It is expected that only the fires that relate directly to those safety features that are incorporated into newly conforming candle production would be reduced.

A portion of the candle fires and associated hazards could potentially be addressed by candleholder performance requirements. There are presently no flammability performance requirements for candleholders, yet these items have been involved in Compliance recalls because of ignition, breakage, or overheating.

In addition, other actions by the Commission, such as the recent adoption of the mattress open-flame fire safety regulation could affect the deaths and injuries caused by candle fires. This action will likely take many years to have a measurable impact on candle fire losses. A table estimating candle casualties prevented by the mattress (open-flame) standard is available in TAB B.

Although candle fires result in substantial societal costs every year, without additional information such as the conformance level of candles involved in fires and the likely effectiveness of the petitioner's requested regulatory action, further analysis of potential benefits and costs cannot be made at this time.

XI. Staff Responses to Public Comments

On April 6, 2004, a request for public comment on the petition was published in the Federal Register (69 FR 18059). The Commission received comments from the National Candle Association (NCA), National Fire Protection Association (NFPA), and Consumer Specialty Products Association (CSPA) (TAB A). Two of the commenters object to mandatory standards for candles and are requesting CPSC to deny the petition. One commenter supports the petition for mandatory standards for candles. The staff evaluation of the comments is presented in this section.

1. Two commenters object to mandatory standards because they believe *the ASTM F15.45 voluntary consensus standards addressing candle fire safety are effective and will continue to reduce the fire risks; it is too early to determine the effectiveness of voluntary standards; the industry is already complying with voluntary standards and industry members have pledged to continue prompt compliance with future standards; and mandatory standards will have a negative impact on safety because changing mandatory standards is complex and they impede advances in technology and design (NCA; CSPA).*

The ASTM International (ASTM) Subcommittee F15.45 Fire Safety Task Group was formed in April 2001 to develop standards to specifically address candle fire safety. A fire safety standard for candles, F2417-04—*Standard Specification for Fire Safety for Candles,* was finalized and published in August 2004 that includes candle performance requirements for characteristics identified with reported hazard patterns (stability, flame height, end of life behavior, and secondary ignition). Based on industry commitments asserted by the NCA and CSPA, a substantial portion of U.S. producers of candles may be in conformance with the latest voluntary standards. It is not known, however, to what extent the rest of the domestic industry or imports conform. Staff agrees that more time is needed to assess the standard's effectiveness in reducing fire hazards involving candles.

Staff does not believe that establishing a mandatory standard would impede advances in technology or design. Staff expects a mandatory standard for candles would be performance-based, allowing manufacturers to continue to improve, innovate, and develop technologies, designs, and manufacturing processes, and thus, provide flexibility in meeting the requirements.

2. Two commenters object to the petition because *the petitioner disregards the additional standards development work by the ASTM Fire Safety Task Group; the ASTM standards include many of the provisions proposed by the petitioner or are under consideration by the ASTM Fire Safety Task Group (NCA; CSPA).*

The petitioner requests mandatory standards based on ASTM PS59-02—*Provisional Specifications for Fire Safety for Candles* with additional specified provisions. The petitioner acknowledges the efforts of the ASTM Fire Safety Task Group and asks CPSC to consider the progress of the Task Group in developing any candle requirements. CPSC staff has participated in the development of the candle standards and is aware of the progress made by the Fire Safety Task Group. Since receipt of the petition, ASTM PS59-02 has been superseded by a final standard, ASTM F2417 that includes additional provisions and requirements, some of which

15

directly incorporate the requests of the petitioner. Staff recognizes that additional requirements are being considered by the Fire Safety Task Group. Staff is also aware that a separate standard for candle accessories is under development and near completion. Any rulemaking by the Commission would include a complete review of current standards.

3. One commenter believes that *it is consumer misuse and inattention to basic fire safety precautions that leads to candle fires*; *consumers leaving lit candles unattended, placing candles too close to combustibles, or placing them within the reach of children and pets is misuse*; *and that only the education of consumers as to the proper burning of candles and observance of candle fire safety rules can have an impact in reducing these candle fires (NCA).*

Staff agrees that consumer misuse and inattention to basic fire safety precautions are factors that play a role in candle fires. A more complete discussion is available in TAB F.

Characteristics of candles and candle accessories, in general, influence the way these products are used; and in this case, are likely factors in consumers leaving lit candles unattended. For example, the thickness and sturdiness of the jar may contribute to users leaving candles unattended. Additionally, all of the candles, from the very small tealights to the large pillar-type candles, have long burning times. It is, therefore, foreseeable that if users believe their candle has a long time to burn, they may leave their candle to answer a phone or a door, or tend to cooking. Additionally, if the candle appears to be burning properly, it may reinforce the notion that it is safe to leave a lit candle. Further, jar candles or candles placed to burn inside containers may give the impression that the candle is safe since the flame appears contained. Therefore, some consumers may feel comfortable leaving the candle unattended.

CPSC staff believes that the effectiveness of an information and education (I & E) campaign depends on a number of variables, including the user's familiarity and/or experience with the product. For example, an I & E campaign is likely to be more effective if the target audience has less experience with a product than if they have more experience. The CPSC regularly disseminates press releases to consumers and features stories on candle safety, warning consumers to exercise caution when using candles and how to do so. The commenter's own organization regularly disseminates educational material to consumers through retailers, fire, safety, and consumer organizations around the country, and industry groups. Government offices, such as The Department of State of New York State, provide educational materials as well. Among these groups, the message promoted on candle safety is consistent. They tell consumers, among other information, to keep candles away from children and pets, never leave burning candles unattended, and keep combustible materials away from candles. Yet, based on injury estimates provided by CPSC staff, candle fires are on the rise. This suggests that, in this instance, product design changes or performance requirements could more effectively address candle fire losses.

16

4. One commenter who supports the petition stated that *while consumer behavior is a factor in most candle fires, ... product problems have also played a role (NFPA).*

Staff agrees with this comment. In the incidents and recalls reviewed by CPSC staff, product problems have played a major role in many of the cases (TAB F).

XII. Discussion

CPSC staff is aware of the increasing fire losses and societal costs associated with candle products. In 1997, CPSC staff requested ASTM to develop voluntary performance standards for candles to reduce fire hazards associated with candle products. ASTM Subcommittee F15.45—*Candles and Candle Products* formed several task groups to focus on specific issues and develop voluntary standards. To date, there are five published standards and one draft standard relating to candles and candle products. CPSC staff has maintained direct involvement in the Subcommittee and has actively and consistently participated in many of the task groups by providing incident data and technical support.

One of the task groups, the Fire Safety Task Group, was formed in 2001 to develop standards specifically for candle performance and fire safety. ASTM F-2417-04—*Standard Specification for Fire Safety for Candles,* published in 2004, establishes performance requirements for candle characteristics identified as contributing factors to candle fires. The rationale for developing the specific fire safety requirements was largely obtained from CPSC recall history and in-depth investigations. Intended product use, technical feasibility, and test data were also considered. A separate standard for candle accessories is being developed.

NASFM petitioned the Commission to issue mandatory fire safety standards, based on the standards developed by ASTM, for candles and candle accessories. The request to the Commission was docketed as a petition, CP 04-1/HP 04-1, on March 10, 2004. The Commission received comments supporting and objecting to issuing mandatory standards for candles. The candle industry, represented by the National Candle Association and Consumer Specialty Products Association (CSPA), objects to mandatory standards for candles and requests CPSC to deny the petition.

The petition from NASFM requests mandatory fire safety standards for candle products based, as a minimum, upon the requirements contained within the preliminary standard, ASTM PS59-02—*Provisional Specifications for Fire Safety for Candles.* PS59-02 was published by ASTM in 2002. The current standard, F2417-04, *Standard Specification for Fire Safety for Candles,* supersedes the provisional standard. The petition requests a number of additional provisions that are either not included in the current standard (ASTM F2417) for technical reasons or are still being developed by the ASTM Fire Safety Task Group.

While the standards developed by ASTM appear to be the most comprehensive published standards for addressing candle fire safety issues, there is no single published standard providing comprehensive performance requirements to adequately address all aspects of candle fire safety or the characteristics identified by the petitioner. Additional performance requirements are being developed by ASTM and are expected to be finalized reasonably soon. The additional

17

performance provisions are expected to address some of the remaining fire safety characteristics, including many of the fire safety issues identified with candleholders and accessories.

With the current standard published in 2004 and the standard for candle accessories under development, it is premature to assess the effectiveness of the requirements. Many of the safety issues identified by an analysis of available incident data and recall information are addressed by the performance requirements of the current standard or are expected to be addressed by the requirements being developed. While the voluntary standards appear to be adequate in addressing some of the identified hazards, more time is needed for the standards to be developed and in place before a more definite assessment of effectiveness can be made.

Although a portion of the fire hazards associated with candles would be addressed by adoption of candle fire safety regulations similar to those proposed by the petitioner, it is not known how effective such a rule would be in preventing deaths and injuries, or whether a mandatory rule would be significantly more effective than the voluntary standards being developed. In addition, other actions by the Commission, such as the adoption of the mattress open-flame fire safety regulation could affect the deaths and injuries caused by candle fires. This action would likely take many years to have a measurable impact on candle fire losses.

Based on industry commitments asserted by the NCA and CSPA, a substantial portion of U.S. producers of candles may be in conformance with the latest voluntary standards. It is not known, however, to what extent the rest of the domestic industry or imports conform. Some U.S. producers are also importers and, thus, it is expected that some portion of imports will also conform by design. While a majority of candle products consumed in the U.S. conform to the latest voluntary standards, there still remains a relatively large percentage where we do not know conformance levels. Given that a considerable number of candles consumed in the U.S. are imported from foreign producers that are not members of the NCA, there remains the substantial likelihood of nonconforming product continuing to enter the U.S. More time is needed to assess this issue.

The People's Republic of China (China) has been the largest single source of imported candles since 1990, when it accounted for 19 percent of all imports. In 2004, China was the source of close to half (48 percent) of all imported candles. Candle imports have fallen dramatically since the second quarter of 2005, likely a result of a pending ruling by the Department of Commerce (DOC) which expanded the scope of candles covered under an antidumping duty order. More time is needed to analyze duty changes and the level of involvement of imported products.

18

XIII. Options

A. Grant petition CP 04-1/HP 04-1 to consider mandatory standards for candles and candle products based on the standards applicable to candle fire safety developed by ASTM International and issue an ANPR to begin a rulemaking for mandatory standards for candles and candle products.

B. Deny petition CP 04-1/HP 04-1 to consider mandatory standards for candles and candle products based on the standards applicable to candle fire safety developed by ASTM International.

C. Defer petition CP 04-1/HP 04-1 to consider mandatory standards for candles and candle products based on the standards applicable to candle fire safety developed by ASTM International.

XIV. Recommendation

The staff recommends that the Commission defer a decision on the petition from NASFM, CP 04-1/HP 04-1, so that staff has additional time to continue to work with the ASTM subcommittee and to assess the impact of the ASTM voluntary standards.

XV. References

ASTM F2417-04—*Standard Specification for Fire Safety for Candles*, available from ASTM International (www.astm.org).

Miller, D. (May 20, 2003). *Summary of Candle Malfunction Incidents*. Memorandum to Allyson Tenney, Project Manager. Directorate for Epidemiology, U.S. Consumer Product Safety Commission.

Kyle, S. (January 14, 2002). *Candle In-Depth Investigations Report*. Directorate for Epidemiology, U.S. Consumer Product Safety Commission.

Hiser, S. (September 19, 2001). *Candle Fires Pilot Study Summary*. Directorate for Epidemiology, U.S. Consumer Product Safety Commission.

Tab A

CP 04-1/HP04-1

NATIONAL ASSOCIATION OF STATE FIRE MARSHALS

Government Relations

3/17/04

CPSA [illegible] PUBLIC

— NO MFRS/PRVTLBLRS OR PRODUCTS IDENTIFIED

EXCEPTED BY PETITION RULEMAKING ADMIN. PROG

WITH PORTIONS REMOVED

© ASTM standard removed

February 10, 2004

Office of the Secretary
United States Consumer Product Safety Commission
Washington, DC 20207

RE: Petition for improved candle products fire safety

The National Association of State Fire Marshals (NASFM) is a membership organization whose members include the senior fire safety officials in the United States. NASFM is committed to the protection of life, property and the environment from fire and other hazards.

For the reasons stated below, NASFM petitions[1] the United States Consumer Product Safety Commission (CPSC) to adopt and enforce a standard addressing candle products fire safety. This standard should be substantially based, as a minimum, upon the requirements contained within ASTM International (ASTM) Provisional Specifications for Fire Safety for Candles (Designation PS59-02) for all candles sold for consumer use in the United States. Details of this ASTM standard are included in Appendix 1 of this correspondence. The CPSC mandatory standard should also incorporate, at a minimum, the following additional provisions:

1. Flammability performance requirements for candle accessories, including candleholders;
2. End of useful life requirements for freestanding, tealight, taper, and votive candles;
3. Stability requirements for votive candles and taper candles mounted in appropriate candleholders; and
4. Miscibility and flash point requirements for gel candles.

The CPSC should consider the recent efforts of the ASTM Candle Products Subcommittee, F15.45, in developing these additional provisions. This Subcommittee is pursuing similar additional requirements to upgrade the provisional standard during the process to convert the provisional standard into a final consumer product safety standard. CPSC has been represented on the task group working in these areas.

[1] This petition on candle fire safety is filed in accordance with the Consumer Product Safety Act (15 U.S.C. 2051 *et seq.),* and in conformity with the requirements set forth under 16 CFR 1051.2-6.

Fire losses related to candle fires are unacceptably high and increasing with time.

In 1999, the most recent year for which data are available, there were an estimated 14,500 home candle fires, resulting in 100 civilian deaths, over 1,500 injuries, and $265.0 million in direct property loss.[2]

While other causes of home fires have decreased, the percentage caused by candles has increased. According to the National Fire Protection Association (NFPA), in 1999 candle fires accounted for 4.1% of all reported fires, more than triple the 1980 share of 1.1%. Home candle fires jumped 20% from 1998 to 1999 to hit their 20-year peak in 1999.[3] Recent charts of the data compiled by NFPA's Fire Analysis and Research Division can be found in Table 1 and Figure 1 in Appendix 2.

According to data collected by the NFPA and the National Fire Incident Reporting System, and detailed in Table 2 in Appendix 3, nearly one-third of home candle fires reported were due to unattended candles or inattention to candles, and a quarter were due to the placement of candles too close to combustible material.[4] These fire loss trends are consistent with increased consumer use of candles, much as reductions in cigarette smoking often are linked to some decrease in cigarette-related fires. According to industry sources, candle sales are increasing 10% to 15% annually. The National Candle Association's (NCA) website[5] reports that each of the more than 350 manufacturers of candles in the United States produce, on average, 1,000 to 2,000 varieties of candles. These candles are produced for commercial, religious and institutional use, and produce sales of approximately $2 billion annually. It is estimated that 7 out of 10 US households use candles on a regular basis. The inherent danger posed by candles with their open flame, coupled with the increase in residential fires caused by candles over the past decade, make fire safety issues paramount in regulation of the candle manufacturing process.

Very few candle fires are intentional.

Consumers are warned repeatedly not to leave candles unattended. Yet, even the most cautious consumer realistically cannot maintain continuous direct visual supervision of candles without some interruption. To place the burden of safety entirely on the consumer makes no sense and has no legal standing.

According to the NFPA, 93% of home candle fires are unintentional. In the most recent NFPA report on the issue, 38% of home candle fires in 1999 "occurred when candles were left

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[2] Miller, D., Smith, L., and Greene, M. 1999 Residential Fire Loss Estimates. Washington, DC: U.S. Consumer Product Safety Commission, November, 2003.
[3] http://www.nfpa.org/Research/NFPAFactSheets/CandleSafety/CandleSafety.asp
[4] Ahrens, Marty. *Candle Fires in US Homes and Other Occupancies: A Statistical Analysis*. Quincy, MA: NFPA, Fire Analysis and Research Division, Dec. 2002.
[5] http://www.candles.org/CandleIndustry/index.htm

unattended, abandoned or inadequately controlled."[6] Twenty-three percent started when a candle was left too close to different types of combustible material. People playing with candles caused eight percent of the incidents. A more comprehensive listing of ignition factors published by NFPA's Fire Analysis and Research Division can be found in Table 3 in Appendix 4.[7] The materials cited in this report as items first ignited range from clothing, mattresses, and upholstered furniture to small electronics and other common combustible goods.

Another NFPA publication, the *U.S. Home Product Report, 1994-1998: Forms and Types of Material First Ignited in Fires,*[8] reports that 45% of decoration fires, 20% of curtain and drape fires, and 5% of mattress and bedding fires were ignited by candles.

According to the NFPA, approximately 40% of home candle fires begin in bedrooms, and 19% originate in living rooms/common rooms. Smaller percentages begin in bathrooms, kitchens, or dining rooms. More than half of the deaths caused by candle fires come from fires that began in the living room, family room, common room, or den.

Candles can be designed and produced to reduce fire loss.

The CPSC has issued approximately 58 candle or candle product recalls since 1994. These recalls involved excessive candle flame heights, candleholders or containers that overheated, shattered or caught fire, the presence of flammable material within the candle, and flammable paint on candleholders or containers.

In 1997, the CPSC approached ASTM to request that ASTM organize a subcommittee to consider the development of a new voluntary standard addressing the safety problems of candles in residences, primarily fires. ASTM contacted all known stakeholders, including the National Candle Association, which represented a significant proportion of the candle manufacturing industry. A new Subcommittee, F15.45, Candle Products, was formed, and the process initiated to develop a standard. Representatives of the National Candle Association and their suppliers provided the leadership and officers to the Subcommittee. To date, three final standards have been adopted, and the Subcommittee remains very active in pursuing additional standards and provisions:

> F1972-99, *Standard Guide for Terminology Relating to Candles and Associated Accessory Items*, establishes standard terms and definitions for common types of candles and associated products.

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[6] Ahrens, Marty. *Candle Fires In U.S. Homes and Other Occupancies: A Statistical Analysis.* Quincy, MA: NFPA, Fire Analysis and Research Division, Dec. 2002.
[7] Ahrens, Marty. *Candle Fires In U.S. Homes and Other Occupancies: A Statistical Analysis.* Quincy, MA: NFPA, Fire Analysis and Research Division, Dec. 2002.
[8] Rohr, Kimberly D. *U.S. Home Product Report, 1994-1998: Forms and Types of Materials First Ignited in Fires.* Quincy, MA: NFPA, Fire Analysis and Research Division, Dec. 2001.

F2058-00, *Standard Specification for Cautionary Labeling for Candles Burned in a Home*, describes labeling requirements, including minimum size, formatting specifications, and the minimum words of "Warning: To Prevent Fire, Burn candle within sight. Out of the reach of children and pets. Never on anything that can catch fire."

F2179-02, *Standard Specification for Annealed Soda-Lime Silicate Glass Containers That are Produced for Use as Candle Containers*, provides for minimum requirements and testing options for containers of this type when they are expected to be used for candles. Containers should be able to withstand a change in temperature without cracking or breaking.

The Provisional Specifications for Fire Safety for Candles (Designation PS59-02), also developed by the technical committee, addresses some of the more common reasons that candles contribute to fires and is also the basis for most of the requested requirements in this petition. This document:

- Establishes a maximum allowable flame height of three inches. The maximum flame height of certain religious candles may be 3¾ inches. Candles intended for use outdoors are exempt from this requirement.

- Prohibits ignition of material other than on the intended wick(s), including flashover.

- Requires candles to terminate burning safely. Candles must go out on their own as intended, cannot be relit, and must not break the container. This requirement applies to all filled container candles, but not to tealight, taper, votive, birthday, freestanding, or floating candles.

- Sets stability requirements for candles that are freestanding, filled candles, and ensembles. Taper and votive candles are excluded. Candles may not tip over when placed on a 10-degree incline. Certain religious candles are excluded from this requirement.

NASFM assumes that since experts from the candle industry provided leadership and participated in the development of these standards, the standards are commercially feasible.

Without some means of ensuring candle manufacturers' compliance with the Provisional ASTM Specifications, consumers are no safer than before the Provisional ASTM Standard was written.

While these voluntary standards have been issued, they are not mandated by ASTM, and to NASFM's knowledge have not been referenced or incorporated into contracts, regulations, laws, codes or procedures. The value of these ASTM documents is that they provide standard definitions, tests and minimum warning wording – in effect, an agreed-upon starting place from which to build. NASFM has been unable to determine what percentage of the hundreds of thousands of candle products in commerce, if any, are or intend to be in compliance with the

Provisional ASTM standard. Neither trade association representing the candle industry makes mention of any effort to encourage compliance with the ASTM Provisional standard,[9] and conversations with representatives of these two groups suggest that no compliance program is planned or under way.

The Consumer Product Safety Act requires the CPSC to defer to an existing voluntary standard if two basic criteria are met. In other words, the CPSC is prohibited from developing, issuing, or enforcing a mandatory consumer product safety rule, regulation, or standard if there exists a voluntary standard that meets these criteria.

These criteria are "whenever compliance with such voluntary standards would eliminate or adequately reduce the risk of injury addressed and it is likely that there will be substantial compliance with such voluntary standards."[10]

NASFM believes that the current ASTM provisional standard – with the additional provisions specified on the first page of this petition and when upgraded through the current efforts to address flammable accessories and to include certain types of candles now excluded – addresses the specific design and manufacturing concerns identified by the CPSC and should be effective in reducing accidental fire losses, thus meeting the first criterion. However, NASFM has seen no evidence of any program to encourage or track compliance with the standard. Without such a coordinated industry-supported compliance program, insufficient compliance is virtually certain. Therefore, mandatory national candle product fire safety requirements must be adopted and enforced by the CPSC.

Most consumers do their part; other industries are doing their part and so must candle producers.

We urge homeowners to install and maintain smoke detectors and most do. We ask all consumers to be careful with candles and most are. After all, 15,000 residential fires were reported from hundreds of millions of candles sold and ostensibly used in 1999.

Safety is the responsibility of everyone, not just of consumers. The CPSC is now working on open flame ignition standards for upholstered furniture and mattresses, and has reported that it expects to begin work on similar requirements for bedclothes. Manufacturers have worked hard to make these products safer. The State of New York, and hopefully the U.S., soon will benefit from cigarettes with reduced ignition power. The International Electrotechnical Commission, Underwriters Laboratories and electronics manufacturers have just defined "candle-ignition" standards for information technology, consumer electronics and telecommunications equipment sold for use in the home. But as effective as these new fire safety standards may be, none is perfect.

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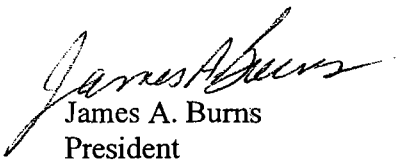
[9] Consumer Specialty Products Association at http://www.cspa.org/index_public.html and National Candle Association at http://www.candles.org/

[10] 15 U.S.C. 2056(b)(1)

Candles can and must be made safer because lives can be saved. The candle industry has had every opportunity to organize and operate a complete and effective voluntary fire safety program, but has not moved forward with such a program. The CPSC's authorizing statutes are clear in the case of any product within its jurisdiction that results in multiple deaths year after year and for which there is no existing voluntary safety program that meets the statutory criteria. As a matter of public safety and fairness, NASFM believes that the manufacturers of candles should share equally with consumers, fire safety officials and the producers of cigarettes, upholstered furniture, mattresses, bedding, cigarette lighters and electronics the responsibility of preventing loss of life and property from fires in the home.

We thank the CPSC for its consideration of this petition and stand ready to assist you as this matter moves forward.

Sincerely,



James A. Burns
President

Attachments

TABLE OF CONTENTS

Exhibit 1

Designation: PS 59 – 02

Provisional Specification for Fire Safety for Candles[1]

This provisional standard is issued under the fixed designation PS 59; the number immediately following the designation indicates the year of original adoption.

1. Scope

1.1 This provisional standard is intended to prescribe requirements for certain candles to help ensure a reasonable degree of safety for normal use, thereby improving personal safety and reducing fires, deaths, and injuries.

1.2 This provisional standard is not intended to replace other safety practices that should be in place, such as, adult supervision, close monitoring, fire detection, alarm or suppression systems, and practical use of candles away from combustible materials.

1.3 *This provisional standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.*

1.4 **Warning**—Flame-producing devices, such as candles, present a potential hazard to the user. This provisional standard cannot eliminate all hazards, but it is intended to minimize the potential hazards of candles to the user.

2. Referenced Documents

2.1 *ASTM Standards:*

E 122 Practice for Calculating Sample Size to Estimate, With a Specified Tolerable Error, the Average for Characteristic of a Lot or Process[2]

F 400 Consumer Safety Specification for Lighters[2]

F 1972 Guide for Terminology Relating to Candles and Associated Accessory Items[3]

F 2058 Specification For Cautionary Labeling For Candles Burned In A Home[3]

2.2 *Military Standards:*[4]

MIL-STD-105D (ISO 2859) Sampling Procedures and Tables for Inspection by Attributes

MIL-STD-414 (ISO 3951) Sampling Procedures and Tables for Inspection by Variables for Percent Defective

3. Terminology

3.1 Certain candle-related terminology has already been addressed in Guide F 1972 and Specification F 2058, and the reader is directed to those standards for definitions not found in 3.2.

3.2 *Definitions:*

3.2.1 *Altar candle*—a candle that is constructed, packaged, and labeled as an "Altar" candle. The candle is used in the institutional house of worship in close proximity to the altar during the religious service or ceremony.

3.2.2 *base material*—intended fuel source for candle flame.

3.2.3 *birthday candle*—candle whose sole purpose is to be used on a birthday cake.

3.2.4 *candle flashover*—condition where the base material's vapors ignite over the entire fuel pool.

3.2.5 *Easter, Paschal, Sacramental candle*—a candle that is constructed, packaged, and labeled as an "Easter," "Paschal," or "Sacramental" candle (or some combination of these names, for example, "Easter/Paschal"), generally 43.2 cm (17.0 in.) or more in length. The candle is to be displayed and burned in the institutional house of worship as the focal candle during Easter or with the celebration of various sacraments. The candle is adorned with symbols and ornamentation as required and deemed appropriate by the institutional house of worship.

3.2.6 *end of useful life*—when the candle ceases to support combustion and the candle flame(s) goes(go) out on its own, as intended, and cannot be re-lit.

3.2.7 *ensemble*—a candle and items physically packaged together and intended for use with the candle for sale as one unit at the retail level.

3.2.8 *filled container candle*—a candle produced and used within the same vessel.

3.2.9 *freestanding candle*—a rigid candle (for example, pillar-shaped, column-shaped, or figurine) recommended to be used on a heat-resistant, nonflammable surface or on a candle accessory.

3.2.10 *fuel pool*—pool of molten base material.

3.2.11 *secondary ignition*—a self-sustained flame other than that on the intended wick(s) that occurs during candle use, including flashover.

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[1] This provisional specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.45 on Candle Products.

Current edition approved Dec. 4, 2002. Published January 2003.

[2] *Annual Book of ASTM Standards*, Vol 14.02.

[3] *Annual Book of ASTM Standards*, Vol 15.07.

[4] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.

Exhibit 2

Table 1

Candle Fires in the Home as a Share of All Home Fires
1980-1999

Year	Home Fires	Home Candle Fires	Percent of Home Fires Started by Candles
1980	733,370	8,240	(1.1%)
1981	711,080	7,870	(1.1%)
1982	659,000	7,270	(1.1%)
1983	626,590	6,710	(1.1%)
1984	606,450	6,690	(1.1%)
1985	607,100	6,900	(1.1%)
1986	566,710	6,520	(1.2%)
1987	537,200	6,440	(1.2%)
1988	537,960	6,650	(1.2%)
1989	499,840	6,290	(1.3%)
1990	454,890	5,460	(1.2%)
1991	465,530	5,900	(1.3%)
1992	459,280	6,090	(1.3%)
1993	457,720	6,310	(1.4%)
1994	439,280	7,160	(1.6%)
1995	414,350	8,440	(2.0%)
1996	417,020	9,930	(2.4%)
1997	395,490	11,600	(2.9%)
1998	370,180	12,540	(3.4%)
1999	370,410	15,040	(4.1%)
1980-1999 Annual average	516,470	7,900	(1.5%)

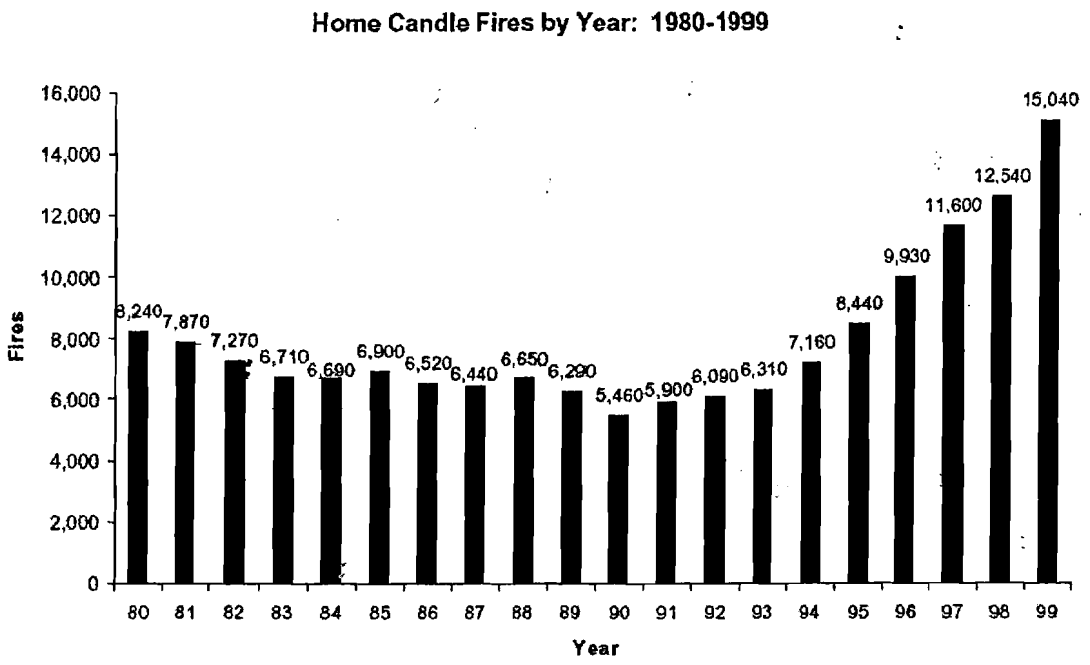
Note: These are fires reported to U.S. municipal fire departments and so exclude fires reported only to Federal or state agencies or industrial fire brigades. Fires are rounded to the nearest ten. A proportional share of fires in which the form of heat of ignition was unknown or unreported is included in the candle fires.

Homes include dwellings, duplexes, manufactured housing and apartments.

Source: National estimates based on NFIRS and NFPA survey.

Ahrens, Marty. *Candle Fires in US Homes and Other Occupancies: A Statistical Analysis.* Quincy, MA: NFPA, Fire Analysis and Research Division, Dec. 2002.

Exhibit 3



Source: National estimates based on NFIRS and NFPA survey.

Figure 1

Ahrens, Marty. *Candle Fires in US Homes and Other Occupancies: A Statistical Analysis.* Quincy, MA: NFPA, Fire Analysis and Research Division, Dec. 2002.

Exhibit 4

Table 2

Factors Contributing to Ignition in Home Candle Fires during 1999

Factor Contributing	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Heat source too close to combustibles	3,460	(23.0%)	5	(5.2%)	349	(23.7%)	$59.5	(21.4%)
Unattended	3,410	(22.7%)	45	(44.3%)	359	(24.4%)	$63.9	(23.0%)
Inadequate control of open fire*	1,350	(8.9%)	12	(11.3%)	159	(10.8%)	$27.5	(9.9%)
Playing with heat source	1,130	(7.5%)	0	(0.0%)	133	(9.0%)	$24.4	(8.8%)
Abandoned or discarded materials or products	920	(6.1%)	0	(0.0%)	56	(3.8%)	$13.7	(4.9%)
Unclassified misuse of product	720	(4.8%)	0	(0.0%)	60	(4.1%)	$13.4	(4.8%)
Unclassified factor	440	(2.9%)	5	(5.2%)	15	(1.0%)	$10.8	(3.9%)
Collision, knockdown or turn over	220	(1.5%)	12	(11.3%)	52	(3.6%)	$4.8	(1.7%)
Improper container or storage	170	(1.2%)	0	(0.0%)	37	(2.5%)	$1.9	(0.7%)
Animal	110	(0.7%)	0	(0.0%)	4	(0.3%)	$2.3	(0.8%)
Property too close to or exposure fire	100	(0.7%)	0	(0.0%)	4	(0.3%)	$0.7	(0.3%)
Cutting, welding too close to combustible	90	(0.6%)	0	(0.0%)	0	(0.0%)	$1.0	(0.4%)
Other known factor	360	(2.4%)	0	(0.0%)	38	(2.6%)	$6.6	(2.4%)
None	190	(1.3%)	0	(0.0%)	7	(0.5%)	$3.0	(1.1%)
Not Reported	2,410	(16.0%)	23	(22.7%)	200	(13.6%)	$44.7	(16.1%)
Total	15,040	(100.0%)	102	(100.0%)	1,473	(100.0%)	$278.0	(100.0%)

* "Inadequate control of open fire" was an ignition factor code in NFIRS Version 4.1 that converts to factor contributing to ignition "Outside or open fire for debris or waste disposal." Since most of these incidents were collected in Version 4.1 and converted, the older code definition seems more appropriate.

Note: These are fires reported to U.S. municipal fire departments and so exclude fires reported only to Federal or state agencies or industrial fire brigades. Fires are rounded to the nearest ten, civilian deaths and injuries are rounded to the nearest one, and direct property damage is rounded to the nearest hundred thousand. Property damage has not been adjusted for inflation. A proportional share of fires in which the form of heat of ignition was unknown or unreported is included in these totals. In NFIRS 5.0, multiple entries may be recorded for factors contributing to ignition. "None" is also a valid choice. Candle fires in which the contributing factor was described as undetermined were allocated proportionally among fires with known, no or "not reported" contributing factors. In some cases, the "not reported" fires were a result of the conversion process. Percentages were calculated on the total number of fires, not number of mentions. Homes include dwellings, duplexes, manufactured housing and apartments.

Source: National estimates based on NFIRS and NFPA survey.

Ahrens, Marty. *Candle Fires in US Homes and Other Occupancies: A Statistical Analysis.* Quincy, MA: NFPA, Fire Analysis and Research Division, Dec. 2002.

Exhibit 5

Table 3

Causes of Home Candle Fires during 1999

Cause	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unintentional	14,010	(93.1%)	90	(88.0%)	1,428	(96.9%)	$256.3	(92.2%)
Unclassified	370	(2.4%)	0	(0.0%)	7	(0.5%)	$9.1	(3.3%)
Intentional	340	(2.3%)	12	(12.0%)	26	(1.8%)	$7.0	(2.5%)
Failure of equipment or heat source	230	(1.5%)	0	(0.0%)	7	(0.5%)	$3.4	(1.2%)
Act of nature	100	(0.7%)	0	(0.0%)	4	(0.3%)	$2.2	(0.8%)
Total	15,040	(100.0%)	102	(100.0%)	1,473	(100.0%)	$278.0	(100.0%)

Note: These are fires reported to U.S. municipal fire departments and so exclude fires reported only to Federal or state agencies or industrial fire brigades. Fires are rounded to the nearest ten, civilian deaths and injuries are rounded to the nearest one, and direct property damage is rounded to the nearest hundred thousand. Property damage has not been adjusted for inflation. A proportional share of fires in which the form of heat of ignition was unknown or unreported is included in these totals. Candle fires in which the cause was unknown or not reported have been allocated proportionally among fires with known cause. Totals may not equal sums due to rounding.

Homes include dwellings, duplexes, manufactured housing and apartments.

Source: National estimates based on NFIRS and NFPA survey.

Ahrens, Marty. *Candle Fires in US Homes and Other Occupancies: A Statistical Analysis*. Quincy, MA: NFPA, Fire Analysis and Research Division, Dec. 2002.

CONSUMER PRODUCT SAFETY COMMISSION

Petition Requesting Mandatory Fire Safety Standards for Candles and Candle Accessories (Petition No. CP 04–1/HP 04–1)

AGENCY: Consumer Product Safety Commission.

ACTION: Notice.

SUMMARY: The United States Consumer Product Safety Commission (Commission or CPSC) has received a petition (CP 04–1/HP 04–1) requesting that the Commission issue mandatory fire safety standards for candles and candle accessories. The Commission solicits written comments concerning the petition.

DATES: The Office of the Secretary must receive comments on the petition by June 7, 2004.

ADDRESSES: Comments on the petition, preferably in five copies, should be mailed to the Office of the Secretary, Consumer Product Safety Commission, Washington, DC 20207, telephone (301) 504–0800, or delivered to the Office of the Secretary, Room 502, 4330 East-West Highway, Bethesda, Maryland 20814. Comments may also be filed by facsimile to (301) 504–0127 or by email to *cpsc-os@cpsc.gov*. Comments should be captioned "Petition CP 04–1/HP 04–1, Petition for Fire Safety Standards for Candles and Candle Accessories." A copy of the petition is available for inspection at the Commission's Public Reading Room, Room 419, 4330 East-West Highway, Bethesda, Maryland. The petition is also available on the CPSC Web site at *www.cpsc.gov*.

FOR FURTHER INFORMATION CONTACT: Rockelle Hammond, Office of the Secretary, Consumer Product Safety Commission, Washington, DC 20207; telephone (301) 504–6833, e-mail *rhammond@cpsc.gov*.

SUPPLEMENTARY INFORMATION: The Commission has received correspondence from the National Association of State Fire Marshals (NASFM) requesting that the Commission issue mandatory fire safety standards for candles and candle accessories including candleholders. Specifically, NASFM requests that the CPSC adopt standards substantially based on the requirements contained in ASTM International Provisional Specifications for Fire Safety for Candles (PS59–02).

In addition, NASFM requests that the standards incorporate:

1. Flammability performance requirements for candle accessories, including candleholders;
2. End of useful life requirements for freestanding, tealight, taper, and votive candles;
3. End of useful life requirements for votive candles and taper candles mounted in appropriate candleholders; and
4. Miscibility and flash point requirements for gel candles.

NASFM asserts that such standards are needed because of the inherent danger posed by candles with their open flames, coupled with the increase in residential fires caused by candles over the past decade. NASFM provided information concerning deaths and injuries involving home candle fires.

The NASFM request that the CPSC adopt a standard substantially based on the requirements contained in ASTM International Provisional Specifications for Fire Safety for Candles (PS59–02), and additional requested items 1., 2., and 3. set forth above, is docketed as petition number CP 04–1 under the Consumer Product Safety Act, 15 U.S.C. 2051–2084. The NASFM request for a standard addressing miscibility and flash point requirements for gel candles is docketed as petition number HP 04–1 under the Federal Hazardous Substances Act, 15 U.S.C. 1261–1278.

Interested parties may obtain a copy of the petition by writing or calling the Office of the Secretary, Consumer Product Safety Commission, Washington, DC 20207; telephone (301) 504–0800. The petition is available on the CPSC Web site at *www.cpsc.gov*. A copy of the petition is also available for inspection from 8:30 a.m. to 5 p.m., Monday through Friday, in the Commission's Public Reading Room, Room 419, 4330 East-West Highway, Bethesda, Maryland.

Dated: March 30, 2004.

Todd A. Stevenson,

Secretary, Consumer Product Safety Commission.

[FR Doc. 04–7657 Filed 4–5–04; 8:45 am]

BILLING CODE 6355–01–P

DEPARTMENT OF DEFENSE

Office of the Secretary

Proposed Collection; Comment Request

AGENCY: Defense Finance and Accounting Service, DoD.

ACTION: Notice.

SUMMARY: In compliance with Section 3506(c)(2)(A) of the Paperwork Reduction Act of 1995, the Defense Finance and Accounting Service announces the proposed public information collection and seeks public comment on the provisions thereof. Comments are invited on: (a) Whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information shall have practical utility; (b) the accuracy of the agency's estimate of the burden of the proposed information collection; (c) ways to enhance the quality, utility and clarity of the information to be collected; and (d) ways to minimize the burden of the information collection on respondents, including through the use of automated collection techniques or other forms of information technology.

DATES: Consideration will be given to all comments received by June 7, 2004.

ADDRESSES: Written comments and recommendations on the proposed information collection should be sent to the Military Pay Operations Directorate, Defense Finance and Accounting Service, DFAS–PMAC/CL, ATTN: Ms. Gail Halfacre, 1240 East 9th Street, Room 2381, Cleveland, Ohio 44199.

FOR FURTHER INFORMATION CONTACT: To request more information on this proposed information collection or to obtain a copy of the proposal and associated collection instruments, please write to the above address, or call Ms. Gail Halfacre, (216) 204–3624.

Title, Associated Form, and OMB Number: Dependency Statements: Parent (DD Form 137–3), Child Born Out of Wedlock (DD Form 137–4, Incapacitated Child Over Age 21 (DD Form 137–5), Full Time Student 21–22 Years of Age (DD Form 137–6, and Ward of a Court (DD Form 137–7); OMB Number 0730–0014.

Needs and Uses: This information collection is used to certify dependency or obtain information to determine entitlement to basic allowance for housing (BAH) with dependent rate, travel allowance, or Uniformed Services Identification and Privilege Card. Information regarding a parent, a child born out-of-wedlock, an incapacitated child over age 21, a student age 21–22, or a ward of a court is provided by the military member or by another individual who may be a member of the public. Pursuant to 37 U.S.C. 401, 403, 406, and 10 U.S.C. 1072 and 1076, the member must provide more than one half of the claimed child's monthly expenses. DoDFMR 7000.14, Vol. 7A, defines dependency and directs that dependency be proven. Dependency claim examiners use the information from these forms to determine the degree of benefits. The requirement to provide the information decreases the possibility of monetary allowances

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

MEMORANDUM

DATE : June 8, 2004

TO : ESFS

Through: Todd A. Stevenson, Secretary

FROM : Martha Kosh

SUBJECT: "Petition CP04-1/HP 04-1, Petition for Fire Safety Standards for Candles and Candle Accessories"

ATTACHED ARE COMMENTS ON THE CH 04-4

COMMENT	DATE	SIGNED BY	AFFILIATION
CH04-4-1	5/05/04	Robert Higgins NCA President	National Candle Assoc. 1156 15th St, NW Suite 900 Washington, DC 2005
CH04-4-2	6/02/04	John Biechman Vice President Government Affairs	National Fire Protection Association 499 South Capitol St., NW Suite 518 Washington, DC 20003
CH04-4-3	6/14/04	John DiFazio Asst General Counsel	jdifazio@cspa.org

Candle PET comment

National Candle Association

1156 - 15th Street, NW, Suite 900 · Washington, DC 20005 · (202) 393-2210 ·
Fax: (202) 223-9741 http://www.candles.org

May 5, 2004

Office of the Secretary
Consumer Product Safety Commission
Washington, DC 20207

"Petition CP 04-1/HP 04-1, Petition for Fire Safety Standards for Candles and Candle Accessories"

The National Candle Association (NCA) submits the following comments in response to the U.S. Consumer Product Safety Commission (CPSC) request for comments on the petition from the National Association of State Fire Marshals (NASFM) requesting the CPSC to issue mandatory fire safety standards for candles and candle accessories (Petition No. CP 04-1/HP 04-1, 69 FR 18059, April 6, 2004).

The NCA is the major trade association for the U.S. candle industry. We are recognized as the North American technical experts on candle manufacturing and formulation. Our member's account for more than 90 percent of the candles manufactured in the United States. Our members include both manufacturers and suppliers.

Because of NCA's leadership in the industry, and its technical expertise in candle manufacturing, the CPSC in 1997 asked NCA to help form a candle products subcommittee under the Consumer Products Committee of the ASTM standards organization. Through the efforts of this ASTM F-15.45 subcommittee, the current voluntary consensus standards regarding candle fire safety have been developed and continue to be expanded. Both NCA and CPSC have actively participated in the subcommittee's consensus deliberations, with representatives from a variety of fire and safety organizations and other interested parties.

Section 7 of the Consumer Product Safety Act (CPSA), 15 U.S.C. 2056, provides that the Commission may issue a mandatory standard only when it finds there is not a voluntary standard that adequately reduces the addressed risk of injury or death, or when substantial compliance with the voluntary standard is absent. NCA strongly believes that the voluntary consensus standards that have been and continue to be developed, for candle product fire safety under ASTM F-15.45, have been effective in reducing candle-fire risks, and that such standards will continue to help reduce the risk of such fires.

Further, we believe that the CPSC staff concurs with NCA in this matter, given the recommendation of the Office of Hazard Identification and Reduction and the concurrence of the Office of the General Counsel that CPSC's involvement in this issue has been so extensive that it is not necessary for the Commission to seek public comment on the NASFM petition.

Adequacy of Voluntary Industry Standards

In proposing that the Commission adopt a mandatory standard for candle fire safety, NASFM implies that the voluntary standards are inadequate. Because the voluntary standard's provisions are relatively new and the standard is being expanded, it is too early to make the judgment that the voluntary standard will not be effective. Our efforts and the efforts of all candle manufacturers to educate the marketplace is still underway.

NASFM also requests that four additional provisions be incorporated into the mandatory standard. Ongoing activities of the ASTM F-15.45 subcommittee are covering these requests. For all intents and purposes, the additional provisions requested by NASFM have already been addressed, either through revisions and inclusions to the PS 59-02 standard, which is currently being readied for balloting, or through the standards drafting procedure, or consensus of the subcommittee.

Specifically, end-of-useful-life requirements for freestanding, tea light and votive candles have been incorporated into the latest revision of PS 59-02; inclusion of tapers in this requirement is not technically possible or economically feasible at this time. Flammability performance requirements for candle accessories and candleholders are being drafted as a new standard by the F-15.45 subcommittee. Stability requirements for tapers and votives packaged with holders as ensembles are also included in the latest revisions of PS 59-02.

The NASFM request for a provision regarding the miscibility and flash points of gel candles addresses fire-safety concerns already achieved by the voluntary candle fire-safety standard. PS 59-02 addresses key fire-safety specifications that can in some way be controlled through manufacturing procedures – flame height, stability, end of useful life, and secondary ignition. These specifications apply to candles regardless of their fuel type – paraffin, soy, beeswax, gels, synthetic waxes, palm wax, etc., or blends of these fuels. In this sense, adding a gel candle-specific provision is redundant, and would inappropriately interject very narrow (and likely anti-competitive) formulation requirements into what is designed to be a universally applicable performance standard. Moreover, adding narrow formulation specifications for one particular type of candle wax would require adding parallel prescriptive specifications for all types and blends of candle waxes, a virtually impossible undertaking involving thousands of possible combinations.

Negative Safety Impact of a Mandatory Standard

Ironically, NASFM's petition for a mandatory standard addressing candle product fire safety would likely impede the improvement of candle-fire safety technology and designs. The promulgation of a mandatory standard would serve to freeze in time any technical advances or innovations in candle product fire safety because of the relatively complex and lengthy procedures required to amend a mandatory standard under the Consumer Product Safety Act.

The value of voluntary industry consensus standards, as developed through recognized standards development bodies such as ASTM, ANSI, ISO, etc., is that they are continually improved through required revision and update procedures. This allows new technologies and innovations to be incorporated into applicable standards on a timely basis. Indeed, the evolving and progressive nature of voluntary consensus standards is what led to the most recent revision of PS 59-02 and its inclusion of the additional provisions contemplated by NASFM.

To issue a mandatory standard for the fire safety of candle products at this time would thwart the efforts of both industry and the CPSC to effectively and expediently address candle fire-safety issues with standards that include the best available technology. Over the past few years, the necessary "critical mass" of personnel and technical expertise has come together in the existing voluntary standards proceedings to allow for rapid expansion and continued refinement of the voluntary standards for candles. It would be premature to halt this synergistic activity until the results of these efforts are complete and have time to work on the market place.

Candle Industry in Compliance

NASFM alleges that the candle industry is not in compliance with the ASTM standards, and that it has made no effort to encourage compliance with the ASTM standards. These allegations are inaccurate and unfounded.

The NCA's commitment to product excellence and the safe and proper use of candles is at the foundation of its aggressive efforts to establish and participate in the ASTM F-15.45 subcommittee. Members in good standing of the National Candle Association pledge to manufacture candles and candle products in accordance with recognized industry standards and practices. Since NCA members account for approximately 90 percent of the candles manufactured in the U.S., this alone constitutes more than substantial compliance by the industry with the ASTM standards.

Further, NCA takes its responsibility and leadership role in the candle industry very seriously. We have undertaken aggressive efforts to educate member and non-member candle manufacturers, suppliers and retailers—as well as large-scale user groups—regarding the ASTM standards and the importance of candle fire safety. Our retailer members, as well as major non-member retailers and mass purchasers, specify the ASTM standards in their procurement and supply contracts.

Consumer Education Is Key to Reducing Candle Fires

Candles are safe products when used correctly. It is consumer misuse and inattention to basic fire-safety precautions that leads to candle fires. When the ASTM F-15.45 subcommittee was first formed, the CPSC presented data from the National Fire Incident Reporting System indicating that 85 percent of all candle fires were due to consumers leaving lighted candles unattended, placing candles too close to combustibles, or placing them within the reach of children and pets. These findings prompted the subcommittee to first address the need to warn consumers of these dangers, resulting in the ASTM F2058 cautionary labeling standard.

However, no product safety standard—whether voluntary or mandatory—can significantly impact the majority of candle fires due to consumer inattention or carelessness. Only the education of consumers as to the proper burning of candles and observance of candle fire safety rules can have an impact in reducing these candle fires.

The NCA has worked tirelessly and aggressively to educate consumers on the paramount importance of fire safety precautions when using candles. We have created and promoted literature stressing the importance of candle fire safety. We disseminate this literature to consumers through our members, non-member industry groups, retailers, and through fire, safety and consumer organizations around the country. Our website is well recognized for its outstanding candle safety information, and the media regularly directs consumers to the site for important safety advice.

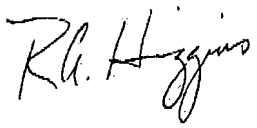
We have contacted national and regional fire groups, restaurant associations, hotel associations, retailers and others, providing them with information on the ASTM candle fire safety standards and encouraging them to join us in promoting candle fire safety. Currently we are working with fire and consumer groups to get our candle safety messages disseminated through the schools to students and their families.

To reach as many consumers as possible, NCA regularly issues press releases and feature stories on candle safety to radio, television, print and the electronic media. In addition, we produce and annually distribute to television stations around the country a holiday season Video News Release on the importance of fire safety when using candles.

As the voice of the U.S. candle industry, the NCA has been steadfast in its commitment to improving candle fire safety, not only through its active participation in the development of voluntary standards, and compliance with those standards, but in its ongoing consumer education and media outreach activities, its cooperative endeavors with fire and safety organizations, and its efforts to involve the entire U.S. candle industry and customers in a commitment to candle fire safety.

The NCA objects to NASFM's petition for a mandatory candle product fire safety standard. There is no evidence to suggest that the CPSC should reject its mandate to rely on voluntary industry standards, and instead promulgate a mandatory one. The continued involvement of the industry in the development of voluntary candle product fire safety standards remains in the best interest of both the U.S. consumer and the candle industry.

Sincerely,



Robert A. Higgins
NCA President

cc: NCA Board of Directors

Stevenson, Todd A.

From: Cooper, Valerie [vcooper@kellencompany.com]

Sent: Wednesday, May 05, 2004 12:23 PM

To: Stevenson, Todd A.

Subject: Petition CP 04-1/HP 04-1, Petition for Fire Safety Standards for Candles and Candle Accessories

National Fire Protection Association
Washington Office: 499 South Capitol Street, SW, Suite 518, Washington, DC 20003
Phone: 202-488-4428 • Fax: 202-488-4452 • www.nfpa.org

Candle Comment rec'd in OS 6/9/04

June 2, 2004

Office of the Secretary
Consumer Product Safety Commission
Bethesda, Maryland 20814

Re: Petition CP 04-1/HP 04-1, Petition for Fire Safety Standards for Candles and Candle Accessories

I am writing today on behalf of the National Fire Protection Association (NFPA) in support of the National Association of State Fire Marshal's (NASFM's) proposal that the U.S. Consumer Product Safety Commission (CPSC) issue mandatory fire safety standards for candles and candle accessories based substantially on ASTM International Provisional Specifications for Candles (PS59-02). The standard addresses stability, flame height, end of useful life in certain candles, and secondary ignition. NASFM is requesting that standards also include flammability performance requirements for candle accessories, including candleholders, end of useful life requirements for a wider variety of candles and circumstances, and miscibility and flash point requirements for gel candles.

NFPA's statistics, derived from the National Fire Incident Reporting System and NFPA's annual fire department survey, show that in 1999 (the most recent data available), home candle fires hit a 20-year peak. During 1999, an estimated 15,040 reported home candle fires caused 102 deaths, 1,473 injuries, and $278 million in direct property damage. The 1999 estimate was almost triple the estimated 5,460 home candle fires reported in 1990. In 1990, 1.2% of reported home fires were started by candles. In 1999, candles started 4.1% of these fires. Thirty-eight percent of the reported home candle fires occurred after candles were left unattended, abandoned, or inadequately controlled. Twenty-three percent occurred when some form of combustible material was left or came too close to the candle. All these statistics attest to the importance of doing something more to improve the safety performance of candles, although it is likely the increases are driven by greatly increased use.

Home candle fires involve a wide variety of scenarios. The leading items first ignited in home candle fires during 1999 were mattresses or bedding (13%), cabinetry (9%), curtains, blinds or drapes (7%), interior wall coverings (7%), and upholstered furniture (6%). During the five-year period pf 1994-1998, candles provided the heat of ignition in 45% of reported home decoration fires, 20% of the curtain and drape fires, 15% of the cabinetry fires, 15% of the book fires, 10% of the non-bedding linen fires, 5% of the mattress and bedding fires and 5% of the floor covering fires.

NFPA collaborated with the Office of the State Fire Marshal of Massachusetts to obtain more information about 1999 Massachusetts candle fires than could be obtained from standard fire reports. A separate question was asked to determine if the candle had been left unattended and more detailed causal information was sought. Three-quarters of the fires occurred when the candles were left unattended. Forty percent (40%) of the Massachusetts candle fires were caused by combustibles too close to the candle. In 35% of the cases, the candle burned down too low. The candle tipped over (on its own) in 10% of the incidents, and was knocked over (by a person, pet or other object) in 7% of the fires. The holder broke in 3% of the cases.

While consumer behavior is a factor in most candle fires, the list of recalls of candles and candleholders on CPSC's website shows that product problems have often played a role. A candle does not start a fire because it is left unattended. An unattended candle poses a threat because no one is there to extinguish a candle that has burned low or to deal with a problem should one occur. The ASTM standard and NASFM's proposal address end of useful life and candle stability issues. Had the proposed standards been in place, it is possible that the 35% of the Massachusetts candle fires that occurred after the candle burned too low and the 10% that occurred when a candle tipped over could have been prevented.

We urge the CPSC to adopt either the proposed ASTM provisional standard or something very similar. We support the goals of NASFM's additional request, and if technical consensus exists, we ask that these requirements be incorporated in the regulations.

We believe that adoption of the proposed requirements will benefit both the consumer and the responsible candle manufacturers. Most candle manufacturers are committed to producing the safest product possible, and this standard would set the standard of safety as high as current practicable technology permits.

Sincerely,

John C. Biechman
V.P., Government Affairs

Candle Pet Comment

From: John DiFazio [jdifazio@cspa.org]
Sent: Monday, June 14, 2004 12:04 PM
To: Stevenson, Todd A.
Subject: Petition CP 04-1/HP 04-1, Petition for Fire Safety Standards for Candles and Candle Accessories; 69 FR 18059, April 6, 2004

To the Secretary:

Please accept these comments which we presumed had been emailed on June 7 but did not go through due to email difficulties.

June 7, 2004

Office of the Secretary
Consumer Product Safety Commission
Washington, DC 20207

Re: Petition CP 04-1/HP 04-1, Petition for Fire Safety Standards for Candles and Candle Accessories; 69 FR 18059, April 6, 2004

To the Commission:

The Consumer Specialty Products Association (CSPA), whose 237 members include most of the major candle manufacturers and marketers in the United States, submits the following comments in response to the U.S. Consumer Product Safety Commission (CPSC) request for comments on the petition from the National Association of State Fire Marshals (NASFM) requesting the CPSC to issue mandatory fire safety standards for candles and candle accessories.

Section 7 of the Consumer Product Safety Act (CPSA) provides that the Commission may issue a mandatory standard only when it finds there is not a voluntary standard that adequately reduces the addressed risk of injury or death or when substantial compliance with the voluntary standard is absent. CSPA is confident that the voluntary consensus standards that have been and continue to be developed for candle-fire safety under ASTM F-15.45 reduce candle-fire risks and consequently will demonstrate a reduction in such fires. NASFM presents no basis in its implication that the ASTM voluntary standards are inadequate. Because the voluntary standards were published only last year and will be finalized by the end of this year, it is too early to make the judgment that these standards will not be effective.

Further, CSPA concurs with the recommendation of the Office of Hazard Identification and Reduction and the Office of the General Counsel, as indicated in the briefing package, that CPSC's involvement in the ASTM process has been sufficient to obviate the need for the Commission to seek public comment on the NASFM petition.

NASFM also requests that four additional provisions be incorporated into a mandatory standard, apparently disregarding the ongoing activities of the ASTM F-15.45 subcommittee addressing these other areas.

To the contrary, NASFM's petition for a mandatory standard itself most likely would impede the improvement of candle fire safety. The promulgation of a mandatory standard would serve to halt any innovations in candle product fire safety because of the relatively complex and lengthy procedures required to amend a mandatory standard under the CPSA. The value of voluntary industry consensus standards, as developed through recognized standards development bodies such as ASTM, is that they continue to be improved through required revision and update procedures. This allows innovations to be incorporated into applicable standards on a timely basis.

NASFM alleges without basis that the candle industry is not in compliance with the ASTM

standards and that it has made no effort to encourage compliance with the ASTM standards. At its Mid-Year Meeting last month, all CSPA member companies that manufacture and/or market candles asserted that they are in compliance with the current ASTM standards and agreed to formalize a pledge to continue prompt compliance with any relevant future standards. Many of these companies are participants in CSPA's Product Caresm initiative that further commits them to conformance with appropriate industry standards.

Further, CSPA has met with NASFM representatives on several occasions in an attempt to build a fruitful relationship with that organization. They have engaged in dialogue with our members at our Mid-Year and Annual Meetings over the past two years and we have dedicated Association funds to support their attendance at future meetings. Former NASFM President Don Bliss sits on the Board of Trustees of a public foundation -- the Alliance for Consumer Education -- founded by and affiliated with CSPA. We have attached a letter sent to NASFM in January of this year in reply to a request for an Association response to a draft of their petition, detailing our extensive efforts to work cooperatively with NASFM. Both NASFM's current president and the chairman of its Consumer Product Fire Safety Task Force were invited to attend our Mid-Year Meeting this year, but they were unable to due to previous commitments.

Therefore, for the reasons cited above, CSPA asks that CPSC deny this petition.

Very truly yours,

/s/John DiFazio
Assistant General Counsel
Air Care Division Staff Executive
202-833-7303

Attachment

Via Facsimile: 202-393-1296 January 9, 2004

Bert Polk
Senior Policy Advisor
National Association of State Fire Marshals
c/o 1319 F Street NW #301
Washington, DC 20004

Re: Your Letter of December 12, 2003

Dear Bert:

Thank you for the information in your letter and the opportunity to comment on the draft petition. As I noted in an email to you, apparently it was delayed in the mail as I did not receive it until the afternoon of December 23 as we were about to break for the holidays.

As a preface, I would like to reiterate our Candle Committee's position statement on candle fire safety, previously noted in our letter to Don Bliss last July. "The CSPA Candle Committee is committed to promoting and advancing candle fire safety. To that end, the Committee will:

- Support the collection of scientific and reliable fire incident data, especially relating to causative information;
- Participate actively with ASTM in the continued development of standards addressing candle fire safety;
- Build and sustain relationships as appropriate with other organizations that are committed to candle fire safety;
- Educate consumers about potential fire dangers related to candle misuse; and,
- Develop a plan to educate and encourage candle makers/importers to

utilize the provisional voluntary ASTM standards, as well as work with retailers to encourage purchase of candles meeting the standards."

To further those goals, members of our Candle Committee met with you and other NASFM representatives here on July 30 and developed a plan to establish an executive committee tasked with recruiting appropriate participants. That same afternoon I emailed NASFM the names of our two selections for the executive committee. A few days later, CSPA President Chris Cathcart received a letter from Pete Sparber noting that his firm's "services will not be required" because "NASFM and CSPA are well on the way towards achieving this partnership."

Unfortunately we never heard back from NASFM on its two choices for the executive committee. I received no response to my email to you and Don on September 8 inquiring as to the status and asking to get together again no later than the CSPA annual meeting in Florida December 7 to 11. In reply to my subsequent email to you and Don on October 6, you advised that you would update us after the NASFM board meeting November 1. On November 5 your email to me raised questions about funding, to which I replied that our Candle Committee had obtained key-issues funding to support your participation in our joint efforts in 2004 and that CSPA would underwrite your attendance at our December meeting in Florida. We anticipated a fruitful discussion with you in Florida until your call to me just before the meeting raised the likelihood of a conflict the day of the Candle Committee meeting, at which time I offered any other day during our Florida convention to meet with you. It is regrettable that your latest letter suggests that "it was difficult to justify the trip for what would have been a one-hour meeting." How much more productive it would have been to present to us in person on December 9 or 10 the points and concerns raised
in your letter mailed on December 12.

I note these communications to demonstrate that our Candle Committee continues to support the aforementioned goals and has taken action in that regard, in contrast to some of the statements in your draft petition to the CPSC. Having said that, we still prefer to work with you, not merely in parallel and not in opposition. As I recommended in my email to you on December 23, "I am enthused about a public education effort" and "ask that you involve the Alliance for Consumer Education (ACE) at the earliest possible opportunity" instead of after the fact.

Specifically regarding the draft petition, our initial reaction is the same as to the legislation -- we see no need for it at this time, as it is premature and may be counterproductive. We take issue with some of its points, especially our members' efforts to comply with the ASTM provisional specifications. CSPA continues to encourage our companies' compliance and to the best of our knowledge they are doing so already. It certainly is inaccurate and unfair to assert that "the candle industry has had every opportunity to organize and operate a legitimate voluntary fire safety program, but has not moved forward with such a program." Our members have made great progress in ASTM Candle Fire Safety Task Group based on the information currently available and will persist in those efforts. We welcome Walter Smittle's participation, which our members sought for more than a year, and would not object to your consulting him or the Task Group chairman, Jim Becker, about the process and progress of the ASTM subcommittee. We still see a need for the "collection of scientific and reliable fire incident data, especially relating to causative information," on which we are still hoping to work with NASFM and other relevant parties. Such cooperation is critical to avoid any question about the legitimacy of data, communication, or motive. Until those data are collected and corroborated, any attempt to mandate and thus freeze the standards may be counterproductive. Finally, we note a fundamental contradiction in the petition: the point properly made that virtually all candle fires are the result of consumer inattention and ignorance and thus "very few candle fires are intentional" versus the requirement in the authorizing statute that a petition be granted when a product compromises safety "when used as intended."

To conclude, CSPA and our Candle Committee thank you for the opportunity to respond and we remain committed to working with you to improve candle fire safety. We would welcome the chance to meet with you again at your earliest opportunity to proceed with our joint plans to further the goals articulated above. We have shared your letter and this response with the National Candle Association. Due to the short deadline you provided we will not be able to coordinate our responses. We presume the NCA will
reply separately and directly to you.

Very truly yours,

John E. DiFazio Jr.
Assistant General Counsel

Tab B

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, DC 20207

Memorandum

		Date:	Draft: July 7, 2006
TO :	Allyson Tenney, Project Manager, Candle Petition Directorate for Engineering Sciences		
THROUGH :	Russell Roegner, Ph.D., Associate Executive Director TRR Directorate for Epidemiology		
FROM :	David Miller DGM Division of Hazard Analysis		
SUBJECT :	Candle Fire Loss Estimates		

Background

In March 2004 the National Association of State Fire Marshals (NASFM) submitted a petition to the CPSC requesting that the voluntary fire safety standard for candles be made mandatory. Additionally, the petition requests that the mandatory standard incorporate provisions regarding candle accessories and gel candles.

Data from the National Candle Association show that the use of candles in the home has increased dramatically over the last 15 years. Not only have candles experienced an increase in popularity, but the types of candles available on the market and their proposed uses have increased greatly. Candles are no longer intended for use only as interior decorating items, but are now marketed as art items, air cleaners, therapy and meditation devices, fragrance disseminators, and so forth.

CPSC staff has worked with the candle manufacturers on a voluntary industry standard for candles. The standard completed the ballot process and then was published in July 2004. The standard addresses issues of flame height, stability, end of life behavior (that the candle burns itself out), and secondary ignition. Also under consideration for adding to the standard are requirements for fuel pool (wax or gel) temperature, ignitable accessories, and holders or containers.

A separate standard for candle accessories, including candle trim rings, tealight burners, and potpourri burners went out for ballot in February 2006. Additional fire performance requirements are being considered for additional accessory types and candles.

Results

Fire Losses Addressable by the Voluntary Standard:

Table 1 shows 4-year averages (1999 – 2002) for estimates of potentially addressable candle fires and associated losses. 2002 is the most recent year of National Fire Incident Reporting System (NFIRS) data available. This data is broken down by different Items First Ignited. Appendix A and Appendix B describe the methodology used for producing these NFIRS fire loss estimates.

There was an estimated annual average of 12,500 potentially addressable fire department attended candle fires in this period causing an estimated 110 deaths, 1,110 injuries, and $248.6 million in property loss. Using the average estimated U.S. population for this period, there were an estimated .40 potentially addressable deaths and 3.95 potentially addressable injuries per million people. Estimates of candle fires and losses that include not just potentially addressable but also those deemed not addressable can be seen in Table 2 on p. 4.

The estimates are for fire department attended fires only. Many candle fires are not attended by the fire department. A National Electronic Injury Surveillance System-based (NEISS) fire injury study[1] produced estimates of emergency room treated injuries for the one year period of July 1, 2002 – June 30, 2003. The estimates were broken down by product and fire department attendance. The estimate of fire department attended candle injuries for this period was **1,165**. The estimate for injuries from candle fires not attended by the fire department was **2,247**. Therefore an estimated **66%** of candle fire injuries seen in emergency rooms were from candle fires that were **not** attended by the fire department. This estimate is only from one year of data and from just 39 NEISS candle cases so it will be important to track this estimated proportion with more data.

Table 1
Estimated Potentially Addressable Residential Fires and Fire Losses Involving Candles, Attended by the Fire Service, 1999 – 2002 Annual Average

Item First Ignited	Fires	Deaths	Deaths per million population[2]	Injuries	Injuries per million population	Property Loss in Millions($)
Potentially Addressable Candle Fires	**12,500**	**110**	**.40**	**1,110**	**3.95**	**248.6**
Floor or Wall Covering	1,300	30	.10	60	.22	20.3
Upholstered Furniture	700	10	.03	130	.46	24.9
Mattress, Bedding	1,300	20	.07	260	.91	34.6
Wearing Apparel, not worn	500	0	.00	30	.09	7.9
Curtains, blinds, drapery, tapestry	1,200	0	.01	110	.39	22.9
Magazines, newspaper, writing paper	400	0	.01	30	.09	7.2
Other Addressable Item First Ignited[3]	7,100	50	.17	500	1.78	130.9

[1] D. Miller, "Estimates of Fire Injuries Treated in Hospital Emergency Departments July 2002 – June 2003", CPSC, January 2005.
[2] Used average of U.S. Census Population Estimates for 1999 – 2002.
[3] Some of the common 'Item First Ignited' codes for candle fires that fall into this 'Other' category are ' 00 - Other item ignited', '20 – Furniture, utensils, other', '33 – Linen; other than bedding', '42 – Decoration', and '99 – Multiple items first ignited'.

Mattress/Bedding Candle Fire Casualties to be Prevented by the Mattress Standard:

In January 2006, CPSC passed a mandatory standard for the open flame ignition of mattresses that takes effect on July 1, 2007. In the analysis performed for that standard, estimates were produced of deaths and injuries that would be prevented by the mattress standard. Applying these estimates of casualties prevented to our estimates of candle fire casualties[4] where mattress/bedding is the item first ignited, gives estimates of 15.4 candle fire deaths and 204.4 candle fire injuries that will be prevented annually by the mattress standard when it becomes fully effective and all mattresses are compliant. In reality, there will be a phase-in of compliant mattresses. Taking this phase-in into account leads to the following estimates of candle fire casualties prevented by the mattress standard:

Year	Deaths Prevented	Injuries Prevented
2007	.8	11.1
2008	2.5	33.3
2009	4.2	55.2
2010	5.8	76.6
2011	7.3	96.8
2012	8.7	115.7
2013	10.0	133.0

See Appendix C for the details of the process of producing these estimates.

Annual Fire Loss Estimates for Candles:

CPSC produces tables of product-specific annual estimates of fire department-attended fires and associated losses. Candles are one of these products. Just as in Table 1, these are NFIRS-based estimates that exclude intentional fires and firefighter casualties. These estimates are not limited to potentially addressable fires. From these estimates an apparent upward trend in fire department attended candle fires and their associated losses is observed. These numbers are displayed in Table 2. Remember that the new NFIRS coding system took effect in 1999 and since then, the data are a mix of data coded in the new system and data converted from the old system. The effect that this has on the estimates is unknown.

[4] Proportions applied to estimates of unrounded death and injury estimates.

Table 2
Estimated Residential Fires and Fire Losses Involving Candles, Attended by the Fire Service, 1990 – 2002

Year	Fires	Deaths	Deaths per million population[5]	Injuries	Injuries per million population	Property Loss in Millions($)
1990	5,400	90	.36	560	2.24	61.2
1991	5,900	60	.24	690	2.74	77.3
1992	6,000	110	.43	630	2.47	57.3
1993	6,400	90	.35	670	2.60	83.3
1994	7,100	80	.31	850	3.27	91.2
1995	8,400	80	.30	1,010	3.84	114.6
1996	10,100	130	.49	1,200	4.52	169.2
1997	12,000	160	.60	1,290	4.82	176.3
1998	12,800	170	.63	1,200	4.44	174.6
1999[6]	15,100	80	.29	1,480	5.43	272.0
2000	15,300	130	.46	1,760	6.24	313.4
2001	15,900	200	.70	1,410	4.95	280.0
2002	14,800	130	.45	1,300	4.51	362.7

[5] Used U.S. Census Population Estimates for each year.

[6] Note: 1999 is the first year of the new NFIRS data collection system. Data from Years 1999 – 2002 are a mix of data coded in the new system and data converted from the old system. Data for years prior to 1999 are not directly comparable due to the change in coding systems.

Figure 1*
Estimated Residential Candle Fires, Attended by the Fire Service, 1990 – 2002

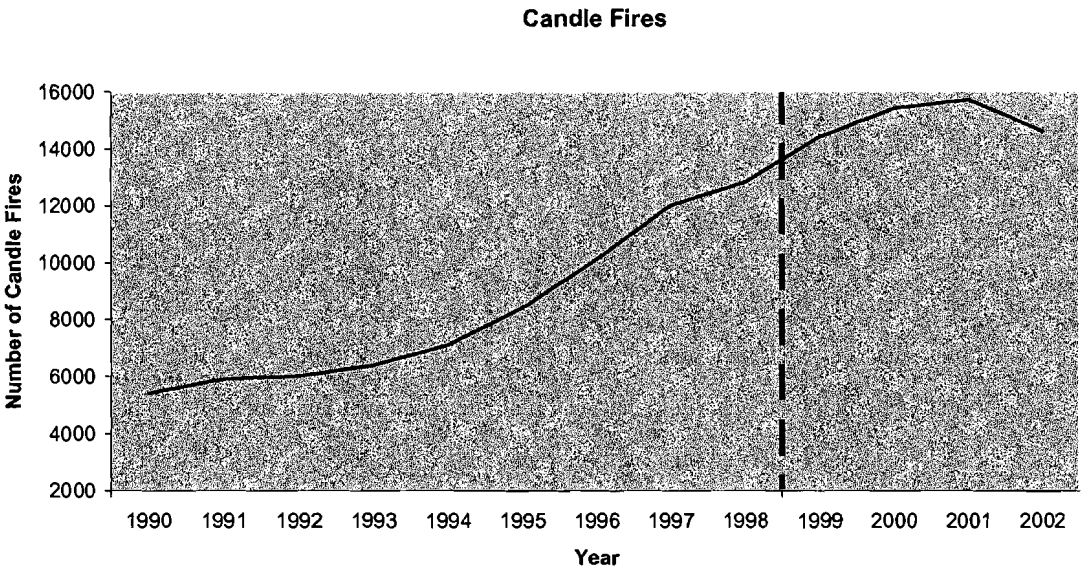
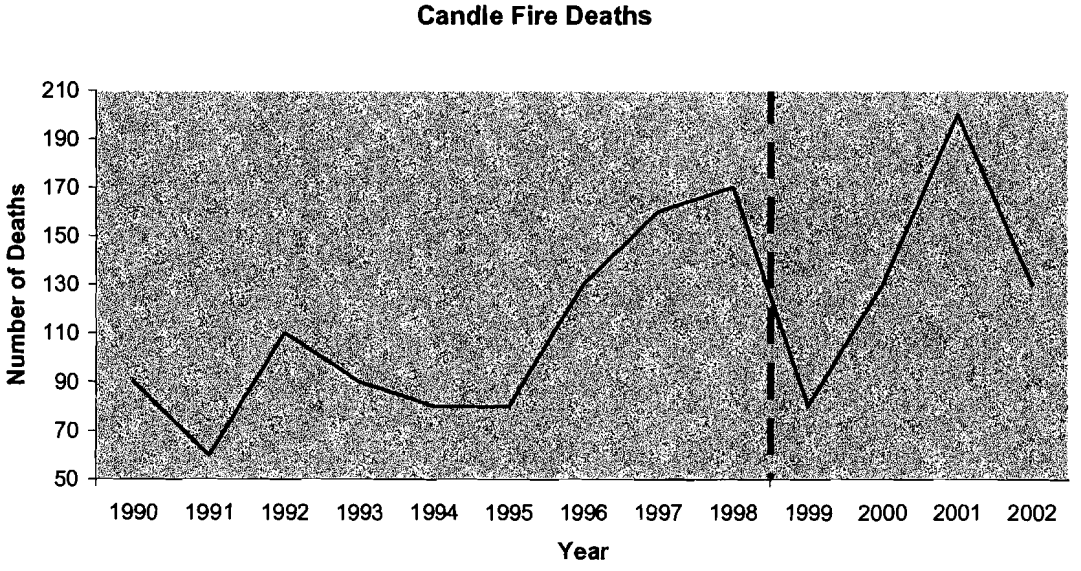
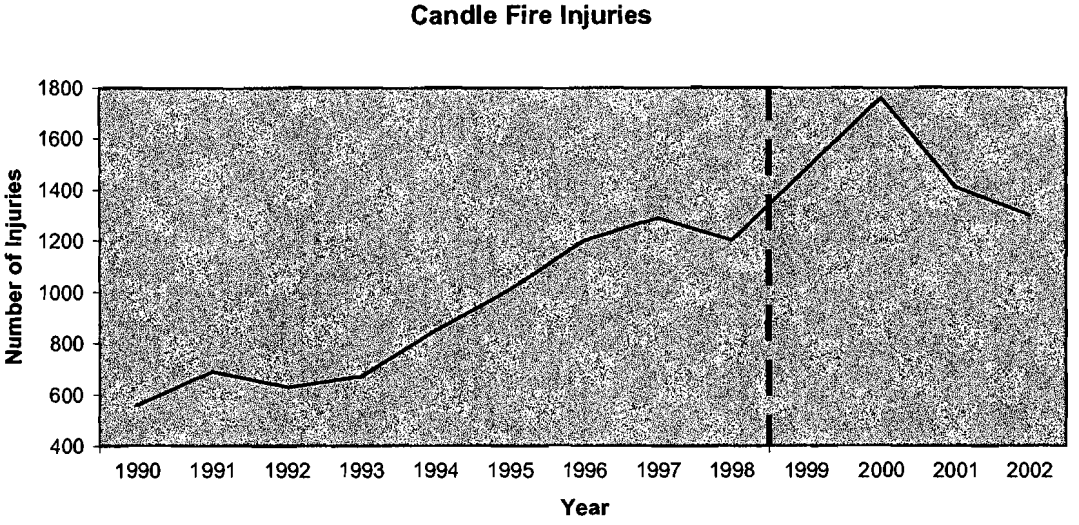


Figure 2*
Estimated Residential Candle Fire Deaths, Attended by the Fire Service, 1990 – 2002



* Note: 1999 is the first year of the new NFIRS data collection system. Data from Years 1999 – 2002 are a mix of data coded in the new system and data converted from the old system. Data for years prior to 1999 are not directly comparable due to the change in coding systems.

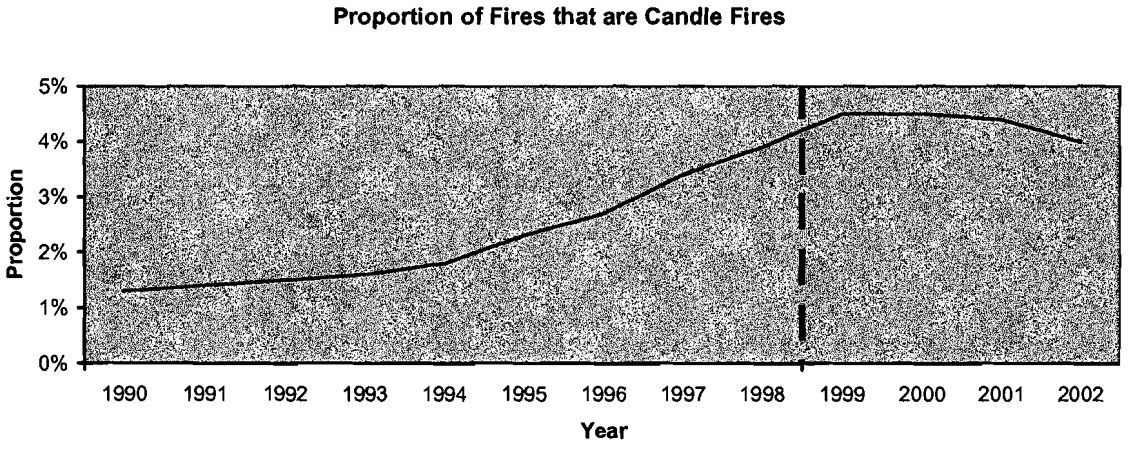
Figure 3*
Estimated Residential Candle Fire Injuries, Attended by the Fire Service, 1990 – 2002



Candle Fires and Losses as a Percentage of Total Residential Structure Fires and Losses:

Estimates of residential structure fires and associated losses have been declining for years. Since 1990, while this has happened, candle fire estimates and associated losses have been increasing for the most part. So the estimated proportion of residential structure fires that are candle fires has risen, as has the estimated proportions for deaths and injuries.

Figure 4*
Estimated Proportion of Residential Fires Attended by the Fire Service that are Candle Fires, 1990 – 2002



* Note: 1999 is the first year of the new NFIRS data collection system. Data from Years 1999 – 2002 are a mix of data coded in the new system and data converted from the old system. Data for years prior to 1999 are not directly comparable due to the change in coding systems.

Figure 5*
Estimated Proportion of Residential Fire Deaths Attended by the Fire Service That are Candle Fire Deaths, 1990 – 2002

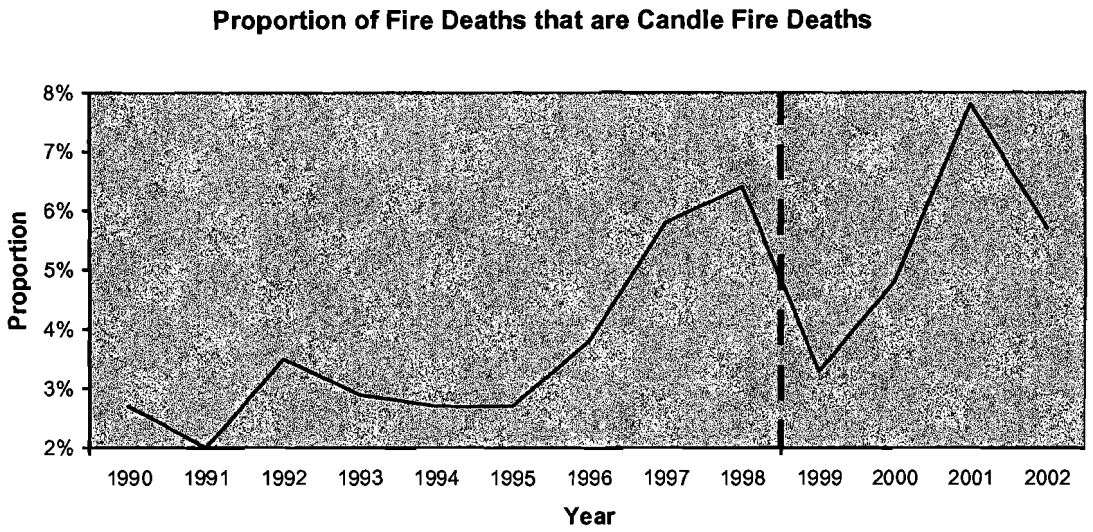
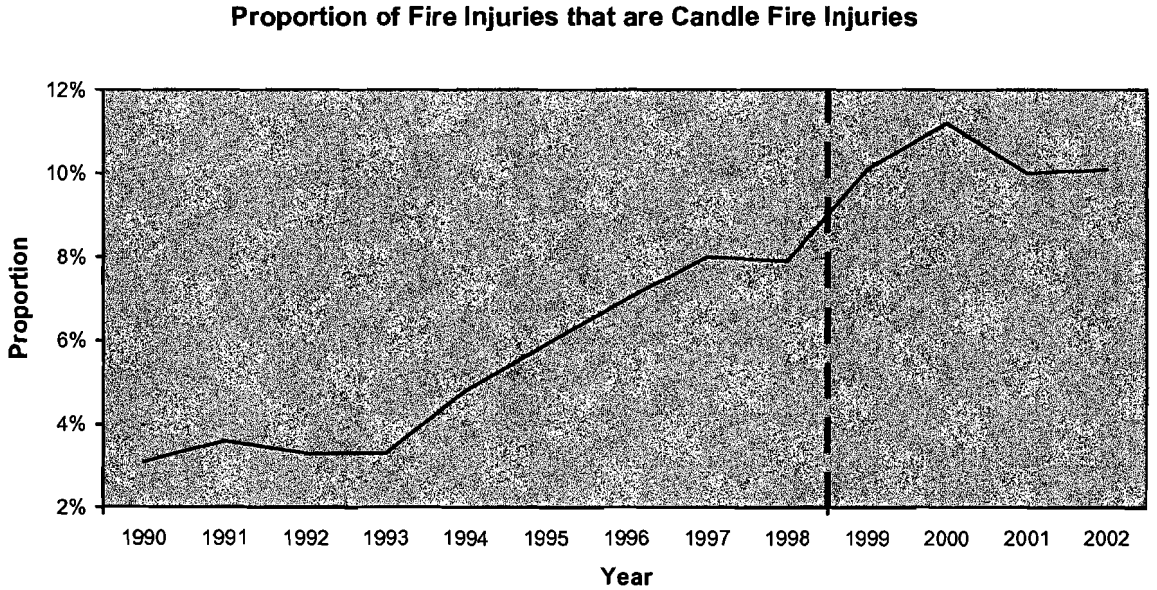


Figure 6*
Estimated Proportion of Residential Fire Injuries Attended by the Fire Service That are Candle Fire Injuries, 1990 – 2002



* Note: 1999 is the first year of the new NFIRS data collection system. Data from Years 1999 – 2002 are a mix of data coded in the new system and data converted from the old system. Data for years prior to 1999 are not directly comparable due to the change in coding systems.

In-depth Investigations:

CPSC assigns candle incidents to field investigators to conduct In-depth Investigations (IDIs). CPSC staff review completed IDIs and report on the hazard scenarios found. There is a report summarizing the candle IDIs from January 1998 – September 2001[7] and one summarizing IDIs from October 2001 – February 2003[8]. See Appendix D for more details about candle IDIs.

Imported/Domestic:

To determine if the candle (or accessory) was domestic or imported, CPSC staff reviewed 200 candle IDIs where a candle or accessory malfunctioned in a way thought to be addressable by the standard. These IDIs have incident dates spanning from late 2002 to early 2006. Of these 200, 81 were found to involve imported products, 56 domestic, and there were 63 where staff was unable to determine where the product was manufactured. Of the 137 where it could be determined, 59% were imports.

[7] S. Kyle, Ph.D., "Preliminary Report on In-depth Investigations of Incidents Involving Candles", CPSC, March 2002.
[8] D. Miller, "Summary of Candle Malfunction Incidents", CPSC, May 2003.

Appendix A

Methodology

General:

Estimates of fires and fire losses from fire department attended candle fires can be derived from the United States Fire Administration's (USFA) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association's (NFPA) annual survey of fire departments. The NFPA survey is a stratified (by size of community protected by a fire department) random sample of fire departments in the U.S. The NFPA makes national estimates of residential structure fires and associated deaths, injuries, and property loss. They do this by weighting the sample results based on the proportion of the U.S. population accounted for by communities of each size.

NFIRS is a compilation of voluntarily submitted incident reports by U.S. fire departments. The reports have details about product involvement. Not all fire departments submit reports and it is not a probability sample. NFIRS data are weighted up to the NFPA totals to produce product specific estimates. There are NFIRS estimates for candle fires, deaths, injuries, and property loss and then appropriate weights are applied to obtain national estimates for candle fires and their associated losses.

NFIRS Coding System Revision:

The NFIRS coding system underwent major changes that took effect beginning with 1999 data. Though the specific code for 'candle' did not change, there were changes to many variables and codes that could indirectly affect the estimates. As a result, data from the two systems (before 1999 and since 1999) are no longer amenable to tracking trends. For this reason estimates before 1999 will be excluded and four year averages covering 1999 – 2002 will be given.

Although the new system began in 1999, many fire departments reporting to NFIRS continued to report using the old system. Each year a higher proportion of the NFIRS data is from the new system but the data (through 2002 at least) are a combination of data from the old and the new system. Data from the old system is converted to the new system but the conversions are not always perfectly one to one and so there remain differences between the converted data and the data reported in the new system.

Historical Fire Loss Estimates:

CPSC has been using NFIRS and NFPA to estimate product-specific fires and fire losses for fire department attended residential structure fires for many years. There are estimates for candles going back to 1980. This report will show estimates back to 1990. These estimates over the years give evidence of an upward trend in the amount of candle fires and associated losses.

Addressability:

Several NFIRS variables were used to determine if a particular incident is a potentially addressable candle fire. Relevant NFIRS variables and codes can be seen in Table B-1 on p. 12 and Table B-2 on p. 13. The variable "Heat Source" has a code '66 – candle' that is used to identify incidents where a candle provided the heat source for the fire. Whether a candle fire case is deemed potentially addressable is dependent upon the coding of each of the following three variables: "Item First Ignited", "Factors Contributing to Ignition", and "Cause of Ignition".

There are five "Item First Ignited" codes that can make a candle fire not addressable. These codes are related to flammable liquid or gas. There are nine factors contributing to ignition codes that can make a case not addressable. These range from different codes for 'misuse of product' such as '19 – Playing with Heat Source' to codes such as '51 – Collision, knock down, run over, turn over' and '66 – Animal'. There is a "Cause of Igntion" code, '4 – Act of Nature' that makes a case not addressable.

Arson fires are excluded from the estimates as are firefighter casualties. The "Cause of Ignition" variable is used in conjunction with a created variable called "Child Play" to identify and eliminate arson cases. Fires coded as 'intentional' are deemed arson unless they are found to be child play. Child play cases are considered not potentially addressable.

The word 'potentially' should be stressed here in the phrase 'Potentially Addressable'. Determinations of potential addressability of candle fires are being made solely by the coding of a few NFIRS variables. NFIRS does not provide a narrative of the incident. An example of a fairly common scenario that we see in the coding is that a candle is the heat source and the item first ignited is 'Curtains, blinds, drapery, tapestry'. These cases count as potentially addressable, unless there is some other reason in the coding of another variable or variables (e.g., the Factor Contributing to Ignition variable indicates 'playing with heat source' was involved). They are deemed potentially addressable because the candle could have tipped over or flared up and in this manner, ignited a curtain for instance. However, the candle may simply have been placed too close to a curtain and led to the fire. This scenario would not be addressable but there is no way of knowing if this is what happened. So, all such cases are considered 'potentially addressable'.

The codes for the different variables that are used to identify 'potentially addressable' or 'not potentially addressable' candle fires are shown in Table B-2 on p. 13.

Because of the difficulty of determining addressability with NFIRS codes, alternatives were attempted. For injuries, a sample of candle fire In-depth Investigations (IDIs) was examined to see what proportion was addressable by the candle voluntary standard. For deaths, fire reports and death certificates from a sample of candle fires were read to see what proportion was addressable. The idea was to apply these proportions to the NFIRS estimates of total candle fires and injuries to obtain estimates of addressable candle fires and injuries. However the IDIs, fire reports, and death certificates often did not give enough detail to make a determination of addressability. This was especially true with the deaths, where it could almost never be determined. If the start of a candle fire is not witnessed, it is unlikely that it can be learned whether or not the fire was addressable. At this time the best option remains relying on the NFIRS data to estimate **potentially** addressable candle fires and losses.

Allocation of Unknowns:

It was possible to have "unknown" values for each of the NFIRS variables used for this analysis. A technique known as raking was used to allocate the unknown values for each of these variables except for child play. Raking involves an iterative mathematical procedure to adjust a cross-tabulation of the data so that the resulting table, without unknowns, maintains the same proportional relationship as the original cross-tabulation. Battaglia, Hoaglin, and Izrael describe the raking algorithm and provide the statistical software (SAS version 6.12; SAS Institute, Inc., Cary, NC).[9]

Child Play:

In the new NFIRS coding system the coding of child play has become more complicated. In the old system a case could be coded as child play explicitly using a code from one variable – Ignition Factor. In the new system there are three variables that must be coded a certain way for a case to count as child play.

In the analysis for another project the inclusion of the child play variable in the raking was found to be problematic and the child play variable was then excluded. It may have been because child play in the new system is defined in a more complicated manner (involving three separate variables). To keep a consistent approach for producing fire loss estimates, child play was excluded from the raking for this analysis. The result is that a case is only considered child play if it is explicitly coded as such. If it has unknown codes for the child play variables it will **not** count as child play. Before raking, the cause variable was changed to 'unintentional' for child play cases if the cause had been 'intentional' or 'unknown'.

[9] M. Battaglia, D. Hoaglin and D. Izrael, "A SAS Macro for Balancing a Weighted Sample", SAS Users Group International (SUGI) 25th Annual Conference, April 9 -12, 2000, Paper #258-25.

A concern would be underestimating child play by excluding it from the raking and, in so doing, counting some cases as potentially addressable that should not be because they are child play. However, Factor Contributing to Ignition is included in the raking and having Factor Contributing to Ignition = '19 - Playing with Heat Source' alone is enough for a case to count as not potentially addressable. So, underestimating child play shouldn't cause an overestimate of potentially addressable candle cases.

Appendix B

Table B-1
NFIRS Version 5.0 Codes Used to Identify Candle Fires

Heat Source	**NFIRS Version 5.0 Codes**
Candle	Candle (66)
Not Candle	All codes except for 66, UU, and blank
Item First Ignited	
Floor or Wall Covering	Floor covering or rug/carpet/mat (14) Interior wall covering excluding drapes, etc. (15)
Upholstered Furniture	Upholstered sofa, chair, vehicle seats (21)
Mattress, Bedding	Mattress, pillow (31) Bedding; blanket, sheet, comforter (32)
Wearing Apparel, Not Worn	Wearing apparel not on a person (34)
Curtains, Blinds, Drapery, Tapestry	Curtains, blinds, drapery, tapestry (36)
Magazine, Newspaper, Writing Paper	Magazine, newspaper, writing paper (92)
Other Addressable Item First Ignited	All other codes including: Other item ignited (00) Furniture, utensils, other (20) Decoration (42) And many more
Not Addressable Item First Ignited	Atomized liquid, vaporized liquid, aerosol (61) Flammable liquid/gas – in/from engine or burner (62) Flammable liquid/gas – in/from final container (63) Flammable liquid/gas in container or pipe (64) Flammable liquid/gas – uncontained (65)
Unknown	Undetermined item ignited (UU) Blank ( )

Table B-2
NFIRS Version 5.0 Codes Used to Identify Addressability for Candle Fires

Variable	Potentially Addressable Candle Fires	Not Potentially Addressable Candle Fires
Item First Ignited	All Other Codes	Atomized liquid, vaporized liquid, aerosol (61) Flammable liquid/gas – in/from engine or burner (62) Flammable liquid/gas – in/from final container (63) Flammable liquid/gas in container or pipe (64) Flammable liquid/gas – uncontained (65)
Factors Contributing to Ignition	No factor contributing to ignition (NN) Abandoned or discarded materials or products (11) Heat source too close to combustibles (12) Improper fueling technique (15) Flammable liquid used to kindle fire (16) Mechanical Failure, Malfunction (20 – 27) Electrical Failure, Malfunction (30 – 37) Installation Deficiency (40 – 44) Accidentally turned on, not turned off (52) Equipment unattended (53) Equipment overloaded (54) Failure to clean (55) Improper startup (56) Equipment used for not intended purpose (57) Equipment not being operated properly (58) Storm (62) High water including floods (63) Earthquake (64) Volcanic action (65) Fire Spread or Control (70 – 75)	Misuse of material or product, other (10) Cutting, welding too close to combustible (13) Flammable liquid or gas spilled (14) Washing part, painting with flammable liquid (17) Improper container or storage (18) Playing with heat source (19) Collision, knock down, run over, turn over (51) High wind (61) Animal (66)
Cause of Ignition	Cause, other (0) Unintentional (2) Failure of equipment or heat source (3)	Intentional (1) Act of Nature (4)

Appendix C

Estimating Candle Casualties Prevented by the Mattress Standard

In the analysis performed for the mattress standard it was estimated that the standard would prevent 77%[10] of the deaths and 80% of the injuries (these are midpoint estimates of the ranges given) that result from small open flame mattress/bedding fires. Multiplying these percentages by our estimates of annual fire deaths and injuries where the heat source was a candle and the item first ignited was a mattress or bedding (**20.0** deaths and **255.5** injuries) gives estimates of 15.4 deaths and 204.4 injuries. These would be the estimates if all mattresses were compliant but since that will happen gradually, the estimates must account for this.

Taking the phase-in estimates of the number of mattress/bedding deaths prevented by the mattress standard annually beginning in 2007[11], and dividing by the midpoint estimate of the total number of mattress/bedding fire deaths that would be prevented annually if all the mattresses were compliant, gives an estimated percentage of the deaths prevented. This percentage for each year is then multiplied by the estimated number of candle-mattress/bedding fire deaths and injuries (15.4 and 204.4 respectively) that would be prevented if all the mattresses were compliant.

Year	Mattress Deaths Prevented	Would be Prevented at Full Compliance	Percent Prevented
2007	13.8	254.13	**5.4%**
2008	41.4	254.13	**16.3%**
2009	68.6	254.13	**27.0%**
2010	95.2	254.13	**37.5%**
2011	120.4	254.13	**47.4%**
2012	143.9	254.13	**56.6%**
2013	165.4	254.13	**65.1%**

These percentages are then applied to the estimates of candle-mattress fire casualties that would be prevented at full compliance (15.4 deaths and 204.4 injuries) to arrive at our estimates:

Year	Percent Prevented	Candle-Mattress Deaths Prevented	Candle-Mattress Injuries Prevented
2007	5.4%	**0.8**	**11.1**
2008	16.3%	**2.5**	**33.3**
2009	27.0%	**4.2**	**55.2**
2010	37.5%	**5.8**	**76.6**
2011	47.4%	**7.3**	**96.8**
2012	56.6%	**8.7**	**115.7**
2013	65.1%	**10.0**	**133.0**

[10] L. Smith, D. Miller, "Updated Estimates of Residential Fire Losses Involving Mattresses and Bedding", CPSC, December 2005.
[11] S. Tohamy, Ph.D., "Estimated Annual Deaths Prevented by the Open-Flame Mattress Standard", CPSC, April 2005.

Appendix D

In-depth Investigations

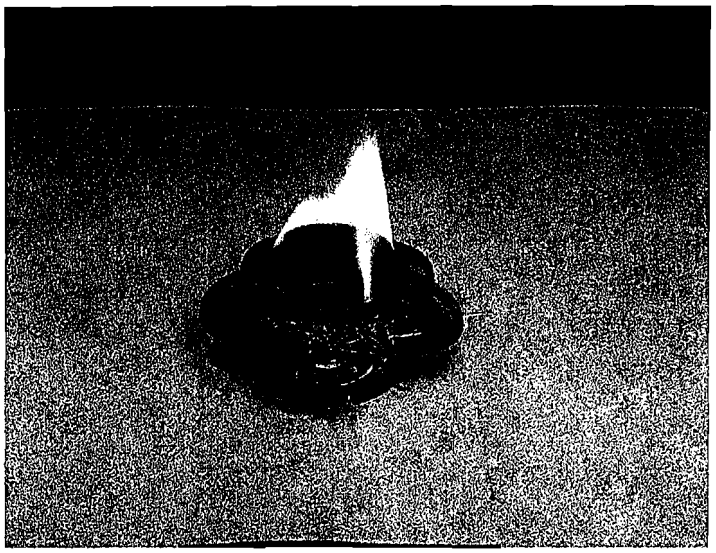
The report[12] that summarizes IDIs from January 1998 – September 2001, covers 593 IDIs, 112 of which were deemed potentially addressable by a possible standard (this analysis was done prior to the voluntary standard). These 112 incidents involved the following scenarios: flare-ups, explosions, wax low, container shattered, container ignited, candle reignited, and candle tipovers. The second report (IDIs from October 2001 – February 2003) covered 99 IDIs, 46 of which were deemed to be potentially addressable. These 46 included all of the above hazard scenarios except for reigniting. These reports not only break down the incidents by hazard type but also by type of candle – tealights, tapers, pillars, gels, etc.

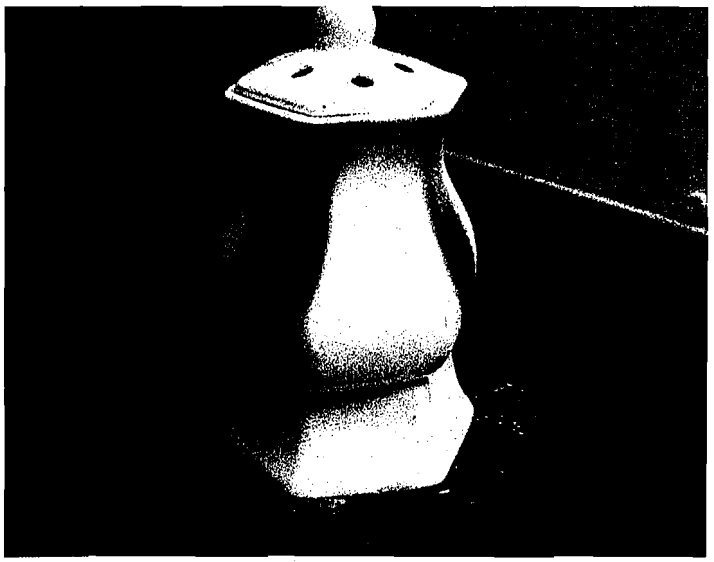
Many investigations do not lead to the incident being deemed addressable because unless somebody is there to see how the incident occurred, it can not be determined that the candle malfunctioned in any addressable way. Many candle fires occur when a candle is burning unattended and it cannot be known how the fire began. Many of the incidents where there is a death or injury are this way – where the candle was burning unattended and there is no witness to the beginning of the fire.

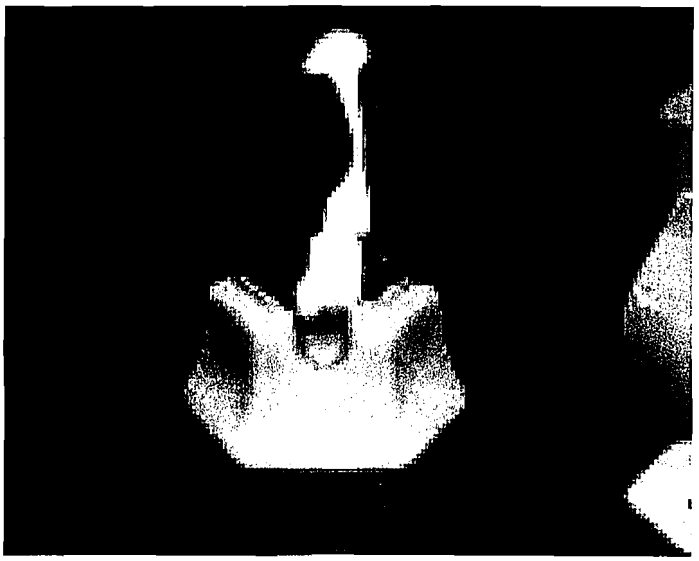
The cases are assigned from CPSC's Injury and Potential Injury Incidents (IPII) database, which is a collection of newspaper accounts, CPSC Hotline reports, internet complaints, reports from medical examiners, and letters to CPSC. They are not a probability sample. Also, the cases which are deemed addressable are biased towards incidents where somebody was there to see what happened. For these reasons, these hazard summaries do not lend themselves to any sort of statistical inference. What they do is provide some details of different types of candle fire scenarios where a candle or a candle accessory behaved in an unexpected manner.

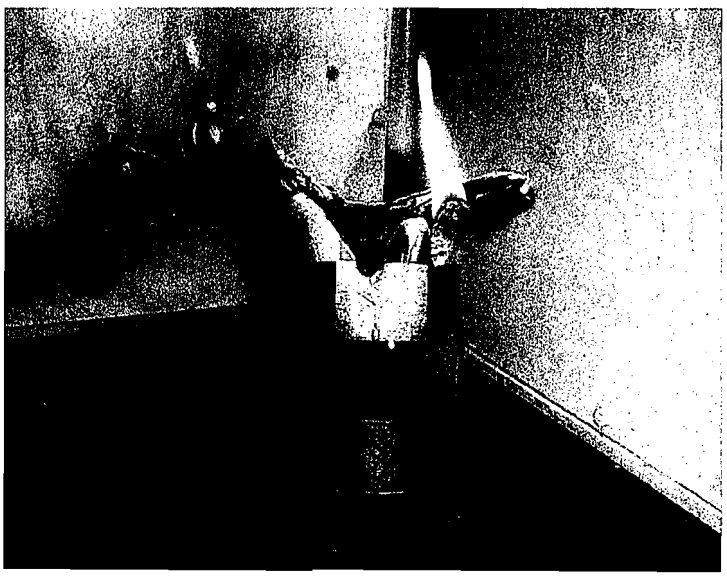
Pictures of Candle Hazard Scenarios

[12] S. Kyle, Ph.D., "Preliminary Report on In-depth Investigations of Incidents Involving Candles", CPSC, March 2002.









Tab C

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, DC 20207

Memorandum

Date: June 27, 2006

TO : Allyson Tenney, Project Manager, Candle Petition, ES

THROUGH: Gregory B. Rodgers, Ph.D., AED, EC GBR

Deborah V. Aiken, Ph.D., Senior Staff Coordinator, EC DVA

FROM : Mary F. Donaldson, EC MFD

SUBJECT : Candle and Accessories Petition, HP-04-1 and CP-04-01

The Consumer Product Safety Commission is considering a petition from the National Association of State Fire Marshals (NASFM) requesting issuance of mandatory fire safety standards for candles and candle accessories. NASFM specifically requested that CPSC mandate the provisions of ASTM PS59-02, *Provisional Specification for Fire Safety for Candles.* NASFM also requests, at a minimum, additional performance provisions for stability and end-of-useful life for candles, flammability of candle accessories, and specific miscibility and flashpoint requirements for gel candles.

The petition was docketed by the Office of the General Counsel under both the Consumer Product Safety Act and the Federal Hazardous Substances Act. The request for a standard addressing miscibility and flashpoint for gel candles falls under the Federal Hazardous Substances Act, while the remaining requests of the petitioner fall under the auspices of the Consumer Product Safety Act.

This memo presents an overview of available information about the market for candles and candle accessories, discusses existing voluntary standards and conformance, and presents the costs to society of candle fires.

Relevant Voluntary Standards

The preliminary standard cited in the petition is PS59-02, *Provisional Specification for Fire Safety for Candles*, which was first published by ASTM in 2002. The current standard, F2417-04, *Standard Specification for Fire Safety for Candles* supersedes the provisional standard and was finalized and published in 2004, after receipt of the petition. This newer standard includes provisions for flame height for all candles except outdoor; secondary ignition for all candles except certain religious candles; end-of-useful life for votive, freestanding, container, and tealights but not tapers, birthday or floating; and stability for freestanding, container, tealights, and ensembles, but not candles needing holders, votives without holders, or certain religious candles. In addition, it specifies a separate, extended burn test for gel candles.

The ASTM candle fire safety standard incorporates the elements of the provisional standard and adds end-of-useful life requirements for freestanding, tealight, and votive candles that were requested by the petitioner. Not included in the latest standard and requested by the petitioner are requirements for end-of-useful life behavior for taper candles; stability requirements for votive and taper candles (except those sold already mounted in an ensemble) and specific flashpoint and miscibility requirements for gel candles. There is an 8-hour burn test specified for gel candles in the latest standard, which addresses flammability issues associated with gel candles, although the test does not apply specific flashpoint and miscibility measures requested by the petitioner.

Flammability specifications for candle accessories, requested by the petitioner, are also not addressed by current ASTM standards; however, there is a draft standard, *Standard Specification for Fire Safety for Candle Accessories*, which addresses stability of all candle accessories and ensembles, flammability of trim rings, and burn performance of candle/potpourri (tealight) burners. The standard is being developed by a separate task group that was expressly set-up for this purpose. In addition to the above requirements, this task group is evaluating possible standards for stability of candleholders.

Besides the provisional voluntary standard mentioned by the petitioner, other voluntary standards exist that address candle fire safety. These are: ASTM F2179-02, *Standard Specification for Annealed Soda-Lime-Silicate Glass Containers that Are Produced for Use as Candle Containers* and ASTM F2058-00, *Standard Specification for Cautionary Labeling for Candles Burned in a Home.* The glass container standard specifies performance requirements to prevent glass candle containers from shattering, while the labeling standard specifies certain cautionary labeling for candles. The staff considers both standards relevant to the petition as they address candle fire safety and because the petitioner requested that the agency consider its recommendations *as a minimum.*

Description of Product

Candles

Candles are manufactured from fuels such as paraffin wax, beeswax, vegetable wax, or gelled mineral oil to which a wick is added. Frequently added ingredients include fragrance and color.

There are two major types of candles: *container* and *freestanding.* Candles which are fabricated and burned in vessels made of non-flammable materials such as glass or ceramic are referred to as *container (or filled)* candles. Tealights and devotional candles are examples of container candles. Candles that are rigid and generally placed on a candleholder for burning are called *freestanding* candles. Freestanding candles include tapers, pillars and novelties (candles formed into shapes, such as figurines).

Candle Accessories

Using definitions developed by ASTM, a candle accessory is "an object designed, intended or marketed for use with a candle." This would include candleholders or candle

containers which provide a functional purpose (i.e., holding a candle upright) during candle burning. Such functional candle accessories include: candle sticks, small glass votive holders, candle burners, lanterns, luminaries, candelabra, candle shades, and wall sconces. These objects are generally made of glass, ceramic, plastic, wood or metal.

Other candle accessories provide a decorative purpose and may be sold as part of a "candle ensemble". An example would be a decorative candle trim ring that encircles a candle. Candle trim rings are generally made of plastic, fabric and/or plant materials.

Industry Trade Associations

A major trade association, which represents manufacturers and suppliers of candles, candle accessories, and candle manufacturing materials, is the *National Candle Association (NCA).* NCA members produce about 90 percent of the U.S. domestic shipments of candles. Included among NCA's members are about 74 candle manufacturers and distributors, nine of which are foreign. Six are based in Canada, two in Mexico and one in Guatemala. Another U.S.-based organization, comprised of crafts persons, is *The International Guild of Candle Artisans*, with 800 members from around the world. The Latin American Candle Association, based in Florida, represents 58 candle manufacturers from North, Central and South America and the Carribean as well as 43 suppliers from around the world (18). Based in France is the *Association of European Candle Manufacturers (AECM),* which represents 13 European manufacturers (1). The Consumer Specialty Products Association, with more than 200 members, represents manufacturers of indoor environment products such as cleaners, air fresheners, fragrances, and candles (1, 2).

The varied trade associations whose members supply candle accessories represent a wide range of manufactured products. The *National Candle Association* supplier members include four firms that supply candle tins (metal containers for candles) and six firms that supply glass containers. The *American Floral Industry Association (AFIA)* represents firms specializing in the "permanent botanical, holiday and decorative accessories industry". Mostly importers, AFIA members include 17 firms supplying candle rings, 29 firms supplying candleholders, and 10 members supplying candelabra. Many AFIA members supply artificial flowers, foliage and holiday decorative items and eight firms supply candles (1, 13). The *Wood Products Manufacturers Association* represents over 400 firms, some of which manufacture turned and shaped wood products that may be made into wooden candlesticks (1, 14).

Manufacturers

Candle Manufacturers

The Reference USA database of businesses in the U.S. identifies 189 candle manufacturers. All but two of these businesses have fewer than 500 employees, the U.S. Small Business Administration's threshold for defining a candle manufacturing business as small. Most firms are much smaller than the threshold limit. In fact, 103 (or 54 percent) have fewer than 5 employees (4, 5). Since start-up expenses are generally small, producers of candles may enter and exit the market easily and frequently.

Candle Accessory Suppliers

Many candle manufacturers market candle accessories in conjunction with candle sales. Establishing the number of firms supplying product to the candle accessories market would be difficult, since much of the accessory products sold with candles are likely acquired by the marketers of candles, i.e., candle manufacturers and suppliers. In fact, most members of the ASTM group developing performance standards for accessories are candle manufacturers and suppliers. The industries supplying candle accessory products are wide ranging and include but are not limited to the floral, plastic, wood, metal, glass and ceramic industries. These would include: manufacturers of artificial flowers, producers of molded plastic novelties, glass container manufactures, decorative glass manufacturers (candleholders), metal crafters (metal works), including stamped metal product manufacturers, iron works, silversmiths, wood products manufacturers, dried plant material suppliers, and ceramic producers.

Sales, Pricing, & Marketing

The National Candle Association estimates that retail sales of candles are about $2 billion per year. Retail prices of candles range from about 10 cents for a small tealight candle up to $75.00 for large columnar candles (6, 7).

Candles and their accessories are marketed to consumers and to commercial and institutional establishments such as restaurants and religious organizations. They are sold through grocery, discount, and department stores, mass merchandise retailers, specialty and gift shops, craft stores, catalogs, the Internet, and through direct sales at in-home shows (8). In recent years, several chains of candle stores have become established nationwide. They include Illuminations, Yankee Candle and White Barn Candle Company (9).

Several trends have contributed to the current year-round popularity of candles and the subsequent decline in the historically strong seasonality of candle sales. One is the increasing popularity of using candles to scent the home. According to an article in *Forbes*, scented candles represent 72 percent of industry sales (10). A recent article in *Global Cosmetics Industry* indicated that in 2003, more than half of retail sales of home fragrance products, (which include products such as potpourri and air fresheners) were for candles (11). In 1992, 40 million scented candles were sold. By 1997, sales of scented candles increased to about 700 million (9). In recent years, candles also have been used increasingly for decorating and aromatherapy (6).

Factory Shipments and International Trade

Candles

Domestic factory shipments increased dramatically in the 1990's, rising, in constant 2004 dollars, from $403.3 million in 1992 to $998.0 million in 2002, a real two-and-a-half fold increase. Table 1 (see appendix) presents the dollar value (nominal and constant) of domestic factory shipments of candles. Factory shipment data was obtained from the U.S. Census Bureau's *Census of Manufactures*. Conversion of the factory shipment values to constant dollars was based on the Producer Price Index for Candles provided by the U.S. Department of Labor, Bureau of Labor Statistics.

Rising even faster were candle imports. Between 1990 and 2000 imports rose from about $56 million to about $563 million in constant dollars, a real ten-fold increase. Imports have leveled off somewhat since then. In 2005, imports amounted to $435 million in constant 2004 dollars. (See Table 2.) Of these imports, more than 60 percent originated from Pacific Rim countries. Imports from the Americas, mostly Canada and Mexico, accounted for about one quarter, while imports from the European Union accounted for less than 8 percent of imports. (See Table 3.)

The People's Republic of China(PRC) has been the largest single source of imported candles since 1990, when it represented 19 percent of all imports in terms of monetary value. Despite an antidumping duty order on imports of petroleum wax candles from China imposed by the U.S. International Trade Commission, Chinese imports of candles grew from 1989 until peaking in 2004 when Chinese candles represented close to half (48 percent) of all imported candles.

However, candle imports from China have fallen dramatically since the second quarter of 2005. In the first quarter of 2006, imports were valued at $14 million, a fall of over 70 percent from the first quarter of 2005 when imports were $47 million. This dropping off of candle imports from China was likely a result of a pending ruling by the Department of Commerce (DOC) on the matter of expanding the scope of candles covered under the antidumping duty order[1] (16, 17).

U.S. exports of candles have increased over the past 15 years to about $75.9 million in 2005. (See Tables 2 and 4.) This represents an increase of more than 820 percent in real terms since 1990 when candle exports were about $8.0 million. Canada receives most of the U.S. candle exports. In 2005, the value of U.S. candle exports to Canada was $44.0 million or 58 percent of all U.S. candle exports. The only other countries receiving more than $1 million value in U.S. candles in 2005 were: The United Kingdom, Mexico, The Netherlands, and Australia.

Combining domestic shipments and imports, and subtracting exports, the U.S. economy consumed about 1.391 billion dollars (wholesale) of candles in 2002, triple the consumption level of 1992, when about 441 million dollars worth of candles were consumed. Imports represent an increasing share of consumption, representing 32.7 percent of 2002 consumption, more than double the 14.5 percent share they held in 1992. Imports from China represent an increasing share of imports and of U.S. consumption, rising from about 4.6 percent of U.S. consumption to 13.2 percent in 2002. (See Table 5.)

[1] Chinese candles that contained less than 50 percent petroleum wax were not before covered by the punitive antidumping duty. This likely resulted in the increasing imports (until 2005) of candles made of majority vegetable waxes. On May 24, 2006, DOC preliminarily ruled that candles containing up to 87.8 percent palm or vegetable oil based waxes are within the scope of the petroleum wax candle antidumping duty order and are subject to the 103.8 percent duty retroactive to February 25, 2005 (19).

Conformance to Voluntary Standards

In its comments to the petition, the National Candle Association takes the position that its members produce candles and candle products "in accordance with recognized industry standards and practices." Since its members represent 90 percent of candles manufactured in the U.S., the NCA argues that the industry is in substantial compliance with the current ASTM standards. Likewise, the Consumer Specialty Products Association (CSPA), in its comments to the petition, also asserts that its members, who include "most of the major candle manufacturers and marketers in the United States," are "in compliance with the current ASTM standards."

Based on comments provided by the NCA and CSPA, a substantial portion of U.S. producers of candles may be in conformance to the latest voluntary standards. It is not known, however, to what extent the rest of the domestic industry or imports conform. Some U.S. producers are also importers and thus, it is expected that some portion of imports will conform by design. It is similarly not known how well current candle and accessory production meets those additional petitioner demands not incorporated into existing standards. CPSC incident data includes many situations where candles and their accessories have performed improperly and resulted in fires. In fact, many candles and accessories have been the subject of recall action by the Commission.

As mentioned above, the U.S. consumed about 1.4 billion dollars (wholesale) worth of candles in 2002, in 2004 dollars. Imports represent 33 percent ($454 million) of this amount. Consumption of domestically produced candles was about $937 (domestic factory shipments minus exports.) Accepting NCA's assertion that 90 percent of domestic production is largely in compliance with the latest voluntary standards, then about $843 million in candle shipments or perhaps 61 percent of candles in commerce in the U.S. comply. Compliance levels for the remaining 39 percent, or $548 million in candles consumed in this country, are unknown.

Using data supplied by the Office of Compliance, there were 118 recalls, involving 12.7 million candle and accessory products between January 1, 1993 and May 18, 2006 for fire safety problems. The country of origin was known for 12.0 million units or 94.5 percent of units. Of the units whose origin was known, imports constituted 7.6 million units or 63.6 percent of the total units recalled while the remaining 4.4 million units or 36.4 percent of the recalled products were domestically produced. Imports from China represented 2.5 million units or 20.6 percent of the recalled items whose origin was known.

In summary, while we may be able to assume, based on industry comments, that a majority of candle products consumed in the U.S. conform to the latest voluntary standards, there still remains a relatively large percentage where we do not know conformance levels. Moreover, given that a considerable number of candles consumed in the U.S. are imported from foreign producers that are not members of the NCA, there remains the substantial likelihood of nonconforming product continuing to enter the U.S. This likelihood is demonstrated by the disproportionately large share of recalls which occur among imports.

Costs to Society of Candle Fires

Fires, deaths, injuries and property losses associated with candle use have increased during the past 15 years. Fires more than doubled between 1990 and 2002 as shown in Table 6 (appendix), rising from 5,400 to 14,800. Deaths also rose, but more erratically, ranging from a low of 60 in 1991 to a high of 200 in 2001. From 1990 to 2002, injuries ranged from a low of 560 in 1990 to a high of 1,760 in 2000. Property losses ranged from $75.5 million in constant 2004 dollars in 1992 to $406.8 million in 2002, more than a four-fold increase in property losses due to candle fires[2].

The societal costs associated with candle fires are significant. Over the period, 1999 to 2002, the average number of candle fire deaths per year has been about 130 (15). These deaths result in an estimated $650 million of economic losses on average per year, assuming a value of statistical life of five million dollars.[3] Additionally, there are about 1,500 injuries treated[4] annually which cost society about $123 million per year[5] in constant 2004 dollars (12, 15). Property losses due to candle fires sustained over this same period resulted in an estimated $345 million in costs per year, on average. Considering the combined costs of deaths, injuries, and property losses, the total costs to society per year of candle fires are estimated to be about $1.12 billion per year in constant 2004 dollars.

While the societal costs associated with candle fires are quite high, the adoption of candle fire safety regulations similar to those proposed by the petitioner may have a limited effect. For example, fires started by child play or acts of nature would not be addressed through the adoption of candle safety regulations. The Directorate for Epidemiology estimates that at least 18.5 percent of deaths, 25 percent of injuries and 14 percent of property losses fall into these types of categories[6](20). Moreover, fires associated with candles that currently meet voluntary safety standards would not be affected by the imposition of candle safety regulations. We do not know the proportion of candle fires started by non-conforming versus conforming candles and cannot estimate the number of fires due to non-conformance. Even if all candles conformed to mandatory safety standards, candle fires would not be eliminated. At best, only the fires that relate directly to those safety features that are incorporated into newly conforming candle production would be reduced. Fires that result from consumer acts that are unrelated to candle safety features are unlikely to be affected.

Although candle fires result in substantial societal costs every year, without additional information such as the conformance level of candles involved in fires and the likely

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[2] Conversion of property losses to constant 2004 dollars was based on the Producer Price Index for Construction Materials published by the U.S. Department of Labor, Bureau of Labor Statistics.

[3] Accepted range based on current economic literature is $3 million to $7 million. We use the midpoint, $5 million.

[4] Includes injuries noted and/or treated at the scene as well as treated at medical facilities.

[5] Based on average $82,605 per injury estimate times 1,487 injuries. See memorandum from William Zamula, EC, Costs for Non-fatal Residential Civilian Injuries Associated with Candle Fires, June 2, 2006.

[6] Societal costs of the remaining potential addressable candle fires are estimated to be $92 million in 2004 dollars (12).

effectiveness of the petitioner's requested regulatory action, further analysis of potential benefits and costs cannot be made at this time.

References:

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3. *Petroleum Wax Candles from China*, Investigation No. 731-TA-282 (Review), Determination and *Views of the Commission*, (USITC Publication No. 3226, August 1999), United States International Trade Commission.

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7. *Candle Industry Facts,* National Candle Association, March 2, 2000, www.candles.org

8. *10-K, SEC Filing for Blyth Industries, Inc.*, April 30, 1999.

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10. Donovan, Doug, "Odor of Magnitude", *Forbes*, February 7, 2000, p. 116.

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13. American Floral Industry Association web site, www.afia.net, January 26, 2005.

14. Wood Products Manufacturers Association web site, www.wpma.org, February 28, 2005.

15. Miller, David, *Candle Fire Loss Estimates*, CPSC Directorate for Epidemiology, March 20, 2006.

16. Letter from the International Trade Administration to All Interested Parties, dated January 18, 2006, re: Anticircumvention Inquiry on later-Developed merchandise: Petroleum Wax Candles from the People's Republic of China ("PRC").

17. Telephone conversation with Alex Villanueva, US International Trade Administration, May 15, 2006.

18. Alafave (Asociacion Latino Americano de Fabricantes De Velas) website, www.alafave.org, May 16 and May 19, 2006.

19. Fact Sheet, *Preliminary Determination in the Anticircumvention Inquiry Under the Later-Developed Merchandise Provision: Antidumping Duty Order on Petroleum Wax Candles from the People's Republic of China.*, Department of Commerce, International Trade Administration, May 24, 2006.

20. Chowdury Risana, et al, Revised 1999-2002 Residential Fire Loss Estimates, November 2005.

Appendix

Table 1: Domestic Factory Shipments of Candles, 1977-2002.

Year	Value of Shipments (in $ millions)	Value of Shipments (in $ 2004, millions)
1977	160.3	271.3 (e)
1982	257.6	390.5 (e)
1987	202.1	274.4
1992	366.2	403.3
1997	907.7	981.1
2002	975.3	998.0

Source: U.S. Bureau of the Census

Table 2: Landed Duty-Paid Value of Candle Imports[1], FAS[2] Value of Exports, 1989-2005.

Year	Value of Imports (millions)	Value of Imports in $2004 (millions)	Value of Exports ($ millions)	Value of Exports $ 2004 (millions)
1989	47.6	60	4.3	5.4
1990	46.5	55.8	6.7	8.0
1991	50.2	56.2	7.7	8.6
1992	61.2	67.5	9.9	10.9
1993	77.9	85.5	14.2	15.5
1994	108.9	118.6	21.7	23.7
1995	152.0	165.3	31.2	34.0
1996	213.1	231.6	49.9	54.2
1997	242.3	262.3	66.5	72.0
1998	363.9	388.5	68.6	73.2
1999	520.9	549.1	72.6	76.5
2000	543.7	562.9	68.5	70.9
2001	464.0	474.4	60.5	61.9
2002	444.1	455.1	59.7	61.2
2003	447.2	455.6	64.4	65.6
2004	460.7	460.7	68.0	68.0
2005	446.7	435.3[3]	75.9	73.9

[1]Landed duty paid value is the sum of the cost, insurance and freight (CIF) plus calculated import duties. [2]Free alongside ship (FAS) value is the value of exports at the U.S. port. [3]Subject to revision of 2005 Annual Producer Price Index for Candles.
Source: United States International Trade Commission

Table 3: Landed Duty-Paid Value of Candle Imports, by Country of Origin, 2005

Country of Origin	Value of Imports ($ Millions)
China	140.2
Canada	86.5
Taiwan	29.7
Vietnam	26.9
Hong Kong	25.4
Thailand	25.0
India	17.3
Israel	13.5
Korea	12.6
Guatemala	9.8
Poland	8.8
Mexico	7.4
France	6.5
Macao	5.2
Malaysia	4.7
El Salvador	4.2
Germany	3.3
Denmark	3.0
United Kingdom	3.0
Portugal	2.4
Philippines	1.7
Hungary	1.5
Italy	1.2
Czech Republic	1.0
All Other Countries[4]	5.9
Total	**446.7**

[4] *All other countries providing less than $1 million in candle imports.*
Source: United States International Trade Commission

Table 4: FAS Value of U.S. Candle Exports by Receiving Country, 2005

Country	Value of Exports (in $ millions)
Canada	44.0
U.K.	12.5
Mexico	8.3
Netherlands	4.6
Australia	1.3
All Other Countries[5]	5.1
Total	**75.9**[6]

[5] All other countries receiving less than $1 million in U.S. candle exports . [6] Does not add due to rounding
Source: United States International Trade Commission

Table 5: U.S. Consumption of Candles and Percent Provided by Imports, 1977-2002

	Candle Consumption $ 2004 (millions)	Percent of Consumption from Imports	Percent of Consumption from China
1977	291.7[6]	7.9	*
1982	432.8	11.1	*
1987	357.7	24.2	*
1992	440.7	13.0	4.6
1997	1171.1	22.4	7.0
2002	1391.4	32.7	13.2

Source: United States International Trade Commission, United States Bureau of the Census
*[6] Underestimated, does not include duties. * Not available.*

Table 6: Candle Fires and Associated Losses, 1990-2002

Year	Number of Fires	Deaths	Injuries	Property Loss in $ 2004 millions
1990	5,400	90	560	$82.6
1991	5,900	60	690	$103.7
1992	6,000	110	630	$75.5
1993	6,400	90	670	$104.6
1994	7,100	80	850	$110.1
1995	8,400	80	1010	$133.3
1996	10,100	130	1200	$195.7
1997	12,000	160	1290	$200.4
1998	12,800	170	1200	$199.4
1999	15,100	80	1480	$307.6
2000	15,300	130	1760	$351.2
2001	15,900	200	1410	$316.7
2002	14,800	130	1300	$406.8

Source: Miller, David, Division of Hazard Analysis, "Candle Fire Loss Estimates", CPSC Memorandum to Allyson Tenney, March 20, 2006

Tab D

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, DC 20207

Memorandum

Date: July 6, 2006

TO : Allyson Tenney,
Textile Technologist, Division of Fire Safety
Project Manager, Petition CP 04-1/HP 04 - 1

THROUGH: Hugh McLaurin,
Associate Executive Director, Directorate for Engineering
Mark E. Kumagai,
Director, Division of Mechanical Engineering

FROM : Thomas E. Caton,
General Engineer, Division of Mechanical Engineering

SUBJECT : ESME Contribution / Response; Review of Domestic and International Standards for Petition No. CP 04-1/HP 04-1

BACKGROUND:

Petition CP 04-1/HP 04-1 submitted by the National Association of State Fire Marshals (NASFM) requested the U. S. Consumer Product Safety Commission (CPSC) issue mandatory fire safety standards for candles, candle accessories including candle holders, and "that the CPSC adopt standards substantially based on the requirements contained in ASTM International (ASTM) *Provisional Specifications for Fire Safety for Candles (PS 59-02).*" The provisional ASTM PS59-02 was approved as *ASTM F 2417-04, Standard Specification for Fire Safety for Candles* on August 1, 2004. The NASFM says that mandatory fire safety standards are needed, in part, because of "the increase in residential fires caused by candles over the past decade." Petition HP 04-1 also requests that the CPSC issue a mandatory standard addressing miscibility and flash point requirements for gel candles.[1]

STANDARDS AND REGULATIONS RELATED TO FIRE SAFETY

United States

In the United States, the primary voluntary standards for candle-related products are published by ASTM International. These voluntary standards include requirements for allowable flame height, secondary ignition, end-of-useful life, candle stability, and minimum requirements for anneal soda-lime-silicate glass containers for use as candle containers.

[1] Notice, Consumer Product Safety Commission, Petition Requesting Mandatory Fire Safety Standards for Candles and Candle Accessories (Petition No. CP 04-1/HP 04-1), Federal Register, Vol. 69, No. 66, Tuesday April 6, 2004, p. 18059.

Additionally, various public and private organizations in the United States have regulations regarding candle usage. The regulations range from prohibiting candle usage to specifying the allowable usages, types and locations of use.

ASTM International

ASTM International has published standards for fire safety of candles and for soda-lime-silicate glass containers produced for use as candle containers. The candle standards have been predominantly developed for paraffin and stearin based candles with minimal standard development for gel candles. The various published standards include:

- *ASTM F 2326-04, Standard Test Method for Collection and Analysis of Visible Emissions from Candles as They Burn.* This test method uses a standard candle made from 54.4°C (130°F) melting temperature wax to provide a standardized method for comparing the relative smoking/burning behavior of various candle designs and formulations. It does not provide a standard level for rating visible smoke, but is intended to enable candle manufacturers to "optimize candle formulations in the reduction of visible smoke emissions." Briefly, the test uses a glass slide with a cover slip placed over a burning candle. The glass slip is coated with soot during the burn cycle. A burn cycle consists of 4 hours continuous burning, extinguishing and cooling, and repeating until a total burning of 16 hours or the total useful life if the candle's total burning periods are less than 16 hours. The average of at least four of the cover slip's darkest soot-coated portions are determined with an optical densitometer and reported as the densitometer reading divided by the hours of exposure for the tested candle.

- *ASTM F 2417-04, Standard Specification for Fire Safety for Candles* provides the following safety requirements:

    1. The maximum allowable *flame height* so that there is no excessive flame height, or secondary ignition for all candles is 76.2 mm (3.0 in.) throughout the burning period, except "Easter, Paschal, Sacramental, Altar, and Outdoor candles." A failure is any flame height above 76.2 mm (3.0 in.) anytime during a test period.
    2. The maximum allowable *flame height* for Easter, Paschal, Sacramental, and Altar candles is 95.3 mm (3.75 in.). A failure is any flame height above 95.3 mm (3.75 in.) anytime during a test period. This higher flame height is allowed because of the need for flame visibility "during services at places of worship."
    3. Any breakage of the container containing a *filled candle* (a candle filled and used within the same container) during a test is a failure.
    4. No *secondary ignition* is allowed for materials "that are integrated into the candles" besides the intended wick because of possible damage to the candles. All candles, except Easter, Paschal, and Sacramental, are to conform.
    5. *End of useful life* requirements specify that a candle must not impinge its supporting surface when the candle ceases to support combustion on its own

and cannot be relit. This requirement applies to votive, freestanding, filled, and tea light candles, and ensembles containing tea light candles. This requirement does not apply to tapers, birthday candles, and floating candles. The end of life testing requires that any container used to hold the candle does not break or crack.

6. *Stability* requirements are that a candle must not tip over when placed on a minimum 10° incline. Asymmetrical candles must not tip over when rotated while inclined a minimum 10° incline.
7. The stability requirements are for "freestanding candles that are not normally used without the aid of a holding device to keep them upright, filled candles (including tea lights), and ensembles. The stability requirements do not apply to candles that are specifically designed for use at places of worship, e.g., Easter, Paschal, Sacramental, and Altar candles.
8. *Gel Candles and Gel-containing Candles* are mentioned in the appendix for informational purposes, although it says that gel candles should be evaluated with an increased burn cycle of 8 hours instead of the 4 hour burn cycle used for paraffin wax candles.

- *ASTM F 2058-00, Standard Specification for Cautionary Labeling for Candles Burned in a Home* describes the wording, font size, appearance, placement, and size requirements for cautionary labels on candles sold or delivered to consumers. The label is to contain the words (bold face as indicated):

> "**WARNING: To Prevent Fire**, Burn candle within sight. Out of reach of children and pets. Never on or near anything that can catch fire."

- *ASTM F 2179-02, Standard Specification for Annealed Soda-Lime-Silicate Glass Containers that are Produced for Use as Candle Containers* is for evaluating the temper of glass containers that the producer knows are to be used for containing candles. The staff interprets the producer to include the candle maker who fills the container to make a contained candle. ASTM F 2179-02 references five ASTM documents: ASTM C 148, ASTM C 149, ASTM C 162, ASTM C 224, and ASTM F 1972.

- *ASTM C 148-95, Test Method for Polariscopic Examination of Glass Containers* specifies that conforming annealed, transparent, glass containers and containers that are to be further processed by reheating the container above the strain point and cooling to room temperature following the original manufacture are to have a maximum real temper number 4 as determined with a polariscope. ASTM C 148 includes an alternative, non-quantitative *Scratch Test* method for evaluating the temper of annealed transparent glass or non-transparent glass containers that do not allow sufficient light transmission for performing a polariscopic test. The scratch test is conducted with the glass container at room temperature by scratching the inside of the container with either a tungsten carbide scribe (Method A) or with fifty-grit emery paper/cloth (Method B). The scratched containers are then immersed in water at the same room temperature as

the glass container. After fifteen minutes, the scratched containers are removed, emptied, and examined for fracture extension from the scratches. A conforming container will not show any fracture extension.

- *ASTM C 149-86 (Reapproved 1995), Test Method for Thermal Shock Resistance of Glass Containers*, uses a 90°F (50°C) temperature differential for sudden cooling (thermal shock). Conforming glass containers are those that do not show cracks or fractures after being tested.

- *ASTM C 224, Practice for Sampling Glass Containers* describes the number of specimens to be sampled for testing based on whether the sample is from continuous production or from a lot.

- *ASTM C 162, Terminology of Glass and Glass Products* is a source of ASTM definitions about glass and glass products.

- *ASTM F 1972, Standard Guide for Terminology Relating to Candles and Associated Accessory Items* defines standard terms to allow "...manufacturers, consumers, retailers, and the scientific community to use a common language to define candles and associated accessory items."

The National Candle Association in their comments about Petition CP 04-1/HP 04-1 stated that ASTM sub-committee F 15.45 is drafting a new standard addressing flammability performance requirements for candle accessories and candleholders.

Federal Regulations and Military Specifications

The Code of Federal Regulations provides package labeling requirement exemptions but does not provide fire safety requirements. *16 CFR Part 501.7 Candles* says that "Tapered candles and irregularly shaped decorative candles which are either hand dipped or molded are exempt from the requirements of Sec. 500.7 of this chapter which specifies that the net quantity of contents shall be expressed in terms of count and measure (e.g., length and diameter), to the extent that diameter of such candles need not be expressed. The requirements of Sec. 500.7 of this chapter for these candles will be met by an expression of count and length or height in inches."[2]

16 CFR Part 500.7 Net quantity of contents, method of expression says: "The net quantity of contents shall be expressed in terms of weight or mass, measure, numerical count, or a combination of numerical count and weight or mass, size, or measure so as to give accurate information regarding the net quantity of contents thereof, and thereby facilitate value comparisons by consumers. The net quantity of contents statement shall be in terms of fluid measure if the commodity is liquid, or in terms of weight or mass if the commodity is solid, semi-solid, or viscous, or a mixture of solid and liquid. If there is a firmly established general

[2] 16 CFR §501.7 Candles, U. S. Government Printing Office via GPO Access, (1-1-03 Edition)

consumer usage and trade custom of declaring the contents of a liquid by weight or mass, or a solid, semi-solid, or viscous product by fluid measure, numerical count, and/or size, or (as in the case of lawn and plant care products) by cubic measure, it may be used, when such declaration provides sufficient information to facilitate value comparisons by consumers. The declaration may appear in more than one line of print or type."[3]

On April 7, 2003, the U. S. CPSC announced the Commission's unanimous vote "to ban the manufacture and sale of lead-cored wicks and candles with lead-cored wicks."[4] Under the authority of the Federal Hazardous Substances Act (*16 CFR Part 1500*), metal-cored candle wicks containing more than 0.06 percent lead by weight in the metal and candles with such wicks are hazardous substances and are banned.[5]

Other active federal/military candle-related standards are purchasing descriptors rather than safety standards. These standards are:

- The United States Army Standards *A-A-50192 for Alter Candles* and *A-A-50173 for Candle Burner.*
- United States Air Force Standard *Mil-C-25539B Illuminating Survival Candles with a High Melting Point.*
- United States Navy Standard *A-A-59255 for Technical Grade Paraffin Wax* [6] and was preceded by *VV-W-95C* for technical (Type II, Grade A) grade paraffin wax defined as a white solid at room temperature that has no odor or a slight hydrocarbon odor. [7]

Public, Educational, and Private Organization Regulations

A review of various organizations' regulations suggests that they may either forbid the use of candles or provide for limited use under specific conditions. These regulations specify how a candle is to be used but do not provide fire safety standards. For example:

1. Chase Court www.chasecourt.com, Baltimore, MD requires the use of all candles to be approved and comply with Baltimore City (MD) Fire Department regulations. "All candles must be enclosed, including a cover, with non-combustible materials. Exception: Votive-type candles are not required to have a cover if the top of the candle flame is at least three inches from the top of the enclosure. Candle enclosures must have a non-combustible stand or base."[8]
2. Alfred University www.alfred.edu Alfred, NY prohibits "the burning of candles in the residence halls" because the flames are a fire hazard. Unused candles with unburned

[3] 16 CFR §500.7 Net quantity of contents, method of expression, U. S. Government Printing Office via GPO Access
[4] "CPSC Bans Candles With Lead-Cored Wicks," Release #03-105, U. S. Consumer Product Safety Commission, April 7, 2003.
[5] 16 CFR 1500 Metal-Cored Candle Wicks Containing lead and Candles With Such Wicks: Notice of Proposed Rulemaking, Federal Register, Vol. 67, No. 79, Wednesday April 24, 2002.
[6] http://www.ihserc.com
[7] http:msds.ogden.disa.mil/msds/owa/web_msds.display?imsdsnr=181015
[8] http://www.chasecourt.com/2Rules-and-Regulations.html

wicks may be used for decoration. Candles with burnt wicks will be confiscated. Waivers may be allowed for religious activities in public places.[9]

3. University of Florida www.housing.ufl.edu prohibits the possession of candles and incense for any purpose in the residence halls. [10]
4. St. Mary's Chapel www.stmaryschapel.com County of Mecklenburg, TN permits the use of dripless candles with the restriction that the use is restricted to an elevated, altar area.[11]
5. Brokaw-McDougall House, City of Tallahassee, FL rental rules allow for only covered candles or candles in containers, i.e., votive candles or candles in completely contained in a holder, or in a hurricane globe.[12]

International Standards

There are various candle use and safety specifications published by various countries and firms that discuss candle use, candle safety, and candle composition.

Canada

Health Canada Regulations

The Canada Gazette reported that the proposed regulations for candle safety include:

- "maximum allowable lead content limit of 600 mg/kg for the cores of metallic candle wicks;"
- "continued prohibition on candles which may spontaneously re-light when extinguished" that was introduced in 1977; and
- restrictions on "...the advertisement, sale, or importation of which are or are likely to be a danger to the health or safety of the public." [13]

ES is aware of Canadian requirements to the *Hazardous Products Act Candle Regulations* that have not been finalized to date. Included is a proposed English version of the warning label to be placed on candles or their packaging as sold:

> "**WARNING:** To prevent fire, do not leave burning candles unattended. Do not place candles on or near anything that can catch fire. Keep burning candles out of reach of children."[14]

[9] http://www.alfred.edu/policies/index.cfm?fuseaction=viewPolicy&id=37
[10] http://www.housing.ufl.edu/housing/Reslife_Rules.htm
[11] http://www.stmaryschapel.com/stmaryrr.html
[12] http://talgov.com/citytlh/parks_recreation/cc/brokawrules.html
[13] Canada Gazette Part I dated November 22, 2003, pp. 3647 to 3660.
[14] http://canadagazette.gc.ca/partI/2003/20031122/html/regle6-e.html

Europe

Comité Europeen de Normalisation (CEN)

The general European standards organization is Comite Europeen de Normalisation (CEN). Technical Committees of *CEN BT/TF 164 Standard on Candle Fire Safety* are developing documents for soot indexing, safety specifications, and safety labels and warnings. Three documents presently for review and comment are: prEN 15426 Enquiry version of "Candles-Test method for measuring the soot index[15]," a draft version of "prEN 15494 Candles-Product safety labels and warnings[16]," and a draft standard version of "prEN 15493 Candles-Specification of fire safety[17]". The draft standards are submitted to CEN/CMC (CEN Management Centre) and then by the CEN/BT/TF 164 secretariat to CEN members for enquiry. From there the draft standard may become a European Standard. Until then, they are subject to change and are not European Standards.

prEN 15426 Enquiry version of "Candles-Test method for measuring the soot index says that its scope is the evaluation of the sooting behavior of all candles designated to be burned indoors, except for multi-wick candles. The draft version of "prEN 15494 Candles-Product safety labels and warnings" says that the scope is to specify "product safety labels and warnings for the burning of indoor candles." The draft standard version of "prEN 15493 Candles-Specification of fire safety" scope says that it specifies the "requirements and test methods for the fire safety of candles intended to be burned."

An internet search for *CEN BT/TF 164 Standard on Candle Fire Safety* identified RAL-GZ 0141 (August 1997) Candles Quality Control from the Quality Association for Candles, Federal Republic of Germany as the probable model for CEN BT/TF 164.

Federal Republic of Germany

Quality Association for Candles

RAL-GZ 041 General Quality Inspection Specifications for Candles (August 1997) published by The Quality Association for Candles, Stuttgart, Germany[18] includes:

1. *General Quality and Inspection Specifications for Candles;*
2. *Special Quality and Inspection Specifications for Household Candles, Tapers, Pillar and Other Candles; and*
3. *Special Quality and Inspection Specifications for Tea Lights;* and *Special Quality and Inspection Specifications for Sanctuary Candles.*

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[15] prEN 15426 Enquiry Version "Candles-Test method for measuring the soot index, CEN/BT/TF 164 Secretariat, 2005-10-11.

[16] Draft Standard prEN 15494 "Candles-Product safety labels and warnings," CEN/BT/BT 164 Secretariat, 2006-02-17.

[17] Draft Standard prEN 15493 "Candles-Specification of fire safety," CEN/BT/TF 164. 2006-02-17.

[18] Gütegemeinschaft Kerzen e.V., Kerzen Gütesicherung RAL-GZ 041 "General Quality and Inspection Specifications for Candles," August 1997.

RAL-GZ 041 provides for limited testing and markings requirements for various candle styles. The tests on the candles are to be conducted in a test room with a temperature range of 15°C to 25°C (59°F to 77°F). During multiple candles testing, each candle is to be separated from adjacent candles so that one burning candle does not affect an adjacent burning candle. Good performance is considered to be a burning candle with a gradually forming cup rim around its burn bowl, no drippings, and a burning wick with medium curvature having a bright, calm flame, and no visible release of soot. Although the tested candle is to not drip nor allow molten wax to run out of the burning candle's bowl, it is acceptable for a few drops of molten wax to run out of the candle's bowl when lighting or re-lighting the candle. The burning wick's acceptable medium shape is shown in the illustrations provided in the specification. A candle's acceptable burning cycle duration is determined by its diameter and weight. The number of test samples selected depends on the production output with the agreement of an "external inspection institute." These specifications include:

1. *Specification for Household Candles, Tapers, Pillar and Other Candles* – This specification says that the glowing wick of an extinguished candle up to 30 mm (1.18 in.) in diameter should stop releasing smoke within 15 seconds after being extinguished and it is considered poor performance if its afterglow exceeds 15 seconds. For candles larger than 30 mm (1.18 in.) in diameter, the glowing wick may continue glowing and releasing smoke for a longer period. The various burning cycles for the various candle sizes:

    - For tree, egg, doll, and other candles weighing up to 40 grams (1.4 oz avdp.) and up to 30 mm (1.18 in.) in diameter, there is one burning cycle (identified as cycle 1) consisting of sustained burning period to within 10 mm (0.39 in.) of the candle's base.

    - For candles weighing over 40 grams (1.4 oz avdp.) and up to 30 mm (1.18 in.) in diameter, there are two separate burning cycle tests. The first burning cycle (identified as cycle 2) consists of a sustained burning within 20 mm (0.8 in.) of the tested candle's base. The second burning cycle (identified as cycle 3) consists of burning another test candle for 2 hours, extinguishing it, relighting it after it has been extinguished for at least one hour, and burning it for 2 hours. It is not specifically stated, but staff assumes that this burning is to continue until the candle is burned to within 20 mm (0.8 in.) of its base.

    - For candles ranging from 31 to 70 mm (1.22 to 2.76 in.) in diameter, there are two burn cycles. These cycles are alternated daily. One cycle (identified as cycle 4) consists of sustained burning for 5 hours. The other cycle (identified as cycle 5) consists of a 2 hour burn, extinguishing the candle for at least one hour, relighting it, burning it for 2 hours, and repeating.

    - For candles with a diameter of over 70 mm (2.76 in.) in diameter, the burn cycle (identified as cycle 6) consists of a burning for 5 hours, extinguishing the candle for 1 hour, relighting it, and repeating.

2. *Special Quality and Inspection Specifications for Tea Lights* – This specification defines a tea light candle as being 17±2 mm in height x 38±1 mm in diameter, (0.66±0.08 x 1.49±0.04 in.) and at least 13 grams (0.46 oz) in weight. A tea light candle has a minimum burning time of 4 hours. After a tea light candle is extinguished, its wick should stop glowing or releasing a "trail of smoke" within 10 seconds.

RAL-GZ 041 (August 1997) identifies CEN BT/TF 164 as an item under discussion for various candles, except ball-, egg-, and special-shaped candles and candles with diameters greater than 70 mm (3.0 in.). These candles should not exceed a soot index of 1 during burning, except that "Visible smoking is expected from an hourly soot index of approximately 1, 2." The hourly soot index is calculated from the ratio of the light intensity from sooted glass plates compared to a cleaned glass plate per hours of sooting exposure from the test burning cycles.[19] ES considers these specification tests to be quality specifications and not for fire safety:

- *Once-off Test of Warming Capacity* - This test determines the ability of a tea light to maintain a previously warmed one liter of water contained in a covered beaker placed on a stand with an initial water temperature ranging from 80° to 90°C (176° to 194°F) at a minimum of 55°C (131°F) after 4 hours of test heating on the stand.
- *One-time Test of Warming Stand* – This test determines the duration and how completely a candle burns. The test is performed by burning a candle for 60 minutes, extinguishing the candle for at least 1 hour, relighting the candle, and repeating the previous steps until the candle self-extinguishes. A good test result is a minimum 4 hour burning time with a maximum remaining candle wax of less than 2 grams (0.07 oz) after the candle self-extinguishes.
- *The Burning Cycle in Routine Test* – This test involves recording of the sustained burning time, amount of smoke/soot released, and the amount of remaining candle wax when the burning tea light extinguishes.

3. *Special Quality and Inspection Specification for Sanctuary Candles RAL–GZ 041/3* – This quality specification provides for the selection of raw materials. It includes sanctuary and sacramental candles and considers oil candles and composition oil candles as a special group. It requires that there be only a slight amount of fuel remaining in the container when the candle self-extinguishes. The specification considers the candles' and the candle containers' appearance when the burning candle self-extinguishes.

Singapore

National Environmental Agency.

The Singapore Environmental Public Health Act (Chapter 95, Section 113), Environmental Public Health (Burning of Joss Sticks and Candles) Regulations essentially prohibit the burning of any candle that has a total height exceeding 500 mm (19.68 in.).

[19] www.kerzenquete.com

United Kingdom

British Standards Institute (BSI)

There is no BSI standard for candles.

British Ministry of Defence,

The British Ministry of Defence, *Defence Standard, Def Stan 62-3/Issue 3, Candles, Illuminating (Domestic and Arctic), dated 14 December 1994* says it was prepared because there is no British standard for candles that is acceptable to the British Ministry of Defence. This quality standard considers domestic candles made from paraffin wax and edible-survival candles (a.k.a. arctic candles) made from fit-for-human-consumption stearin.

Domestic candles are nominally 37 g (1.3 oz avdp.) in weight with an overall length of 135 mm (5.3 in) and a base diameter of 20 mm (0.8 in). The base diameter is not to exceed their shoulder diameter by more than 2.5 mm (0.1 in). Domestic candles are to burn for not less than 5.5 hours or more than 7.5 hours.

Arctic candles are nominally 88 g (3.1 oz avdp.) in weight with an overall length of 115 mm (4.5 in.) and a base diameter of 35 mm (1.4 in). The base diameter is not to exceed their shoulder diameter by more than 2.5 mm (0.1 in). Arctic candles are to burn for not less than 7.5 hours or more than 8.5 hours.

Both candles' wicks are to be made from "good quality cotton." These candles are evaluated for appearance, congealing points, penetration resistance (or hardness), storage, and burning. The burning test, which is a fire safety test, is conducted within a room temperature range of 18°C to 22°C (64.4°F to 71.6°F) with the candle burning "with an even flame, without excessive smoke or soot.[20]

Sweden

IKEA of Sweden AB

The candle guidelines and specifications used by IKEA of Sweden AB (IKEA) are for assuring the quality of the stearin and paraffin candles received from IKEA's suppliers. IKEA's tests are conducted within a room temperature range of 20° C to 25°C (68°F to 77°F). This is a smaller temperature range than the ASTM International specifications. IKEA's suppliers are required to perform these tests and to be able to provide the test reports within 24 hours of a request from IKEA.

[20] DEF STAN 62-3, Candles, Illuminating (Domestic and Arctic), British Ministry of Defence Standard, 14 December 1994.

Paraffin and Stearin Candles Testing Instruction TI-0149 2000-06-30 Edition 1 en

IKEA's *Testing Instruction, Paraffin and Stearin Candles TI-0149 2000-06-30, Edition 1 en* provides descriptions of test methods for most candle types, except for some exempt candles that are identified in the prefix of the individual tests. IKEA specifications differ from the ASTM International specifications in various ways. This IKEA instruction allows a draft air velocity of 0.05 m/s (0.16 ft/s) against the burning candle compared to the ASTM specification that says drafts shall be minimized. IKEA specifies a 70 mm (2.76 in.) distance between candles being tested versus the 20 mm (0.8 in.) specified by ASTM. IKEA specifies the use of a candle snuffer to put a burning candle out while ASTM says manual extinguishing. The IKEA instructions provide for:

- A 10 mm (0.39 in.) candle wick length before igniting;

- Four burning cycles, depending on the diameter of the candle being evaluated:
    a) Burning cycle A is for candles with diameters less than or equal to 30 mm (1.2 in) and consists of a 3 hour burning period, a 1 hour pause (extinguished by smothering), and repeating until a 30 mm (1.2 in.) length of candle remains;
    b) Burning cycle B is for candles with a diameter greater than 30 mm and less than or equal to 60 mm (2.36 in.) and consists of a 3 hour burning period, a 2 hour pause (extinguished by smothering), and repeating until a 20 mm (0.8 in.) length of candle remains;
    c) Burning cycle C is for candles with a diameter greater than 60 mm (2.36 in.) and consists of a 5 hour burning period, a 2 hour pause (extinguished by smothering) and repeating until 20 mm (0.8 in.) length of candle remains; and
    d) Burning cycle D is for Tea Lights and consists of a sustained burning period until the tea light candle self-extinguishes.
- *Flame Height* measurements made at 10 minutes and 60 minutes within a burning period. Unlike ASTM F 2417-04 which allows a maximum flame height of 76.2 mm (3.0 in.) or 95.3 mm (3.75 in.) depending on the candle type. IKEA's instructions allow flame heights of: 25 to 40 mm (0.8 to 1.57 in.) for paraffin candles, 30 to 45 mm (1.2 to 1.77 in.) for stearin candles, and 15 to 20 mm (0.59 to 0.8 in.) for tea lights.
- An allowable *Afterglow* that varies depending on candle composition of 10 seconds for paraffin candles and 5 seconds for stearin candles.
- A *Running Test* that evaluates the molten wax running (dripping) from a burning candle by initially burning a candle for 30 minutes in a draft-free location. Then, the candle is placed on a revolving plate and exposed to a 0.2 to 0.25 m/s (0.66 to 0.82 ft/s) draft for 90 minutes. An acceptable test result is no molten wax running or molten wax remaining in the candle's burning cup. An unacceptable test result is molten wax running out of the burning cup.
- A *Sooting Test* to determine the average soot generated by a burning candle's exhaust by exposing five filter papers for 30 minutes each to the candle's exhaust. The amount of

sooting is determined by comparing the soot on the exposed filter papers with the grey scale of a Bacharach oil burner smoke scale.

IKEA instructions differ from ASTM's standards because IKEA's instructions include candle composition and quality requirements for the materials used to make the candle to "prevent defective candles from being delivered to IKEA..." [21]

Candle Test Specification AA-25718-2, IOS-T-0019, 2000-05-03

IKEA Candle Test Specification AA-25718-2, IOS-T-0019, 2000-05-03 provides a "description of the requirements and tests to be carried out on stearin and paraffin candles by the IKEA supplier." This specification includes a Burning Test, a Running (Dripping) Test, and a Sooting Test.[22]

- The *Burning Test* is conducted in a draft-free room. When multiple candles are tested together, they are to be separated by a distance of 7 cm (2.76 in.). There are four burning cycles whose selection depends on the size of the candle. Each burning period within a cycle is to end by smothering the flame. A burning cycle is complete when a 30 mm (1.2 in.) length of candle remains; except tea lights that are to be burned until self-extinguishment. Burning cycles depend on the diameter of the candle. The burning cycle period for candles with diameters up to 30 mm (1.2 in.) is a 3 hour burning period, a minimum of 1 hour extinguished, and repeating. For candles with diameters ranging from 30 mm (1.2 in.) to 60 mm (2.36 in.), the burning cycle period is 3 hours burning, a minimum of 2 hours extinguished, and repeating. For candles with a diameter greater than 60 mm (2.36 in.), the burning cycle period is 5 hours burning, a minimum 2 hour extinguished, and repeating. The burning cycle period for tea lights is to burn the tea light until it self-extinguishes. During a burning cycle, the candle is to burn with a "bright, calm flame without sooting." The burning wick is to be centered with its outer part in a "ten past twelve" position. The flame height is to be measured 30 minutes after lighting. For paraffin candles, the allowable flame height ranges from 25 to 40 mm (0.98 to 1.57 in.). For stearin candles, the allowable flame height ranges from 30 to 45 mm (1.2 to 1.77 in.). For tea lights, the allowable flame height ranges 15 to 20 mm (0.59 to 0.8 in.). For the above tests, the wick afterglow is recorded when the candle is smothered for the last time. An afterglow of 5 seconds or less is allowed for stearin candles and a maximum of 10 seconds is allowed for paraffin candles.

- The *Running Test* evaluates the dripping of candles with diameters less than or equal to 30 mm (1.2 in.). During testing, the candles are to be separated from each other by a distance of 15 cm (5.9 in.) from edge to edge. They are to be

[21] TI-0149, Testing Instruction Paraffin and Stearin Candles-Candle Testing, Edition 1 en, IKEA of Sweden AB, June 30, 2000.
[22] AA-25718-2, IOS-T-0019, Specification-Candle Test, IKEA of Sweden AB, May 3, 2000.

burned in a draft of 0.20 to 0.25 m/s (0.66 to 0.82 ft/s) for 1.5 hours. The only acceptable running (dripping) is what remains on the candle.

- The *Sooting Test* evaluates the amount of soot generated by a burning candle that is exposed to a draft of 30 puffs of air per second in an approved chamber. The sooting test is to be conducted five times with each filter paper being exposed for 30 minutes to the exhaust from a burning candle passing through each filter paper. The exposed filter papers are to be evaluated by comparing them to the gray scale of a specified Bacharach Oil Burner Smoke scale. An acceptable test value is where the average of five tests results in a value ranging from 0 to 4.4 on the specified gray scale. Candles with diameters of less than 30 mm (1.2 in.) are to be burned for 30 minutes before testing. Candles with diameters greater than 30 mm (1.2 in.) are to be burned for 2 hours before testing.

Candleholders and Candlesticks Requirements AA-32633-1, IOS-PRS-0006, 1999-04-29

IKEA *Candleholder and Candlestick Requirements AA-32633-1* considers stability, sizes, and tolerances for all free-standing devices that candles are placed into. The standard candle stability testing requirements are that all candlesticks and candleholders "should be able to stand in a 15° slope..." and "...also stand without wobbling on a flat horizontal surface." The requirements allow for candles that can be used in different positions to have different stabilities depending on their position and slope; these candles are to conform to these requirements in the least stable direction.[23]

Finland

Finnish Consumer Agency & Ombudsman Agency

The Finnish Consumer Agency has published: Guidelines on Safety Requirements for Candle Products and Related Indications, Publication Series 6/2001, 15 October 2001 and Precision to the Surveillance Practice Concerning Candle Products, Dno. 2003/52/3478, 14 August 2003 that provides requirements for indoor-use candles, outdoor-use candles, mosquito-repellant candles, candle-gels, and candle rings that are sold to consumers. The requirements that apply include:

- "Candles may not contain flammable parts such as dried flowers, bits of fruit etc,"
- A prohibition on the use of lead wire or polyvinyl chloride in the wick.
- "Candle materials must not sputter,"
- Consumer touchable parts of an indoor candle, including the base or supporting surfaces, shall not reach a temperature that might burn skin (60°C/140°F) or damage the materials that the candle is liable to come into contact,

[23] AA-32633-1, IOS-PRS-0006, Specification-Candleholders and Candlesticks, IKEA of Sweden AB, April 29, 1999.

- A properly used candle should not flare-up; During a simulated flare up, an indoor candle container's temperature should not exceed 180°C (356°F),
- The maximum allowable temperature of a tea light's bottom and sides is about 70°C (158°F) (although during a flare-up, maximum temperatures have been measured as high as 300°C(572°F)),
- the surface of an outdoor candle in a metal container should not exceed 450°C (842°F) and the flame should not be higher than normal during a flare-up,
- "Do not leave a burning candle unattended" on the label,
- "Extinguish the candle by smothering" on the label,
- Multiple tea lights should be burned at least 3 cm (1.18 in.) apart from each other,
- "An oil lantern is defined as any candle product which has a wick and an oil reserve,"
- Mosquito repellent candles are classified as pesticides and the Pesticides Board does not inspect their fire safety,
- Candlesticks must be designed so they do not turn over easily, are non-flammable, and do "not pose a risk if the candle burns down completely,"
- Candle rings should be made from non-flammable materials. A warning to not burn a candle completely should be supplied if its candle ring is made from a flammable material,
- Candle gels and waxes for consumer use should be provided with use safety instructions and warnings as indicated in these guidelines,
- Candle product coverings "shall not maintain a fire," and
- Expressions that could mislead a consumer's opinion of candle safety, such as "This candle is fire-proof," shall not be used.[24] [25]

CONCLUSION:

ES Staff reviewed standards from ASTM International, IKEA of Sweden AB, Canada, Finnish Consumer Agency & Ombudsman Agency; the Federal Republic of Germany Quality Association for Candles, CEN (Comite Europeen de Normalisation), Singapore, and United Kingdom. Each standard has different degrees of comprehensiveness in its test methods and specifications. The various national, international, and retailer standards collectively consider the candle burning behavior of the candle and wick, flame height, sooting, burning duration, composition and use of single wick candles, but not multiple wick candles.

The ASTM standards provide flame height, relative smoking/burning, secondary ignition, end of useful life, and stability requirements for various wax candles. ASTM standards for containers produced for containing candles are presently limited to annealed soda-lime-silicate glass containers with none for other materials, such as ceramics or metal containers that are used as candle containers.

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[24] Kuluttajavirasto/Consumer Agency & Ombudsman, Consumer Agency's Guidelines on Safety Requirements for Candle Products and Related Indications, Publication Series 6/2001, Dno. 2001/52/1930, 15 October 2001.
[25] Kuluttajavirasto/Consumer Agency & Ombudsman, Precision to the surveillance practice concerning candle products, Dno. 2003/52/3478, 14 August 2003

ASTM has published several candle-related standards and is developing other standards. IKEA of Sweden AB's specifications provide requirements for candle use, burning cycles, flame height, afterglow, sooting, running (dripping) requirements and purchasing requirements for the materials used for candle making and requirements for candleholders and candlesticks. There are differences between ASTM and IKEA standards. For example, ASTM standards require a maximum flame height of 76.2 mm (3.0 in.) for indoor candles except for 95.3 mm (3.75 in.) for Easter, Paschal, sacramental, and altar candle flame heights, while IKEA provides for three flame height ranges from 15 to 20 mm (0.59 in. to 0.8 in.) for tea lights to 25 to 40 mm (0.98 to 1.57 in.) for paraffin candles to 30 to 45 mm (1.2 to 1.77 in.) for stearin candles. Other standards do not provide flame height requirements.

Further, ASTM standards include sooting requirements through a relative sooting test while IKEA provides a sooting test that refernces to a published smoke scale. Canada's regulations uniquely prohibit candles that spontaneously re-ignite after being extinguished. Finland provides consumers with instructions for candle use and acceptable temperatures for various containers used to contain a burning candle. Germany's regulations appear to be used as the model for the CEN fire safety standards. These standards consider sooting, burning behavior, labeling, and selection of candle making materials. Singapore's act appears to be most concerned about maximum candle height. United Kingdom's standards are published by the British Ministry of Defence and provide dimensional, burning, and burning duration requirements.

ES staff believes that the ASTM and IKEA standards are the most comprehensive standards that address candle fire safety. However, each national and international standard could provide source material for a more comprehensive standard than currently exists.

Tab E

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, DC 20207

Memorandum

May 22, 2006

TO : Allyson Tenney, Project Manager, Directorate for Engineering

THROUGH: John Gibson Mullan, Director, Office of Compliance JGM

FROM : Tanya Topka, Compliance Officer, Office of Compliance TLT

SUBJECT : Candle Recall History

I. Introduction

In 2004, the National Association of State Fire Marshalls (NASFM) petitioned the CPSC to adopt and enforce a mandatory standard addressing candle products fire safety. NASFM asked that the mandatory standard be based upon the requirements contained within the voluntary standard, ASTM Provisional Specifications for Fire Safety for Candles. The petitioners requested that the mandatory standard apply to all candle products sold in the United States.

II. Compliance's Role and Actions

The Office of Compliance is responsible for identifying hazards in consumer products and conducting recalls of potentially hazardous products. Compliance staff works with firms to negotiate joint recalls using our resources to help firms organize corrective action plans. Compliance also conducts Fast Track recalls where no formal hazard determination is made to quickly get products off the market and recalled. Fast Track recalls are initiated by the firms and negotiated with the Office of Compliance. Compliance works with U.S. Customs and Border Protection ("Customs") offices to obtain products for testing before they enter the U.S. market. Customs will notify our network of field investigators about a potential problem they see in a particular shipment. Samples are then obtained and sent to Compliance for testing and hazard determination.

Compliance has played an active role with the candle industry. From 1993 until May 18, 2006, there have been 118 candle and candle accessory recalls. These 118 recalls have included 12,748,627 products that could have potentially led to fires or burns to consumers. Of the 118 candle related recalls, 81 were imported products with 16 being made in the United States. There are 21 recalls where the country of origin is unknown as that information was not captured for reports prior to 1999. Of the 81 imported candles recalled between 1993 and May 2006, 56 of those recalls involved products from China. China is the country of origin with the most candle product recalls in this time period. Other countries of origin for recalled candles products are: Estonia, Hong Kong, Philippines, Macau, Taiwan, India, Spain, Italy, Guatemala, and Japan.

There were 55 recalls involving candle holders, which account for the largest portion of the 118 recalled candle products. Holders either ignited or allowed too much heat to build up, causing flashovers. The second most common reason for a recall was due to irregular burning, including both high flame height and flare ups/flashovers. The third leading cause of a recall was items in the candle wax causing burning problems, including too much fragrance or color and embedded items that ignite.

There were 421 reported incidents and 54 reported injuries from the 118 recalled products. Injuries mainly consisted of minor and moderate burns to hands and lacerations from shattered glass. There were no reported deaths from any of the recalls conducted between 1993 and May 2006. Reported incidents ranged from minor property damage to a home fire that was a total loss. Most property damage reported in this data mentioned counters, furniture, or drapes that were destroyed.

Tab F

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, DC 20207

Memorandum

Date: July 5, 2006

TO : Allyson Tenney,
Project Manager, Candle Petition

THROUGH: Hugh McLaurin, Associate Executive Director for
Engineering Sciences
Robert B. Ochsman, Ph.D., Director,
Divsion of Human Factors

FROM : Sharon R. White,
Division of Human Factors

SUBJECT : Response to Comments on Petition CP 04-1/HP 04-1, Petition for Fire Safety Standards for Candles and Candle Accessories

The Consumer Product Safety Commission was petitioned to adopt and enforce a standard addressing fire safety for candle products. The petition was received February 10, 2004 and docketed as a petition on March 10, 2004. The FR notice with the request for comments was published April 6, 2004. This memorandum responds to Human Factors issues raised by two commenters to Petition HP 04-1. Staff responses are based on an analysis of 179 Indepth Investigations (IDIs). The IDIs reviewed are not a random sample of candle incidents and should not be considered necessarily representative of candle incidents as a whole. However, the IDI's reviewed do provide insight into some candle fire scenarios.

The incidents occurred between the period January 1, 2003 to January 6, 2005. The incident scenarios identified from the IDIs are as follows: flareups, explosions, holder incidents, extinguishing incidents, container breaking/shattering, tipovers, reignition incidents, too close to combustibles, within reach of children and pets, and reaching over candle and clothing/other igniting. The product types include filled candles in a jar, tealights in tin containers, pillar or column-type candles, votives and gel candles.

Comment

The commenter designated as CH04-4-1 believes that "it is consumer misuse and inattention to basic fire safety precautions that leads to candle fires." The commenter labeled consumers leaving lit candles unattended, placing candles too close to combustibles, or placing them within the reach of children and pets as misuse. The commenter believes that "only the education of consumers as to the proper burning of candles and observance of candle fire safety rules can have an impact in reducing these candle fires."

Staff Response

Staff believes that consumer misuse and inattention to basic fire safety precautions are factors that play a role in candle fires and that such misuse and inattention are foreseeable. Of the 179 IDIs that staff reviewed, familiarity and/or experience with the product was reported in 63 percent (111) of the IDIs. Therefore, most candle users are familiar with and experienced in their use. The more familiar users are with these products, the less likely they perceive a hazard associated with them. And, as people frequently use these products without having had a prior incident (43 of 111 incidents), they quite naturally become even less concerned about their dangers and more confident in their use. Therefore, this may explain why some users felt comfortable leaving their candle unattended (101/179 incidents). Further, of the 111 incidents where users reported having experience with the product, users in 20 of the cases reported that they always engaged in safe use practices. For example, in seven cases, the respondents indicated that they only leave the candle burning unattended for short periods of time or that they check on the candle periodically. In four cases, respondents reported that they keep the wick properly trimmed. In two cases, the respondents reported that they do not place candles near combustibles. Thus, users may mistakenly assume that as long as they engage in these practices that nothing will happen if they leave the lit candle unattended.

Characteristics of products in general influence the way a product is used, and in this case, are likely a factor in leaving lit candles unattended. For example, the thickness and sturdiness of the jar may contribute to users leaving candles unattended. Two cases are illustrative. In one case, the user selected the model of candle because it had an extra thick glass jar that looked safer than other candle models on the market. In the other case, the user stated that she liked the container because it was heavy and seemed sturdy. Also, during a personal conversation with an experienced candle user, the user stated that she feels safer leaving a candle unattended when the candle is contained in a thick jar.

Additionally, all of the candles, from the very small tealights to the large pillar-type candles, have long burning times. It is, therefore, foreseeable that if users believe their candle has a long time to burn, they may leave their candle to answer a phone or a door, or tend to cooking. Additionally, if the candle appears to be burning properly, it may reinforce the notion that it is safe to leave a lit candle.

Further, jar candles or candles placed to burn inside containers may give the impression that the candle is safe since the flame appears contained. Therefore, some consumers may feel comfortable leaving the candle unattended.

As for placing a candle too close to combustibles (23 incidents), people generally lack knowledge about combustible materials and/or conditions that can lead to a fire (Woodson, Tillman, and Tillman, 1992).[1] Therefore, they may inadvertently initiate a situation that can lead to hazardous conditions. A candle left unattended in 21 of the 23 cases exacerbated the problem

[1] Woodson, W.; Tillman, B.; and Tillman, P. (1992). *Human Factors Design Handbook.* New York: McGraw Hill.

since users were not present to deal with the situation. In the remaining two cases, the IDIs reported that illegal drugs played a role in one and alcohol a role in another.

Regarding the comment about children (14 incidents) and pets (1 definite and 3 possible incidents), staff believes as mentioned earlier that most candle users are quite experienced in using the product. Therefore, they become less concerned about its dangers and more confident in its use. Therefore, users may proceed with little conscious thought and inadvertently place their candle in a location that is accessible to a child or a pet.

CPSC staff believes that the success of an information and education campaign (I & E), in general, depends on a number of variables including the user's familiarity and/or experience with the product. For example, an I & E campaign is likely to be more effective if the target audience has less experience with a product than if they had more experience. Since most candle users are very experienced in the use of the product, and therefore, have previously held beliefs about the product, an I & E campaign may not be very effective in this particular instance.

The CPSC regularly disseminates press releases to consumers and features stories on candle safety, warning consumers to exercise caution when using candles and how to do so. The commenter's own organization regularly disseminates educational material to consumers through retailers, fire, safety, and consumer organizations around the country, and industry groups. Government offices such as The Department of State of New York State provides educational materials as well. Among these groups, the message promoted on candle safety is consistent. They tell consumers, among other information, to keep candles away from children and pets, never leave burning candles unattended, and keep combustible materials away from candles. Yet, based on injury estimates provided by CPSC staff, candle fires are on the rise (Miller, D. 2006).[2]

Comment

The commenter designated as CH04-4-2 who supports the petition stated that, "while consumer behavior is a factor in most candle fires, ... product problems have often played a role ..."

Staff Response.

Staff agrees. Of the 179 IDIs that CPSC staff has reviewed, product problems have played a role in 74 percent (133 IDIs) of the cases.

[2] Miller, D. (2006). *Candle Fire Loss Estimates*. U..S. Consumer Product Safety Commission: Bethesda, Md.