



***Preliminary Report on
In-Depth Investigations of
Incidents Involving Candles***

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CPSA 6 (b)(1) Cleared

X No Mfrs/Private Labels on
Products Identified

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Introduction

Overall, residential fires have been decreasing in recent years. However, residential fires in which a candle was the source of the heat ignition have been increasing. In 1998 there were an estimated 12,800 candle-associated fires that resulted in 170 deaths and 1,200 injuries.¹ The Consumer Product Safety Commission (CPSC) staff has begun working with ASTM International to develop a voluntary standard for candles. As part of this effort, CPSC staff conducted a study of candle-associated incidents.

Candle-associated incidents of which CPSC staff became aware were assigned for follow-up, in-depth investigation (IDI). Assignments were based on reports from all available sources indicating that a candle was involved in a fire or a situation that might have caused a fire. Sources included fire department reports, newspaper clips, and consumer complaints. All available information was collected regarding the candle (s) and any other product (s) involved, its characteristics, and how it was being used. Where possible the candle, any remaining part of it, or an identical candle was collected as a sample. Since the incidents investigated were not a statistically derived sample of candle-associated fires, the data collected are reported only in a descriptive manner, since no inferences can be made concerning all candle-associated fires.

Results

In all, 593 IDIs were assigned spanning the time period from January 1998 through September 2001. The summary description of every IDI was read by one analyst and the IDI was categorized as having one or more of the following hazard patterns: candle flared up; candle exploded; wax was low; container shattered; container caught on fire; candle reignited; candle tipped over; candle tipped over (attributed to pet involvement); possible candle defect; child play; candle unattended, including fell asleep, left the room, and left the residence; and other.

This report summarizes information from 112 IDIs in categories where the hazard was considered to be potentially addressable by a voluntary standard requirement. This included the following categories: candle flared up, candle exploded, wax was low, container shattered, container caught on fire, candle reignited, and candle tipped over (not involving a pet). These categories represent an initial identification of scenarios of interest. Other scenarios might be identified on further analysis. IDIs from each category are discussed separately.

Candle Flared Up

There were 30 cases where the candle was described as “flaring up”. A summary of each of these cases is presented in Appendix 1. Of these 30 cases, 12 involved gel candles and 18 involved candles made of wax.

¹Mah, Jean. 1998 Residential Fire Loss Estimates. Division of Hazard Analysis, Directorate for Epidemiology, U.S. Consumer Product Safety Commission, Washington, D.C. 20207

Six of the gel candle incidents were due to two particular gel candles (cases 4,5,6, & 9,10,11 in Appendix 1). The candle involved in cases 4, 5 and 6 was recalled (CPSC Press Release #97-005) and the manufacturer of the candles involved in cases 9, 10 and 11 is no longer in business and its purchaser ceased manufacturing gel candles in 1998². While this addresses the immediate hazard of these candles, it does not prevent future manufacture of similar candles. CPSC has one sample of each of these candles (samples 01-830-4393/1,2 and 01-840-7445) which could be used for chemical or other analyses to attempt to determine the hazardous components of these candles.

Of the flare up cases involving wax candles, four involved tea light candles. All four were in holders, three holders were ceramic, one was glass.

Additionally, wax candle flare-ups may have involved flammable coatings and paints on the candles themselves or their containers (cases 21, 27, and 28) or flammable containers (dried coconut shells, case 20) catching fire. In some cases (16 and 21) low wax may have contributed to the coating catching fire.

Flare up case 19 involved a small (1.5 inches in height) filled candle in a glass container slightly larger than the wax. The wax immediately turned liquid when the candle was lit. A "safe use tip" cited in IDI 010823HWE5008 stated "if the remainder of your candle is liquefied when burning, it's time to stop burning".

Candle Exploded

Five incidents where the candle was described as having exploded are summarized in Appendix 2. One of these cases (5) was a gel candle that exploded after having burned for two hours the first time it was used. First time use was also cited in a number of gel candle flare-ups (see Appendix 1).

Case 3 involved a small (2 inches in diameter by 2.75 inches in height) filled candle in a glass container that exploded carrying wax with it. A letter from the retailer included in the IDI in case 3 states that "the candle container met with the UL guidelines for temperature".

Case 6 involved a 3-wick candle with low wax that exploded. A second candle did the same thing when tested by the consumer. The explosion appeared to be related to low wax. The consumer's comment was "the wax had gotten low, but it seems to me, that the fire would have gone out had it been that low."

Case 4 may also have involved low wax, or the flame becoming too close to the holder. The consumer appeared to be using a refill candle in its plastic packaging on a glass ashtray rather than placing the candle in its intended glass holder. As the candle burned down, it caused the ashtray to shatter.

The remaining case (2) contained very little detail.

² See letter from Sula McAuley to Ann Montalbano in IDI 991220HCC2131.

Wax Low

In the five cases summarized in Appendix 3, low levels of wax were cited as contributing factors in fires or explosions of candles. In two of these cases the candle appears to have simply burned all the way down and ignited its holder and/or the surrounding materials: in case 3, a house fire where candles were being used for light, some candles found at the scene were very short and in case 5 a candle burned down, igniting a wooden holder and then an entertainment center.

In the three other cases, either the candle or its container may have exploded when the candle burned all or most of the way down. Two cases were witnessed to have exploded when the wax in the container got low (case 2 and a previous incident in case 4). Both had glass containers. In the other case (case 6), the first items ignited were 1.5 or more feet from the burning candles, so the user believes the candles must have exploded or otherwise spattered wax. She witnessed only the wicks remaining in the holders where the candles had been burning.

Container Shattered

The incidents in which a candle container shattered are summarized in Appendix 4. All of the shattered containers were glass.

Of the eight cases that involved a gel candle, three were previously summarized under the flare-up cases (Appendix 1). Of the remaining 5 gel cases, three (cases 2, 3,4) involved the recalled candle identified in the above discussion of gel flare up cases and one (case 5) involved the out-of-business-manufacturer discussed above. The remaining case (7) provided no new hazard information.

Of the eight wax candle incidents, four (cases 11,13,14, and 17) involved low levels of wax. In case 11, the glass container for a 15.5 oz candle broke and hot wax spilled, igniting clothing and a dresser. A letter from the manufacturer states that the candle had probably burned down too far. In case 13, a three-wick aromatherapy candle was lit when its wax was low and its glass container shattered. In case 14, the fire department report stated that the candle probably burned low, heated the glass of the container, causing it to crack, spilling liquid wax that ignited combustibles. In case 17, the holder burned when the candle wax was low.

Container Fire

The most common scenario in the container fire cases (Appendix 5) involved a flammable container. Cases included possible flammable paint on the interior of a metal holder (case 9), some kind of flammable plastic holder which fire department personnel were able to easily ignite (case 10), and the flammable plastic head of an angel candle holder (case 8, recalled, press release #99-126). In one case (7), the porous container ignited as the last of the wax burned. Another case (4) appears to have been due to a combination of too little wax and a flammable container: after burning about 15 minutes, all the wax in the container had melted; the container itself caught fire at 30 minutes.

The other cases provided no new hazard information.

Reignition

The reignition cases (Appendix 6) highlight the issue of heat storage in candles. Case 9 involved a candle that reignited after having been burned for 3-4 hours and then extinguished with a snuffer. The manufacturer's comments express doubt that the candle involved in the incident was theirs, based on the size of the candle and the location where it was purchased. However, a smaller similar candle was theirs. They note that the caution label on their candle states "Burn candle for no more than 2 or 3 hours at a time." The manufacturer's comments continue "This is noted to prevent two situations, first that the candle does not melt over and second that the candle does not overheat. In the second case, this prevents re-ignition of the candle." These comments acknowledge that reignition is a potential hazard when a candle is extinguished after having burned for a long period of time.

There were additional cases where heat storage within the candle or the candle wax may have contributed to a fire. In case 3, wax splattered onto a kitchen counter when a tea light was blown out as the consumer left her house. She returned one hour later to find the house on fire. In case 4, the consumer blew out three candles that had been burning on the rim of her bathtub before going to bed. Three hours later she smelled a melting smell and discovered the tub was on fire. In case 8, a consumer thought she had blown out the five candles in a styrofoam holder inside a wreath before she left home. She returned to find the home destroyed by fire. In case 2, a blown out candle being used during a power outage may have fallen from its holder and ignited bedding. In case 10, the consumer blew out the candle and went to take a shower. Curtains may have come into contact with the candle.

Flammable inclusions in the candle may add another hazard factor in some cases. In case 9, cited above, the candle included vanilla beans that may have ignited. In case 5, cinnamon sticks surrounded the candle and may have ignited after the candle wax flickered out.

Of course, an alternative explanation in all these cases is that the involved candle had not actually been extinguished. However, given that "overheating" of candles is a known possibility and is the reason for suggested limitations on burning time, as stated in the manufacturer's letter in case 9, it cannot be totally discounted in these cases.

Tipovers, not attributed to a pet

Tipover cases are summarized in Appendix 7. Four of these cases involved only a candle, as opposed to a candle in a holder or a candle on a shelf, etc. In case 34, the consumer nodded off after lighting a candle on a table next to a mattress that had been placed on the floor and used as a bed. After burning for more than two hours, the candle rolled off the table, and ignited the bedding on the floor. In case 35, a consumer lit a candle and placed it on a spiral stairway to a loft at about 8:00 p.m. She subsequently fell asleep on a sofa under the stairway. She was awakened by a smoke detector at approximately 4:00 a.m. The candle had fallen on the sofa and ignited it. In case 36, a candle fell from a windowsill onto newspapers, igniting them.

In case 37, a filled candle in a 3-inch round glass container fell off an organizer (apparently some type of shelving unit) and rolled under the bed, igniting the bedding. The candle had been burning unattended for about 1.5 hours.

It is difficult to discern an addressable hazard pattern in these cases. Based on their burn times, cases 34 and 35 may involve the "melt over" discussed above under the section on reignition. There was no information on the candle involved in case 36. The rounded shape of the candle in case 37 is inherently less stable than some other shapes, and might present a hazard if the candle burned unevenly or otherwise became unbalanced.

There were 10 cases investigated where the tipover involved a candle in some type of holder. In case 2, a 3- to 4-inch candle in a glass-size cup holder either dropped or tipped over onto a tablecloth covering an endtable. In case 4, an unattended taper candle in a wooden candlestick leaned or tipped over, and ignited a blanket hung as a wall in a basement bedroom. In case 5, a pillar candle in a metal candleholder left unattended on a dresser fell over and ignited bedding. In case 6, 12-inch pillar candles in metal holders on a bedroom dresser may have been knocked over by a child jumping on a bed against a common wall in an adjacent room. In case 8, a 3-inch by 8-inch pillar candle, lit for only a few minutes, fell from a wrought-iron-type metal holder into a space between a TV console and a sofa, igniting synthetic carpeting. In case 26, a votive candle set in a holder too small for it and left unattended on a table in a dorm room fell off the table into a laundry basket, igniting synthetic clothing. In case 27, the consumer lit a candle on a bedroom table, went to another area of the house, and smelled smoke 40 minutes later. The fire department concluded that the candle fell from the table and ignited nearby papers or clothing. In case 29, two taper candles lit on a brass plate on a kitchen table were left unattended while the consumer went to the bedroom to change clothes. She smelled smoke about 15 minutes later. The total burn time for the candles was about half an hour. In case 30, a novelty 2-inch by 1-inch flower-shaped candle fell off its mounting stick after about 20 minutes of use, igniting a small fire on a tablecloth. In case 38, a taper candle in a plastic holder may have fallen out of the holder or off the table and ignited a sofa. The burn time in this case may have been overnight (there was a power outage).

Again, it is difficult to discern any addressable hazard patterns in these cases. Obviously, the attachment between the candle and the holder has the potential to compromise stability. However, in these cases, not enough is known about that attachment to be able to identify specific causes of any hazards involved.

In two cases, the candle was blown over by the wind. In case 7, a 6-inch taper candle in an unspecified type of candle holder on a wooden night shelf in a bedroom was blown onto the bed by wind from an open window, igniting the bedding. In case 22, a round candle, 3 inches high by 3 inches in diameter, was being used on a dining room table to clear cooking smells and was knocked over by the wind, igniting a rug.

In three cases, the candle fell from a wall hanger: a votive candle in a glass holder fell from a wooden wall hanger (case 9), a wall sconce and candle fell onto a bed, igniting the bedding (case 16), and a candle fell from a plastic wall mount, igniting carpet (case 39).

In four cases the candle fell from a shelf: a votive/tea light candle in a ceramic angel holder may have fallen from a plastic shelf and ignited bedding (case 13); a small round candle (possibly a tea light) fell from a plastic corner shelf in a bathtub and ignited the plastic liner of a metal tub in a dormitory room (case 15); a pillar candle, 6 inches tall and 4 or 5 inches in diameter, fell from a windowsill, igniting nearby furniture (case 20); and a candle on a glass candle holder fell off a wooden shelf onto a sofa (case 24).

In some instances initially categorized as tipovers, there may be other possible explanations. In three cases, the candle may have burned too long, causing the candle to fold over, or to reignite. In case 21, a taper candle in a holder was left burning all night and “tipped over”, igniting a stereo. In case 23, a brand new 6-inch column candle folded over after 2.5 hours use, fell off its holder, and ignited the dresser it was on. In case 31, a candle in a glass dish/saucer on top of a computer was thought to be extinguished when the owners left the residence approximately three hours before the fire department was called. The fire department report stated that the candle fell onto a pile of books and papers located under or near the computer table. However, the consumer reported a previous instance of reignition with the same candle. In one incident (case 17), the flammable wrapper on the candle may have cause the fire, rather than a tipover: A 2.5-inch by 7-inch pillar candle on a ceramic dish on a tablecloth ignited the tablecloth. There was “paper” on the front of the candle that the consumer did not remove.

Additionally, there were 5 cases attributed to tipover where candles were being used because of lack of electric power to the residence. These power outages were from a storm, from non-payment of bills, or from attempts to lower electric costs. In all these cases, the fire appeared to have started after the consumer either went to sleep with the candle burning, or left the residence with the candle burning.

In general, as noted above, it is difficult to discern any addressable hazard patterns in these tipover cases. There were very few cases that involved only a candle. For cases involving a candle holder, shelf, hanger, etc., there is generally insufficient information known to be able to identify specific causes of instability.

Appendix 1
Flare-Up Cases

Each row in the following spread sheet summarizes information from one In-Depth Investigation (IDI). The row number (appearing in the first column of the spread sheet) is referred to as the "case number" in the body of this report and is used to identify the IDI. Since the first row of the spread sheet contains the titles for each column, there is no case number 1.

Key to Column Headings

Col Heading

- A** **taskno** – task number - the number used internally by CPSC to identify each IDI
- B** **haz pat** – hazard pattern - a brief description of the incident scenario
- C** **other comment** - additional information about the incident scenario
- D** **flm ht** – flame height - the height of the flame during the flare-up (if reported)
- E** **cnldlge** – candle age
how long the candle had been in the possession of the owner/victim at the time of the incident
- F** **cnld1st** – candle first time - was the incident the first time the candle had been used
- G** **burntime** – how long the candle had been burning when the incident occurred
- H** **candtype** – candle type
as described by ASTM F1072-00 "Standard Guide for Terminology Relating to Candles and Associated Accessory Items"
- I** **gel**- was this a gel (as opposed to wax) candle
- J** **scent**- if known, the candle scent, if scented unk=unknown
- K** **colored** - the color of the candle, if known
- L** **shape** - the shape of the candle
- M** **dia in** – diameter in inches
the diameter of the candle, in inches. For circular candles, this number is the circular diameter of the candle. If the candle was rectangular, it is one of the two rectangular dimensions and Dep in is the other dimension
- N** **ht in** – height in inches - the height of the candle, in inches
- O** **dep in** – depth in inches - the depth of the candle, in inches
- P** **cntnr** – container - was the candle in a container
A container generally refers to a container such as that of a filled candle into which the candle was placed when formed or made, as opposed to a holder which does not determine the shape of the candle placed in it.
- Q** **conttype** – container type - what the container was made of
- R** **lid** – did the container have a lid
- S** **hldr** – holder - was the candle in a holder – see description under container above
- T** **holdtype** – holder type - what the holder was made of
- U** **wicks** – how many wicks the candle had
- V** **wkanc** – wick anchor
Was there a wick anchor, generally a small metal tab at the end of the wick which anchors the wick to the bottom of the candle

W	sample – was a sample collected as part of the In-Depth Investigation The number given is the number which CPSC uses to identify the sample. A sample may be the actual candle involved in the incident, or the remains of the candle and/or its container or holder, or a new candle similar to the one involved in the incident.
Y	whatign – what ignited - during the flare-up, what was actually burning, if known
Z	other comments – further information about the scenario
AA	reig – reignition - was reignition of the candle reported to be involved in the incident
AB	embedin – embedded in - was anything embedded in the candle, such a flowers or beans
AC	embedon – embedded on Was anything embedded on the outside of the candle, such a flowers, leaves, etc
AD	unatnd – unattended Was the candle left burning with no one present to monitor it, including did the person in attendance fall asleep
AE	fell aslp – fell asleep Did the person fall asleep in the presence of a lit candle
AF	lft rm – left the room Did the person in attendance leave the room, leaving the candle burning
AG	time gone how much time passed between the person’s leaving the room, or falling asleep, with a lit candle before a problem was noticed
AH	left hse – left house Did the person leave the house, leaving the candle burning
AI	wax low Were low levels of wax thought to contribute to the incident and, if so, how much wax was left
AJ	label – did the candle have a warning label
AK	city – city in which the incident occurred
AL	state – state in which the incident occurred
AM	time – time of day at which the incident occurred
AN	pilot – was this case part of the previously reported pilot study
AO	guidelin – guideline Was the CPSC Investigation Guideline for Candle Fires and Fire Hazards used in the investigation. If so, what version, the draft version or the final version.
AP	userage – user age The age of the user of the candle involved in the incident. This may be reported as the actual age in years, or as one of the age ranges specified in the investigation guideline: under 10, 10-14, 15-19, 20-64, 65-74, and 75 & up. In some cases, the only information was “adult”.

Col Heading Appendix 1 Flare-Up Cases

- AQ** **locpurch** – location where the candle was purchased
- AR** **where manu** – where the candle was manufactured
- AS** **candcost** – how much the candle cost
- AT** **candset** – candle set - was the candle purchased as part of a set
- AU** **how ext** – how extinguished - how the flare-up and/or fire was extinguished
- AV** **roomused** – room in which the candle was used
- AW** **surface** – surface on which the candle was sitting
- AX** **purpose** – why the candle was being used
- AY** **smokedet** – smoke detector – was there a smoke detector in the residence
- AZ** **sdwhere** – where the smoke detector was located
- BA** **sdwork** – did the smoke detector sound an alarm
- BB** **sprinkler** – was there a sprinkler system in the home
- BC** **oftenuse** – how often candles were used in the household
a=daily; b=once a week or more; c=once a month or more; d=only at special or holiday occasions; and e=never
- BD** **income** – the household’s annual income
a=less than \$15,000; b=between \$15,000-\$34,999; c=\$35,000and greater; d=don’t know
- BE** **educat** – the user’s highest level of education attained and that of spouse/partner
- BF** **numdead** – number of fatalities resulting from incident
- BG** **nocivinj** – number of civilian (non-fire fighter) injuries resulting from incident
- BH** **bdpt** – part part injured – National Electronic Injury Surveillance System codes
- BI** **diag** – diagnosis of injury – National Electronic Injury Surveillance System codes
- BJ** **nofdpinj** – number of fire fighter injuries resulting from incident

A	B	C	D	E	F	G	H	I
taskno	haz pat	other comment	flm ht	cnlage	cnidf1st	burntime	candtype	gel
1								
2	flared up - hot wax exploded	described as "liquid" candle in clip	3.5-4 ft	2 mo	no	3/4-1 hr	gel?	gel
3	entire cndl engulfed in flames	lit, left, within seconds, entire cndl in	4 in	10 mo	1st	30 secs	gel	y
4	gel cndl flared-up	pineapple-shaped goblet - one foot f	1 ft	7 days	no	30 min	gel	y
5	flared up, blew up in hand as c	gel candle in glass jar	4 in	2 wks	1st	20 min	gel	y
6	gel cndl flared-up	entire top surface ign - 6-8in flame	6-8 in	1.5 yr	1st	1-1.5hr	gel	y
7	six inch flame, gel liquified	extinguished by covering with bk, when lifted u		15 months	no	5-10 min	gel	y
8	gel cndl glass container expld	gel substance became little fireballs			4th		gel	y
9	unattnd cndl covered in flames	returned after leaving room for about 10 min	10 min	9 mos	4th	10 min	gel	y
10	entire cndl ignited 3inx6in flame		6 in	2 mos	1st	20 min	gel	y
11	cndl flared up, glass hldr crckd		unk	unk	unk	unk	gel	y
12	gel cndl flared up			1-2 days	1st	1.5 hrs	gel	y
13	foot high flame after 4 hrs	gel candle glass broke	1 ft	days	1st	4 hr	gel	y
14	cndl flare-up	tin bucket cndl wax caught fire, shot up			2nd	unk	citronella	n
15	left cndl lit - scented, glass cor	four-inch flame	4 in	2 mo	3rd?	2 min	filled	n
16	flame flared 2 ft	cndl out of wax	2 ft	2 mo	2nd/3rd	2 hours	filled	n
17	cndl in its porcelain bowl ignite	flames 8in - 10in high - recall NR# 98	8in-10in	1.5 yr	unk	30 min	filled	n
18	cndl generated 4ftx8ft fireball	attempting to extinguish with water	4 ft	4-6 mos	1st	20 min	filled	n
19	two inch flames from cndl & gla	four lit cndls on wooden dresser	2 in	1 day	2nd	5 min	filled	n
20	cndl caught fire	half a coconut shell filled with wax	3ft	1.5 yr	2nd	1-1.5hr	filled	n
21	cndl burst into flames	difficult to extinguish	4 ft (to ce	4 mo	4th	1 hour	filled	n
22	fire ball - votive cndl - tin holde	left unwrapped for 6 mos before use		6 mo	1st	3 min	filled	n
23	cndl flared up	4 to 6 inch flames - pineapple shape	4-6 in	1 mo	2nd/3rd	20 minutes	pillar	n
24	9" flames - cinnamon sticks	thought candle flickered out	9 in	20 days	2nd	10 hr	pillar	n
25	cndl flare-up - flames engulfed	cndl - three wick cndl - one gone	12-14in	1 mo	no	1/2 hr	pillar	n
26	entire surf flamed, spilled wax	candle inside ceramic church			possible	2 hr	tea light	n
27	tea light cndl flared up	when water poured on, flamed 1 1/2'	1.5 ft	6-12 mo	1st	.75-1hr	tea light	n
28	flared 3-6 inches	in plastic-coated glass holder	3-6in	1 yr	1st	1 hour	tea light	n
29	tea light flared up	oil (incense) burner's tea cndl flared up	4 mo	4 mo	no	20 min	tea light	n
30	cndl flared up	gave off burning type odor on anothe	18 in	1 mo	1st	30 min	votive	n
31	cndl holder caught fire	snowman-shaped candleholder	8-12 in	1 yr plus	no	45 min	votive?	n

	J	K	L	M	N	O	P	Q	R	S	T	U	V
	scent	colored	shape	dia in	ht in	dep in	cntnr	contype	lid	hldr	holdtype	wicks	wkanc
1		pink	cylindrical	3	3		yes	metal w/lid	yes	no		2	yes
2	cinnamon	blue	rectangular solid	2.5	3	2.5	yes	glass		no		1	yes
3	yes - unk	red	roughly cylindrical	2.5	2.5		yes	pressed glass		no		1	yes
4	apple cider	red	cylindrical	2 1/2	2.5		yes	glass		no		1	no
5	apple cider	clear	cylindrical	2.5	5		yes	glass		no		1	yes
6	apple cider	clear	cylindrical	4?	6?		yes	glass		no			
7	sensual jasmine	no	cylindrical				yes	glass		no			
8	yes - unk	green	rectangular solid	2.5	3(?)	2.5	yes	glass		no		1	
9	vanilla	clear	cylindrical, tapering	1.75-2.75	1.75		yes	glass		no		1	no
10	vanilla	blue-green	cylindrical, tapering	2.75	2.75		yes		yes	no		1	?
11	vanilla	clear	cylindrical, tapering	pic	pic		yes	glass		no		ns	unk
12	cinnamon	red	unk	ns	ns		yes	glass		no		ns	unk
13	jasmine	pink	not slated	unk	3		yes	glass		no		ns	unk
14	citronella	?		4.5-6.5	5.5		yes	metal		no		1	unk
15	sky	white	cube	3	3.5	3.5	yes	glass	yes			1	yes
16	cinnamon		roughly spherical	2.5	2.5		yes	glass				1	yes
17			in bowl	7?	4?		yes	porcelain		no		3	?
18	vanilla	cream	cylindrical	2	2		yes	metal - silver		no		1	unk
19	passion blossom	white	cylindrical	1	2		yes	glass		no		1	yes
20	coconut	brown	coconut shell	3.25	1.5	4.5	yes	coconut shell		no		1	
21	unk	unk	unk	ns	ns		yes	tin		no		ns	unk
22	apple jack & peel	burgundy	cylindrical	3.5	2		yes	tin		no		1	yes
23	no	cream	pineapple	3	7		no					1	no
24	cinnamon?	white	rectangular solid	2.5	3	2.5	no			no		1	no
25	vanilla	cream	cylindrical	6	6		no			no		3	unk
26	vanilla	ivory	cylindrical	1.5	0.75		yes	metal		yes	ceramic	1	yes
27	lavender		tea light	1	0.5		yes	metal		yes	ceramic	1	unk
28		white	cylindrical, tapering	1.5	0.75		yes	metal		yes	glass	1	yes
29	no	white	tea light	1.5	0.5		yes	metal		yes	ceramic	1	unk
30	cinnamon&spice	red	cylindrical, tapering	1 5/8	1 3/4		no			no		1	yes
31	unk	unk		ns	2.5-3		no			yes	ceramic	1	ns

Flare-Up Cases

Appendix 1

Sorted by
Gel, Cndf Type

	W	X	Y
1	sample		whatign
2	99-820-6230/1,2		candle
3	00-800-2622/1&2	x	entire top in flames
4	01-830-4393/1,2	x	gel
5	no		gel
6	no		gel
7	99-830-4427		
8	00-830-3494	x	- 1 to 1.5 inches from top of glass
9	01-840-7445	x	gel
10	98-800-1758		entire surface?
11	99-820-6453		entire surface?
12	98-830-4954		entire surface?
13	no		gel
14	no		entire surface of cndl
15	01-830-4894	x	wax
16	no		wax?
17	no		only cndl
18	01-810-3295		vapor??
19	00-860-5521	x	candle?
20	00-860-5724/45?E	x	coconut shells, table
21	no		entire contents engulfed in flames
22	no		wax
23	01-810-3292		wax? exterior coating?
24	00-860-6133	x	wax? cinnamon sticks
25	no		wax
26	00-860-6430	x	wax
27	no		wax
28	00-800-2867	x	wax? cndfhdr coating?
29	01-810-2080/1		wax? Vapor?
30	99-820-6433		entire top of candle
31	no		ceramic snowman cndfhdr

Flare-Up Cases

Appendix 1

Sorted by
Gel, Cndl Type

	Z	AA	AB	AC
1	Other Comments	reig	embedin	embedon
2	two wicks very close together- one found 14ft away from cndl			
3	cndl emitted two cracking noises - smelled kerosene - glass of blue cndl is cracked - top is sooty			
4	decorative ring melted somewhat			
5				
6	only about 1/4 of gel gone, but layer of dark gel/soot mixture			
7				
8	glass container is shattered- remaining gel caught on fire - wick too close to glass?			
9				
10				
11	came in sets of three colors, two of each color			
12	3/4in to 1in gel left in candle after flare-up - sold in set of 3			
13				
14	possible inclusions may have caused "explosion"			
15	mason jar type container - burned sample has very little wax left - wick anchor is off to one side near corner			
16				
17	recall 98-044 - victim received recall notification, whether before or after incident is unclear			
18	fireball when attempted to extinguish using water in sink			
19	wax immediately turned to a liquid texture - just too small- cndr ht approx 2x cndl ht			
20	shell about 0.25 in thick very hard and dry			
21	tin container - painted?? - Also may have burned down - burned 3 previous times for 45 min/time plus 1 hr this time			
22				
23	paint-like coating of candle may have ignited thru soft spot			
24	could be burig inclusions, not flare-up - about 1/4 height gone at start of burn in question - all gone at end - sample is y?			cinnamon sticks
25	one of three wicks completely gone - side of cndl melted away			
26	entire surface of tealight ignited, but not church			
27	entire crmc hldr filled w/flame - water caused flare-up			
28	glass cndlhdr 1.75 dia x 2 ht has plastic/wax (?) decorative coating with hearts and flowers - appears bumpy at top			
29	tea light flared up, attempted to blow out, blew wax onto hand			
30	watched for 30 seconds, then put out w/fire extinguisher			
31	narrative mentions earlier glass insert that came with votive candle, incident candle had no holder			

	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP
	unatnd	fell aslp	ft rm	time gone	left hse	wax low	label	city	state	time	pilot	guidelin	usage
1	y?	y?	45-60 min				y	Elwood City	PA	evening	n	no	22
2	y	y	30 secs		no		yes	Troy	PA	8:30 a.m.	n	draft	20-64
3	n	n			almost		yes	Jackson	MI	10:00 a.m.	n	final	20-64
4	n	n					yes	Buford	GA		n	draft	49
5	n	n			no		yes	Redding	CA	a.m.	n	final	20-64
6	n	n					yes	Madison	WI		no	no	4
7	n	n					yes	Tinley Park	IL		n		37
8	y	y	10 min				yes	Portland	OR	6 a.m.	n	final	53
9	y	y	20 min		no		yes	Otter River	MA	8:00 p.m.	n	no	47
10	?	?					yes	Frackville	PA	9:30 a.m.	n	no	adult
11	y	y	not stated				yes	Lyons	KS	10:00 p.m.	n	no	30
12	y	y?	4 hrs				no	Garfield	NJ	7:30 p.m.	n	draft	28
13	n	n					yes	Atlanta	GA	afternoon	n	no	28
14	?	?			1/2 in left		yes	Milwaukee	WI	early evening	n	final	32
15	y	y	few min		yes		yes	St. Pete	FL		n	draft	29
16	y	y					no	Seymour	TN		n	no	
17	y	y	20-30 min				unk	Oliney	MD	4-6 p.m.	n	final	46
18	?	?	?		?		unk	N. Hollywood	CA	evening	n	no	mid 40s
19	y	y	few min				?	Ft. Collins	CO	after dinner	n	no	34
20	y	y	60 min		?? half full		unk	Atlanta	GA		n	no	adult
21	n	n					yes?	Winterville	GA	12:30 p.m.	n	draft	20-64
22	n	n					no	Washington	DC	6 p.m.	n	final	55
23	y	y	5 hrs		yes		yes	Sandy	UT	4:00 a.m.	n	draft	55
24	y	y	10-15 min		no 6in can		unk	Charlotte	NC	evening	n	no	adult
25	n	n					yes	Bellevue	WA	7:30 p.m.	n	no	57
26	y	y	45-60min?				yes	Washington	NJ		n	draft	45
27	n	n			?photo?		no	Fulton	MD	morning	n	draft	17
28	?	?	?		yes		yes	Cary	NC		n	draft	43
29	n	n					yes	Warminsler	PA	late afternoon	n	no	51
30	y	y	45 min				unk	Monmouth	IL	evening	n	no	adult

	AQ	AR	AS	AT	AU	AV	AW
		where manu	candcost	candset	howext	roomused	surface
1	Iocpurch		unk	no	water - outside	liv rm	mantle
2	Hills Dept Store	MO		no	smothered/magazine	bth rm	counter
3	Odd's-N-End's	China	\$0.99	no	thrown in snow	basement	glass table
4	Meijers	OH	\$5	no	smothered/shirt	kitchen	counter
5	dept store	OH	unk	no	blown out	kitchen	counter
6	unk	OH	<\$2	no	with book	bedroom	nightstand
7	Marshall Fields				water	unk	computer table
8	Super K Mart	China	unk	no	smothered/rag,hand	bed rm	ent ctr
9	Wal-Mart	TN	unk	no	water	bth rm	toilet tank
10	Christmas Tree Shop	TN	\$1	no	not stated	bth rm	sink
11	unk	TN	unk	yes	smothered/glass dish	bd rm	shelf
12	Dollar Gen Store	Mexico	unk	yes	smothered/towel	bed rm	dresser
13	unk	unk	\$3	no	smothered/dirt	outdoors	lawn
14	Family Dollar Store	Canada	unk	no	smothered/lid	fam rm	tv stand
15	Eddie Bauer	USA	\$18	no	by itself	din rm	din rm tble
16	unstated	WI	\$3		thrown	liv rum	coffee table
17	Gump's By Mail	Japan	\$35?		by itself	liv rm	coffee table
18	unk		\$50-70	no	blown out	bd rm	dresser
19	Fred Segal, WH'wd	unk	unk	yes	water	din rm	din rm tble
20	Phoenix, AZ	Spain			water	bth rm	counter
21	Bath&Body Works	OH?	unk	unk	water	kitchen	counter
22	Belk's, Athens, GA		\$8	no		liv rm	dirt
23	Smith & Hawkin		\$5-\$10	no		fam rm	tv set
24	local mall giveaway	MX	unk	no	smothered/blanket	liv rm	coffee table
25	Home Place	unk	\$14.95	no	smothered/baking soda	liv rm	ent ctr
26	candle party MI	USA	\$5.75	no	by itself	liv rm	table
27	home candle party	MA	unk	no	water	bed rm	dresser
28	unk		unk		smothered/plate	liv rm	wooden table
29	The Body Shop	UK?	\$18	yes	wet towel	fam rm	mantle
30	Linens & Things	NJ	unk	yes	fire extinguisher	liv rm	television
31	her area	unk	unk	no	water	liv rm	

Appendix 2

Candle Exploded Cases

Each row in the following spread sheet summarizes information from one In-Depth Investigation (IDI). The row number (appearing in the first column of the spread sheet) is referred to as the "case number" in the body of this report and is used to identify the IDI. Since the first row of the spread sheet contains the titles for each column, there is no case number 1.

Key to Column Headings

Col Heading

- A** **taskno** – task number - the number used internally by CPSC to identify each IDI
- B** **haz pat** – hazard pattern - a brief description of the incident scenario
- C** **other comment** - additional information about the incident scenario
- D** **witnsd** – witnessed
was the key event (flare-up, explosion, etc.) witnessed by the complainant
- E** **candtype** – candle type
as described by ASTM F1072-00 "Standard Guide for Terminology Relating to Candles and Associated Accessory Items"
- F** **cnldage** – candle age
how long the candle had been in the possession of the owner/victim at the time of the incident
- G** **cnld1st** – candle first time - was the incident the first time the candle had been used
- H** **burntime** – how long the candle had been burning when the incident occurred
- I** **cnldlife** – candle life – what the expected lifetime of the candle was in hours of burntime
- J** **gel-** was this a gel (as opposed to wax) candle
- K** **scent-** if known, the candle scent, if scented unk=unknown
- L** **colored** - the color of the candle, if stated
- M** **shape** - the shape of the candle
- N** **oz** – ounces – the size of the candle in ounces of wax or gel
- O** **dia in** – diamter in inches – the diameter of the candle, in inches
- P** **ht in** – height in inches - the height of the candle, in inches
- Q** **cntnr** – container - was the candle in a container
A container generally refers to a container such as that of a filled candle into which the candle was placed when formed or made, as opposed to a holder which does not determine the shape of the candle placed in it.
- R** **conttype** – container type - what the container was made of
- S** **hdr** – holder - was the candle in a holder – see description under container above
- T** **holdtype** – holder type - what the holder was made of
- U** **wicks** – how many wicks the candle had
- V** **wkanc** – wick anchor
Was there a wick anchor, generally a small metal tab at the end of the wick which anchors the wick to the bottom of the candle

- W** **sample** – was a sample collected as part of the In-Depth Investigation
The number given is the number which CPSC uses to identify the sample. A sample may be the actual candle involved in the incident, or the remains of the candle and/or its container or holder, or a new candle similar to the one involved in the incident.
- X** **whatign** – what ignited - during the flare-up, what was actually burning, if known
- Y** **other comments** – further information about the scenario
- Z** **reig** – reignition - was reignition of the candle reported to be involved in the incident
- AA** **embedin** – embedded in - was anything embedded in the candle, such a flowers or beans
- AB** **embedon** – embedded on
Was anything embedded on the outside of the candle, such a flowers, leaves, etc
- AC** **unatnd** – unattended
Was the candle left burning with no one present to monitor it, including did the person in attendance fall asleep
- AD** **fell aslp** – fell asleep
Did the person fall asleep in the presence of a lit candle
- AE** **lft rm** – left the room
Did the person in attendance leave the room, leaving the candle burning
- AF** **left hse** – left house
Did the person leave the house, leaving the candle burning
- AG** **wax low**
Were low levels of wax thought to contribute to the incident and, if so, how much wax was left
- AH** **label** – did the candle have a warning label
- AI** **city** – city in which the incident occurred
- AJ** **state** – state in which the incident occurred
- AK** **time** – time of day at which the incident occurred
- AL** **pilot** – was this case part of the previously reported pilot study
- AM** **guidelin** – guideline
Was the CPSC Investigation Guideline for Candle Fires and Fire Hazards used in the investigation. If so, what version, the draft version or the final version.
- AN** **how ext** – how extguished - how the flare-up and/or fire was extinguished
- AO** **roomused** – room in which the candle was used
- AP** **surface** – surface on which the candle was sitting
- AQ** **purpose** – why the candle was being used

Col *Heading*

Appendix 2

Candle Exploded Cases

AR **smokedet** – smoke detector – was there a smoke detector in the residence
AS **sdwhere** – where the smoke detector was located
AT **sdwork** – did the smoke detector sound an alarm
AU **sprinkler** – was there a sprinkler system in the home
AV **sprwork** – did the sprikler system operate
AW **oftenuse** – how often candles were used in the household
 a=daily; b=once a week or more; c=once a month or more; d=only at special or holiday
 occasions; and e=never
AX **income** – the household’s annual income
 a=less than \$15,000; b=between \$15,000-\$34,999; c=\$35,000and greater; d=don’t know
AY **educat** – the user’s highest level of education attained and that of spouse/partner
AZ **numdead** – number of fatalities resulting from incident
BA **nocivinj** – number of civilian (non-fire fighter) injuries resulting from incident
BB **bdpt** – part part injured – National Electronic Injury Surveillance System codes
BC **diag** – diagnosis of injury – National Electronic Injury Surveillance System codes
BD **nofdpinj** – number of fire fighter injuries resulting from incident
BE **disp** – outcome of the injury
 1=treated, not hospitalized; 4=hospitalized; 8=fatality

Candle Exploded

Appendix 2

	A	B	C	D	E	F	G	H
1	taskno	haz pat	other comment	witnsd	candtype	cnclage	cncl1st	burntime
2	000224HCN0122	cncl exploded while burning	ignited bedsprd ruffle and mattress	unk	taper(?)	unk	unk	unk
3	001201HCC0125	small cncl exploded	sprayed victim with hot glass	y	filled	1.5 mo	no	10-15 min
4	980310CBB1167	cncl exploded(?)	low cncl shattered ashtry/holder	n	filled	unk	unk	up to 1 hr
5	990204CCC2253	gel cncl exploded 2 hrs after	teenage lit cncl and went to sleep	n	gel	11 mo	yes	2 hr
6	991005HCC2003	glass cndls expldd, 3 wick	able to repeat explosion	y	filled	new	yes	1 hr

Candle Exploded

Appendix 2

	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
	cn dlife	gel	scent	colored	shape	oz	dia in	ht in	cntnr	contype	hdr	holdtype	wicks	wickanch	sample
1	unk	unk	unk	unk	unk				unk		unk		unk	unk	none
2	unk	n	spring	off white	cylindrical	2.2	2	2.75	yes	glass			1		00-810-3119
3															
4	up to 30 hrs	n	vanilla	beige	cylindrical				yes	plastic	no			yes	98-800-1315/6
5		y	starfire	unk	unk										none
			relaxation well-being												
6	?	n	sensuality	yes	cylindrical				yes	glass			3		00-830-4508

Candle Exploded

Appendix 2

	X	Y	Z	AA	AB	AC	AD	AE	AF	AG
		other comments	reig	embedin	embedon	unatnd	fell asip	left rm	left hse	wax low
1	whatign expid cndl fragments ignited bedspread ruffie	burned down "far enough" and then "popped open"				unk				yes?
2										
3		appeared to be using refill in its plastic holder without removing and placing in glass holder as directed				n				
4	shattered ashtray spread burning wax to flannel shirt					y				
5	unk	attny alleges another similar incident								
6	3 wick cndl with less than	1/2 of wax left				n				

Candle Exploded

Appendix 2

	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU
	label	city	state	time	pilot	guide/in	howext	roomused	surface	purpose	smokedet	sdwhere	sdwork	sprinkler
1	unk	Urbana	IL		n	draft		bedroom	nightstand		unk			no
2	y	Biloxi	MS		n	final	blown out	bathroom	porcelain	relaxation	yes		no	no
3														
4	y	Penfield	NY	11:25 p.m.	n	none		basement		fragrance				
5	unk	McMinville	TN	2:00 a.m.	n	none		bedroom	unk	unk	unk			unk
6	y	Lawton	OK		n	none		liv rm	wood table		unk			unk

Candle Exploded

Appendix 2

	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE
	sprwork	oftenuse	income	educat	numdead	nocivinj	bdpt	diag	nofdpinj	disp
1										
2	unk	unk	unk	unk	0	1	2	51	0	4
3	b	c		coll grads	0	1	31	51	0	1
4										
5	unk	unk	unk	unk	1	1	85			8
6					0	1	36	51	0	1
					0	0				

Appendix 3
Wax Low

Each row in the following spread sheet summarizes information from one In-Depth Investigation (IDI). The row number (appearing in the first column of the spread sheet) is referred to as the "case number" in the body of this report and is used to identify the IDI. Since the first row of the spread sheet contains the titles for each column, there is no case number 1.

Key to Column Headings

Col. Heading

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- B** **haz pat** – hazard pattern - a brief description of the incident scenario
- C** **other comment** - additional information about the incident scenario
- D** **witnsd** – witnessed
was the key event (flare-up, explosion, etc.) witnessed by the complainant
- E** **wax when lit**
how much wax was in the candle when it was lit when the incident occurred
- F** **candtype** – candle type
as described by ASTM F1072-00 "Standard Guide for Terminology Relating to Candles and Associated Accessory Items"
- G** **cnldage** – candle age
how long the candle had been in the possession of the owner/victim at the time of the incident
- H** **cnld1st** – candle first time - was the incident the first time the candle had been used
- I** **burntime** – how long the candle had been burning when the incident occurred.
- J** **gel**- was this a gel (as opposed to wax) candle
- K** **scent**- if known, the candle scent, if scented unk=unknown
- L** **colored** - the color of the candle, if stated
- M** **shape** - the shape of the candle
- N** **oz** – ounces – the size of the candle in ounces of wax or gel
- O** **dia in** – diamter in inches – the diameter of the candle, in inches
- P** **ht in** – height in inches - the height of the candle, in inches
- Q** **depthin** – depth in inches
- R** **cntr** – container - was the candle in a container
A container generally refers to a container such as that of a filled candle into which the candle was placed when formed or made, as opposed to a holder which does not determine the shape of the candle placed in it.
- S** **conttype** – container type - what the container was made of
- T** **lid** – did the container have a lid
- U** **hldr** – holder - was the candle in a holder – see description under container above
- V** **holdtype** – holder type - what the holder was made of
- W** **wicks** – how many wicks the candle had

- X** **wkanc** – wick anchor
Was there a wick anchor, generally a small metal tab at the end of the wick which anchors the wick to the bottom of the candle
- Y** **sample** – was a sample collected as part of the In-Depth Investigation
The number given is the number which CPSC uses to identify the sample. A sample may be the actual candle involved in the incident, or the remains of the candle and/or its container or holder, or a new candle similar to the one involved in the incident.
- Z** **other comments** – further information about the scenario
- AA** **reig** – reignition - was reignition of the candle reported to be involved in the incident
- AB** **embedin** – embedded in - was anything embedded in the candle, such a flowers or beans
- AC** **embedon** – embedded on
Was anything embedded on the outside of the candle, such a flowers, leaves, etc
- AD** **unatnd** – unattended
Was the candle left burning with no one present to monitor it, including did the person in attendance fall asleep
- AE** **fell aslp** – fell asleep
Did the person fall asleep in the presence of a lit candle
- AF** **lft rm** – left the room
Did the person in attendance leave the room, leaving the candle burning
- AG** **left hse** – left house
Did the person leave the house, leaving the candle burning
- AH** **time gone**
how much time passed between the person’s leaving the room, or falling asleep, with a lit candle before a problem was noticed
- AI** **wax low**
Were low levels of wax thought to contribute to the incident and, if so, how much wax was left
- AJ** **incidate** – incident date – date on which the incident occurred
- AK** **label** – did the candle have a warning label
- AL** **city** – city in which the incident occurred
- AM** **state** – state in which the incident occurred
- AN** **time** – time of day at which the incident occurred
- AO** **pilot** – was this case part of the previously reported pilot study
- AP** **guidelin** – guideline
Was the CPSC Investigation Guideline for Candle Fires and Fire Hazards used in the investigation. If so, what version, the draft version or the final version.
- AQ** **userage** – user age
The age of the user of the candle involved in the incident. This may be reported as the actual age in years, or as one of the age ranges specified in the investigation guideline: under 10, 10-14, 15-19, 20-64, 65-74, and 75 & up. In some cases, the only information was “adult”.

AR	locpurch – location where the candle was purchased
AS	candcost – how much the candle cost
AT	candset – candle set - was the candle purchased as part of a set
AU	how ext – how extinguished - how the flare-up and/or fire was extinguished
AV	roomused – room in which the candle was used
AW	surface – surface on which the candle was sitting
AX	purpose – why the candle was being used
AY	smokedet – smoke detector – was there a smoke detector in the residence
AZ	sdwhere – where the smoke detector was located
BA	sdwork – did the smoke detector sound an alarm
BB	sprinkler – was there a sprinkler system in the home
BC	sprwork - did the sprinkler system operate
BD	oftenuse – how often candles were used in the household a=daily; b=once a week or more; c=once a month or more; d=only at special or holiday occasions; and e=never
BE	income – the household’s annual income a=less than \$15,000; b=between \$15,000-\$34,999; c=\$35,000and greater; d=don’t know
BF	educat – the user’s highest level of education attained and that of spouse/partner
BG	numdead – number of fatalities resulting from incident
BH	nocivinj – number of civilian (non-fire fighter) injuries resulting from incident
BI	nofdpinj – number of fire fighter injuries resulting from incident

Wax Low

Appendix 3

	A	B	C	D	E	F	G	H	I
1	taskno	haz pat	other comment	witnsd	wax when lit	candytype	cnclage	cncl1st	burntime
2	000112HCC2202	3 container candles exploded	less than 1/2" wax in candles when expld	y	less than 1/2 in	filled	2 wks	no	5 min
3	000612HNE5597	cncl burned dwn during night unattnd jar cncl exploded (?) as previous candle had	used for light, ignited particle bd stereo cabinet	n	cncls found at scene < 1/2 in	unk	unk	unk	unk
4	010110HCN0236	unattnd cncl used up prior to fire	most of cncl used up prior to fire	n	burned for 40 hr prior to incident	filled	4 mos	no	
5	010226HNE6189	unattnd cncl burned dwn, ignited	wooden hldr, ent ctr	n	no specifics	voive?	1 day	yes	0.5 hr
6	010823HWE5008	low cncls exploded or spit wax	ignited speaker, paper, sweater - insurance cfm	n	approx 0.75 in	voive	9 days	2nd	1.0 hr

	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
	gel	scent	colored	shape	oz	dia in	ht in	depth in	cntnr	contype	lid	hldr	holdtype	wicks	wickanch	sample
1	n	pine	ns	square	6.5	3	3		yes	glass		no		ns	ns	no
2	n	unk	unk	unk					unk			unk		unk	unk	no
3	n	sugar cookie	white	cylindrical	unk	unk	unk		yes	mason jar	cork	no		1	yes	no
4	n	vanilla or	beige or						no			yes	wood	unk	unk	no
5	n	strawberry	pink	cylindrical?		3						yes				no
6	n	ocean scent	jasmine rose rainbow	cube		1.75	1.75	1.75	no			yes	glass	1	yes	02-840-6296

Wax Low

Appendix 3

	Z	AA	AB	AC	AD	AE	AF	AG	AH
	other comments	relg	embedin	embedon	unatnd	fell as/p	left rm	left hse	time gone
1		n			n				
2	sent glass and wax 24 in from candle, wick still burning								
3	cndl lit at night for children to find way to bathroom				y	y			hours?
4	duplicate candle was seen to explode about 1 yr before				y		y	y	hours?
5	FD: cndl burned down, ignited holder, then ent ctr ignited items 1.5 to 4 or 5 feet away - glass may have cracked only thing left standing were the wicks - label on another candle said was supposed to self-ex when wick 1/2 in		unk	unk	y		?		
6		n	n	n	y		y		not stated

AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
wax low	incdate	label	city	state	time	pilot	guidelin	usage	locpurch	candcost	candset	howext	roomused
1	1/6/00	yes	Fairfield	OH	7:00 p.m.	n	draft	3(16-19)	Target		no	blown out	liv rm
2	6/10/01	unk	Baltimore	MD	4:00 a.m.	n	yes	unk	unk	unk		fire dept	hallway
3								4(20-64)	Dollar General	\$3.00		fire dept	bedroom
4	10/28/00	unk	Pittsburgh	PA	12:00 PM	y	yes	adult (4?)	CVS	unk	no	fire dept	bedroom
5	1/25/01		Santa Cruz	CA	5:43 p.m.	n	yes	4(20-64)	Cruz'n Candles	\$16.20/18	no	fire dept	common rm/den

	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI
	surface	purpose	smokedet	sdwhere	sdwork	sprinkler	sprwork	offenuse	income	educat	numdead	nocivlnj	nofdpinj
1	three locs		yes	hallway				b	d	refused	0	0	0
2	particle board cabinet	light	no			no		unk	unk	unk	0	0	0
3	wooden dresser	fragrance	yes	hallway?	yes	no		a	c	hi school	0	0	0
4	ent ctr	fragrance	yes	hallway	no	no	n/a	b	b	hi school	0	0	0
5	ent ctr	ambiance	yes	hallway	no	no		b	c	some coll	0	0	0

Appendix 4
Container Shattered

Each row in the following spread sheet summarizes information from one In-Depth Investigation (IDI). The row number (appearing in the first column of the spread sheet) is referred to as the “**case number**” in the body of this report and is used to identify the IDI. Since the first row of the spread sheet contains the titles for each column, there is no case number 1.

Key to Column Headings

Col **Heading**

- A** **taskno** – task number - the number used internally by CPSC to identify each IDI
- B** **haz pat** – hazard pattern - a brief description of the incident scenario
- C** **other comment** - additional information about the incident scenario
- D** **cnclage** – candle age
how long the candle had been in the possession of the owner/victim at the time of the incident
- E** **cncl1st** – candle first time - was the incident the first time the candle had been used
- F** **burntime** – how long the candle had been burning when the incident occurred.
- G** **candtype** – candle type
as described by ASTM F1072-00 “Standard Guide for Terminology Relating to Candles and Associated Accessory Items”
- H** **gel-** was this a gel (as opposed to wax) candle
- I** **scent-** if known, the candle scent, if scented unk=unknown
- J** **colored** - the color of the candle, if stated
- K** **shape** - the shape of the candle
- L** **oz** – ounces – the size of the candle in ounces of wax or gel
- M** **dia in** – diamter in inches – the diameter of the candle, in inches
- N** **ht in** – height in inches - the height of the candle, in inches
- O** **cntnr** – container - was the candle in a container
A container generally refers to a container such as that of a filled candle into which the candle was placed when formed or made, as opposed to a holder which does not determine the shape of the candle placed in it.
- P** **conttype** – container type - what the container was made of
- Q** **hldr** – holder - was the candle in a holder – see description under container above
- R** **holdtype** – holder type - what the holder was made of
- S** **wicks** – how many wicks the candle had
- T** **wkanc** – wick anchor
Was there a wick anchor, generally a small metal tab at the end of the wick which anchors the wick to the bottom of the candle
- U** **sample** – was a sample collected as part of the In-Depth Investigation
The number given is the number which CPSC uses to identify the sample. A sample may be the actual candle involved in the incident, or the remains of the candle and/or its container or holder, or a new candle similar to the one involved in the incident.

V	whatign – what ignited – the first thing to catch fire
W	other comments – further information about the scenario
X	unatnd – unattended Was the candle left burning with no one present to monitor it, including did the person in attendance fall asleep
Y	fell aslp – fell asleep Did the person fall asleep in the presence of a lit candle
Z	lft rm – left the room Did the person in attendance leave the room, leaving the candle burning
AA	lft hse – left house Did the person leave the house, leaving the candle burning
AB	wax low Were low levels of wax thought to contribute to the incident and, if so, how much wax was left
AC	incidate – incident date – date on which the incident occurred
AD	label – did the candle have a warning label
AE	city – city in which the incident occurred
AF	state – state in which the incident occurred
AG	time – time of day at which the incident occurred
AH	pilot – was this case part of the previously reported pilot study
AI	guidelin – guideline Was the CPSC Investigation Guideline for Candle Fires and Fire Hazards used in the investigation. If so, what version, the draft version or the final version.
AJ	userage – user age The age of the user of the candle involved in the incident. This may be reported as the actual age in years, or as one of the age ranges specified in the investigation guideline: under 10, 10-14, 15-19, 20-64, 65-74, and 75 & up. In some cases, the only information was “adult”.
AK	locpurch – location where the candle was purchased
AL	candcost – how much the candle cost
AM	roomused – room in which the candle was used

Col *Heading*

Appendix 4

Container Shattered Cases

AN **surface** – surface on which the candle was sitting
AO **purpose** – why the candle was being used
AP **smokedet** – smoke detector – was there a smoke detector in the residence
AQ **sdwhere** – where the smoke detector was located
AR **sdwork** – did the smoke detector sound an alarm
AS **sprinkler** – was there a sprinkler system in the home
AT **spriwork** – did the sprinkler system operate
AU **oftenuse** – how often candles were used in the household
 a=daily; b=once a week or more; c=once a month or more; d=only at special or holiday
 occasions; and e=never
AV **inc** – the household’s annual income
 a=less than \$15,000; b=between \$15,000-\$34,999; c=\$35,000 and greater; d=don’t know
AW **educat** – the user’s highest level of education attained and that of spouse/partner
AX **numdead** – number of fatalities resulting from incident
AY **nocivinj** – number of civilian (non-fire fighter) injuries resulting from incident
AZ **bdpt** – part part injured – National Electronic Injury Surveillance System codes
BA **diag** – diagnosis of injury – National Electronic Injury Surveillance System codes
BB **nofdpinj** – number of fire fighter injuries resulting from incident

Container Shattered

Appendix 4

	A	B	C	D	E	F	G	H
	taskno	haz pat	other comment	cnl/age	cnl/1st	burntime	candtype	gel
1	000112HCC0274	glass container shattered	smelled odor of kerosene	3 wks?	2nd	10 min	gel	y
2	990111CCCC0208	glass hldr shattered, sprayed	gel and soot	unk	unk	10 min	gel	y
3	990127CWE7167	glass cntr top broke	hot material sprayed around room, melted stuff	2-3 yr	yes	1 hour	gel	y
4	991220HCC2131	gel cndl glass container expld	one-year old, first time use	1 yr	yes	15 min	gel	y
5	981118CMC9005	cndl flared up, glass hldr crckd	flare-up case				gel	y
6	001212HCC3100	gel cndl shattered, ignited bed	gel 1/2" from top of container	2 days	yes	15?min	gel	y
7	000112HCC0279	foot high flame after 4 hrs	gel candle glass broke - flare-up case			4 hr	gel	y
8	991220HCC2139	gel cndl glass container expld	gel became little fireballs - flare-up case					y
9	000104HCC2164	glass container shattered	heard pop, hot wax & shird glass flew	1 day	yes	20 min	filled?	n?
10	000713HCN0343	glass cndl encasement expld	basket of clothes ignited, dresser ignited		no	1-1.5 hr	filled	n
11	010426HCC0538	glass cndl's glass lid shattered	cndl out, put lid on, shtrd - fst temp chg?	1-2 mo	no	unstated	filled	n
12	991221HCC0217	glass container expld	less than 1 in of wax when started burn	1 mo	no	<1hr	filled	n
13	010416HCN0512	unatnd cndl ignited shwr curt	burned down, liquified, glass container broke		no	45 min	filled	n
14	000328HCN0155	cndl left burning ignited table	glass container had exploded	2 wks	yes	2 hr	votive	n
15								
16	000105HCC0234	glass holder shattered	while replacement votive burning	1 yr	?	unstated	votive	n
17	000201HCC2256	holder burned (not candle?)	oyster cup votive cup burned			10 min	votive	n

Container Shattered

Appendix 4

	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
	guidelin	usage	locpurch	candcost	roomused	surface	purpose	smokedet	sdwhere	sdwork	sprinkler	sprwork
1	draft	5(65-74)	K-Mart	\$2	kitchen	table with cloth	scent	yes	kitchen	no	no	
2	no		K-Mart	\$3.50	liv rm	wooden shelf						
3	no		Wal or K-Mart		playroom	shelf						
4	no	4(20-64)	Sam's Club									
5	draft	4(20-64)	Lompoc, CA	\$6.99/2	bedroom	wood hdboard		unk			unk	
6												
7												
8	draft	5(65-74)	PX	\$0.99	kitchen	victrola		yes	hallway		no	
9	final	4(20-64)		\$16.99	bedroom	wood dresser	mask odor	y	close	yes	no	
10	final?	4(20-64)	Wal-Mart		unstated			unk			unk	
11	no	4(20-64)	Wal-Mart		kitchen	table						
12	final?	4(20-64)	conv store	unk	bathroom	toilet tank		y	hallway	no	no	
13	draft	4(20-64)		\$3.00/3	din room	table	mask odor	yes	immediate	yes	no	
14												
15	no			\$10-15	liv rm	table						
16	draft				bathroom	countertop		y	3 ft away	no	no	

Container Shattered

Appendix 4

	AU	AV	AW	AX	AY	AZ	BA	BB
	oftense	inc	educat	numdead	nocivinj	bdpt	diag	nofdpin
1				0	1	33	51	0
2	c		coll grad					
3								
4								
5								
6								
7	a	d	unk	0	1	83	51	0
8								
9								
10	b	c	coll grad	0	0			0
11	c	d	unk	0	0			0
12	b	d	unk	0	1	92	50	0
13				0	1	83	59	0
14	b	d	unk	0	1	85	65	0
15	a	c	some coll	0	0			0
16				0	0			0
17	c	b	hs/coll	0	0			0

Appendix 5 Container Fire

Each row in the following spread sheet summarizes information from one In-Depth Investigation (IDI). The row number (appearing in the first column of the spread sheet) is referred to as the “**case number**” in the body of this report and is used to identify the IDI. Since the first row of the spread sheet contains the titles for each column, there is no case number 1.

Key to Column Headings

<i>Col</i>	<i>Heading</i>
A	taskno – task number - the number used internally by CPSC to identify each IDI
B	haz pat – hazard pattern - a brief description of the incident scenario
C	other comment - additional information about the incident scenario
D	cndlage – candle age how long the candle had been in the possession of the owner/victim at the time of the incident
E	cndl1st – candle first time - was the incident the first time the candle had been used
F	burntime – how long the candle had been burning when the incident occurred.
G	candtype – candle type as described by ASTM F1072-00 “Standard Guide for Terminology Relating to Candles and Associated Accessory Items”
H	gel- was this a gel (as opposed to wax) candle
I	scent- if known, the candle scent, if scented unk=unknown
J	colored - the color of the candle, if stated
K	shape - the shape of the candle
L	dia in – diameter in inches – the diameter of the candle, in inches
M	ht in – height in inches - the height of the candle, in inches
N	cntnr – container - was the candle in a container A container generally refers to a container such as that of a filled candle into which the candle was placed when formed or made, as opposed to a holder which does not determine the shape of the candle placed in it.
O	conttype – container type - what the container was made of
P	hldr – holder - was the candle in a holder – see description under container above
Q	holdtype – holder type - what the holder was made of
R	wicks – how many wicks the candle had
S	wkanc – wick anchor Was there a wick anchor, generally a small metal tab at the end of the wick which anchors the wick to the bottom of the candle
T	sample – was a sample collected as part of the In-Depth Investigation The number given is the number which CPSC uses to identify the sample. A sample may be the actual candle involved in the incident, or the remains of the candle and/or its container or holder, or a new candle similar to the one involved in the incident.

- U** **whatign** – what ignited – the first thing to catch fire
- V** **other comments** – further information about the scenario
- W** **unatnd** – unattended
Was the candle left burning with no one present to monitor it, including did the person in attendance fall asleep
- X** **fell aslp** – fell asleep
Did the person fall asleep in the presence of a lit candle
- Y** **lft rm** – left the room
Did the person in attendance leave the room, leaving the candle burning
- Z** **left hse** – left house
Did the person leave the house, leaving the candle burning
- AA** **wax low**
Were low levels of wax thought to contribute to the incident and, if so, how much wax was left
- AB** **incidate** – incident date – date on which the incident occurred
- AC** **label** – did the candle have a warning label
- AD** **city** – city in which the incident occurred
- AE** **state** – state in which the incident occurred
- AF** **time** – time of day at which the incident occurred
- AG** **pilot** – was this case part of the previously reported pilot study
- AH** **guidelin** – guideline
Was the CPSC Investigation Guideline for Candle Fires and Fire Hazards used in the investigation. If so, what version, the draft version or the final version.
- AI** **usage** – user age
The age of the user of the candle involved in the incident. This may be reported as the actual age in years, or as one of the age ranges specified in the investigation guideline: under 10, 10-14, 15-19, 20-64, 65-74, and 75 & up. In some cases, the only information was “adult”.
- AJ** **locpurch** – location where the candle was purchased
- AK** **candcost** – how much the candle cost

AL	howext – how extinguished – how the fire was put out
AM	roomused – room in which the candle was used
AN	surface – surface on which the candle was sitting
AO	purpose – why the candle was being used
AP	smokedet – smoke detector – was there a smoke detector in the residence
AQ	sdwhere – where the smoke detector was located
AR	sdwork – did the smoke detector sound an alarm
AS	sprinkler – was there a sprinkler system in the home
AT	spriwork - did the sprinkler system operate
AU	oftenuse – how often candles were used in the household a=daily; b=once a week or more; c=once a month or more; d=only at special or holiday occasions; and e=never
AV	income – the household’s annual income a=less than \$15,000; b=between \$15,000-\$34,999; c=\$35,000and greater; d=don’t know
AW	educat – the user’s highest level of education attained and that of spouse/partner
AX	numdead – number of fatalities resulting from incident
AY	nocivinj – number of civilian (non-fire fighter) injuries resulting from incident
AZ	bdpt – part part injured – National Electronic Injury Surveillance System codes
BA	diag – diagnosis of injury – National Electronic Injury Surveillance System codes
BB	nofdpinj – number of fire fighter injuries resulting from incident

Container Fire

Appendix 5

A		B		C		D	E	F
1	taskno	haz pat	other comment	cnclage	cncl1st	burntime		
2	000201HCC2253	cnclhdr caught on fire - 10-11" flames	votive cncl in used holder		yes	8-10hr		
3	000601HCN0271	cncl in cnclhdr - wax caught fire	attempted to move cncl&hdr - spilled hot wax	1.5-2 yr	yes	minutes		
4	010117HCC2193	long wick ignited wedding cncl hdr	wick did not shorten as candle burned	1 mo	yes	30 min		
5	010226HNE6189	unattnd cncl burnd dwn, ignited	wooden hldr, ent ctr - <i>Wax Low case</i>	1 day	yes	.5 hours		
6	990111CCC0213	hdr engulfed in flames	flames ignited plush toys 9 in away	6 mo		3 hrs		
7	990407CWE5003	porous ceramic cncl hdr flamed 3"	cncl 1/2 gone at start - all gone at end	1-2 mo	no	2 hrs		
8	990419CMC9021	cncl ignited plastic cncl hdr	flame from tealight ignited plastic angel head	1 mo	?	30 min		
9	991101CWE5002	cncl hdr burst into flames	flame grew higher, then interior burst into flame	7-10 day	yes	30 min		
10	991103CCN0013	plastic? cncl hdr ignited, melted	FD able to set exemplar on fire with lighter	days	yes	?		

Container Fire

Appendix 5

	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
	candtype	gel	scent	colored	shape	dia in	ht in	cntnr	conttype	hldr	holdtype	wicks	wickanch	sample
1														
2	votive	no	vanilla or gardenia							yes	polystyrene?	1	yes	00-830-4933
3	tealight	no	botanical garden	green	tealight			yes	metal	yes	frosted glass	1	yes	00-830-4944
4	filled?	no	unk	cream	vase	2.75	3.75	yes	silver metallic	no		1	unk	01-830-4437/8
5	unk		yes	yes	unk			no	n/a	yes	wood	unk	unk	no
6	votive	no	unk	unk	votive			2	unk	yes	painted glass	1	unk	none
7	filled	no	unk	unk	cylindrical	3.25	2.25	yes	ceramic	no		1	yes	99-860-5013
8	tealight	no	unk	unk	tealight			yes	metal angel			1	unk	none
9	votive	no								yes	metal building painted interior	1?	unk	00-860-6351
10	unk	no?	yes	unk	unk	11	1.75	yes	plastic	yes	plastic?	1?	unk	00-830-3584/5

Container Fire

Appendix 5

	U	V	W	X	Y	Z	AA	AB	AC	AD	AE
1	whatign	other comments	unatnd	fell aslp	left rm	left hse	wax low	lnccdate	label	city	state
2	candle holder	candle burned all the way down; holder made of polystyrene? this is really a flare-up - manuf blames flare-up on ignition of extraneous material or carbon ball	y		y	n	y	1/23/00	yes	Kenosha	WI
3	candle wax	entire candle appeared to melt container finally also ignited	n				n	1/30/00	yes	Mt. Horeb	WI
4	candle wax							1/6/01	yes	New Lexington	OH
5	candle holder	egg-shaped holder w/dec paint ignited, nearby beanie babies also ignited	y		?		y	10/28/00	unk	Pittsburgh	PA
6	candle holder		unk					1/11/98	unk	Perryopolis	PA
7	candle holder							3/25/99	yes/no	Kailua	HI
8	cncl hldr head	bad design allowed flame to near flammable plastic?						12/??/98	unk	Dallas	PA
9	cncl hldr interior	original candle used up, so used own votive	n				?	10/27/99	unk	Jefferson	OR
10	candle holder	appears to be flammable material						10/28/99	yes/no	Cincinnati	OH

Container Fire

Appendix 5

	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP
	time	pilot	guidelin	usage	locpurch	candcost	howext	roomused	surface	purpose	smokedet
1											
2	p.m.	n	no		candle:Target holder:schl fndrsr		blown out	bathroom	vanity	unk	unk
3	evening	n	final	4(20-64)	cncl:Bed, Bath&Beyond		smothered with rag and hand	liv rm	table	ambiance	yes
4	unk	n	none	4(?)	Value City		pepsi	reception	table		
5	12:00 PM	y	yes	unk	CVS	unk	firedept	bedroom	entertainment center	fragrance	yes
6	unk	n	none		Dollar Tree Stores	unk	water	unk	unk	unk	unk
7	11:00 p.m.	n	none	4(20-64)	Ross Stores						yes
8	unk	n	none	4(20-64)	Eckert Drug	\$3.99 hydr	thrown outdoors	living room	TV	relaxation	unk
9	dinner	n	none	adult	Jo-Ann Stores, Inc		taken outdoors	dining room	tablecloth on table		unk
10	daytime	n	none	adult	99 Cent Center	unk	FD		table	scent	no

Container Fire

Appendix 5

	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1	sdwhere	sdwork	sprinkler	sprwork	offense	income	educat	numdead	nociv/n	bdpt	diag	nofd/pln
2			unk		unk		unk	0	0			0
3	same room	no	no		b	c	grad degree	0	1	92	51	0
4								0	0			0
5	hallway	no	no	n/a	2	2		0	0			0
6			unk		unk	unk	unk	0	1	82	51	0
7	distance	no			c	c	coll grad	0	0			0
8			unk		unk	unk	unk	0	1	82	51	0
9			unk		unk	unk	unk	0	0			0
10			unk		unk	unk	unk	0	0			0

Appendix 6 *Reignition*

Each row in the following spread sheet summarizes information from one In-Depth Investigation (IDI). The row number (appearing in the first column of the spread sheet) is referred to as the “**case number**” in the body of this report and is used to identify the IDI. Since the first row of the spread sheet contains the titles for each column, there is no case number 1.

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Col. Heading

- A** **taskno** – task number - the number used internally by CPSC to identify each IDI
- B** **haz pat** – hazard pattern - a brief description of the incident scenario
- C** **other comment** - additional information about the incident scenario
- D** **cnclage** – candle age
how long the candle had been in the possession of the owner/victim at the time of the incident
- E** **cncl1st** – candle first time - was the incident the first time the candle had been used
- F** **burntime** – how long the candle had been burning when the incident occurred.
- G** **candtype** – candle type
as described by ASTM F1072-00 “Standard Guide for Terminology Relating to Candles and Associated Accessory Items”
- H** **gel-** was this a gel (as opposed to wax) candle
- I** **scent-** if known, the candle scent, if scented unk=unknown
- J** **colored** - the color of the candle, if stated
- K** **shape** - the shape of the candle
- L** **dia in** – diameter in inches – the diameter of the candle, in inches
- M** **ht in** – height in inches - the height of the candle, in inches
- N** **cntnr** – container - was the candle in a container
A container generally refers to a container such as that of a filled candle into which the candle was placed when formed or made, as opposed to a holder which does not determine the shape of the candle placed in it.
- O** **conttype** – container type - what the container was made of
- P** **hldr** – holder - was the candle in a holder – see description under container above
- Q** **holdtype** – holder type - what the holder was made of
- R** **wicks** – how many wicks the candle had
- S** **wkanc** – wick anchor
Was there a wick anchor, generally a small metal tab at the end of the wick which anchors the wick to the bottom of the candle
- T** **sample** – was a sample collected as part of the In-Depth Investigation
The number given is the number which CPSC uses to identify the sample. A sample may be the actual candle involved in the incident, or the remains of the candle and/or its container or holder, or a new candle similar to the one involved in the incident.

<i>Col</i>	<i>Heading</i>	<i>Appendix 6</i>	<i>Reignition Cases</i>
U	whatign	– what ignited – the first thing to catch fire	
V	other comments	– further information about the scenario	
W	reig	– reignition – did the candle reignite	
X	embedin	– embedded in - was anything embedded in the candle, such a flowers or beans	
Y	embedon	– embedded on	
Z	unatnd	– unattended	
		Was the candle left burning with no one present to monitor it, including did the person in attendance fall asleep	
AA	fell aslp	– fell asleep	
		Did the person fall asleep in the presence of a lit candle	
AB	lft rm	– left the room	
		Did the person in attendance leave the room, leaving the candle burning	
AC	lft hse	– left house	
		Did the person leave the house, leaving the candle burning	
AD	wax low		
		Were low levels of wax thought to contribute to the incident and, if so, how much wax was left	
AE	incidate	– incident date – date on which the incident occurred	
AF	label	– did the candle have a warning label	
AG	city	– city in which the incident occurred	
AH	state	– state in which the incident occurred	
AI	time	– time of day at which the incident occurred	
AJ	pilot	– was this case part of the previously reported pilot study	
AK	guidelin	– guideline	
		Was the CPSC Investigation Guideline for Candle Fires and Fire Hazards used in the investigation. If so, what version, the draft version or the final version.	
AL	userage	– user age	
		The age of the user of the candle involved in the incident. This may be reported as the actual age in years, or as one of the age ranges specified in the investigation guideline: under 10, 10-14, 15-19, 20-64, 65-74, and 75 & up. In some cases, the only information was “adult”.	
AM	locpurch	– location where the candle was purchased	
AN	candcost	– how much the candle cost	
AO	roomused	– room in which the candle was used	
AP	surface	– surface on which the candle was sitting	

Col *Heading*

Appendix 6

Reignition Cases

AQ **purpose** – why the candle was being used
AR **smokedet** – smoke detector – was there a smoke detector in the residence
AS **sdwhere** – where the smoke detector was located
AT **sdwork** – did the smoke detector sound an alarm
AU **sprinkler** – was there a sprinkler system in the home
AV **sprwork** – did the sprinkler operate
AW **oftenuse** – how often candles were used in the household
 a=daily; b=once a week or more; c=once a month or more; d=only at special or holiday occasions; and e=never
AX **income** – the household’s annual income
 a=less than \$15,000; b=between \$15,000-\$34,999; c=\$35,000and greater; d=don’t know
AY **educat** – the user’s highest level of education attained and that of spouse/partner
AZ **numdead** – number of fatalities resulting from incident
BA **nocivinj** – number of civilian (non-fire fighter) injuries resulting from incident
BB **nofdpinj** – number of fire fighter injuries resulting from incident

Appendix 7
Tipovers

Each row in the following spread sheet summarizes information from one In-Depth Investigation (IDI). The row number (appearing in the first column of the spread sheet) is referred to as the “**case number**” in the body of this report and is used to identify the IDI. Since the first row of the spread sheet contains the titles for each column, there is no case number 1.

Key to Column Headings

Col **Heading**

- A** **taskno** – task number - the number used internally by CPSC to identify each IDI
- B** **haz pat** – hazard pattern - a brief description of the incident scenario
- C** **other comment** - additional information about the incident scenario
- D** **cndl info** – candle information
how much information was available about the characteristics of the candle involved in the incident
- E** **cndl age** – candle age
how long the candle had been in the possession of the owner/victim at the time of the incident
- F** **cndl1st** – candle first time - was the incident the first time the candle had been used
- G** **burntime** – how long the candle had been burning when the incident occurred.
- H** **candtype** – candle type
as described by ASTM F1072-00 “Standard Guide for Terminology Relating to Candles and Associated Accessory Items”
- I** **gel-** was this a gel (as opposed to wax) candle
- J** **scent-** if known, the candle scent, if scented unk=unknown
- K** **colored** - the color of the candle, if stated
- L** **shape** - the shape of the candle
- M** **dia in** – diameter in inches – the diameter of the candle, in inches
- N** **ht in** – height in inches - the height of the candle, in inches
- O** **cntnr** – container - was the candle in a container
A container generally refers to a container such as that of a filled candle into which the candle was placed when formed or made, as opposed to a holder which does not determine the shape of the candle placed in it.
- P** **conttype** – container type - what the container was made of
- Q** **hldr** – holder - was the candle in a holder – see description under container above
- R** **holdtype** – holder type - what the holder was made of
- S** **wicks** – how many wicks the candle had
- T** **wkanc** – wick anchor
Was there a wick anchor, generally a small metal tab at the end of the wick which anchors the wick to the bottom of the candle

- U** **sample** – was a sample collected as part of the In-Depth Investigation
The number given is the number which CPSC uses to identify the sample. A sample may be the actual candle involved in the incident, or the remains of the candle and/or its container or holder, or a new candle similar to the one involved in the incident.
- V** **whatign** – what ignited – the first thing to catch fire
- W** **other comments** – further information about the scenario
- X** **unatnd** – unattended
Was the candle left burning with no one present to monitor it, including did the person in attendance fall asleep
- Y** **fell aslp** – fell asleep
Did the person fall asleep in the presence of a lit candle
- Z** **lft rm** – left the room
Did the person in attendance leave the room, leaving the candle burning
- AA** **lft hse** – left house
Did the person leave the house, leaving the candle burning
- AB** **wax low**
Were low levels of wax thought to contribute to the incident and, if so, how much wax was left
- AC** **incdate** – incident date – date on which the incident occurred
- AD** **label** – did the candle have a warning label
- AE** **city** – city in which the incident occurred
- AF** **state** – state in which the incident occurred
- AG** **time** – time of day at which the incident occurred
- AH** **plot** – was this case part of the previously reported pilot study
- AI** **guidelin** – guideline
Was the CPSC Investigation Guideline for Candle Fires and Fire Hazards used in the investigation. If so, what version, the draft version or the final version.
- AJ** **userage** – user age
The age of the user of the candle involved in the incident. This may be reported as the actual age in years, or as one of the age ranges specified in the investigation guideline: under 10, 10-14, 15-19, 20-64, 65-74, and 75 & up. In some cases, the only information was “adult”.

Col *Heading*

Appendix 7

Tipover Cases

AK **locpurch** – location where the candle was purchased
AL **candcost** – candle cost - how much the candle cost
AM **howext** – how extinguished – how the fire was put out
AN **roomused** – room in which the candle was used
AO **surface** – surface on which the candle was sitting
AP **purpose** – why the candle was being used
AQ **smokedet** – smoke detector – was there a smoke detector in the residence
AR **sdwhere** – where the smoke detector was located
AS **sdwork** – did the smoke detector sound an alarm
AT **sprinkler** – was there a sprinkler system in the home
AU **sprwork** - did the sprinkler system operate
AV **oftenuse** – how often candles were used in the household
 a=daily; b=once a week or more; c=once a month or more; d=only at special or holiday
 occasions; and e=never
AW **income** – the household’s annual income
 a=less than \$15,000; b=between \$15,000-\$34,999; c=\$35,000and greater; d=don’t know
AX **educat** – the user’s highest level of education attained and that of spouse/partner
AY **numdead** – number of fatalities resulting from incident
AZ **nocivinj** – number of civilian (non-fire fighter) injuries resulting from incident
BA **bdpt** – part part injured – National Electronic Injury Surveillance System codes
BB **diag** – diagnosis of injury – National Electronic Injury Surveillance System codes
BC **nofdpinj** – number of fire fighter injuries resulting from incident

A		B		C		D	E	F	G	H	I
taskno	haz pat	other comment	cncl info	cnclage	cnclfst	burntime	candytype	gel			
1											
2	000112HCC0283	candle fell over	onto end table with table cloth	3-4 inch		2 hr??	taper?				
3	000124HCC2207	candle tipped over?	power outage-cncl left burning while sleeping	no							
4	000228HCN0129	unattended cncl in wood cndlstick	leaned over, ignited blanket - bsmt bdrm	some		2 hr	taper				
5	000317HCN0143	unattended cncl tipped over	on dresser - ignited bed linens - residential hotel	some		unk	pillar				
6	000321HCN0146	cncl knocked/feil over	on metal cndlhidr on dresser in bdrm	some	no	1 hr	pillar				
7	000403HWE5002	wind blew cncl on night shelf over	bedding ignited	some		1 hr	taper				
8	000404HCN0168	cncl fell between sofa & TV console	metal holder survived fire	some	3-4 mo	minutes	pillar				
9	000410HCN0172	votive in glass holder	fell from wooden wall hanger, ignited carpet	some	1 wk?	1 hr	votive				
10	000417HCN0180	unatnd cncl(fell) ignited carpet	owner had left house	-							
11	000518HWE5012	unatnd cncl left near bed	ignited bedding - owner had left house	-							
12	000707HNE5653	lit cncl on nislid ignited bedding	no real info - ETOH involvement	-							
13	000724HWE5609	candle and holder fell off shelf?	votive candle in ceramic angel holder ignited bedding	yes	3 mos	minutes	votive/tealight				
14	000728HCN0376	cncl fell into wicker bskt	ignited combustibles - no real candle info								
15	001010HNE5798	unatnd cncl fell off shelf	into bathtub w/plastic liner that smoldered/smoked	no	unk	unk	unk				
16	001017HWE6007	cncl/wall sconce fell, ignited bed		no	unk	unk	unk				
17	001019HCN0040	cncl fell, ignited bdside lbclith	there was "paper" on the front of the candle	some	1 mo	0.5-1 hour	pillar				
18	001024HCN0047	cncl tipped over, ignited curtain	electricity turned off	little	unk	unk	taper				
19	001106HNE5856	cncl near wood stove tipped over	floor ignited renovating cottage	little	unk	unk	unk				
20	001108HNE5871	unatnd cncl on windowsill fell on TV	ignited furniture - candle found on its side	some	unk	unk	pillar				
21	001115HCN0085	cncl left burning all night tipped over	ignited stereo	little	unk	all night	taper				
22	001117HNE5891	wind knocked cncl over on wood tbl	ignited rug	little	unk	.25-.33 hours	filled				
23	001211HCN0141	new cncl collapsed, fell off pedestal	ignited book, cloth and dresser top	some	new	2.5 hours	pillar				
24	010103HCN0198	unatnd cncl fell off shelf onto sofa		none	unk	unk	unk				
25	010213HCN0318	cncl hidr fell on bhkt, ignited	no electricity in house	none	unk	all night	unk				
26	010213HNE6161	cncl fell from tbl, ignited laundry	placed on top of holder too small for candle	some	unk	1 hr	votive				
27	010228HNE6201	unatnd cncl tipped over		little	unk	40 min	taper				
28	010409HNE6281	unatnd cncl fell off wall shelf	ignited floor	little	unk	1.5hr plus	unk				

	A	B	C	D	E	F	G	H	I
29	010524HNE6398	cnlds fell off plate, ign nwspprs		little	unk	no	30 min	taper	
30	010628HCC3359	cnld fell off mounting stick	flower-shaped 2inx1in - novelty candle- defect?	yes	2 mos	yes	10-20 min	novelty	
31	010727HNE6589	unattnd cnld fell off computer	ignited nearby paper combs - possible reignition	some	unk	no	3 hrs plus	unk	
32	980731HCC2738	cnld tipped over, ignited sofa	no info available about candle						
33	980818HCC2790	cnld fell on sheet on uphstrd chr	power outage - storm	none	unk	unk	unk	taper (FD)	
34	981211HCC0138	cnld rolled off table, landed on bed	ignited mattress	scant	3 days	unk	2 hrs plus	unk	
35	981215HCC0150	cnld fell onto sofa, ignited it		scant	1 mo	unk	6 hrs	unk	
36	991018HCC3011	cnld fell on nwspprs, igniting them	when water thrown on fire, it flared up	none	unk	unk	unk	unk	
37	991123HCC2083	cnld fell off organizer, rolled undr bd	ignited bedding	yes	lt 1 mo	yes	1-1.5 hour	filled	
38	991201HCC0132	unattnd cnld in hldr fell over/off	ignited sofa—power outage, Hurricane Floyd	scant	unk	unk	overnight?	taper	
39	991201HCC0137	wall mounted cnld fell, ignited carpet	charred pool of wax on carpet - no info on candle	none	unk	unk	unk	unk	

	J	K	L	M	N	O	P	Q	R	S	T	U	V
	scent	colored	shape	dia in	ht in	cntnr	conttype	hidr	holdtype	wicks	wickanch	sample	whatign
1					3-4(?)			yes	glass-size cup holder			no	tablecloth
2								yes	wooden candlestick			no	blanket used as wall
3					unk			yes	metal			no	bedding
4					unk	no		yes	black metal	1	no	no	nearby combs
5					unk	6		yes				no	bedding
6		red			3	8		yes	black wrought iron type plate	1	unk	no	synthetic carpeting
7					unk	yes	glass	yes	hanging wooden	ns	unk	no	carpet
8	yes/unk												
9	no												
10													
11													
12													
13	vanilla	white	cylindrical	1.5	2			yes	ceramic angels holding candle	1	yes	no	bedding
14													
15	yes/unk	unk	round	1.5				yes	plastic 0.75" high wall sconce	1	metal	no	tub liner
16	unk	unk	unk		unk	unk		yes		unk	unk	no	bedding
17	yes/unk	chestnut	round pillar	2.5	7	no		yes	ceramic dish	1	no	no	tablecloth? FD says bedding
18	unk	unk	taper	1.25	4	unk		unk				no	curtains?
19	unk	unk	unk	unk	unk	unk		unk		unk	unk	no	floor
20	no	mauve	round pillar	4to5	6	no	n/a	no	n/a	1	no	no	furniture
21	unk	unk	unk	unk	unk	unk		yes		1	unk	no	stereo
22	yes/unk	red	round	3	3	yes	glass	no	n/a	1	no	no	rug
23	sandalwood	pink	column	2?	6	no		yes	brass, footed	1	unk	01-830-4541	dresser top
24	unk	unk	unk			unk	unk	yes	glass	unk	unk	no	sofa
25	unk	unk	unk	unk	unk	unk		yes	unk	unk	unk	no	blanket
26	unk	white	cylindrical rounded top	1/2in	1	unk		yes	tealight holder	1	no	no	laundry
27	unk	unk	unk	unk	unk	unk		unk		1	unk	no	paper or laundry
28	unk	unk	unk	4	unk	no		no		unk	unk	no	

Tipovers

Appendix 7

	J	K	L	M	N	O	P	Q	R	S	T	U	V
29	unk	taper		unk	unk	unk		yes	brass plate	1	unk	no	table
30	citronella?	unk	flower	2	1	no		yes	own flower pot	1	unk	no	tablecloth
31	unk	unk	unk	unk	unk	no		yes	glass dish/saucer	unk	unk	no	books or paper
32													
33	unk	unk	unk	unk	unk	unk		unk		unk	unk	no	sheet on chair, then chair
34	gardenia	unk	unk	2.5	3to4	unk		unk		unk	unk	no	bedding
35	unk	unk	unk			unk		no?		unk	unk	no	sofa
36	unk	unk	unk	unk	unk	unk		unk		unk	unk	no	sofa, other combustibles
37	apple cinnamon	red	spherical	3	3	yes	glass	no		1	unk	00-830-49867	bedding
38	unk	unk	unk	0.5	8	unk		yes?	clear plastic	1	unk	no	sofa
39	unk	unk	unk	unk	unk	unk	unk	yes	plastic	unk	unk	no	carpet

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
1	other comments	unatnd	fell asip	left rm	left hse	wax low	incdate	label	city	state	time	pilot	guidelin	usage
2	power outage		y				11/7/99		Doylestown	PA	8:11 p.m.	n	draft	5(65-74)
3	wooden crndl hidrs visible in wreckage						11/24/99		Ada	MI	12:26 a.m.	n	no	
4	after fire	y		y			1/8/00		Libertyville	IL	11:00 p.m.	n	draft	4(20-64)
5	child may have jumped on bed on wall adjacent to dresser with candles	y		?			3/17/00		Highland Park	MI	1:20 a.m.	n	draft	unk
6		y		y		no	2/28/00		Madison Heights	MI	7:34 p.m.	y	final	4(20-64)
7		y	y				3/21/00		Benicia	CA	12:00 noon	n	draft	4(20-64)
8		y		y			3/20/00	yes	Hastings	NE	4:13 p.m.	n	final	4(20-64)
9	heard a bang, went to investigate	y		y			3/24/00	unk	Lincoln	NE	8:00 p.m.	n	draft	4(20-64)
10		y		?										
11		y		y										
12														
13	saw candle holder on bed					no	5/30/00	no	Aiea	HI	9:15 p.m.	n	final	4(20-64)
14														
15	dorm room	y		y			9/28/00	yes	Canton	NY	10:19 p.m.	n	final	college student
16		y	y				10/16/00	unk	Las Vegas	NE	10:14 p.m.	n	draft	2(10-14)
17	there was "paper" on the front of the candle which she did not remove	y					10/3/00	yes	Chicago	IL	4:00 AM	y	draft	4(20-64)
18	no electricity	?					10/21/00		Pontiac	MI	2:24 a.m.	n	final	4(20-64)
19	used candles to save eifec	y		y			11/2/00	unk	Coventry	RI	6:19 p.m.	n	none	4(20-64)
20		y		y			11/8/00	unk	Brooklyn	NY	9:30 PM	y	draft	4(20-64)
21	FD thinks candle heated up and bent over	y					11/14/00		Burton	MI	6:00 a.m.	n	final	4(20-64)
22		y		y			11/8/00	unk	Brooklyn	NY	11:30 AM	y	draft	4(20-64)
23	heard popping noise of glass dish breaking only about 1/4 inch of candle gone	y		y			12/6/00	unk	Homewood	IL	unk	n	draft	4(20-64)
24	adults left house about 45 minutes before alarm	y		y			11/13/00	unk	Chicago	IL	7:00 PM	y	final	4(20-64)
25		?			y		2/10/01	unk	Fl. Worth	TX	6:30 a.m.	n	final	4(20-64)
26	crndl too large to fit in hidr	y			y		2/8/01	unk	Burlington	VT	6:13 p.m.	n	draft	3(15-19)
27		y		y			1/29/01	unk	Norwalk	CT	9:55 p.m.	n	final	6(75+)
28		y	y	?			4/4/01	unk	Kingston	NY	11:30 AM	n	final	4(20-64)

Tipovers

Appendix 7

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
29	relatively small fire detectors too far away to sound	y		y			10/8/00		Kingston	NY	8:57 p.m.	n	final	5(65-74)
30	flower shaped candle fell off its mounting stick	y		y			5/26/01	unk	Fresno	CA	5:00 p.m.	n	final	4(20-64)
31	previous instance thought put crdl out but did not go out and fell over in dish	y			y		7/25/01		Atlantic City	NJ	4:00 a.m.	n	draft	4(20-64)
32														
33		y			y		6/30/98	unk	Peoria	IL	3:38 p.m.	n	none	adult
34	bed was a sofa bed mattress used on the floor	y					12/3/98	unk	Naples	FL	2:14 a.m.	n	M/Bed fire	4(20-64)
35		y		y			11/10/98	unk	Kinnelon	NJ	4:08 a.m.	n	upfurn fire	4(20-64)
36	owner under care of public guardian post-fire	unk					8/2/99		Novato	CA	12:37 a.m.	n	none	4(20-64)
37		y		y			10/20/99	yes	Fairfield	IA	1:19 a.m.	n	none	4(20-64)
38		y		?			9/17/99	unk	Oakhill	FL	5:09 a.m.	n	draft	unk
39	trailer	unk					10/1/99	unk	Canandaigua	NY	2:00 a.m.	n	draft	3(15-19)?

Tipovers

Appendix 7

	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
	locpurch	candcost	howext	roomused	surface	purpose	smokedet	sdwhere	sdwork	sprinkler	sprwork	oftenuse	income	educat
1	unk	unk	FD	liv rm?	tablecloth on end table	ambiance	no			no		a	d	unk
2	unk	unk	FD	basement	wooden dresser		yes		yes					
3	unk	unk	FD	basment	wooden dresser		yes	basement	yes	no		unk	unk	unk
4	unk	unk	FD	bedroom	dresser		yes	room/hallway	yes	no		unk	unk	unk
5	unk	unk	FD	bedroom	wooden dresser		yes	hallway	yes	no		a	d	unk
6	K-Mart	2/\$1.00	FD	bedroom	wooden night shelf	religious	yes	hallway	yes	no		b	c	high school
7	unk	unk	FD	bedroom	TV console	fragrance	yes	hallway	yes	no		b	a	high school
8	Dollar General	\$1-2	FD	living room	wall hanging	ambiance	yes	hallway	yes	no		b	c	coll degree
9	unsure	unk	FD	bathroom										
10														
11														
12														
13	mail order	12/\$10.90	FD	bedroom	plastic shelf	ambiance fragrance	no			no		a	d	some college
14	unk	unk	FD	bathroom	plastic corner shelf	unk				yes	yes	unk	unk	college student
15	unk	unk	FD	bedroom	wall sconce	unk	yes	unk	yes	unk		unk	unk	unk
16	unk	unk	FD	bedroom	nightstand	aromatherapy	yes	in unit and in hallway	yes	no	n/a	unk	1	3 college degree
17	illuminations	unk	FD	bedroom	unk	illumination?	no			no		unk	unk	unk
18	unk	unk	FD	bedroom	?	illumination	yes	unk	unk	no		unk	unk	unk
19	unk	unk	FD	kitchen?	windowsill	decorative	unk	unk	unk	no		unk	unk	unk
20	unk	unk	FD	living room	unk	unk				no		unk	unk	unk
21	unk	unk	FD	bedroom	wood table	unk	yes	hallway	yes	no		unk	unk	unk
22	unk	unk	FD	dining room	wood table	fragrance	yes	hallway	yes	no		unk	unk	unk
23	unk	\$8.00	water	bedroom	dresser	unk	yes	hallway	no	no		b	d	4 yrs college
24	unk	unk	FD	living room	shelf	honor mother	yes	unk	yes	no		unk	unk	unk
25	unk	unk	FD	living room	end table	light	yes		yes	no		unk	unk	unk
26	unk	unk	FD	dorm room	table	unk	no			no		unk	unk	college student
27	unk	unk	FD	bedroom	table	ambiance	yes	several		no		c	d	unk
28	unk	unk	FD	living room	shelf	unk	yes		yes	unk		unk	unk	unk

	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
29	unk	unk	FD	kitchen	table	religious	yes	hallway	no	no		c	d	unk
30	Pier 1	\$1.00	owner	patio	table with cloth	ambiance	unk	unk	unk	unk		b	d	unk
31	local Korean sundry store	unk	FD	bedroom	computer	unk	no		no			b	c	unk
32														
33	unk	unk	FD	unk	unk	light	yes	not in room	yes	no		unk	unk	unk
34	unk	unk	FD	living room	table next to bed	unk	no		no			unk	unk	some coil
35	unk	unk	FD	living room	spiral stairs	unk	yes	kitchen	yes	no		unk	c	some coil
36	unk	unk	FD	living room	window sill	unk	unk			unk		unk	unk	unk
37	Wal-Mart	\$2.50	FD	bedroom	organizer	unk	yes	in apt	yes	no		unk	unk	unk
38	unk	unk	FD	family room	table	light	yes	family room	no	no		unk	unk	unk
39	unk	unk	FD	living room	unk	unk	yes		yes	unk		unk	unk	unk

Tipovers

Appendix 7

	AY	AZ	BA	BB	BC
29	0	0			0
30	0	0			0
31	0	0			0
32					
33	0	0			0
34	1	1	85	65	1
35	0	0			0
36	0	1	76	51	1
37	0	0			0
38	0	0			0
39	0	0			0

Tipovers

Appendix 7

	AY	AZ	BA	BB	BC
1	numdead	nocivinj	bdpt	diag	nofdpinj
2	0	4	85	65	0
3	0	1	85	65	0
4	0	0			0
5	0	several			
6	0	0			0
7	0	0			0
8	0	0			0
9	0	0			0
10					
11					
12					
13	0	1	81	51	0
14					
15	0	0			0
16	0	0			0
17	0	0			0
18	4	1	83	59	0
19	0	0			0
20	0	0			0
21	0	0			0
22	0	1	82	burn	0
23	0	0			0
24	0	0			0
25	0	1	85	65	0
26	0	0			0
27	0	1	85	65	0
28	0	0			1