Health Canada Santé Canada

Consumer and Hazardous Products Safety Directorate
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RE: Notice to interested parties – Updated danger determination and risk mitigation measures for certain containers of pourable alcohol-based fuels and certain portable firepots that use pourable fuels

In response to incident reports describing fatalities and serious injuries resulting from flame jetting occurrences, Health Canada distributed a Notice to interested parties in October 2019 that included a danger determination for certain containers of pourable alcohol-based fuels and certain portable firepots that use pourable fuels.

The October 2019 Notice stated that meeting the performance criteria outlined in the draft ASTM International work item ASTM WK60590, "New Standard Specification for Flame Mitigation Devices for Disposable Flammable Liquid Fuel Containers", or the equivalent, may be sufficient to mitigate the danger to human health or safety associated with certain containers of pourable alcohol-based fuel.

The ASTM technical committee has since concluded its work on ASTM WK60590, which has led to the September 2020 publication of ASTM F3429 / F3429M - 20, “Standard Specification for Performance of Flame Mitigation Devices Installed in Disposable and Pre-Filled Flammable Liquid Containers”. As a result, Health Canada’s danger assessment has been updated to reference the final standard. Containers of pourable alcohol-based fuel sold on the Canadian market are now expected to meet the requirements of ASTM F3429 / F3429M - 20, or the equivalent.

The purpose of this follow-up Notice is to inform you that, on the basis of the assessment described in this Notice, Health Canada has determined that:

- certain containers of pourable alcohol-based fuel that do not have a flame mitigation device that meets the performance criteria outlined in ASTM F3429 / F3429M – 20, or the equivalent, for the useful life of the product pose a danger to human health or safety (this is consistent with the previous determination related to ASTM WK60590), and

- certain portable firepots that use pourable fuels and that do not meet the performance criteria outlined in ASTM F3363-19, or the equivalent, pose a danger to human health or safety.

The details of Health Canada’s analysis, including an updated description of the products of concern, are provided in Appendix A.

Products that are a danger to human health or safety are prohibited from manufacture, importation, advertisement or sale according to paragraphs 7(a) and 8(a) of the *Canada Consumer Product Safety Act* (CCPSA). Consequently, Health Canada is asking that industry stop selling the products of concern.

It is important to note that Health Canada may take immediate compliance and enforcement action in line with the Consumer Product Safety Program's compliance and enforcement policy framework when it has reason to believe that a product is a danger to human health or safety or is non-compliant with the CCPSA or its regulations. Under the CCPSA, compliance and enforcement actions may include seizure, orders to take corrective action, mandatory recall of products, administrative monetary penalties and criminal prosecution.

Appendix B provides information about the criteria that Health Canada considers may be sufficient to mitigate the danger associated with flame jetting occurrences that may result from the use of certain containers of pourable alcohol-based fuels and portable firepots that use pourable fuels.

Health Canada will continue to monitor the situation and will update this Notice as warranted.

Health Canada reminds regulated parties that:

- it is their responsibility not to manufacture, import, advertise or sell any consumer products that pose a danger to human health or safety; and
- they must not wait for a communication from Health Canada in order to comply with the CCPSA.

You may wish to subscribe to our electronic newsletter so that you can receive the latest news and information about Health Canada's work in the area of consumer product safety. Instructions on how to subscribe are provided at this link: https://www.canada.ca/en/health-canada/services/consumer-product-safety/advisories-warnings-recalls/subscribe.html.

Information resources

If you require additional information regarding this Notice, visit the resources below or contact a Health Canada Consumer Product Safety Office via email (hc.ccpsa-lcspc.sc@canada.ca) or telephone at 1-866-662-0666 (toll-free within Canada and the United States).

- *Canada Consumer Product Safety Act* (CCPSA) and its regulations https://laws-lois.justice.gc.ca/eng/acts/C-1.68/index.html
- Industry Guidance – "Danger to Human Health or Safety" Posed by Consumer Products https://www.canada.ca/en/health-canada/services/consumer-product-safety/reports-publications/industry-professionals/industry-guidance-danger-human-health-safety-posed-consumer-products.html

Appendix A

Legislative Background

The purpose of *Canada Consumer Product Safety Act* (CCPSA) is to protect the public by addressing or preventing dangers to human health or safety that are posed by consumer products in Canada. Any person who manufactures, imports, advertises, sells or tests a consumer product must comply with all applicable requirements of the CCPSA and its regulations. The Act prohibits the manufacture, importation, advertisement or sale of any consumer product that is a "danger to human health or safety" (paragraphs 7(a) and 8(a)), and defines the term as follows.

> Danger to human health or safety means any unreasonable hazard — existing or potential — that is posed by a consumer product during or as a result of its normal or foreseeable use and that may reasonably be expected to cause the death of an individual exposed to it or have an adverse effect on that individual's health — including an injury — whether or not the death or adverse effect occurs immediately after the exposure to the hazard, and includes any exposure to a consumer product that may reasonably be expected to have a chronic adverse effect on human health.

Definitions

Pourable alcohol-based fuel: a pourable substance or mixture of substances (viscosity less than 50 Pa·s at 20 °C) containing alcohol(s) and marketed for igniting or sustaining a flame. The term "fuel" on product labels indicates igniting or sustaining a flame.

Portable firepot: also referred to as a fireburner, portable fireplace, firebowl, patio burner, flamepot, firelight or table top fire pit, is a portable, decorative lighting accent that supports open flame burning. It generally consists of a pot or base, usually made of a ceramic or other heat resistant material, an open fuel reservoir (burn cup) that holds alcohol-based fuel, and may also include a snuff tool to extinguish the flame. A portable firepot may be marketed for indoor or outdoor use. In the context of this danger to human health or safety assessment, a "portable firepot" is considered not fixed and movable.

Scope of Affected Products[1]

The danger to human health or safety assessment focuses on two distinct products given that a flame jetting occurrence can happen when these products are used together. Such use is foreseeable since one (the container of pourable alcohol-based fuel) provides the intended fuel for the other (the portable firepot) and the fuel will need to be replenished when the portable firepot is used as intended. A general description of each product follows.

[1] The scope of affected products has not changed from the scope presented in the October 2019 Notice under the "Nature of the Products" section. However, the new "Definitions" and "Scope of Affected Products" sections were added to improve clarity regarding the products that are in scope and outside the scope of Health Canada's danger assessment. These additions reflect information provided to industry since distribution of the October 2019 Notice.

1. **Containers of pourable alcohol-based fuel** – While this danger to human health or safety assessment is focused on containers of pourable alcohol-based fuel intended for use with portable firepots, it is foreseeable that a user may use any container of pourable alcohol-based fuel in conjunction with a portable firepot, thus presenting the same fire or burn hazard from a flame jetting occurrence. The scope of affected products captured by this danger assessment therefore includes all containers of pourable alcohol-based fuel, as defined in this assessment, including:

    - fuels intended for use with firepots, food warming products (fondue or chafing fuels) and camping or marine stoves; and
    - fire starters and charcoal lighter fluid.

    The containers of pourable alcohol-based fuel of concern are necked bottled containers that are typically sold pre-filled with fuel, are non-refillable, disposable, and their volume is typically less than 4 L.

    While there may be other products available on the Canadian market that may be used for igniting or sustaining a flame, the scope of this danger to human health or safety assessment is not intended to capture products that are not marketed as a fuel product.

    The scope of products to which the danger assessment applies does not include:

    - cleaning products containing isopropyl alcohol;
    - containers of alcohol-based fuels for use in combustion engines (E85 fuel);
    - methyl hydrate products (methanol) marketed solely for de-icing applications;
    - non-alcohol-based fuels such as gasoline or naphtha;
    - portable gasoline containers, also referred to as “jerry cans”; or
    - alcohol-based fuels available in single-use canisters or pastes in squeezable containers.

2. **Portable firepots** – Health Canada has identified the scope of portable firepots that are captured by the danger to human health or safety assessment to include devices that use pourable fuels and that are not fixed and are movable. In the context of this assessment, “not fixed and are movable” means devices that do not require installation using tools and securing hardware into existing infrastructure such as a wall, flooring or a similar fixed setting; the dry weight, power output, fuel capacity, or physical dimensions of the device have no impact on this assessment.

    Freestanding and tabletop devices that are “not fixed and are movable” are considered to be captured in the scope of products to which this danger to human health or safety assessment applies. Inclusion of securing hardware such as screws or bolts with a device at the point of sale without the device requiring these materials for installation into a fixed setting does not exclude the product from the scope of this assessment.

For clarity, the following types of products are not products of concern for the purposes of this assessment:

- firepots that use non-pourable fuel, such as wood, propane and natural gas;
- firepots that use non-pourable, single-use fuel canisters;
- products that do not have an open fuel reservoir, such as a refillable oil lamp and outdoor garden torches, which use a wick to sustain the flame; and
- reservoirs intended to contain and burn fuels for food warming applications, such as chafing and fondue fuel reservoirs.

Incident Reports

Health Canada is aware of 15 reports of flame jetting incidents that occurred between June 20, 2011, and October 23, 2020, involving portable firepots and containers of pourable alcohol-based fuel in Canada. These incident reports described 2 deaths and burn injuries to 30 users and bystanders. In many cases, the burn injuries described were severe and life-threatening or disabling.

In general, the incidents reported were similar in nature and indicated that attempting to refuel a portable firepot with pourable alcohol-based fuel resulted in a “fireball” being rapidly projected out of the fuel container.

Hazards of concern

A fire or burn hazard from a flame jetting occurrence is present, with the combined use of a container of pourable alcohol-based fuel and a portable firepot, when the user, believing that there is no longer heat or a flame within a portable firepot (possibly due to the low visibility of the alcohol flame), refuels the device by pouring alcohol-based fuel into the burn cup or similar component. The act of pouring the fuel from a container that is not equipped with a functional flame mitigation device onto a flame within the portable firepot, or into a portable firepot that is still hot, may, under certain conditions result in a flame jetting occurrence. This happens when an existing flame, or hot fuel reservoir, ignites the fuel vapours around the pouring fuel stream and the flame front travels up the stream and ignites the air/fuel mixture in the headspace of the fuel container. The ignition of vapours in the container results in a burst of flames and fuel rapidly "jetting out" of the container opening and travelling a distance that is hazardous to the user and/or bystanders. Ignition of vapours within the fuel container may result in a rupture of the container that also presents a fire or burn hazard to the user.

A flame jetting occurrence presents a fire and burn hazard. A flame jetting occurrence is unexpected and occurs on a millisecond time scale, thus the user and/or bystanders are unable to react quick enough to move away from an incoming flame jet. During an occurrence, fuel may also be expelled from the container and may come into contact with the user and/or bystanders and can result in the burning of clothing and skin over a longer time frame.

Health Canada has identified that the user risk level associated with flame jetting is in the range of high to very high when a container of pourable alcohol-based fuel without a flame mitigation device is used in conjunction with certain portable firepots.

The likelihood of a flame jetting occurrence is greatly reduced if a fuel container is equipped with a functional flame mitigation device (flame arrestor). Such a device diminishes the likelihood that the air and fuel mixture in the headspace of the fuel container will ignite when a flame travels up the pouring fuel stream.

The likelihood of a flame jetting occurrence can also be affected by the design and construction of a portable firepot. For example, while there may be other effective options, the likelihood of a flame jetting occurrence can be reduced when a portable firepot:

- does not have an open reservoir to sustain a flame (for example, a refillable oil lamp with an enclosed fuel reservoir and a wick);
- does not allow pourable fuel to accumulate in a fuel burning feature or has a refueling area separate from the flame area;
- is supplied with a snuffer to completely extinguish flames; and
- includes warnings and instructions to guide users in their safe use.

Danger Determination

Based on the danger to human health or safety considerations and details discussed in the following sections, Health Canada believes that the following products pose a danger to human health or safety:

- **certain containers of pourable alcohol-based fuel that do not have a flame mitigation device that meets the performance criteria outlined in ASTM F3429 / F3429M – 20, or the equivalent, for the useful life of the product; and**

- **certain portable firepots that use pourable fuels and that do not meet the performance criteria outlined in ASTM F3363-19, or the equivalent.**

Health Canada recognizes that there may be other possible health or safety concerns with the use of these or similar products. Industry should review their products for all potential hazards and respond appropriately to make sure they are safe for consumers.

The Consumer Product Safety Program of Health Canada operates as a post-market regulatory regime, meaning that there is no pre-market review or approval of consumer products by Health Canada.

Health Canada may update this assessment as warranted.

Danger to Human Health or Safety Considerations

Considerations for a product to pose a potential danger to human health or safety are outlined in Health Canada's "Industry Guidance - "Danger to Human Health or Safety" Posed by Consumer Products" (Danger Policy). The main considerations assessed are:

1) Unreasonable hazard
2) Existing or potential hazards
3) Normal or foreseeable use
4) May reasonably be expected to cause
   a) Death
   b) Adverse effect on health

1) Unreasonable hazard

The consideration of unreasonable hazard includes the following components.

a) Inherent hazard

Portable firepots are products intended to produce open flames, thus they are considered to have an inherent fire and burn hazard associated with their use. However, the fire or burn hazard from a flame jetting occurrence is not required for the functioning of the portable firepot. Additionally, the flame jetting phenomenon that can happen during the refueling of a portable firepot is not known by the general public. It occurs during reasonably foreseeable

use of the products and it is considered a hidden hazard because alcohol flames may be difficult to see, especially when the fuel is getting low, and alcohol vapours are invisible.

b) Severity of hazard

A flame jetting occurrence that occurs during portable firepot refuelling can cause burn injuries ranging from minor to fatal in severity. Based on incident reports received by Health Canada, a flame jetting occurrence can be extremely severe in nature, often causing second and third degree burns to the user or bystanders, and can involve burns to a large portion of the victim's total body surface area. In many cases, a survivor of a flame jetting occurrence experiences debilitating pain, requires multiple reconstructive surgeries and is scarred for life. There have been two reported fatalities in Canada. Health Canada has identified that the user risk level associated with flame jetting is in the range of high to very high when a container of pourable alcohol-based fuel without a flame mitigation device is used in conjunction with a portable firepot.

c) Intended and foreseeable users

The intended users of portable firepots and containers of pourable alcohol-based fuels are adults. A flame jetting occurrence has the potential to severely or fatally injure the intended user and multiple bystanders, who may include children; however, the flame jetting hazard is not known to affect vulnerable populations disproportionately.

d) Obviousness of the hazard

The flame jetting phenomenon that can happen during the refueling of a portable firepot is not known by the general public. Alcohol flames may be difficult to see, especially when the fuel is getting low, and alcohol vapours are invisible, which makes this a hidden hazard. Therefore, how and why flame jetting occurs and how to avoid the hazard is not considered to be obvious to the user or bystanders.

e) Social utility

A portable firepot has little to no social utility. The main purpose of the product is decorative. It does not provide substantial heat, is not used for cooking and is not bright enough to be used as a primary light source.

A container of pourable alcohol-based fuel is used to fuel a product such as a portable firepot. This product may be a fuel source for other consumer products that may have greater social utility.

f) Availability of alternatives

Some alcohol-based fuels for use in portable firepots are sold in one-time use (single-use) disposable canisters requiring no pouring of fuel. The fire or burn hazard from a flame jetting occurrence is not present when these types of disposable canisters are used as intended. There exist similar products to portable firepots that are fuelled by different fuel sources such as propane, natural gas or firewood. The fire or burn hazard from a flame jetting occurrence is not present when alternative fuel sources are used that do not involve

refuelling by pouring. Other decorative open flame sources such as candles are available to create a similar ambience to portable firepots without introducing a fire or burn hazard from a flame jetting occurrence. Flame arrestor technology on fuel containers that can mitigate the risk of flame jetting currently exists.

g) Consensus-based safety standards or government regulations

The October 2019 Notice to interested parties referenced an ASTM International consensus-based safety standard for flame mitigation devices installed in disposable containers of flammable liquid: ASTM WK60590 - "New Standard Specification for Flame Mitigation Devices for Disposable Flammable Liquid Fuel Containers". The ASTM technical committee has since concluded its work on ASTM WK60590, which has led to the September 2020 publication of ASTM F3429 / F3429M – 20, “Standard Specification for Performance of Flame Mitigation Devices Installed in Disposable and Pre-Filled Flammable Liquid Containers”.

A consensus-based safety standard for portable firepots was published in February 2019: ASTM F3363-19, "Standard Specification for Unvented Liquid/Gel Fuel-Burning Portable Devices”. This standard sets out requirements for portable firepots including requirements related to:

- the ability to accumulate fuel in the fuel burning area,
- the materials used in their construction,
- the supply of a means to extinguish the flame,
- the emissions for indoor use devices, and
- the stability of the product.

2) Existing or potential hazards

A lit portable firepot presents an existing inherent fire and burn hazard, as it has an open flame.

Pourable alcohol-based fuels are flammable and therefore also present a fire and burn hazard when ignited. The flammability hazard of alcohol-based fuels that are classified as consumer products is regulated by the *Consumer Chemicals and Containers Regulations, 2001* (CCCR, 2001) under the CCPSA. The regulations set out requirements that include hazard symbols, bilingual cautionary labelling and first aid treatment instructions on containers of pourable alcohol-based fuel to inform users of the flammability hazard and how to use the product safely. The fire or burn hazard from a flame jetting occurrence is not addressed by these requirements.

Health Canada has focused its determination on the risk of a flame jetting occurrence when a container of pourable alcohol-based fuel is used to refuel a portable firepot. An existing hazard is present when such products are used together, as evidenced by the fatalities and serious injuries reported to Health Canada. Other hazards may be relevant for containers of pourable alcohol-based fuel, or for portable firepots, such as flammability hazards related to stability or emissions during use, but these were not considered in the determination.

3) Normal or foreseeable use (including foreseeable misuse)

Pouring alcohol-based fuel into a lit portable firepot is not the intended use of the product; the flame should be fully extinguished, and the portable firepot should be allowed to cool before refuelling. However, since the low visibility of the alcohol flame may cause the user to believe that the flame is fully extinguished, it is foreseeable that a user may pour alcohol-based fuel into a lit portable firepot. The act of pouring alcohol-based fuel from a container not equipped with a functional flame mitigation device may, under certain conditions, result in a flame jetting occurrence. Therefore, the fire or burn hazard from a flame jetting occurrence presents itself under foreseeable use conditions.

4) May reasonably be expected to cause

a) Death

Health Canada has identified that the user risk level associated with flame jetting is in the range of high to very high when a container of pourable alcohol-based fuel without a flame mitigation device is used in conjunction with a portable firepot. When alcohol-based fuel is poured onto a flame in a portable firepot, or into a portable firepot that is still hot, a flame jetting occurrence may reasonably be expected to occur. As of October 23, 2020, Health Canada is aware of 15 reports of flame jetting incidents that occurred involving portable firepots and containers pourable of alcohol-based fuel in Canada. These incidents described 2 deaths.

It is therefore reasonable to expect that a container of pourable alcohol-based fuel without a functional flame mitigation device that is used in conjunction with a portable firepot that does not conform to applicable criteria outlined above to address the risk of flame jetting may cause death.

b) Adverse effect on health

The circumstances that may reasonably be expected to cause death may also reasonably be expected to cause adverse effects on health, including second and third degree burns to the user or bystanders that can involve a large portion of the victim’s total body surface area. In many cases, a survivor of a flame jetting occurrence experiences debilitating pain, requires multiple reconstructive surgeries, and is scarred for life. As of October 23, 2020, Health Canada is aware of 15 reports of flame jetting incidents that occurred involving portable firepots and containers of alcohol-based fuel in Canada. These incident reports described burn injuries to 30 users and bystanders. In many cases, the burn injuries described were severe and life-threatening or disabling.

It is therefore reasonable to expect that the use of a container of pourable alcohol-based fuel without a functional flame mitigation device in conjunction with a portable firepot may cause an adverse effect on human health.

Appendix B

Risk Mitigation Measures Related to a Danger Determination

As part of its assessment, Health Canada may identify existing performance criteria, including consensus-based safety standards, which may be effective in mitigating the danger identified. The statements below outline the performance criteria known to Health Canada, and Health Canada's position on whether or not they may be effective in mitigating the identified danger to human health or safety.

Containers of pourable alcohol-based fuel – Based on the analysis in Appendix A, Health Canada believes that containers of pourable alcohol-based fuel that do not have a flame mitigation device that meets the performance criteria outlined in ASTM F3429 / F3429M – 20, or equivalent, for the useful life of the product pose a danger to human health or safety.

Based on the information currently available, Health Canada considers that the performance criteria outlined in ASTM F3429 / F3429M – 20, or an equivalent safety standard, may be sufficient to mitigate the danger to human health or safety associated with flame jetting occurrences that may result from the use of certain containers of pourable alcohol-based fuels, and to comply with paragraphs 7(a) or 8(a) of the CCPSA.

Portable Firepots – Based on the analysis in Appendix A, Health Canada believes that certain portable firepots that use pourable fuels and that do not meet the requirements of ASTM F3363-19, or equivalent, are a danger to human health or safety.

Based on the information currently available, Health Canada considers that meeting the performance criteria outlined in ASTM F3363-19, or an equivalent safety standard, may be sufficient to mitigate the danger to human health or safety associated with flame jetting occurrences that may result from the use of certain portable firepots that use pourable fuels, and to comply with paragraphs 7(a) or 8(a) of the CCPSA.

Compliance and Enforcement – In the absence of appropriate mitigation of the danger described in this Notice, Health Canada holds the view that the manufacture, importation, advertisement or sale of these products is a contravention of paragraph 7(a) or 8(a) of the CCPSA. Products captured under the CCPSA that pose a danger to human health or safety are subject to compliance and enforcement actions in line with the Program's compliance and enforcement policy framework. Compliance and enforcement actions under the CCPSA may include seizure, orders to take corrective action, mandatory recall of products, administrative monetary penalties and criminal prosecution.