United States
Consumer Product Safety Commission

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THIS MATTER IS NOT SCHEDULED FOR A BALLOT VOTE

A DECISIONAL MEETING FOR THIS MATTER IS SCHEDULED ON: July 31, 2024

TO: The Commission
Alberta E. Mills, Secretary

DATE: July 10, 2024

THROUGH: Jessical L. Rich, General Counsel
Austin C. Schlick, Executive Director

FROM: Daniel R. Vice, Assistant General Counsel, Regulatory Affairs
David M. DiMatteo, Attorney, Regulatory Affairs

SUBJECT: Notice of Proposed Rulemaking: Banned Hazardous Substances: Aerosol Duster Products Containing More than 18 mg in Any Combination of HFC-152a and/or HFC-134a

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Staff is forwarding to the Commission a draft notice of proposed rulemaking (NPR) recommending that the Commission issue an NPR, pursuant to sections 2 and 3 of the Federal Hazardous Substances Act, 15 U.S.C. §§ 1261 & 1262, to establish a hazardous substance regulation that addresses the risk of death and injury caused by inhalant abuse of aerosol duster products. The Office of the General Counsel is providing for the Commission's consideration a draft NPR that would establish a ban on the use of two specified propellants above specified amounts in aerosol duster products.

Please indicate your vote on the following options:

I. Approve publication of the attached notice in the *Federal Register,* as drafted.

_____ _____
(Signature) (Date)

II. Approve publication of the attached notice in the *Federal Register,* with specified changes.

_____ _____
(Signature) (Date)

United States
Consumer Product Safety Commission

III. Do not approve publication of the attached notice in the *Federal Register.*

_____ _____
(Signature) (Date)

IV. Take other action specified below.

_____

_____

_____

_____

_____ _____
(Signature) (Date)

Attachment: Draft *Federal Register* Notice of Proposed Rulemaking: Banned Hazardous Substances: Aerosol Duster Products Containing More than 18 mg in Any Combination of HFC-152a and/or HFC-134a

U.S. Consumer Product Safety Commission
4330 East-West Highway
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National Product Testing and Evaluation Center
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Rockville, MD 20850

Billing Code 6355-01-P

CONSUMER PRODUCT SAFETY COMMISSION

16 CFR Part 1500

[CPSC Docket No. CPSC–2024-00XX]

Banned Hazardous Substances: Aerosol Duster Products Containing More than 18 mg in Any Combination of HFC-152a and/or HFC-134a

AGENCY: Consumer Product Safety Commission.

ACTION: Notice of proposed rulemaking.

SUMMARY: The U.S. Consumer Product Safety Commission (Commission or CPSC) is proposing to declare that any aerosol duster products that contain more than 18 mg in any combination of HFC-152a and/or HFC-134a are banned hazardous substances under the Federal Hazardous Substances Act (FHSA). For the ten-year period from 2012 to 2021, CPSC is aware of more than 1,000 deaths, and estimates 21,700 treated injuries involving the inhalation of aerosol duster products. The proposed rule addresses deaths and injuries associated with the propellants HFC-152a and HFC-134a used in aerosol duster products. The Commission is providing an opportunity for interested parties to submit written comments on this notice of proposed rulemaking (NPR).

DATES: Written comments must be received by [**INSERT DATE THAT IS 60 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER**].

ADDRESSES: *Written Comments*:

Comments related to the Paperwork Reduction Act aspects of the proposed rule should be directed to the Office of Information and Regulatory Affairs, OMB, Attn: CPSC Desk Officer, FAX: 202-395-6974, or e-mailed to oira_submission@omb.eop.gov.

Other written comments in response to the proposed rule, identified by Docket No. CPSC-2024-00XX may be submitted by any of the following methods:

Electronic Submissions: Submit electronic comments to the Federal eRulemaking Portal at: www.regulations.gov. Follow the instructions for submitting comments. CPSC typically does not accept comments submitted by e-mail, except as described below. CPSC encourages you to submit electronic comments by using the Federal eRulemaking Portal, as described above.

Mail/Hand Delivery/Courier/Written Submissions: Submit comments by mail/hand delivery/courier to: Office of the Secretary, Consumer Product Safety Commission, 4330 East West Highway, Bethesda, MD 20814; telephone: (301) 504-7479. If you wish to submit confidential business information, trade secret information, or other sensitive or protected information that you do not want to be available to the public, you may submit such comments by mail, hand delivery, courier, or you may e-mail them to: cpsc-os@cpsc.gov.

Instructions: All submissions must include the agency name and docket number. CPSC may post all comments without change, including any personal identifiers, contact information, or other personal information provided to: www.regulations.gov. Do not submit through this website: confidential business information, trade secret information, or other sensitive or protected information that you do not want to be available to the public. If you wish to submit such information, please submit it according to the instructions for mail/hand delivery/courier/written submissions.

Docket for NPR: For access to the docket to read background documents or comments received, go to: www.regulations.gov, insert the docket number CPSC–2024-00XX into the "Search" box, and follow the prompts.

FOR FURTHER INFORMATION CONTACT:

Mary Kelleher, Directorate for Health Sciences, Consumer Product Safety Commission, National Product Testing and Evaluation Center, 5 Research Place, Rockville, MD 20850; telephone: 240-429-4894; mkelleher@cpsc.gov.

SUPPLEMENTARY INFORMATION:

In this NPR, The Commission proposes to declare any aerosol duster canister containing more than 18 mg of the hazardous chemicals HFC-152a and/or HFC-134a as banned hazardous substances under the FHSA. From 2012 to 2021, inhalation of these products resulted in 1,039 known deaths and an estimated 21,700 emergency department (ED) treated injuries in the United States. Although aerosol duster products that do not contain these hazardous substances would likely be more expensive, over 30 years the proposed rule is projected to yield net benefits of nearly $2 billion, with more than 16 dollars of benefit for every dollar of cost. Furthermore, aerosol duster products will remain available and affordable alternatives such as electric dusters are also available.

I. Background

On April 2, 2021, Families United Against Inhalant Abuse (FUAIA) submitted a petition requesting that the Commission initiate rulemaking to adopt a mandatory safety standard to address the hazards associated with aerosol duster products used for cleaning electronics and other items containing the chemical 1,1-difluorethane, or any derivative thereof. The petition requested CPSC conduct rulemaking to address the numerous deaths and injuries associated with inhalant abuse of aerosol duster products. Specifically, the petition requested a performance standard requiring that manufacturers add an aversive agent (bitterant other than denatonium

benzoate) to all duster aerosol products at a level of 30-40 ppm, and it requested a required warning stating: "DANGER: DEATH – This product can kill you if you breath [sic] it."[1]

On June 29, 2021, the Commission published in the *Federal Register* a request for comments on the petition. 86 FR 34171. On July 20, 2022, staff submitted a briefing package to the Commission regarding the petition.[2] On July 26, 2022, the Commission voted to defer action on the petition to allow staff to conduct further research.[3] On July 26, 2023, staff submitted an updated briefing package to the Commission regarding the petition.[4] The Commission granted the petition on August 1, 2023, directing staff to initiate rulemaking to address the inhalation hazard associated with aerosol duster products.[5]

II. Statutory Authority

This rulemaking is conducted under the provisions of the FHSA and the Consumer Product Safety Act (CPSA). 15 U.S.C. 1261-1278; 15 U.S.C. 2058. The rulemaking proposal involves two elements. First, pursuant to sections 2(f)(1)(A), 2(q)(1)(B), and 3 of the FHSA, the Commission is proposing to ban any aerosol duster product containing more than 18 mg of either of two hydrofluorocarbon propellants—1,1-difluoroethane (HFC-152a, CAS # 75-37-6) and 1,1,1,2-tetrafluoroethane (HFC-134a, CAS # 811-97-2)—or of a combination of these propellants. 15 U.S.C. 1261(f)(1)(A), (q)(1)(B), 1262 (proposed 16 CFR 1500.17(a)(14)).

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[1] The petition is available at https://www.cpsc.gov/Regulations-Laws--Standards/Rulemaking/Petitions. The petitioner also requested that CPSC require retailers to limit multiple duster can purchases during a one-month time period; the Commission, however, explained that it does not have rulemaking authority over such personal purchasing decisions. 86 FR 34171, n.1 (June 29, 2021).

[2] www.cpsc.gov/s3fs-public/Petition-Requesting-Rulemaking-to-Establish-Safety-Standard_0.pdf?VersionId=GNEl7pYZUBOxf1BLSC0f4.X6TlA8gT4f.

[3] www.cpsc.gov/s3fs-public/RCA-Petition-Requesting-Rulemaking-to-Establish-Safety-Standard-for-Aerosol-Dusters-Products-Petition-CP-21-1.pdf?VersionId=uD1mraIGCZcjBd9xiyZsanVRbngVzUvP.

[4] www.cpsc.gov/s3fs-public/Petition-Requesting-Rulemaking-to-Establish-Safety-Standard-for-Aerosol-Duster-Products-Petition-CP-21-1.pdf?VersionId=.NohA6DG6WsXh_tsjhGuA7RuqMCOvxSW.

[5] www.cpsc.gov/s3fs-public/RCAPetitionRequestingRulemakingtoEstablishSafetyStandardforAerosolDusterProductsPetitionCP21_1.pdf?VersionId=nQcgEM4wvCJE97zmhwYCdAkwuluYerIt.

Second, to prevent circumvention of the proposed ban, pursuant to section 9(g)(2) of the CPSA, the Commission is proposing a stockpiling prohibition that would prohibit a manufacturer from stockpiling banned aerosol duster products containing above the specified amount of HFC-152a and/or HFC-134a that are subject to the proposed ban. 15 U.S.C. 2058(g)(2).

More specifically, the Commission is proposing to declare that any aerosol duster canister containing more than 18 mg of HFC-152a and/or HFC-134a to be a "hazardous substance" and a "banned hazardous substance" within the meaning of sections 2(f)(1)(A) and (q)(1)(B) of the FHSA.[6] 15 U.S.C. 1261(f)(1)(A), (q)(1)(B). Section 2(q)(1)(B) of the FHSA defines a ''banned hazardous substance'' to include any hazardous substance intended, or packaged in a form suitable, for household use which, notwithstanding the precautionary labeling required by the FHSA, presents such a hazard that keeping the substance out of interstate commerce is the only adequate means to protect the public health and safety. 15 U.S.C. 1261(q)(1)(B).

A proceeding to classify a hazardous substance as a "banned hazardous substance" under section 2(q)(1)(B) of the FHSA is governed by the requirements set forth in section 3 of the FHSA. *See* 15 U.S.C. 1261(q)(2) and 1262. The proposed rule begins the rulemaking process in accordance with the requirements of sections 3(a) and (h) of the FHSA. See 15 U.S.C. 1262(a) and (h). Pursuant to section 3(a), the Commission is proposing to declare any aerosol duster canister containing more than 18 mg in any combination of HFC-152a and/or HFC-134a to be a hazardous substance. In order to declare that a hazardous substance is banned, section 3(h) of the FHSA requires the Commission to publish in the *Federal Register* the text of a proposed rule, including any alternatives together with a preliminary regulatory analysis containing: (1) a

[6] The Commission voted X-X to publish this notification.

preliminary description of the potential benefits and costs of the proposed rule; (2) a discussion of the reasons why any standard or portion of a standard submitted to the Commission was not published as the proposed rule; (3) a preliminary determination regarding why the voluntary standards process would not, within a reasonable time, result in the development of a voluntary standard that would eliminate or adequately reduce the risk of injury identified in the rule; and (4) a description of any reasonable alternatives to the proposed rule, together with a summary description of the potential benefits and costs, and a brief explanation of why such alternatives should not be published as the proposed rule. 15 U.S.C. 1262(h).

Before issuing a final rule banning any hazardous substance, the Commission must publish the text of the final rule and a final regulatory analysis that includes: (1) a description of the potential benefits and costs of the rule (including costs and benefits that cannot be quantified in monetary terms, and identification of those likely to receive the benefits and bear the costs); (2) a description of alternatives considered by the Commission (including a description of their potential benefits and costs and an explanation of why the alternatives were not chosen); and (3) a summary of significant issues raised by comments on the preliminary regulatory analysis and a summary of the assessment by the Commission of such issues. 15 U.S.C. 1262(i)(1). The Commission must also make findings that: (1) any relevant voluntary standard is unlikely to adequately reduce the risk of injury or substantial compliance with the voluntary standard is unlikely; (2) the expected benefits of the regulation bear a reasonable relationship to expected costs; and (3) the regulation imposes the least burdensome requirement that would adequately reduce the risk of injury. 15 U.S.C. 1262(i)(2).

III. The Product

A. Description of the Product

Aerosol duster products use a trigger or similar means to release a propellant[7] (typically a hydrofluorocarbon) through an orifice or attachment such as a nozzle or straw for the purpose of blowing and removing dust and debris from hard-to-reach places. Although sometimes referred to as "canned air," aerosol duster products actually contain essentially 100% propellent,[8] which is typically a chemical such as a hydrofluorocarbon that can be compressed into a liquid for storage. Each such aerosol duster canister typically contains about 3 to 20 ounces (85 g to 567 g) of compressed liquid in equilibrium with a small amount of evaporated gas or vapor of that same chemical. The gas or vapor, consisting of nearly pure propellant chemical, is expelled when the trigger or similar means is activated, which causes more of the liquid to evaporate into gas or vapor within the canister in order to return to equilibrium. This allows multiple uses per canister. Figure 1 below, from US Patent, US-9234123-B2[9] illustrates an example of an aerosol duster product showing the propellent liquid and vapor existing in equilibrium.

[7] Aerosol propellant is a liquid which exists in equilibrium also as a gas, or compressed gas that is used to expel aerosol content from a pressurized container.
[8] Various aerosol duster products include trace amounts of denatonium benzoate, or other bitterants in order to discourage inhalant abuse.
[9] https://patentcenter.uspto.gov/applications/13848372.

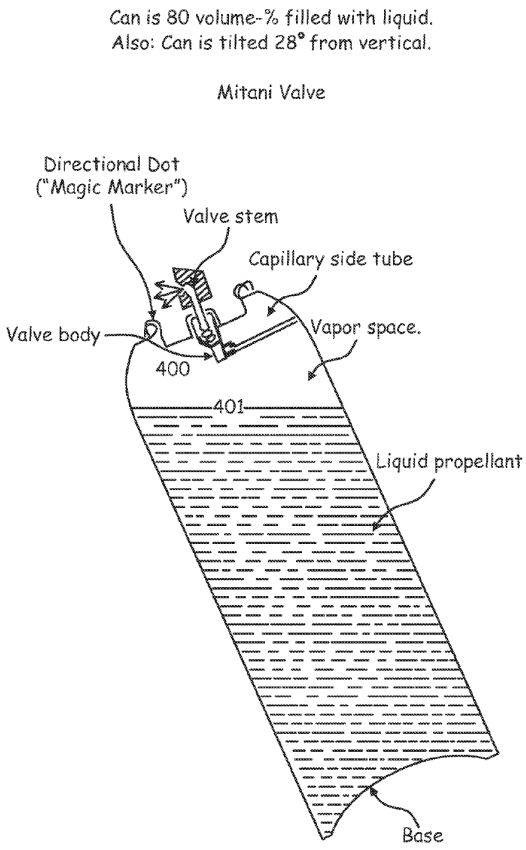


Figure 1: Illustration of the Contents of an Aerosol Duster Product.

Aerosol duster products are sold under a variety of brand names and are available in various brick and mortar stores and online retail locations. They are relatively inexpensive to purchase and easy to obtain either in stores or online. For example, online retailers sell individual canisters for about $8-10 per canister, and some retailers offer a discount when the product is purchased in bulk. Aerosol duster products are often referred to as electronics dusters, computer keyboard cleaners, canned air or compressed air dusters, aerosol cans or spray, and electronics air cleaners, among other names. (See Figure 2 below for examples of 10 oz aerosol duster products).

Figure 2: Aerosol Duster Product Examples.

Aerosol duster products typically use one or more of three propellants:1,1-difluorethane (HFC-152a, CAS# 75-37-6), 1,1,1,2-tetrafluoroethane (HFC-134a, CAS# 811-97-2), and/or trans-1,3,3,3-tetrafluoropropene (HFO-1234ze, CAS# 29118-24-9). HFC-152a and HFC-134a are known to be hazardous as explained in this Notice. According to Euromonitor, approximately 87 percent of aerosol duster products available for sale in the U.S. use the propellant HFC-152a and 11 percent use HFC-134a. HFO-1234ze is a new propellant. The abuse potential for HFO-1234ze is unknown due to its relatively low use in consumer applications. Similarly, other effects on humans have not been reported. Further discussion about HFO-1234ze can be found in Tab B of the July 2023 staff petition briefing package.[10]

In order to determine the amount of propellant released from a single use of an aerosol duster product, laboratory sciences staff conducted testing of various aerosol duster products,[11] and based on that testing, determined that a trigger pull from a single aerosol duster canister

[10] www.cpsc.gov/s3fs-public/Petition-Requesting-Rulemaking-to-Establish-Safety-Standard-for-Aerosol-Duster-Products-Petition-CP-21-1.pdf?VersionId=.NohA6DG6WsXh_tsjhGuA7RuqMCOvxSW.
[11] www.cpsc.gov/s3fs-public/Petition-Requesting-Rulemaking-to-Establish-Safety-Standard-for-Aerosol-Duster-Products-Petition-CP-21-1.pdf?VersionId=.NohA6DG6WsXh_tsjhGuA7RuqMCOvxSW, July 26, 2023, Table 9, Page 27.

lasting 5 seconds[12] releases 7.53 grams of propellant, when not using the straw provided with the product. This information regarding the 5 second time trigger per pull helped staff better understand how much propellant inhalant abusers are able to inhale with a single trigger pull of an aerosol duster product.

B. Scope of Products Subject to the NPR

Aerosol duster products are generally intended to be used for cleaning and blowing off dust from electronics as well as other household items. This NPR would apply only to aerosol duster products that contain the propellants HFC-152a or HFC-134a. Aerosol duster products using HFO-1234ze (or other substances) as a propellant are outside the scope of this NPR. Other examples of aerosol products that are outside the scope of this NPR include products that use HFC-152a or HFC-134a as propellants in freeze sprays used to cool circuit boards, automotive refrigerants, and medical freeze sprays used to cool tissue specimens as well as aerosol products that use HFC-152a or HFC-134a as propellants but include substantial additional components (such as air fresheners, paints, lubrication oils, body sprays, and silicone lubricant sprays for food pans).

C. Alternatives to Aerosol Duster Products with HFC-152a and HFC-134a

Alternatives to aerosol duster products are currently being sold for the same purpose as aerosol duster products. For example, alternatives include compressed air dusters which use corded or cordless electric pumps, or hand pumps that compress air and blow and/or vacuum it through a nozzle to remove dirt and debris. According to data collected in 2023, the average price of an electric duster is approximately $56, similar to the price of seven disposable aerosol

[12] A trigger pull lasting 5 seconds was chosen based on online video research which found users inhaling aerosol dusters without any straw attachment for that length of time: https://youtu.be/FjlazUNE2-8?si=WsA4nfSbLX_jJ2SR&t=40. This reference video shows that the euphoric/high effects appear to occur with a single trigger pull of five seconds.

duster canisters.[13] Staff tested battery operated USB rechargeable duster devices. The goal was to compare air speeds, measured in meters/second (m/s), generated by the battery powered devices to the speeds generated by an aerosol duster product. Three battery powered devices and two name-brand aerosol dusters were chosen for the comparison. Staff concluded that battery powered air duster devices generate comparable air speeds to the propellant speeds of aerosol duster products. See Tab D of the July 26, 2023, staff briefing package for more details on electronic dusters.[14] Carbon dioxide (CO_2) cartridge dusters that use disposable CO_2 cartridges to blow CO_2 through a nozzle to remove dirt and debris are available as well. Consumers can also use vacuum cleaners to remove dust. Thus, a number of alternative products exist that provide similar utility to that provided by aerosol duster products.

IV. Description of the Hazard

Aerosol duster products can cause significant toxicity or death if used as inhalants (Williams, 2007). Inhalants are volatile substances that produce chemical vapors that can be inhaled to induce psychoactive, or mind-altering, effects.[15] The inhalants in aerosol duster products are legally sold for purposes other than use as inhalants, are widely available, and are inexpensive. Inhalant abusers include males and females ranging in age from teenagers to adults in their 60s. Approximately 10 to 50 percent of cases of inhalant abuse may lead to abuse or dependance, depending on the characteristics of the population studied (Perron et al., 2021).

Staff has identified two toxic substances, HFC-152a and HFC-134a, that are commonly used as propellants in aerosol duster products and are widely used for inhalant abuse. Inhalant

[13] Aerosol Duster Supporting Database, August 2023. (https://www.cpsc.gov/content/Aerosol-Duster-Supporting-Database).
[14] www.cpsc.gov/s3fs-public/Petition-Requesting-Rulemaking-to-Establish-Safety-Standard-for-Aerosol-Duster-Products-Petition-CP-21-1.pdf?VersionId=.NohA6DG6WsXh_tsjhGuA7RuqMCOvxSW.
[15] See nida.nih.gov/publications/research-reports/inhalants/what-are-inhalants.

abusers use propellants to get "high" (Koehler and Henninger, 2014). These propellants can be sniffed, snorted or sprayed,[16] huffed,[17] or bagged[18] as inhalants to obtain a rapid euphoric effect (DEA, 2020). The euphoric effect only lasts a few minutes, requiring the repeat use of an aerosol duster product every few minutes to maintain the euphoria. These propellants can damage the heart when abused, making an individual more susceptible to a heart attack or arrhythmia[19] after an individual inhales the propellant. The abuse potential of the propellants HFC-152a and HFC-134a are further discussed below.

A. Inhalants Used in Aerosol Duster Products

1. HFC-152a (1,1-difluorethane)

HFC-152a is widely used as a propellant in the aerosol duster product market.[20] HFC-152a works through specific brain receptors[21] such as glutamate/ N-methyl-D-aspartate (NMDA),[22] gamma-aminobutyric acid (GABA),[23] and dopamine[24] to elicit euphoria (Duncan and Lawrence, 2013). Aerosol duster products, especially those containing HFC-152a, are the "drug of choice" for many who use inhalants because they are easy to obtain, inexpensive, and contain 100 percent HFC-152a without any additional components such as paint or air freshener in the propellant (Beauvais and Oetting, 1987). After inhalation of such a lipophilic[25] propellant, the substance is rapidly absorbed into the pulmonary vasculature, going directly into the lungs and

[16] Inhaling or spraying refers to inhaling the substance into the nose or mouth directly from the container.
[17] Huffing refers to placing a bag saturated with a substance over the mouth and using the nose or mouth to inhale the concentrated fumes.
[18] Bagging refers to concentrating an aerosol in a bag before inhaling.
[19] A heart arrhythmia is an irregular heartbeat caused by electrical problems in the heart.
[20] According to Euromonitor, approximately 87 percent of aerosol duster products available for sale in the U.S. use the propellant HFC-152a and 11 percent use HFC-134a.
[21] Proteins that serve as a sensor for a particulate type of molecules.
[22] The NMDA receptors are a class of receptors that respond to the neurotransmitter N-methyl-D-aspartate.
[23] The GABA receptors are a class of receptors that respond to the neurotransmitter gamma-aminobutyric acid.
[24] Dopamine is a brain neurotransmitter.
[25] Lipophilic means the tendency to combine with fats.

easily crossing the blood-brain barrier into the brain to exert its euphoric effects. The onset of HFC-152a intoxication is rapid, and the intoxication effects are brief and dose-related, ranging from euphoria, decreased inhibition, motor excitation, and light-headedness (Koehler and Henninger, 2014).

Toxicity in humans can occur after an acute or chronic exposure to HFC-152a (Poisindex, 2021). Severe HFC-152a toxicity can cause a depressed mental state, respiratory depression, pulmonary edema, hepatic injury, and death (Poisindex, 2021). Death can occur due to sudden sniffing death syndrome (SSDS), which was first described in 1970 (Bass, 1970; George et al., 2021). Individuals inhale fluorinated hydrocarbons to become "high" and, if physical exertion or stress occurs, the inhaler may collapse and die. (Smeeton and Clark, 1985; Kamm, 1975; Dingle and Williams, 2019; Poisindex, 2021). Predicting the toxicity of inhaling a certain number of aerosol duster canisters is difficult because there is no clear dose-response evident in the medical literature. Death from abusing aerosol duster products is not dose dependent.[26] The medical literature indicates the use of only one canister has resulted in death (Xiong et al., 2004), while in another case inhaling multiple canisters over several years did not cause death (Peicher and Maalofouf, 2017). However, abrupt cessation of HFC-152a abuse can induce withdrawal[27] with tremors, excessive sweating, nausea, vomiting, depression, anxiety, irritability, psychosis, and hallucinations (Custer et al., 2020).

2. HFC-134a (1,1,1,2-tetrafluoroethane)

HFC-134a is another substance used as a propellant in aerosol duster products. HFC-134a is a member of the anesthetic drug class[28] (Shah et al., 2015). HFC-152a and HFC-134a

[26] If the effect is changing with the dose of the drug it is described as dose dependent.
[27] Psychotic symptoms associated with drug cessation.
[28] Substance that induces insensitivity to pain.

have different binding mechanisms.[29] It is unclear whether the same addictive properties of HFC-152a translate to HFC-134a, but data from CPSC's Consumer Product Safety Risk Management System (CPSRMS) discussed below, show that multiple individuals have died after inhaling HFC-134a. Two other papers from medical literature demonstrate that acute exposure of HFC-134a from inhalation can be harmful (Romero et al., 2022; Burke et al., 2020). Several papers have indicated that inhalation with acute exposure to HFC-134a in humans has resulted in reactive airway dysfunction syndrome,[30] (Doshsti et al., 2016), severe hypotension, loss of consciousness, shock (Vinegar, 1997), cardiac sensitization, neurotoxicity (National Research Council, 2002), and death (Burke et al et al., 2020).

B. Description of the Hazard Pattern

To examine the hazard pattern for inhalation abuse of aerosol duster products, staff conducted 23 in-depth investigations (IDIs) with family members of individuals who died from inhaling aerosol duster products during 2020 and 2021. These IDIs were all related to HFC-152a abuse and included nine females and 14 males, between the ages of 15 to 61 years-old.

The review of the IDIs indicated the number of canisters found at the scene, the victim's history of abuse, and the scene of the incident. In five IDIs[31] only one empty canister was identified, though in some of these IDIs multiple full cans were found at the scene, and the victim had a history of aerosol duster abuse. In twelve incidents,[32] the IDIs reported that more than one completely or partially empty canister was found at the victim's death scene. In several IDIs,[33]

[29] Binding of a substance to a receptor molecule changes its shape or activity to transmit a signal.
[30] Breathing symptoms similar to asthma but with an uncertain cause.
[31] IDI numbers 230406HCC1189, 230815HCC1044, 230822HCC1098, 230906HCC1211, 231005HCC3036.
[32] IDI numbers 23071HCC3850, 230329HCC1057, 230707HCC1701, 230720HCC1777, 230725HCC1827, 230808HCC3987, 230822HCC1099, 230906HCC1208, 230906HCC1209, 230929HCC1377, 230329HCC1048, 230711HCC1721.
[33] IDI numbers 230711HCC3850,230329HCC1057, 230707HCC1701, 230711HCC1721, 230720HCC1777, 230725HCC1827, 230808HCC3987, 230822HCC1099, 230906HCC1208, 230906HCC1209, 230929HCC1377, 230929HCC1048.

twenty or more canisters of aerosol duster product were found with the victim at the death scene. The majority of the victims died at home, while some were found deceased in motels or in parked vehicles.

Based upon staff's review of 23 IDIs and available medical literature, the hazard pattern for inhalation deaths from HFC-152a aerosol duster products includes both males and females; covers a wide age range; indicates that death can occur from inhalation of a single canister or multiple canisters; and shows that most victims died at home, but deaths also occurred in motels and parked vehicles. As stated above, the hazard pattern for HFC-134a is believed to be similar to the hazard pattern for HFC-152a because both propellants are inhalational anesthetics with similar toxicities at high doses.

C. Incident Data

1. Deaths

This section presents information on fatal incidents reported to CPSC that involved inhalation abuse (commonly known as sniffing, spraying or huffing, but referred to here as inhaling or inhalation) of aerosol duster products. The most recent search of the CPSC databases for incidents involving inhalation abuse of aerosol duster products was conducted in February 2024.

CPSC databases (CPSRMS and the National Electronic Injury Surveillance System (NEISS)) do not contain a specific product code for aerosol duster products. Accordingly, the product codes searched in CPSRMS at that time were 1133 (Aerosol containers), 921 (Chemicals not elsewhere classified), and 954 (General-purpose household cleaners). Aerosol duster products are included as a sub-category of product code 954 but may occasionally be sorted into product codes 1133 and 921. Aerosol duster products were identified in CPSRMS incident

narratives or product descriptions as dusters, aerosol dusters, computer/keyboard/electronics dusters or cleaners, canned/compressed air, or by specific brand names, including misspelled variants of the above keywords. This review excluded aerosol duster incidents that were exclusively associated with common non-inhalation hazards from aerosol duster products, such as explosions, fires, chemical burns, or respiratory injuries related to the product's intended use.

CPSC's CPSRMS database contains reports for 1,039 unique fatal incidents involving inhalation hazards from aerosol duster products that occurred between January 1, 2012, and December 31, 2021. Data collection is ongoing in CPSRMS and reporting is considered incomplete for more recent years (2022-2024). The number of deaths associated with aerosol duster products reflected in CPSRMS and classified as involving aerosol duster inhalation is almost certainly an underestimate of the actual number of aerosol duster inhalation deaths.

Almost all of the 1,039 deaths were reported from death certificates and Medical Examiners and Coroners Alert Project (MECAP) reports. Among these 1,039 deaths, 775 (75%) were attributed to HFC-152a toxicity, and three were attributed to HFC-134a toxicity. In the remaining incident reports, the specific aerosol duster propellant is not explicitly identified. For several of the deaths that occurred in 2020 and 2021, staff conducted IDIs to learn more about the details surrounding the fatal incident (i.e., victim's history of using aerosol duster products). This death count only includes incidents where the product involved was explicitly identified as an aerosol duster product.

Deaths from HFC-152a toxicity where the specific product was not identifiable, and deaths resulting from the inhalation of unspecified aerosols, are not included in the figures given above. Although HFC-152a is commonly used as a propellant in aerosol duster products, the compound is also used in other aerosol products, such as pesticides and air fresheners. Between

2012-2021, there were an additional 1,031 deaths reported in CPSRMS resulting from HFC-152a toxicity from an unspecified aerosol product. The age, gender, and race/ethnicity distributions of these deaths are similar to those for the aerosol duster product inhalation deaths discussed in this section. Additionally, between 2012-2021, there were at least 63 deaths found in CPSRMS that mentioned inhalation of aerosol products, without giving sufficient information to determine if the product was an aerosol duster product. Because the scope of the data analyses here only includes incidents explicitly mentioning an aerosol duster product, these deaths are not included among the 1,039 fatal incidents in the analyses discussed above.

CPSC is aware of at least seven deaths resulting from HFC-134a toxicity between 2012 and 2021. In three of these deaths, the product involved was identified as an aerosol duster product, and these three deaths are included in the above aerosol duster products fatality count. The remaining four deaths either did not specify the type of product involved, or they involved an unspecified aerosol product. CPSC has also received reports of deaths involving HFC-134a toxicity that occurred between 2006 and 2010, including some that specifically identified an aerosol duster product being involved.

Table 1 below provides an overview of the distribution of aerosol duster inhalation deaths found in CPSRMS, which, as noted, almost certainly understates the actual number of deaths reported to CPSC from these products. Data in CPSRMS are anecdotal in nature and do not necessarily represent all incidents that have actually occurred. Furthermore, death certificates tend to have a greater lag time between the incident/death date and the date the death was reported to CPSC. Therefore, the counts below are subject to increase, especially for the more recent years.

Table 1: Aerosol Duster Inhalation Deaths by Year (2012 – 2021)

Year	Total Deaths
2012	54
2013	104
2014	90
2015	124
2016	130
2017	127
2018	124
2019	114
2020	89
2021	83
Total	**1,039**

Source: CPSRMS.
Percentages may not add to 100% due to rounding.

Table 2 below provides an overview of the distributions of aerosol duster product inhalation deaths by age group and gender. Among the identified deaths, almost 70 percent were male, and 94 percent were between the ages of 18 and 54, with ages ranging between 13 and 70 years old.

Table 2: Distribution of Aerosol Duster Inhalation Victims by Age Group and Gender (2012 – 2021)

Age Group (Years)	Male	Female	Total
0 – 17*	4	8	**12 (1%)**
18 – 34	296	159	**455 (44%)**
35 – 54	376	143	**519 (50%)**
55 or older	40	12	**52 (5%)**
Unspecified	1	0	**1 (<1%)**
Total	**717 (69%)**	**322 (31%)**	**1,039**

Source: CPSRMS.
Percentages may not add to 100% due to rounding.

Race information was reported in 881 (85%) of the 1,039 deaths. Table 3 provides an overview of the distribution of aerosol duster inhalation deaths by race where the data were available. Over 92% of the victims were white.

Table 3: Distribution of Aerosol Duster Inhalation Deaths by Race (2012 – 2021)

Race	Total	Percent
White	814	92%
Black/African-American	24	3%
American Indian/Alaska Native	17	2%
Other*	26	3%
Total	**881**	**100%**

Source: CPSRMS.
*Includes Asian, Native Hawaiian/Pacific Islander and Other race categories.

Ethnicity data for aerosol duster inhalation deaths between 2012 and 2021 are also incomplete. The ethnicity is known for 769 (74%) of the 1,039 deaths. Among the 769 deaths with known ethnicity, 56 (7%) were identified as Hispanic, while 713 (93%) were identified as non-Hispanic.

Table 4 below provides an overview of the distribution of aerosol duster inhalation deaths found in CPSRMS by the incident location of the death. Location information was specified for

891 (88%) of the 1,039 deaths. Most of the deaths (78%) occurred in a housing unit, apartment, or condominium.

Table 4: Distribution of Aerosol Duster Inhalation Deaths by Incident Location (2012 – 2021)

Location	Total	Percent
Home/Apartment/Condominium*	711	78%
Other Public Property/Office	128	14%
Street/Highway	8	1%
Place of Recreation or Sports	5	1%
Other**	63	7%
Total	**915**	**100%**

Source: CPSRMS.
Percentages may not add to 100% due to rounding.
*Includes mobile and manufactured homes.
**Includes a school, industrial location or any other location.

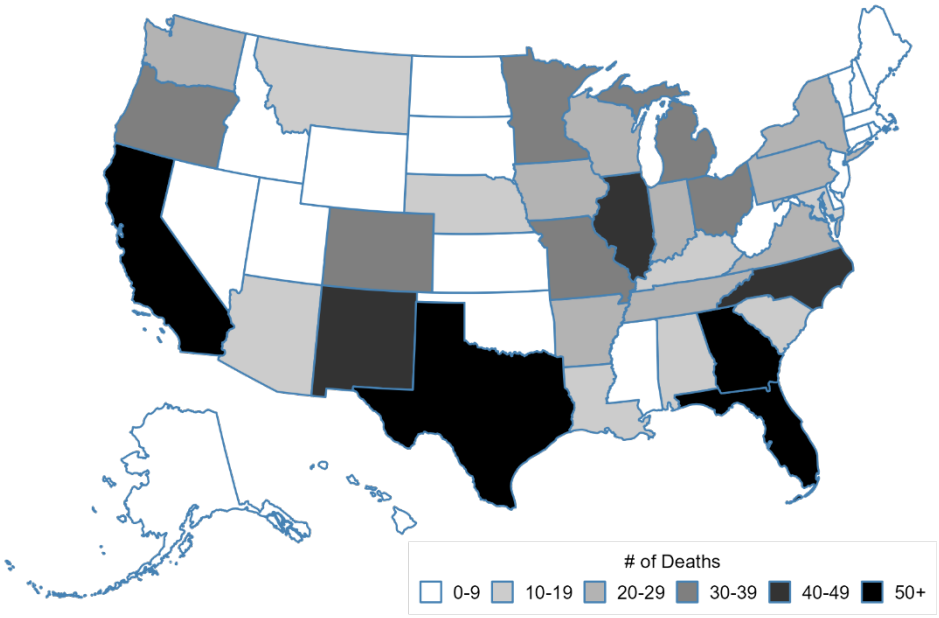
Table 5 and Figure 3 provide an overview of the distribution of aerosol duster product inhalation deaths in CPSRMS by U.S. state. The states with the most reported aerosol duster inhalation deaths are Florida (83), Texas (67), California (67), Georgia (58) and North Carolina (47). Over 30 percent of all aerosol duster inhalation deaths reported to CPSC occurred in these five states.

Table 5: Number of Reported Fatal Duster Incidents by State (2012-2021)

State	Deaths	State	Deaths
Florida	83	Arizona	11
California	67	Nebraska	11
Texas	67	Maryland	10
Georgia	58	Montana	10
North Carolina	47	Massachusetts	9
Illinois	46	South Dakota	9
New Mexico	40	Nevada	8
Oregon	37	Oklahoma	8
Minnesota	36	Kansas	7
Colorado	35	Delaware	6
Missouri	33	Mississippi	6
Michigan	30	North Dakota	6
Ohio	30	Wyoming	6
Arkansas	29	Alaska	5
Pennsylvania	28	New Jersey	5
Tennessee	28	Idaho	4
Virginia	28	Maine	4
Indiana	27	New Hampshire	4
New York	25	Connecticut	3
Iowa	21	Hawaii	3
Washington	20	Rhode Island	3
Wisconsin	20	Vermont	3
Louisiana	18	Utah	2
South Carolina	17	West Virginia	0*
Alabama	13	D.C.	0*
Kentucky	13	**TOTAL**	**1,039**

Source: CPSRMS.

*CPSC did not receive any reports related to deaths due to aerosol duster inhalation from West Virginia or the District of Columbia that occurred between 2012 and 2021.



Source: CPSRMS.
CPSC did not receive any reports related to deaths due to aerosol duster inhalation from West Virginia or the District of Columbia that occurred between 2012 and 2021.

Figure 3: Number of Reported Fatal Duster Incidents by State (2012-2021)

2. Injury Estimates

This section presents information on emergency department treated injuries resulting from inhalation abuse of aerosol duster products. The estimates are derived from injury cases that were recorded in CPSC's NEISS database,[34] and the injuries were treated during the 10-year period between January 1, 2012, and December 31, 2021. Between 2012-2021, it is estimated that there were 21,700 ED-treated injuries in the United States resulting from inhalation of aerosol duster products. This estimate is based on a sample of 491 NEISS-reported injury cases, three of which were deaths. These three deaths are included among the 1,039 deaths from CPSRMS that are discussed above.

[34] More information about the NEISS sample and estimate calculation can be found here: Explanation Of NEISS Estimates Obtained Through The CPSC Website | CPSC.gov.

Injury incident cases were included in the sample only if the product being used could reasonably be classified as an aerosol duster product. While CPSRMS incidents typically report product identifying characteristics (i.e., manufacturer, brand, model, retailer, product description), NEISS injury narratives rarely provide such detailed information on the products involved. Thus, NEISS data are likely an underestimate of the true number of ED-treated injuries, as more generic product classifications (i.e., cleaning product, household cleaner, etc.) may be used to describe aerosol duster products. An additional 2,500 estimated ED-treated injuries resulted from "huffing" unspecified products, or inhalation of products described as "aerosol cans," "aerosol cleaners," or simply "aerosols," but these injuries are excluded from this analysis because of the non-specificity of the product description and the lack of information on the propellant being inhaled. Other types of injuries not involving aerosol duster inhalation, such as respiratory injuries from the product being sprayed, are not included in the above estimates.

Table 6 below presents yearly estimates of ED-treated injuries in the United States from inhaling aerosol duster products. Between 2012-2021, there is no evidence of a statistically significant linear trend in ED-treated injuries due to aerosol duster inhalation (p-value > 0.05).

Table 6: NEISS Estimates for Aerosol Duster Inhalation Injuries by Year (2012 – 2021)

Year	Estimate[35]	Sample Size	CV
2012	**	23	.28
2013	2,000	46	.22
2014	1,500	35	.28
2015	2,500	45	.26
2016	3,000	66	.28
2017	2,700	67	.22
2018	2,100	53	.21
2019	2,000	50	.30
2020	**	56	.38
2021	2,000	50	.27
2012 – 2021	**21,700**	**491**	**.18**

Source: NEISS.
Estimates rounded to nearest 100; estimates that failed to meet NEISS publication criteria are presented as **. Rows may not add to total due to rounding.

Table 7 below depicts a breakdown of the disposition of the injured patients. A large majority (70%) of the estimated injuries were categorized as "treated and released" or "examined and released without treatment," while around 20% involved more serious injuries requiring hospitalization or additional observation.

[35] According to the NEISS publication criteria, an estimate can only be presented if it is 1,200 or greater, is derived from a sample size of at least 20 injury cases and has a coefficient of variation (CV) no greater than 33 percent. As such, estimates that do not meet all three of the above criteria are not presented in any table. CV is calculated by dividing an estimate's standard deviation by the estimate itself.

Table 7: NEISS Estimates for Aerosol Duster Inhalation Injuries by Disposition

Disposition	Estimate	Sample Size
Treated and released, or Examined and released without treatment	15,200 (70%)	341
Treated and admitted for hospitalization, or Held for observation	4,400 (20%)	103
Left without being seen, or Left without treatment	1,900 (9%)	44
Death*	** (<1%)	3
All Severities	**21,700**	**491**

Source: NEISS.* Fatal injury cases in NEISS are also included in CPSRMS data and are thus included in the overall death count.
Estimates rounded to nearest 100; estimates that failed to meet NEISS publication criteria are presented as **.
Rows may not add to total due to rounding.

Table 8 below depicts an overview of the injuries based on age and gender. Around two-thirds of the estimated injuries occurred in males, and around 91% of estimated injuries occurred in patients between ages 18 and 54.

Table 8: NEISS Estimates for Aerosol Duster Inhalation Injuries by Age & Gender

Age Group (Years)	Male	Female	Total
0 – 17	**	**	**1,500 (7%)**
18 – 34	6,800	3,300	**10,100 (47%)**
35 – 54	6,200	3,400	**9,600 (44%)**
55 or older	**	**	**** (2%)**
Total	**14,300 (65%)**	**7,500 (35%)**	**21,700 (100%)**

Source: NEISS.
Estimates rounded to nearest 100; estimates that failed to meet NEISS publication criteria are presented as **.
Estimates and percents may not add to the total due to rounding.

Race and ethnicity data are largely incomplete for aerosol duster product inhalation injury cases between 2012-2021. Race is unknown for around 37% of the 21,700 ED-treated injuries during the 10-year period. Among the 13,700 injuries where race is known, white individuals constituted around 83% of injuries; Black individuals constituted 6% of injuries; and other races

constituted the remaining 11%. Ethnicity data was added to the NEISS database starting in mid-2018. As such, ethnicity is unknown for the majority (79%) of injuries reported during the period reviewed. Among the 4,500 injuries with known ethnicity, Hispanic individuals constituted 37% of injuries, while non-Hispanic individuals constituted the remaining 63%.

Approximately 5,700 of the estimated 21,700 ED-treated injuries (26%) occurred at home. Another 6,300 estimated injuries (29%) took place on public property, and 2,200 estimated injuries (10%) took place on a street or highway, at a school, or at a place of recreation. The location for the remaining 7,600 estimated injuries (35%) was either unknown or not recorded.

Approximately 18,700 of the estimated 21,700 ED-treated injuries (86%) were diagnosed primarily as poisonings, while the remaining 3,000 estimated injuries were diagnosed mostly as burns (chemical, thermal or unspecified), anoxia, contusions/abrasions, lacerations, or internal organ injuries. Approximately 18,900 of the estimated 21,700 ED-treated injuries (87%) were considered "whole body" injuries (i.e., no specific individual body part injured as a result of inhalation). Another 1,700 estimated injuries (8%) were classified as head, face, or mouth injuries, while the remaining 5% of injuries were mostly classified as hand, lower arm, or upper trunk injuries.

D. Availability of Incident Data

Upon publication of the NPR in the *Federal Register*, CPSC will make available for review and comment, to the extent allowed by law, the CPSRMS and NEISS incident reports relied upon and discussed in the NPR, along with the associated IDIs. The data can be obtained by submitting a request to: [insert link]. You will then receive a website link to access the data at

the email address you provided. If you do not receive a link within 72 hours, please contact [insert email address].

V. Absence of Relevant Voluntary Standard

Two existing voluntary standards, ASTM D3061-97, *Standard Guide for Three-Piece Steel and Tinplate Straight-Wall and Necked-In Aerosol Cans*, and DIN EN 15008:2017, *Aerosol Containers – Aluminum Containers – Dimensions of One-Piece Cans with 25.4 mm Aperture*, apply to aerosol duster products. Both standards provide a list of currently manufactured aerosol canister sizes as well as industry voluntary dimensional guidelines, but neither standard addresses the hazard of intentional inhalant abuse.

On February 27, 2023, ASTM Committee F15 hosted an exploratory meeting discussing potential solutions that would prevent intentional inhalation and abuse of aerosol duster products such as including bitterants, warning labels, and use of alternative propellants and alternative technologies. On March 4, 2024, ASTM Committee F15 hosted a second exploratory meeting to discuss developing a possible future voluntary standard and forming a task group for the prevention of intentional inhalation and abuse of aerosol duster products. To date no such task group has been formed.

VI. Justification for the Proposed Ban

The FHSA defines a hazardous substance to include a substance that is "toxic." 15 U.S.C. 1261(f)(1)(A)(i). A substance is toxic if it "has the capacity to produce personal injury or illness to man through ingestion, inhalation, or absorption through any body surface." 15 U.S.C. 1261(g). As discussed in section IV, staff has identified HFC-152a and HFC-134a as two toxic hydrofluorocarbons used as propellants in aerosol duster products. Both hydrofluorocarbons are intentionally inhaled by individuals to experience a euphoric high, resulting in numerous deaths

and injuries. Severe HFC-152a toxicity can cause a depressed mental state, respiratory depression, pulmonary edema, hepatic injury, and death (Poisindex, 2021). Symptoms of acute HFC-134a toxicity include severe hypotension, loss of consciousness, shock (Vinegar, 1997), cardiac sensitization, neurotoxicity (National Research Council, 2002), and death (Burke et al, 2020).

Staff researched published medical literature for papers regarding the toxicity of HFC-152a and HFC-134a. While medical literature demonstrates toxicity of the two substances, staff was unable to identify any relevant human data regarding HFC-152a and HFC-134a that would allow for the calculation of a non-toxic human dose. However, that research did provide staff with data to be able to calculate a no observed adverse effect level[36] (NOAEL) in animals for HFC-152a. In toxicology, it is customary to convert animal data to human data in the absence of human data. The Food and Drug Administration (FDA), for example, uses this approach to determine the safe dose of a drug when studying it for the first time in human clinical trials. Based on the generally accepted approach used by FDA, staff converted the NOAEL found in the medical literature to calculate a human equivalent dose (HED) using appropriate scaling factors.[37] Staff used the resulting HED it developed to determine the safe level for the proposed ban after applying a safety factor of 10.[38] Below is a description of the staff approach used in developing the level for the proposed ban on HFC-152a and HFC-134a.

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[36] A NOAEL is the highest dose level that does not produce a significant increase in adverse effects in comparison to the control group. The NOAEL is a generally accepted benchmark for safety when derived from appropriate animal studies.

[37] Scaling factors account for differences in size between animals and humans. *See* FDA, 2005, Guidance for Industry Estimating the Maximum Safe Starting Dose in Initial Clinical Trials for Therapeutics in Adult Healthy Volunteers (FDA Guidance), available at: www.fda.gov/regulatory-information/search-fda-guidance-documents/estimating-maximum-safe-starting-dose-initial-clinical-trials-therapeutics-adult-healthy-volunteers.

[38] A safety factor allows for variability in extrapolating from animal toxicity studies in humans resulting from: (1) different sensitivity of drugs to animals and humans; (2) differing receptor affinity to drugs between animals and humans; (3) unexpected toxicities; and (4) interspecies differences between the metabolism and time course effect of

A study was conducted on groups of three rats to mimic the exposure of humans while inhaling HFC-152a (Avella et al., 2010). The rats were exposed to 30 seconds (s) of 20 L/min HFC-152a in an inhalation chamber. During that exposure, all the rats showed signs of intoxication manifested by sedation which began at about 20 s and rapidly progressed to more profound intoxication. At the end of the exposure periods the rats were prostrate and could not get up. The rats remained visibly intoxicated until about four minutes post exposure. Recovery was rapid, and at about eight minutes post exposure, the rats showed no signs of obvious intoxication. Staff calculated a non-toxic human dose of 0.476 mg/kg using the information in the Avella et al., 2010 paper and applying an additional safety factor of 10 for a total safety factor of 100 (see footnote 38 for explanation regarding safety factors). The resulting calculation for a non-toxic human dose is equivalent to 18 mg for 38 kg human (5th percentile weight for 13-year-old female).[39]

Although there are no relevant human inhalation toxicology studies available regarding HFC-134a, the injury and death evidence and properties of HFC-134a discussed above demonstrate a similar hazard to that presented by HFC-152a. HFC-134a has somewhat lower inhalational toxicity in rats compared to HFC-152a (Rusch, 2018). Therefore, the non-toxic dose calculated for HFC-152a will be also protective for HFC-134a.

Based on the assessment that individuals who inhale aerosol duster products inhale a single spray at a time, but may use multiple sprays within a single period of use, and applying the conversion process described above, staff concluded that a single canister of aerosol duster

drugs between animals and humans. Ten is a default value for a safety factor. An additional safety factor of 10 could be used to protect sensitive populations.

[39] This dose will be at least as protective for older females and males of the same age and older due to their higher weight. Anthropometric reference data for children and adults: United States, 2015-2018; https://stacks.cdc.gov/view/cdc/100478.

product should be limited to 18 mg or less of HFC-152a and/or HFC-134a to render it non-toxic to humans. Although 18 mg of HFC-152a or HFC-134a is too small an amount to effectively be used as a propellant in an aerosol duster product, because this amount of propellant is not harmful, the Commission is proposing to allow trace amounts of 18 mg or less of HFC-152a and/or HFC-134a in aerosol duster products to allow for low level contamination that may occur during the manufacturing process. For example, if a manufacturer made a propellant change from the manufacture of an unregulated product to a regulated aerosol duster product, leftover contaminant levels remaining in hose lines used to fill aerosol duster products during manufacturing would not result in violative products as long as there is 18 mg or less per canister of the banned propellants. Therefore, the Commission preliminarily finds that any aerosol duster product containing more than 18 mg in any combination of HFC-152a and/or HFC-134a is toxic, and thus, is a hazardous substance under the FHSA.

Under the FHSA, the Commission may classify a hazardous substance that is packaged in a form suitable for use in the household as a "banned hazardous substance" if the Commission finds that "notwithstanding such cautionary labeling as is or may be required under this chapter for that substance, the degree or nature of the hazard involved in the presence or use of such substance in households is such that the objective of the protection of the public health and safety can be adequately served only by keeping such substance, when so intended or packaged, out of the channels of interstate commerce." 15 U.S.C. 1261(q)(1)(B). The Commission preliminary makes such a finding for HFC-152a and HFC-134a used in aerosol duster products.

Aerosol duster products are sold to consumers for use in their homes, and almost all aerosol duster products currently on the market display cautionary labeling including at a minimum a signal word (POISON, DANGER, WARNING, CAUTION) and statement(s) of

principal hazard(s) such as FLAMMABLE and VAPOR HARMFUL as required by the FHSA and 16 CFR § 1500.121. Aerosol duster products on the market also contain statements to inform consumers of intentional misuse, inhalation abuse, and the potential consequences of either activity. Tab C in the July 20, 2022, staff briefing package contains an in-depth analysis regarding the labeling of aerosol duster products.[40]

Although current aerosol duster products on the market contain both FHSA-required labeling, as well as statements identifying the potential hazard of aerosol duster abuse and misuse, these labels have not prevented the more than 1,000 deaths described in section IV of the preamble. The Commission therefore preliminary finds that labeling of aerosol duster products does not effectively address the inhalation hazard presented by aerosol duster products. Because large numbers of deaths and injuries continue to occur despite the cautionary labeling on aerosol duster products, the Commission is proposing to ban the use of toxic propellants HFC-152a and HFC-134a in any aerosol duster canister in amounts above 18 mg.

VII. Description of the Proposed Rule

The proposed rule would amend 16 CFR part 1500 to add a new provision under 16 CFR § 1500.17 declaring single canisters of aerosol duster products containing more than 18 mg in any combination of HFC-152a and/or HFC-134a to be banned hazardous substances under the FHSA. The provisions of the proposed ban are described below.

A. Proposed § 1500.17(a)(14)(i) – Ban on aerosol duster products containing more than 18 mg in any combination of HFC-152a and/or HFC-134a

The proposed rule would add a new paragraph, § 1500.17(a)(14)(i) to 16 CFR § 1500.17, that would declare any canister of aerosol duster product containing more than 18 mg in any

[40] www.cpsc.gov/s3fs-public/Petition-Requesting-Rulemaking-to-Establish-Safety-Standard_0.pdf?VersionId=GNEl7pYZUBOxf1BLSC0f4.X6TlA8gT4f.

combination of 1,1-difluoroethane (HFC-152a, CAS # 75-37-6) and/or 1,1,1,2-tetrafluoroethane (HFC-134a, CAS # 811-97-2) to be a banned hazardous substance under section 2(q)(1) of the FHSA. Section VI of the preamble provides the technical justification for the proposed ban. Proposed § 1500.17(a)(14)(i) also defines "aerosol duster product" to mean a product that uses a pressurized canister filled with gas or liquified gas to create a stream of gas propellant that can be used to dislodge or remove dust and debris.

B. Proposed § 1500.17(a)(14)(ii) - Prohibited stockpiling

Pursuant to section 9(g)(2) of the CPSA, 15 U.S.C. 2058(g)(2), § 1500.17(a)(14)(ii) of the proposed rule would prohibit a manufacturer from "stockpiling" or substantially increasing the manufacture or importation of noncompliant aerosol duster products between the date of publication of the final rule and the effective date. Section 9(g)(2) defines stockpiling to mean manufacturing or importing a product between the date of promulgation of a rule, regulation, standard, or ban and its effective date at a rate which is significantly greater than the rate at which such product was produced or imported during a base period ending before the date of promulgation of the rule standard, or ban. The proposed anti-stockpiling provision for hazardous aerosol dusters, which is explained more fully in Tab A of the staff NPR briefing package [INSERT HYPER LINK], would prohibit the manufacture or importation of noncompliant aerosol duster products in any 1-month period between the date of publication of the final rule and the effective date of the final rule at a rate greater than 105 percent of the rate at which they were manufactured or imported during the base period for the manufacturer or importer. The base period for aerosol duster products is defined in the proposed rule as the monthly manufacture or import volume for a firm-selected month that is within the last 13 months immediately preceding the month of the publication of the final rule.

C. Proposed § 1500.17(a)(14)(iii) - Findings

Proposed § 1500.17(a)(14)(iii) describes the Commission's preliminary findings required under sections 2(q)(1) and 3(h) of the FHSA, including requirements regarding voluntary standards, relationship of benefits to costs, and the least burdensome requirement.

VIII. Preliminary Regulatory Analysis

Pursuant to section 3(h) of the FHSA, publication of a proposed rule must include a preliminary regulatory analysis containing:

- a preliminary description of the potential benefits and potential costs of the proposed rule, including any benefits or costs that cannot be quantified in monetary terms, and an identification of those likely to receive the benefits and bear the costs;
- a discussion of why a relevant voluntary safety standard would not eliminate or adequately reduce the risk of injury addressed by the proposed rule;
- a discussion of the reasons for the Commission's preliminary determination of why the voluntary standards process would not within a reasonable time result in the development of a voluntary standard that would eliminate or adequately reduce the risk of injury identified in the rule; and
- a description of any reasonable alternatives to the proposed rule, together with a summary description of their potential costs and benefits and why such alternatives should not be published as a proposed rule.

15 U.S.C. 1262(h).

Below is a summary of the preliminary regulatory analysis for the proposed rule. See Tab A of the staff NPR briefing package [INSERT HYPER LINK] for the complete preliminary regulatory analysis.

A. Market Information

1. The Product

Aerosol duster products, also known as canned air, are pressurized canisters filled with liquified gas propellant. They utilize the force of compressed gas, released through a nozzle or straw attachment, to create a direct stream of gas that dislodges and blows away debris. Many aerosol duster products are labeled for "electronics dusting," or more generically, as a "multi-purpose duster." These products are marketed for dusting laptops, keyboards, computers, TVs, phones, printers, electronic toys, gaming devices, and other common household products including sewing machines, clocks, watches, musical instruments, and for auto detailing.

Other alternative products that would not be subject to the proposed ban exist for consumers to use for similar dusting purposes, including aerosol duster products using the propellant HFO-1234ze, compressed air dusters which use corded or cordless electric pumps or even hand pumps to compress air and blow it through a nozzle, CO_2 cartridge dusters which use disposable CO_2 cartridges to blow CO_2 through a nozzle, as well as vacuum cleaners.

While prices for aerosol duster products vary widely, the average price for a canister of aerosol duster is $8.00 according to a Maia Research market report[41] and $10.19 according to the Aerosol Duster Market Report available on the CPSC website.[42] Aerosol duster products that use an HFC-152a propellant are most common due to this propellant being less expensive than the less common alternative propellants HFC-134a or HFO-1234ze (*trans*-1,3,3,3-tetrafluoropropene). HFC-134a is non-flammable but is considered a potential greenhouse gas.

[41] Maia Research (January 2024). United States Air Duster Industry Market Research Report. 2025 price estimate, deflated to 2023 dollars using CPI.
[42] www.cpsc.gov/content/Aerosol-Duster-Study-Final-Report.

HFO-1234ze was introduced as an environmentally friendly alternative to HFC-134a, with low global warming potential. (See the staff's preliminary regulatory analysis in Tab A of the staff NPR briefing package [INSERT HYPER LINK] for a more complete discussion of aerosol duster products and a complete list of references.)

2. Market Trends for Aerosol Duster Products

Firms that sell aerosol duster products typically engage in either contract manufacturing or are private labelers. Typically, a company that engages in contract manufacturing has another company produce their product for them but remains involved in all components of manufacturing by providing specifications. When a company engages in contract manufacturing, the firm owns the end products for which they have contracted out production. Similarly, private labelers have their production manufactured by a third party; however, the product is owned by that third party and can be sold to other companies, as well. Typically, a private labeler owns a brand name and buys products from the third party to sell it under their established brand. While slightly different in structure, both of these arrangements (contract manufacturing and private labeling) allow firms that produce aerosol duster products to benefit from flexibility in their production processes, and typically avoid large, fixed manufacturing costs to produce their products.

3. Future Market Size for Aerosol Duster Products

Staff forecast aerosol duster products sales for a 30-year study period (2026 – 2055) using data from a market research report by MAIA Research. In this forecast, staff estimates the number of units of aerosol duster products sold in 2026 will be 18.31 million, absent the regulation of the product described in the proposed rule. In the scenario without the proposed rule, staff estimates the number of units sold in 2055 will be 35.81 million. This estimate is

based on a continuation of historical sales growth for the product, which could be affected by a number of unknown factors such as reduced use of computer keyboards or revised environmental regulations.

B. Preliminary Description of Potential Benefits and Costs of the Proposed Rule

Staff conducted a benefits analysis of the proposed rule. The benefits analysis accounted for mitigated deaths and injuries from the proposed rule, which staff monetized using the value of statistical life (VSL) for deaths and the Injury Cost Model (ICM) for injuries. As discussed above, this is likely an undercount of benefits, because staff's count of deaths was limited to cases where the product was explicitly identified as an aerosol duster product. Over a 30-year study period, staff estimated the total annualized net benefits (benefits less costs) from the proposed rule, discounted at 2 percent, to be $1.93 billion due to reduced fatalities and injuries from inhalation. Stated differently, every dollar of cost from the proposed rule is estimated to produce $16.59 of benefits.

The proposed rule would impose three main costs: (1) markup losses to manufacturers/importers of aerosol duster products; (2) increased prices paid by consumers; and (3) deadweight losses or market impacts caused by the increased price associated with compliance with the regulation and the subsequent decline in demand. As detailed in Tab A of the staff NPR briefing package, staff estimates that these costs total $123 million over the 30-year study period, discounted at 2 percent.

When the estimated benefits of $2.05 billion are compared to the estimated costs of $123 million, the estimated benefits of the rule are far greater than the estimated costs. Staff calculates net benefits (benefits less costs) to be $1.93 billion on an annualized basis, after discounting at 2 percent. However, staff notes that one of the unquantified costs of the proposed rule is the

assumed creation of a black market for noncompliant aerosol duster products. Due to the euphoric high experienced with HFC-152a and HFC-134a, consumers who use aerosol duster products as inhalants may still want to purchase noncompliant canisters. This inelastic demand and significant reduction in supply of noncompliant canisters due to the proposed rule would create an incentive for individuals to supply those individuals with noncompliant canisters, such as those that are illegally imported from other countries. The creation of a black market can create significant negative externalities such as increased illicit activity, increased crime and subsequently increased spending on law enforcement, and greater health and safety risks to consumers. Staff cannot estimate the magnitude of these externalities with any certainty. In addition, this analysis does not consider individuals who may stop inhaling aerosol duster products after the rule would go into effect but start using other intoxicants in its place. If staff were able to forecast and quantify this effect, the impact could reduce the estimated benefits from the proposed rule. However, given net estimated benefits of $1.93 billion per year in staff's analysis, the benefits of the proposed rule would likely still outweigh the costs even if these externalities occur.

To investigate the impact of using alternative values for some of the key inputs and assumptions of the analysis, staff conducted a sensitivity analysis to compare with the main preliminary regulatory analysis. In the main preliminary regulatory analysis, staff assumes a large number of individuals would continue to use most aerosol duster products obtained on the black market as inhalants due to the euphoric high experienced with HFC-152a and HFC-134a.

In the sensitivity analysis, staff considered an alternative scenario. The sensitivity analysis assumes that the prohibition of HFC-152a and HFC-134a in aerosol duster products results in a greater reduction in inhalant abuse. Staff estimated that, currently, 7.88 percent of

aerosol duster products are potentially used by consumers as inhalants. After the regulation goes into effect, staff estimated that there would be an overall reduction in products used as inhalants, but the share of products used as inhalants increases to about 30 percent. In the sensitivity analysis, staff assumes that the share of products used as inhalants goes unchanged at 7.88 percent. This change in input inherently assumes that the proposed rule would be more effective at changing the behavior of consumers who use aerosol duster products as inhalants.

This change in assumption increases benefits without affecting the costs. In this scenario, net benefits increase to $2.94 billion when annualized at 2 percent, which boosts the benefit-cost ratio from $16.59 of benefits for every $1 of cost shown in the main preliminary regulatory analysis, to $24.78 of benefit for every $1 of cost show in the sensitivity analysis.

C. Evaluation of Voluntary Standards

Based on the current state of the voluntary standard's process for aerosol duster products discussed in section V of the preamble, the Commission determines that no current U.S. voluntary standard exists to address the inhalation hazard posed by aerosol duster products. Further, there is no indication that any voluntary standards organization has a clear plan to address the inhalant hazard in a new or existing voluntary standards. Therefore, the Commission preliminarily determines at this time that the voluntary standards process will not within a reasonable time result in the development of a voluntary standard that would eliminate or adequately reduce the risk of injury identified in the proposed rule. No standard or portion of a standard has been submitted to the Commission under sections 3(f)(5) and (6) of the FHSA.

D. Alternatives to the Proposed Rule

The Commission considered four alternatives to the proposed rule: (1) performance requirements; (2) aversive agents (bitterants); (3) labeling; and (4) take no regulatory action and

rely upon the voluntary standard's process. The Commission finds that none of these alternatives would adequately address the inhalation hazard associated with aerosol duster products.

1. Performance Requirements

Rather than banning hazardous aerosol duster products under the FHSA, the Commission could in principle mandate a performance requirement under sections 7 and 9 of the CPSA, 15 U.S.C. 2056, 2058, aimed at making aerosol duster products using the propellants HFC-152a and HFC-134a less likely to be used for inhalation. This alternative assumes that an effective performance standard for preventing aerosol duster abuse could be developed. To date, however, suppliers have been unable to develop a performance standard that would effectively prevent the inhalation or abuse of aerosol duster products while still allowing for use of the product as intended. Staff is unaware of any existing voluntary standard to address the inhalation hazard. In March 2024, ASTM considered establishing a task group to develop a standard, but no task group was formed. Incident data indicates that victims of injury and death are primarily adults who purchase aerosol duster products with the intended goal of intentionally inhaling the product. Even assuming a performance requirement could be developed, while such a requirement may be effective in preventing young children from releasing the contents of aerosol duster products by adding child-safe features, it would not be effective in preventing adults from abusing and inhaling aerosol duster products, and notably the overwhelming number of injuries and deaths occur among adults. Thus, it would be very difficult, if not impossible, to develop a performance standard that would be effective in addressing inhalant abuse of aerosol duster products. Therefore, the Commission finds this alternative would not address the unreasonable risk of injury associated with aerosol duster products.

2. Aversive Agents (Bitterants)

As FUAIA recommended in its 2021 rulemaking petition, the Commission could adopt a CPSA performance standard to require aversive agents (bitterants) to be used in aerosol duster products. At the petition stage, staff evaluated the use of aversive agents such as bitterants in aerosol duster products and concluded that adding bitterants would not be effective at addressing the inhalant hazard posed by aerosol duster products. Tab B in the July 20, 2022 staff briefing package contains an in-depth analysis regarding the use of bitterants in aerosol duster products.[43] Additionally, many aerosol duster products currently on the market contain bitterants,[44] which appears not to have led to a decline in deaths and injuries associated with inhalant abuse of aerosol duster products. Therefore, the Commission finds this alternative would not adequately address the unreasonable risk of injury associated with aerosol duster products.

3. Labeling

The Commission could require warning and other labels on aerosol duster products. However, most aerosol duster products currently on the market are labeled regarding the inhalation hazard, which appears to have had little impact on deaths and injuries associated with inhalant abuse of aerosol duster products. Additionally, at the petition stage, staff concluded that labeling of aerosol duster products is unlikely to be effective at addressing the inhalation hazard posed by aerosol duster products. In fact, labeling could have the perverse consequence of causing people inclined to abuse inhalants to seek out products with the enhanced warning on the label, thereby facilitating the problem that the label was intended to avoid. Therefore, the

[43] www.cpsc.gov/s3fs-public/Petition-Requesting-Rulemaking-to-Establish-Safety-Standard_0.pdf?VersionId=GNEl7pYZUBOxf1BLSC0f4.X6TlA8gT4f.

[44] According to the Aerosol Duster Study completed by Euromonitor International in July 2023, approximately 70 percent of all aerosol duster sales are of bitterant-containing products. (https://www.cpsc.gov/s3fs-public/Aerosol-Duster-Study-2023-Redacted.pdf?VersionId=idRW1RnIfr_5Jkc9sA9mkss8kTyUmZDD).

Commission finds this alternative would not adequately address the unreasonable risk of injury associated with aerosol duster products.

4. Take No Regulatory Action and Rely Upon the Voluntary Standard's Process

The Commission could take no regulatory action and rely upon the voluntary standards process to address the inhalation hazard posed by aerosol duster products. Currently, however, no U.S. voluntary standard exists or is under consideration to address the inhalation hazard posed by aerosol duster products. Therefore, as discussed in section V of this preamble, the Commission finds this alternative would not adequately address the unreasonable risk of injury associated with aerosol duster products.

IX. Initial Regulatory Flexibility Analysis

Whenever an agency publishes an NPR, Section 603 of the Regulatory Flexibility Act (RFA), 5 U.S.C. 601–612, requires the agency to prepare an initial regulatory flexibility analysis (IRFA), unless the head of the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. The IRFA, or a summary of it, must be published in the *Federal Register* with the proposed rule. Under Section 603(b) of the RFA, each IRFA must address:

(1) a description of why action by the agency is being considered;

(2) a succinct statement of the objectives of, and legal basis for, the proposed rule;

(3) a description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply;

(4) a description of the projected reporting, recordkeeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which

will be subject to the requirement and the type of professional skills necessary for preparation of the report or record; and

(5) an identification, to the extent practicable, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule.

The IRFA must also describe any significant alternatives to the proposed rule that would accomplish the stated objectives and that minimize any significant economic impact on small entities.

A. Reason for Agency Action

The intent of the proposed rulemaking is to reduce deaths and injuries associated with inhalant abuse of aerosol duster products. The Commission is considering the action because of the numerous deaths and injuries associated with the use of aerosol duster products.

B. Objectives of and Legal Basis for the Rule

The Commission proposes this rule to reduce death and injury associated with inhalant abuse from aerosol duster products. This standard is promulgated under the authority of the FHSA. To declare a substance a banned hazardous substance under section 2(q)(1) of the FHSA the Commission must follow the procedural requirements set forth in section 3(f)-(i) of the FHSA. *See* 15 U.S.C. 1261(q)(2) and 1262(f)-(i).

C. Small Entities to Which the Rule Will Apply

The proposed rule would apply to all manufacturers and importers of aerosol duster products. According to estimates by Euromonitor International (Euromonitor), the household consumer market for aerosol duster products was $99.7 million in 2022, and approximately 87 percent of aerosol duster products examined use the propellant HFC-152a and 11 percent use HFC-134a. The remainder use a mixture of these two propellants or an alternative propellant.

According to information collected by staff, in 2024 there were an estimated 31 firms that supply the domestic market for aerosol duster products. Among these firms, 26 are manufacturers and five are importers/wholesalers. Approximately 90 percent of suppliers (28 suppliers) are located domestically in the United States.

D. Compliance, Reporting, and Record-Keeping Requirements of Proposed Rule

In accordance with Section 14 of the CPSA, 15 U.S.C. 2063, manufacturers would have to issue a General Certificate of Conformity (GCC) for each aerosol duster product model, certifying that the model complies with the proposed ban. Each GCC must also be based on a test of each product or a reasonable testing program and provided to all distributors or retailers of the product. The manufacturer would have to comply with 16 CFR part 1110 concerning the content of the GCC, retention of the associated records, and any other applicable requirements.

E. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rule

CPSC currently has no regulations regarding the use of HFC-152a and/or HFC-134a in aerosol duster products or any other consumer product. However, the U.S. EPA regulates, or is in the process of regulating, the use of HFC-152a and HFC-134a as hydrofluorocarbons for various uses, including for use in motor vehicle air conditioning, as refrigerants for use in self-chilling cans for household refrigeration, transport refrigeration, vending machines, cold storage warehouses and retail food refrigeration (40 CFR part 82), and as per- and polyfluoroalkyl substances (PFAS) which are broadly used in food, water, and increasingly consumer products, as exposure to some types of PFAS substances are linked to serious health effects. None of EPA's regulations regulating HFC-152a and HFC-134a address the inhalation hazard the proposed rule is intended to address, and thus do not overlap or conflict with the proposed rule.

F. Potential Impact on Small Entities

1. Impact on Small Manufacturers

For the majority of firms in this market, aerosol duster products are ancillary to their manufacturing of products such as degreasers, lubricants and other aerosol products that would not be regulated under the proposed rule. Staff identified 31 firms that would be impacted by the proposed rule. Twenty-six of these firms are manufacturers of aerosol duster products and five are wholesales/importers. Among the 26 manufacturers of aerosol duster products, 20 would be considered small firms according to Small Business Administration (SBA) thresholds.[45] The SBA size standard threshold for NAICS code 325998, All Other Miscellaneous Chemical Product and Preparation Manufacturing, is having fewer than 650 employees in order to be considered small.

Staff identified four small domestic manufacturers of aerosol duster products where the potential impact of the proposed regulation could be significant. These firms enjoy strong brand recognition, and their products are widely used aerosol duster products for electronics. For these firms, their aerosol duster products comprise a large share of their total product offerings. Staff assessed the impact to these small manufacturers to be significant (i.e., greater than one percent of annual revenue) as the proposed rule is expected to increase the price of a canister of aerosol duster product more than threefold, and subsequently cause a steep decline in demand.[46]

[45] Small Business Administration, Table of Size Standards (https://www.sba.gov/document/support-table-size-standards).
[46] The proposed rule is expected to cause firms to shift to more expensive propellants, and therefore is expected to increase the price of a canister of aerosol duster product. For a more complete discussion of the expected price increase and subsequent projected decline in demand, see the full economics memorandum in Tab A.

2. Impact on Small Importers

Staff identified five wholesalers/importers of aerosol duster products. The SBA size standard threshold for NAICS code 424690, Other Chemical and Allied Products Merchant Wholesalers, is having fewer than 175 employees in order to be considered small. According to SBA size standards, two of these firms would be considered small and three would be considered large. Staff assessed the impact to these small importers and wholesalers to be significant (i.e., greater than one percent of annual revenue) as the proposed rule is expected to increase the price of a canister of aerosol duster product more than threefold, and subsequently cause a steep decline in demand.

3. Conclusion

Given the significant impact that the proposed rule would have on the market overall, staff assessed that there would be a significant impact on a substantial number of small entities from the proposed rule.

G. Alternatives for Reducing the Adverse Impact on Small Businesses

Section VIII.D Preliminary Regulatory Analysis of this preamble provides a discussion of four alternatives to the proposed rule that were considered and why those alternatives were rejected. While the alternatives could reduce the burden on small entities, none of the alternatives are consistent with achieving the rule's objective of improving consumer safety by protecting consumers from the inhalant risks posed by aerosol duster products. The Commission is not proposing these alternatives because they would not effectively reduce the number of injuries and fatalities associated with aerosol duster products as discussed in Section VIII of the preamble.

The Commission welcomes public comments on this IRFA. Small businesses that believe they would be affected by the proposed rule are encouraged to submit comments. The comments should be specific and describe the potential impact, magnitude, and alternatives that could reduce the impact of the proposed rule on small businesses.

X. Paperwork Reduction Act

This proposed rule contains information collection requirements that are subject to public comment and review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (PRA). 44 U.S.C. 3501–3521. We describe the provisions in this section of the document with an estimate of the annual reporting burden. Our estimate includes the time for gathering certificate data and creating General Certificates of Conformity (GCCs), the keeping and maintaining of records associated with the GCCs, and the disclosure of GCCs to distributers and retails.

CPSC particularly invites comments on: (1) whether the collection of information is necessary for the proper performance of the CPSC's functions, including whether the information would have practical utility; (2) the accuracy of CPSC's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used; (3) the accuracy of CPSC's estimate of the share of canisters used as inhalants; (4) ways to enhance the quality, utility, and clarity of the information to be collected; (5) ways to reduce the burden of the collection of information on respondents, including the use of automated collection techniques, when appropriate, and other forms of information technology; and (6) estimated burden hours associated with label modification, including any alternative estimates.

Title: *Ban on Specified Aerosol Duster Products*

Description: The proposed rule would ban any canister of an aerosol duster product containing more than 18 mg in any combination of HFC-152a and/or HFC-134a.

Description of Respondents: Persons who manufacture or import aerosol duster products. Staff estimates the burden of this collection of information as follows in Table 9.

Table 9. Estimated Annual Reporting Burden

Burden Type	Number of Respondents	Frequency of Responses	Total Annual Responses	Minutes per Response	Total Burden Hours
GCC Creation	30	5	150	20	50
Recordkeeping	30	5	150	2	5
Third Party Disclosure	30	500	15,000	5	1,250
Total	–	–	15,300	–	1,305

Section 14(a)(1) of the CPSA, 15 U.S.C. 2063(a)(1), would require manufacturers to certify that their products conform to the proposed rule and issue a GCC. There are 31 known corporate entities supplying aerosol duster products to the U.S. market (consisting of 26 manufacturers and 5 wholesalers/importers), and we assume the majority of these entities would respond annually, though this may be an overestimate.

On average, each entity may respond 5 times per year for collection requirements related to compliant aerosol duster products in the market. Each manufacturer or importer that responds may create 5 certificates annually for a total of 150 responses (30 responses × responses per respondent = 150 annual responses). The estimated time required to create a GCC is about

twenty minutes. Therefore, the estimated burden associated with issuance of GCCs is 50 hours (150 responses × 20 minutes per response = 50 hours).

We estimate for the purpose of this burden analysis that records supporting GCC creation, including testing records, would be maintained for a 5-year period. Staff estimates another 150 record-keeping responses, each one of which requires two minutes per year in routine recordkeeping. This adds up to 5 hours (150 records × 2 min per record = 300 minutes or 5 hours).

Section 14(g)(3) of the CPSA also requires that GCCs be disclosed to third party retailers and distributors. We estimate that each respondent will submit 5 GCCs to 100 retailers or distributers annually. Therefore, respondents are estimated to disclose 15,000 GCCs to third party retailers and distributors annually (30 responses × 500 disclosures per year = 15,000 responses). Staff estimates each one of which requires 5 minutes per year. This adds up to 1,205 hours (15,000 responses x 5 minutes per response = 75,000 minutes or 1,250 hours).

Based on this analysis, the proposed ban for aerosol duster products would impose a total paperwork burden to industry of 1,305 hours (50 hours for GCC creation + 5 hours for recordkeeping + 1,250 hours for third-party disclosure). To estimate the cost to industry staff uses total compensation data from the U.S. Bureau of Labor Statistics (BLS) on hourly compensation paid to private industry workers in goods-producing industries of $44.75.[47] At an hourly wage rate of $44.75, the estimated cost of the collection is $58,399 annually (1,305 hours × $44.75 = $58,398.75). There are no operating, maintenance, or capital costs associated with the collection.

[47] U.S. Bureau of Labor Statistics, "Employer Costs for Employee Compensation," December 2023, Table 4, total compensation for private industry working in goods-producing industries: https://www.bls.gov/news.release/archives/ecec_03132024.pdf.

Existing aerosol duster product manufactures would incur these costs in the first year following the proposed rule's effective date. In subsequent years, costs could be less, depending on the number of new GCCs issued for aerosol duster products. As required under the PRA (44 U.S.C. 3507(d)), CPSC has submitted the information collection requirements of this proposed rule to the OMB for review. Interested persons are requested to submit comments regarding information collection by [**insert date 60 days after date of publication in the FEDERAL REGISTER**], to the Office of Information and Regulatory Affairs, OMB as described under the **ADDRESSES** section of this notice.

XI. Effective Date

The FHSA does not specify any requirements regarding the setting of an effective date for a rule promulgated pursuant to that authority. The Administrative Procedure Act (APA) generally requires that the effective date of a rule be at least 30 days after publication of a final rule. 5 U.S.C. 553(d).

The Commission preliminarily proposes an effective date of 30 days after publication of the final rule in the *Federal Register.* Pursuant to section 19(a)(2)(D) of the CPSA, once the rule is effective, it would be unlawful to "sell, offer for sale, manufacture for sale, distribute in commerce, or import into the United States" any aerosol duster product containing 18 mg in any combination of HFC-152a and/or HFC-134a. 15 U.S.C. 2068(a)(2)(D). Therefore, it would be unlawful to sell any remaining inventory of aerosol duster products containing more than 18 mg of HFC-152a or HFC-134a as of the effective date.

While there are potential vulnerabilities regarding shortages and revenue loss, these potential vulnerabilities are greatly outweighed by the reduction in benefits that would result from delaying the effective date past 30 days. Staff estimates the incremental loss in benefits

from a 60-day effective date – 30 additional days from the recommended 30-day effective date – to be $62.54 million in net benefits, using a 2 percent discount rate. This loss is the result of 290 additional injuries and 4 additional deaths from delaying the rule for an additional 30 days. Under a 180-day effective date – 150 additional days from the recommended 30-day effective date – staff estimates a loss of $312.69 million in net benefits. This estimated further loss is the result of 1,452 additional injuries and 20 additional deaths from delaying the rule for 150 days.

Staff also considered manufacturers' expected actions required to become compliant with the proposed ban in recommending the 30-day effective date. Manufacturers of aerosol duster products would switch to an alternative propellant. Switching to an alternative propellant is a near drop-in replacement, having only minimal changes required to formulations and equipment. As such, while the new propellant itself will be more expensive, the one-time costs of switching propellants will be negligible. The manufacturing process which includes filling, sealing, and crimping the aerosol duster products remains unchanged from current manufacturing practices. It would also require manufacturers to change the labels on their canister to list the alternative propellant, which staff assesses can be accomplished in 30 days. Therefore, the cost of any retooling in the manufacturing process would be minimal. In addition, consumer aerosol duster products that would not be impacted by the proposed rule are already in use, and available for sale. Alternatively, instead of switching to a new propellant in an aerosol duster product, as discussed in section III.C of this preamble, there are manufacturers and importers that currently supply battery powered USB rechargeable duster products to the market, which provide similar utility to consumers as an aerosol duster product. For these reasons, the Commission proposes a 30-day effective date. The Commission invites comments regarding the amount of time needed to come to compliance with a final rule.

XII. Certification

Section 14(a)(1) of the CPSA requires that products subject to a consumer product safety rule under the CPSA, or to a similar rule, ban, standard or regulation under any other act enforced by the Commission, must be certified with a GCC as complying with all applicable CPSC-enforced requirements. 15 U.S.C. 2063(a)(1). A final rule establishing a ban under the FHSA would subject aerosol duster products to this requirement. Aerosol duster products would need a certification stating that they do not contain more than 18 mg in any combination of HFC-152a and/or HFC-134a.

XIII. Environmental Considerations

Generally, the Commission's regulations are considered to have little or no potential for affecting the human environment, and environmental assessments and impact statements are not usually required. *See* 16 CFR § 1021.5(a). The proposed rule is not expected to have an adverse impact on the environment and is considered to fall within the "categorical exclusion" for the purposes of the National Environmental Policy Act. 16 CFR § 1021.5(c). In fact, because HFO-1234ze was introduced as an environmentally friendly alternative to HFC-134a, substitution of HFO-1234ze for HFO-134a in aerosol duster products as a result of the proposed rule could have beneficial environmental effects.

XIV. Preemption

Executive Order (EO) 12988, Civil Justice Reform (Feb. 5, 1996), directs agencies to specify the preemptive effect of a rule in the regulation. 61 FR 4729 (Feb. 7, 1996). The proposed ban on any aerosol duster canister containing more than 18 mg in any combination of HFC-152a and/or HFC-134a is being promulgated under the authority of the FHSA. 15 U.S.C. 1261-1278. The FHSA provides that, generally, if the Commission issues a banning rule under

section 2(q) of the FHSA to protect against a risk of illness or injury associated with a hazardous substance, "no State or political subdivision of a State may establish or continue in effect a requirement applicable to such substance and designed to protect against the same risk of illness or injury unless such requirement is identical to the requirement established under such regulations.'' 15 U.S.C. 1261 Note. Upon application to the Commission, a State or local standard may be excepted from this preemptive effect if the State or local standard: (1) provides a higher degree of protection from the risk of injury or illness than the FHSA standard and (2) does not unduly burden interstate commerce. In addition, the Federal government, or a State or local government, may establish and continue in effect a non-identical requirement that provides a higher degree of protection than the FHSA requirement for the hazardous substance for the Federal, State or local government's own use. 15 U.S.C. 1261 note. Thus, with the exceptions noted above for standards that provide higher levels of protection, the proposed rule banning any aerosol duster canister containing more than 18 mg in any combination of HFC-152a and/or HFC-134a would preempt non-identical state or local requirements applicable to such aerosol duster products designed to protect against the same risk of injury.

XV. Request for Comments

We invite all interested persons to submit comments on all aspects of the proposed rule. The Commission specifically seeks comment on the following topics:

- Alternative propellants manufacturers would likely use in aerosol duster products and the intoxicating effects and safety implications of inhaling these alternative propellants;
- Any test methods that can be used to test for compliance of HFC-152a and HFC-134a at the proposed level of 18 mg per single aerosol duster canister;

- Information or data on future market trends, including projected sales, size of the market, growth of firms in the market, forthcoming innovation, or any other information that would inform CPSC of the expected future for the aerosol duster market with or without the proposed rule; and
- The ability of firms to complete these actions to produce compliant products within the proposed effective date.

XVI. References

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List of Subjects in 16 CFR Part 1500

Consumer protection, Hazardous materials, Hazardous substances, Imports, Infants and children, Labeling, Law enforcement, and Reporting and recordkeeping.

For the reasons stated in the preamble, the Commission proposes to amend Title 16 of the Code of Federal Regulations to read as follows:

PART 1500—HAZARDOUS SUBSTANCES AND ARTICLES; ADMINISTRATION AND ENFORCEMENT REGULATIONS.

1. The authority for part 1500 continues to read as follows:

Authority: 15 U.S.C. 1261–1278.

2. In § 1500.17, add a new paragraph (a)(14) to read as follows:

§ 1500.17 Banned hazardous substances.

(a) * * *

(14)(i) ***Aerosol Duster Products Containing more than 18 mg in any combination of HFC-152a and/or HFC-134a.*** Any canister of an aerosol duster product containing more than 18 mg in any combination of 1,1-difluoroethane (HFC-152a, CAS # 75-37-6) and/or 1,1,1,2-tetrafluoroethane (HFC-134a, CAS # 811-97-2). The term aerosol duster product means a product that uses a pressurized canister filled with gas or liquified gas to create a stream of gas propellant that can be used to dislodge or remove dust and debris.

(ii) ***Prohibited Stockpiling*** —

(A) *Prohibited acts.* Manufacturers and importers of aerosol duster products shall not manufacture or import aerosol duster products that do not comply with paragraph (a)(1)(i) in any one-month period between **[DATE OF PUBLICATION OF FINAL RULE]** and **[EFFECTIVE DATE OF THE FINAL RULE]** at a rate greater than 105 percent of the rate at which they manufactured or imported aerosol duster products during the base period for the manufacturer or importer.

(B) *Base period.* The base period for aerosol duster products is the monthly manufacture or import volume for any month within the last 13 months immediately preceding the month of publication of the final rule.

(iii) ***Findings*** —

(A) ***General.*** To issue a rule under section 2(q)(1) of the FHSA, 15 U.S.C. 1261(q)(1), classifying a substance or article as a banned hazardous substance, the Commission must make certain findings and include them in the regulation. These findings are discussed in paragraphs (a)(14)(iii)(B) through (D) of this section.

(B) ***Voluntary standard.*** No voluntary standard currently exists to address the potential for death and injury posed by inhalant abuse of aerosol duster products containing HFC-152a or HFC-134a. The Commission finds that there is no evidence that a voluntary standard will be adopted and implemented within a reasonable period of time that would eliminate or adequately reduce the risk of injury regarding the potential for death and injury posed by the intentional inhalant abuse of aerosol duster products.

(C) ***Relationship of benefits to costs.*** The Commission estimates that the ban will be effective in reducing the potential for injury and death from compliant aerosol duster products. When benefits are compared to costs, the estimated benefits of the rule are

greater than the estimated costs. Net benefits (benefits less costs) are estimated to be $1.93 billion on an annualized basis. Staff performed a 30-year prospective cost analysis (2026-2055) on all cost categories and estimated the total annualized cost from the proposed rule to be $123 million. Staff estimated the total annualized benefits from the proposed to be $2.05 billion, discounted at 2 percent.

(D) ***Least burdensome requirement.*** The Commission considered the following alternatives: require a performance requirement for aerosol duster products preventing inhalation of their propellant; require aversive agents (bitterants); require warning labels; and take no action and rely on a voluntary standard. The Commission finds none of the alternatives considered would adequately reduce the risk of death or injury. Therefore, the Commission finds that a ban on any aerosol duster product containing more than 18 mg in any combination of 1,1-difluoroethane (HFC-152a, CAS # 75-37-6) and/or 1,1,1,2-tetrafluoroethane (HFC-134a, CAS # 811-97-2) is the least burdensome requirement that would prevent or adequately reduce the risk of death or injury.

Alberta E. Mills, Secretary

Consumer Product Safety Commission

United States
Consumer Product Safety Commission

Memorandum

TO:	The Commission Alberta E. Mills, Secretary	**DATE:** July 10, 2024
THROUGH:	Jessica L. Rich, General Counsel Austin C. Schlick, Executive Director DeWayne Ray, Deputy Executive Director of Operations	
FROM:	Duane E. Boniface, Assistant Executive Director Office of Hazard Identification and Reduction Cheryl Scorpio Ph.D., Aerosol Dusters Project Manager, Division of Pharmacology and Physiology Assessment, Directorate for Health Sciences Adrienne Layton Ph.D., Pharmacologist, Division of Pharmacology and Physiology Assessment, Directorate for Health Sciences Andrei Komarov M.D., Ph.D., DABT Physiologist, Division of Pharmacology and Physiology Assessment, Directorate for Health Sciences Cynthia Gillham M.S., Economist, Economics Directorate Jeffrey Giliam M.A., Economist, Economics Directorate Julia Kerns, Engineering Psychologist, Division of Engineering Sciences, Directorate of Human Factors Ryan Cudemus-Brunoli MPP, Compliance Officer, Regulatory Enforcement, Office of Compliance and Field Operations Chao Zhang, Mathematical Statistician, Division of Hazard Analysis, Directorate for Epidemiology Matt Kresse, Mechanical Engineer, Division of Mechanical Engineering, Directorate for Laboratory Sciences. Emily Matthews, Chemist, Division of Chemistry, Directorate for Laboratory Sciences	
SUBJECT:	Draft Proposed Rule to Ban 1,1-difluorethane (HFC-152a), and 1,1,1,2-tetrafluoroethane (HFC-134a) above specified amounts in Aerosol Duster Products	

This draft notice of proposed rulemaking (NPR) reflects the views and recommendations of the above-listed staff. The NPR is intended to reduce the risk of associated injuries and deaths associated with intentionally inhaling aerosol duster products.

On April 2, 2021, Families United Against Inhalant Abuse (FUAIA) submitted a petition requesting that the Commission initiate rulemaking to adopt a mandatory CPSC safety standard to address the hazards associated with duster aerosol products used for cleaning electronics and other items and containing the chemical 1,1-difluorethane, or any derivative thereof. The Commission published a request for comments on the petition in the Federal Register. On July 20, 2022, staff submitted a briefing package to the Commission. On July 26, 2022, the Commission voted to defer action on the petition to allow staff to conduct further research. Staff submitted a further briefing package to the Commission on July 26, 2023. The Commission granted the petition on August 1, 2023, directing staff to begin rulemaking.

The product is aerosol dusters, which have a trigger or similar mechanism used to release a propellant intended for the purpose of cleaning electronics and other items having areas where dust resides. According to Euromonitor, approximately 87 percent of aerosol duster products available for sale in the U.S. use the propellant 1,1-difluoroethane (HFC-152a) and 11 percent use 1,1,1,2-tetrafluoroethane (HFC-134a). The remainder use a mixture of these two propellants or trans- 1,3,3,3-tetrafluoropropene (HFO-1234ze). There is no existing voluntary standard that addresses the abuse of aerosol duster products. On February 27, 2023, ASTM Committee F15 hosted an exploratory meeting discussing topics such as bitterants, warning labeling, alternative propellants, and alternative technologies. On March 4, 2024, ASTM Committee F15 hosted a second exploratory meeting to discuss a possible future voluntary standard and development of a task group. No task group has been formed.

The propellants HFC-152a and HFC-134a are the drug of choice for many inhalant abusers because of low cost, ease of access and immediate euphoria without the lingering effects like other drugs. Aerosol duster products contain pure HFC-152a and/or HFC-134a mixtures that are administered directly into the lungs resulting in a quick high. The drug effects of HFC-152a and HFC-134a clear quickly from the body resulting in frequent repeated (within minutes) use of the aerosol duster to maintain a high.

CPSC field staff performed in depth investigations (IDIs) of 23 incidents we received from the National Electronic Injury Surveillance System (NEISS). These 23 IDIs from consumers of 9 female and 14 males aged 15 to 61 years-old, were used to determine the hazard patterns of those who died from inhaling aerosol dusters. Based upon staff's review of IDIs, the hazard pattern for inhalation deaths from aerosol duster products includes both males and females; covers a wide age range; involves death from inhalation of a single can or multiple cans; and leads to deaths primarily at home, but also in motels and parked vehicles.

Between 2012 and 2021, CPSC received CPSRMS reports for 1,039 unique fatal incidents involving inhalation hazards from aerosol dusters. Most victims (94%) were between the ages of 18 and 54 and the victims' ages ranged between 13 and 70 years old. Seventy percent of the victims were male, and 92 percent were white. Staff are also aware of at least 7 deaths resulting from HFC-134a toxicity

between 2012 and 2021. In three of these deaths, the product involved was identified as an aerosol duster product. Between 2012 and 2021, it is estimated that there were 21,700 emergency department (ED) treated injuries resulting from inhalation of aerosol duster products in the United States. This estimate is based on a sample of 498 NEISS injury cases.

Staff calculated a human non-toxic dose for HFC-152a and HFC 134a as 18 mg for a 38 kg human. Therefore, staff recommends a rule under which a single package of aerosol duster cannot contain more than 18 mg of HFC-152a and/or HFC-134a.

Staff completed a cost-benefit analysis of the proposed rule. When costs are compared to benefits, the estimated benefits of the rule are far greater than the estimated costs. Staff calculates net benefits (benefits less costs) to be $1.93 billion on an annualized basis, when discounted at 2 percent. Overall, the draft proposed rule has a benefit-cost ratio of 16.59 when comparing benefits and costs, discounted at 2 percent. Therefore, for every $1 in cost of the draft proposed rule, there is a return of $16.59 in benefits. Staff's cost-benefit analysis rest on a 100 percent effective rate of mitigating deaths and injuries for compliant canisters and a zero percent effective rate for any noncompliant canisters that remain in circulation. Overall, staff's analysis forecasts a 60 percent reduction in deaths and injuries in terms of societal costs from the draft proposed rule over 30 years. Effectiveness could be as low as 5 percent and still have net benefits.

Staff then conducted a sensitivity analysis that would make the draft proposed rule more effective at decreasing the number of consumers who use aerosol duster products as inhalants. Staff estimated that, currently, 7.88 percent of aerosol duster products are potentially used by consumers as inhalants. After the regulation goes into effect, staff estimated that there would an overall reduction in products used as inhalants, but the share of products used as inhalants increases to about 30 percent. In the sensitivity analysis, staff assumes that the share of products used as inhalants goes unchanged at 7.88 percent. This change in input inherently assumes that the draft proposed rule would be more effective at changing the behavior of consumers who use aerosol duster products as inhalants. The changes result in the benefit-cost ratio increasing to 24.78.

Staff identified 31 firms that supply the domestic market for aerosol duster products. Twenty-six are manufacturers and five are wholesalers/importers of aerosol duster products. According to the Small Business Administration size standards, 22 of these firms would be considered small and nine would be considered large. The draft proposed rule is expected to cause firms to shift to more expensive propellants, and therefore increase the price of a canister of aerosol duster product. Subsequently, the expected price increase is projected to lead to a decrease in demand, as described in the economics memorandum found in Tab A. Accordingly, staff assessed that there would be a significant impact to a substantial number of small entities from this proposed rule, given the significant impact the proposed rule would have to the overall market.

TAB A

TO: Cheryl Scorpio, Project Manager
Division of Pharmacology and Physiology
Directorate for Health Sciences

DATE: July 9, 2024

THROUGH: Alexander Moscoso, Associate Executive Director
Directorate for Economic Analysis

FROM: Cynthia Gillham, Economist
Directorate for Economic Analysis

Jeffrey Giliam, Economist
Directorate for Economic Analysis

Jose Tejeda, Division Director
Directorate for Economic Analysis

SUBJECT: Aerosol Dusters Containing HFC-152a and HFC-134a
Preliminary Regulatory Analysis

Executive Summary

The U.S. Consumer Product Safety Commission (CPSC) is considering a draft proposed rule for the propellants HFC-152a (1,1-difluoroethane) or HFC-134a (1,1,1,2-tetrafluoroethane) in aerosol duster products to address the risk of injury and death from these propellants being used as inhalants. Aerosol duster products, also known as "canned air", are pressurized canisters filled with liquified gas propellant designed for household use in removing dust and debris from hard-to-reach places. The draft proposed rule addresses the risk from using aerosol duster products as inhalants, which is not currently covered by any existing voluntary standard. The draft proposed rule would ban the use of HFC-152a and HFC-134a as propellants in aerosol duster products at quantities above 18mg. By removing products with high levels of HFC-152a and HFC-134a, the draft proposed rule would restrict availability of products containing HFC-152a and HFC-134a in amounts likely to be abused, thereby preventing injuries and deaths from intentional inhalation.

Staff identified 1,039 deaths from aerosol duster products containing HFC-152a and HFC-134a that occurred from 2012 through 2021. Staff estimated that there were 56,507 nonfatal injuries in the same period.[1] The injuries are comprised of 17,496 injuries that resulted in an emergency department (ED) visit, 1,260 injuries that resulted in hospital admissions, 4,520 injuries that resulted in hospital admissions via the ED, and 33,232 injuries that resulted in a doctor's or clinic visit.

The draft proposed rule would cause prices of aerosol duster products to increase, and subsequently cause a large reduction in consumer demand. Staff capture the cost of this disruption, which represents the cost of this draft proposed rule, by estimating the deadweight loss[2], loss of consumer surplus, and loss of producer surplus in the market. Staff performed a 30-year prospective cost analysis (2026-2055)

[1] Staff estimated nonfatal injuries using its Injury Cost Model. The Injury Cost model generates national estimates from the observed 22,164 nonfatal injuries from inhaling aerosol dusters through CPSC's National Electronic Information System. The Injury Cost Model uses the observed incidents in conjunction with information it has about the injury and other factors to extrapolate it into a national estimate.
[2] Deadweight loss is the value of transactions lost due to major market events, such as a new regulation.

and estimated the total annualized cost from the draft proposed rule to be $123.73 million, using a discount rate of 2 percent.[3]

Staff also conducted a benefits analysis of the draft proposed rule. The benefits analysis accounted for mitigated deaths and injuries from the draft proposed rule, which staff monetized using the value of statistical life (VSL) for deaths, and the Injury Cost Model (ICM) for injuries. Over the 30-year study period, staff estimated the total annualized benefits from the draft proposed rule to be $2.05 billion, discounted at 2 percent.

When costs are compared to benefits, the estimated benefits of the rule are far greater than the estimated costs. Staff calculates net benefits (benefits less costs) to be $1.93 billion on an annualized basis, when discounted at 2 percent. Overall, the draft proposed rule has a benefit-cost ratio of 16.59 when comparing benefits and costs discounted at 2 percent. For every $1 in cost of the draft proposed rule, there is a return of $16.59 in benefits.

Staff's cost-benefit analysis rest on a 100 percent effective rate of mitigating deaths and injuries for compliant canisters and a zero percent effective rate for any noncompliant canisters that remain in circulation. Overall, staff's analysis forecasts a 60 percent reduction in deaths and injuries in terms of societal costs from the draft proposed rule over 30 years. This reduction could be as low as 5 percent and the rule would still generate positive net benefits.

However, staff notes that there are unquantifiable effects from this draft proposed rule. Most notably, this draft proposed rule could potentially create a black market for aerosol duster products with HFC-152a and HFC-134a. A black market could create negative externalities such as increased illicit activity, increased crime, and increased spending on law enforcement. Another unquantified effect is that consumers who may stop inhaling aerosol duster products after the rule, could potentially start using other intoxicants in its place. The overall severity of the health effects of those potential alternatives cannot be estimated with any certainty. On the other hand, this analysis may underestimate benefits attributable to reduction in societal costs outside of deaths and injuries. Substance abuse has other potential costs such as employment loss, stress on families, child neglect, and financial hardships that are not reflected here.

1. Introduction

The CPSC is considering a draft proposed rule to ban the use of HFC-152a and HFC-134a in aerosol duster products in any amount greater than 18 mg. Aerosol duster products, also known as "canned air", are pressurized canisters filled with liquified gas propellant designed for removing dust and debris from hard-to-reach places.

1.1. Draft Proposed Rule

Based on subject matter experts (SME) from CPSC's Directorate for Engineering Science, firms would have to do the following in preparation for compliance with the new rule if it is finalized: (i) source an alternative propellant, (ii) switch production from the banned propellant to an alternative propellant or to a substitute product such as a fan or vacuum, and potentially (iii) shift use of any excess quantities of the banned propellant to alternative products, sell it to other firms for such use, sell it to other international markets where the propellant is not banned, or dispose of it.

This document presents the findings from the preliminary regulatory analysis which assesses the costs and benefits of the draft proposed rule.

[3] Staff uses a discount rate to incorporate the time value of money during the 30-year study period. In the analysis, staff presents both costs and benefits in undiscounted dollars, discounted at 2 percent, and discounted at 3 percent.

1.2. Preliminary Regulatory Analysis

Pursuant to section 3(h) of the Federal Hazardous Substances Act, publication of a proposed rule must include a preliminary regulatory analysis containing the following:

(1) a preliminary description of the potential benefits and costs of the proposed rule, including any benefits or costs that cannot be quantified in monetary terms, and an identification of those likely to receive the benefits and bear the costs;
(2) a discussion of the reasons any standard or portion of a standard submitted to the Commission under subsection (f)(5) was not published by the Commission as the proposed rule or part of the proposed rule;
(3) a discussion of the reasons for the Commission's preliminary determination that efforts proposed under subsection (f)(6) and assisted by the Commission as required by section 5 (a)(3) [of the CPSA] would not, within a reasonable period of time, be likely to result in the development of a voluntary consumer product safety standard that would eliminate or adequately reduce the risk of injury addressed by the proposed rule; and
(4) a description of any reasonable alternatives to the proposed rule, together with a summary description of their potential costs and benefits, and a brief explanation why such alternatives should not be published as a proposed rule.[4]

An overview of the aerosol duster product market can be found in section 2 of this memorandum. A preliminary description of the potential costs and benefits of the draft proposed rule can be found in sections 3 and 4 of this memorandum, respectively. An analysis of benefits relative to costs can be found in section 5 of this memorandum. In addition, no standard or portion of a standard was submitted to the Commission under sections 3(f)(5) and (6) of the FHSA. Finally, a discussion of the reasonable alternatives to the draft proposed rule can be found in section 6 of this memorandum.

1.3. Proposed Rule Effective Date

Staff recommends an effective date for this draft proposed rule that is 30 days after promulgation of the final rule. Staff makes this recommendation after evaluating three relevant factors: (1) the benefits from mitigated deaths and injuries, (2) the number and complexity of actions most firms would need to take to bring compliant products to market, and (3) the vulnerability of the market to significant supply chain and market disruptions. Staff recommends requesting comment on the utility and feasibility of this effective date.

Added Benefits

The purpose of an earlier effective date is realizing safety benefits of the rule more quickly: injuries that are prevented and lives saved. Staff can calculate the change in benefits under an effective date later than the recommended 30 days. For this assessment, staff measures the loss of net benefits from a 60- and 180-days effective dates.

Staff estimated the loss in benefits from a 60-day effective date – 30 additional days from the recommended 30-day effective date – of $45.71 million in net benefits, using a 2 percent discount rate. This loss is the result of 246 additional injuries and 3 additional deaths from delaying the rule for 30 days. Under a 180-day effective date – 150 additional days from the recommended 30-day effective date – staff estimated a loss of $228.57 million in net benefits as compared to the 30-day effective date. This loss is due to 1,229 additional injuries and 17 additional deaths from delaying the rule's implementation for 150 days.

[4] 15 U.S.C. § 1262(h).

Firm Actions for Compliance

Based on the assessment of SMEs from CPSC's Directorate for Engineering Science, firms would have to do the following in preparation for compliance with the new rule: (i) source an alternative propellant, (ii) switch production from the banned propellant to an alternative propellant, and (iii) shift use of any excess quantities of the banned propellant in to alternative products, sell it to other firms, sell it to other international markets where the propellant is not banned, or dispose of it.

Based on these actions, staff estimates that most firms, including firms with significant market share, would be able to complete these actions and manufacture or import compliant products within 30 days from promulgation of a final rule. The firms' actions for compliance do not require significant changes to the manufacturing process or operations; compliance instead requires the replacement of the prohibited propellants with an alternative propellant or product. It would also require firms to change the labels on their canister to list the alternative propellant, which staff assesses can be accomplished within 30 days.

HFO-1234ze (trans-1,3,3,3-tetrafluoropropene) is already in use in consumer aerosol duster products that would not be impacted by the draft proposed rule, and available for sale. Staff recommends the Commission request public comment on the ability of firms to complete these actions to produce compliant products within the proposed effective date for the rule.

Impact of Effective Date on Industry

Staff assessed how the proposed rule's 30-day effective date could impact production, and how it could impact individual firms and consumers.

Staff determined that the recommended effective date could create product shortages and could cause a loss of revenue for firms. Staff determined that it is somewhat likely that firms could experience shortages in their production from a 30-day effective date. Small domestic firms could fail to produce at their typical production levels if they are unable to fully switch to an alternative propellant within 30 days. This could likewise lead to lost revenue for the two domestic aerosol duster firms – both of which are private labelers and distributors – that rely on aerosol duster sales for their primary revenue source. Staff assessed this could have a high impact on these firms because the domestic firms may be unable to fully switch to an alternative propellant quickly and unlike other firms, currently do not have other products to rely on.

Recommended Effective Date

Based on these three factors, staff recommends a 30-day effective date. While there are potential vulnerabilities regarding shortages and revenue loss, staff assesses that these potential vulnerabilities are greatly outweighed by the loss in benefits from delaying the effective date past 30 days. Delaying the effectiveness of the rule by 30 days (i.e., a 60-day effective date) would represent a loss of benefits, including additional injuries and deaths, of $45.71 million while a delay of 150 days (i.e., a 180-day effective date) would represent a loss of benefits of $228.57 million. The latter figure is more than the estimated annual revenue for the entire industry.[5] For these reasons, staff recommends a 30-day effective date.

1.4. Proposed Anti-Stockpiling Provision

The draft proposed rule includes an anti-stockpiling provision[6] that would limit the manufacturing or importing of noncompliant aerosol duster products between the promulgation of the final rule and the

[5] Forecasted to be $148.59 million in 2025 according to Maia Research.
[6] According to Section 9 paragraph (g)(2) of the CPSA, CPSC may prohibit stockpiling from the date of promulgation of the rule to the effective date of the rule. Stockpiling is defined as manufacturing or importing a non-complying product at a rate that is significantly greater than the rate at which such products were produced or imported during a base period. The base period is defined as the 13 months preceding promulgation of the rule.

effective date. Firms could not manufacture or import noncompliant products in a given month more than a rate of 105 percent of the base period. The base period is described in the draft proposed rule as average monthly manufacturing or import volume within the last 13 months of production that immediately precedes the month of promulgation of the final rule.

2. Market Information

2.1. The Product

Aerosol duster products, also known as "canned air", are pressurized canisters filled with liquified gas propellant. They utilize the force of compressed gas, released through a nozzle or straw attachment, to create a direct stream of gas that dislodges and blows away debris.

Many aerosol duster products are labeled for "electronics dusting," or more generically, as a "multi-purpose duster." These products are marketed for dusting laptops, keyboards, computers, TVs, phones, printers, electronic toys, gaming devices, and other common household electronic products. Aerosol duster products can also be sold for dusting common household products including sewing machines, clocks, watches, and musical instruments, or for auto detailing. Product reviews of aerosol duster products indicate that consumers use these products for many other purposes outside of their marketed use, including blowing air into a cast, making edible bakery decorations, and drying paints, finishes, and small parts quickly.

Aerosol duster products are available for purchase online and at a variety of in-store retail locations, such as office-supply stores, hardware stores, home-electronics stores, auto-supply stores, grocery stores, and pharmacies.

Because aerosol dusters may be used for the purpose of intoxication, various U.S. states have restricted the sale of aerosol duster products to only consumers over the age of 18 and require that a valid form of identification be presented at the time of purchase. Aerosol duster products sold at stores may be secured within a locked shelf or behind a counter, where a sales associate must assist the consumer to access the product. Consumers buying aerosol duster products online may be asked to verify they are 18 or older before purchase. Despite these actions, injuries and deaths continue to occur.

While prices for aerosol duster products vary widely, the average price for a single product is $8.00 according to a Maia Research market report[7] and $10.19 according to another reference.[8] While online retailers sell individual cans at about $8 to $10 per can, some retailers also offer a discount when the product is purchased in bulk as a multipack case for home delivery. Aerosol duster products that use an HFC-152a (1,1-difluoroethane) propellant are typically less expensive than aerosol dusters that use HFC-134a (1,1,1,2-tetrafluoroethane), HFO-1234ze (*trans*-1,3,3,3-tetrafluoropropene), or HFO-1234yf (2,3,3,3-Tetrafluoropropene) propellant. HFC-152a is extremely flammable while HFC-134a is not flammable, and HFO-1234ze and HFO-124yf are both mildly flammable. Some aerosol duster products mix HFC-134a with HFC-152a to reduce flammability of the product.

Other alternative products that would not be subject to this ban exist for consumers to use for similar purposes, including aerosol duster products using the propellant HFO-1234ze, compressed air dusters which use corded or cordless electric pumps or hand pumps to compress air and blow it through a nozzle, "mini" vacuum cleaners, or carbon dioxide (CO_2) cartridge dusters which use disposable CO_2 cartridges to blow CO_2 through a nozzle. According to data collected in 2023, the average price of an electric duster is

[7] Maia Research (January 2024). United States Air Duster Industry Market Research Report. 2025 price estimate, deflated to 2023 dollars using CPI.
[8] Euromonitor International, (July 2023). Aerosol Duster Study. https://www.cpsc.gov/s3fs-public/Aerosol-Duster-Study-2023-Redacted.pdf?VersionId=idRW1RnIfr_5Jkc9sA9mkss8kTyUmZDD

approximately $56, similar to the price of seven disposable aerosol duster canisters.[9] Consumers can also use vacuum cleaners to remove dust. Thus, a number of alternative products exist that provide similar utility to that provided by aerosol duster products.

2.2. The Firms

Firms that sell aerosol duster products typically engage in contract manufacturing or are private labelers. Contract manufacturing involves a firm entering a contract with a manufacturer to produce their specific product to their specifications. The firm receiving the product from the manufacturer owns the intellectual property rights to the product. A private labeler buys the product from a manufacturer who is already making the product but selling it to multiple vendors (likely other private labelers) who sell the same products under different names. A private labeler owns the intellectual property rights to its brand but not the product. Both arrangements allow the firms to have flexibility in their production processes, and typically avoid large, fixed manufacturing costs.

According to information collected by staff, there are 31 firms in 2024 that supply the domestic market for aerosol duster products. Among these firms, 26 are manufacturers and 5 are importers/wholesalers. Approximately 90 percent of suppliers (28) are domestic. According to the Maia Research market report reviewed by staff, the annual growth rate of aerosol duster firms averaged 2.6 percent, from 2018 to 2023.

2.3. The Market

Two firms capture a large share of the consumer market for aerosol duster production. A third firm is a significant player in the consumer market but predominantly serves the commercial-industrial market. Together, these three firms account for 33 percent of the aerosol duster product market. The other 28 firms comprise the remaining 66 percent of the market, while 1 percent remains unaccounted for.

For most firms, aerosol duster products are not their main product line. For example, a firm that produces aerosol duster products may also produce aerosol degreasing and polishing products that use the HFC-152a propellant. That firm's main product lines would be aerosol products that fall outside of the scope of this rule. However, the two more dominant firms have aerosol duster products as their primary product. These two firms are private labelers and have invested heavily in brand recognition. Both these firms are considered small businesses based on the size standards from the Small Business Administration (SBA).

2.4. Future Market and Use Trends

Staff forecasted aerosol duster sales under the baseline scenario (a scenario without this draft proposed rule) for the 30-year study period (2026-2055). In this forecast, staff distinguished between aerosol duster products that are used for cleaning as intended and those used as inhalants. Finally, staff also forecasted the number of aerosol duster products in use (i.e., in circulation) under the baseline scenario. For these analyses, staff used Maia Research's data on historical and future sales,[10] which are shown in Figure 1.

[9] Aerosol Duster Supporting Database, August 2023. (https://www.cpsc.gov/content/Aerosol-Duster-Supporting-Database).

[10] Maia Research (January 2024). United States Air Duster Industry Market Research Report.

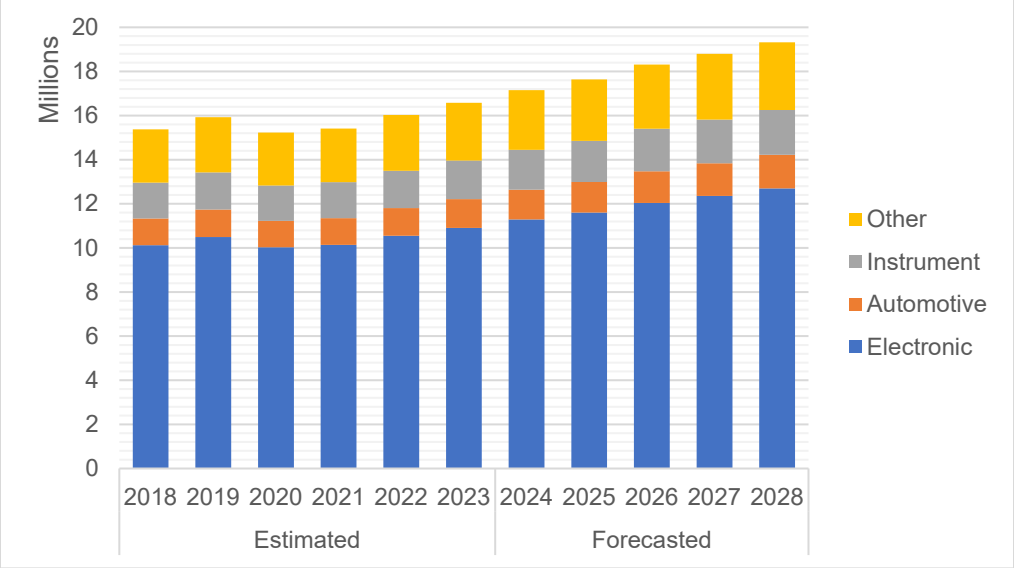

Figure 1: Forecast Aerosol Duster Product Sales, 2018 - 2028

30-Year Sales Forecast

Maia Research has projected that the aerosol duster market will grow by an average annual rate of 3.11 percent from 2025 through 2028. For comparison, the average annual growth rates from 2018 through 2024 is 1.89 percent.[11] To forecast national sales after 2028, staff calculated the compounding annual growth rate (CAGR) of sales in Figure 1 between 2018 and 2028, which is 2.31 percent. In this forecast, staff estimated the number of units sold in 2026 to be 18.31 million and would grow to 35.81 million in 2055.

Usage Data

Maia Research found aerosol duster products were divided by type of use as the following: electronic (66 percent), automotive (8 percent), instrument (10 percent), and other (approximately 16 percent). Staff assumed that 50 percent of "other" aerosol duster uses represent the number of aerosol duster canisters used for inhalation; or approximately 7.88 percent of the total aerosol duster market.

To further analyze the use of aerosol dusters as inhalants, staff used information from the National Survey on Drug Use and Health (NSDUH) conducted by SAMHSA (Substance Abuse and Mental Health Services Administration). The NSDUH asks a question about the frequency of inhalation of computer cleaners or air dusters (i.e., aerosol dusters) over the past 12 months.

The survey found a total of 284,350 estimated users who inhaled aerosol duster products during a 12-month period. The survey estimated a total of 9,920,483 use days. *Use days* are the number of days the respondent used aerosol duster products for inhalation over the previous 365 days.[12] The average individual who used aerosol dusters as inhalants did so on 34.9 days of the year. A histogram in Figure 2 presents the number of use days. It shows a right-skewed distribution with the highest frequencies at low

[11] The 2024 sales estimate is a forecast.

[12] NSDUH asks the following questions to users of aerosol duster products: i) Have you ever, even once, inhaled computer keyboard cleaner, also known as air duster, for kicks or to get high? and ii) During the past 12 months, how frequently did you use these inhalants? The response to the second question is provided as the number of days the inhalant was used in the range from 0 to 365 days over the last year. For instance, a response of 20, means the respondent used air dusters for inhalation 20 days - 20 "use days" - in the 365 days prior to the day the question was asked.

values of use days with a median value of 9.6 use days, a first quartile of 2.1 use days, and a third quartile of 36 use days.

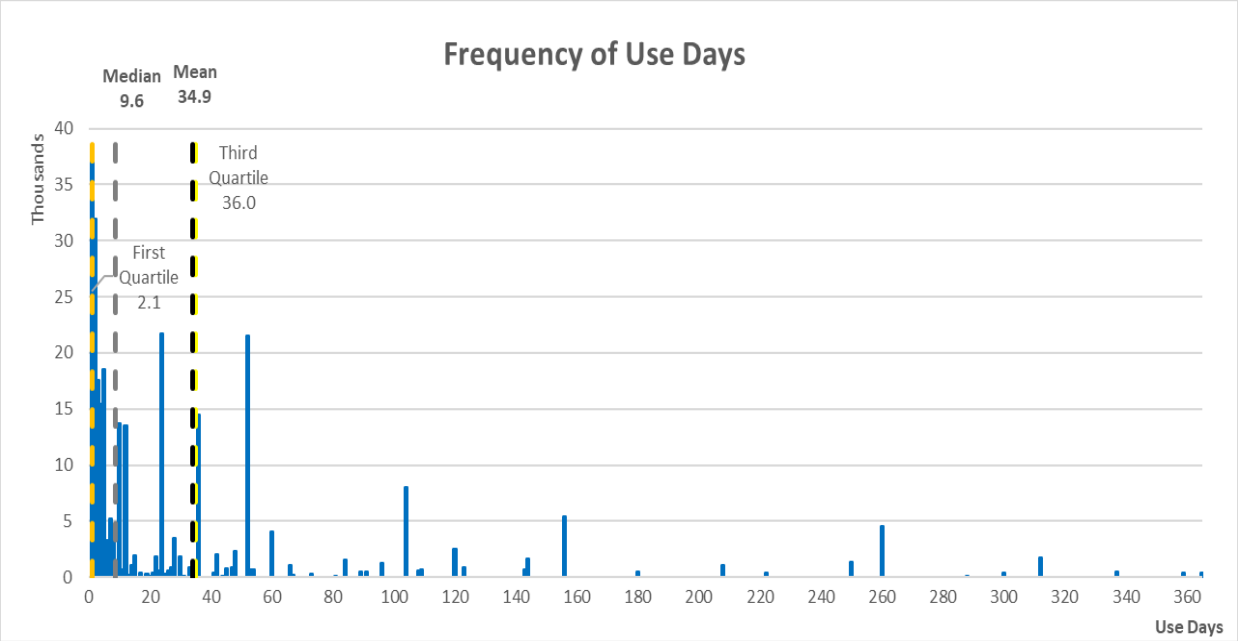

Figure 2: Number of Days when Aerosol Dusters were Inhaled Over the Prior 12 Months

The assumption that 50 percent of aerosol dusters in the category "Other" are used for inhalation aligns with other data on aerosol dusters. For example, 7.88 percent of all products is 1.44 million products per year; that number across approximately 285,000 users suggests an average of five cans per user on average. When 1.44 million products are spread across 10 million use days, it implies around 8 usage days per can. Neither of these implications are unrealistic. For these reasons, staff maintains the 50 percent assumption. Staff recommends that the Commission seek public comment on this assumption.

30-Year In Use Forecast

To forecast the number of aerosol duster products that will be in circulation – both products that are used as intended and those used for inhalation – staff used the historical sales volume (Figure 1), projected long-term growth rate (2.31 percent after 2028), the share of products used for inhalation (7.88 percent), and the average useful life of a product.

Staff estimated that an individual aerosol duster product (i.e., canister) that is used as an inhalant is used to emptiness after an average of eight use days.[13] To estimate the average useful life of an aerosol duster product, staff used this eight use-days average per product with the consumers' stated frequency of use days (Figure 2). For example, a person who stated eight use days a year would be expected to use one aerosol duster product in one year (8 use days per product ÷ 8 use days per year). If another

[13] The total number of aerosol duster use days from the NSDUH is 9,920,483, and staff estimated the average annual number of aerosol duster canisters used as inhalants in the period 2018-2023 to be 1,241,167. Staff estimated this number as 50 percent the average annual number of canisters used for "other" applications in the period 2018-2023 from Maia Research's historical sales The ratio of the number of use days and the number of aerosol canisters used as inhalants is 8.0; therefore, the average aerosol duster canister used for inhalation is estimated to last for an average of 8 use days.

person stated 16 use days per year, the useful life of the products they used would be 6 months (8 use days per product ÷ 16 use days per year), and so on.

Staff applied this approach to all data in Figure 2 to create a distribution of product useful lives shown in Figure 3. The distribution of average useful life of aerosol duster products has a mean value of 25.1 months (2.1 years), a median of 9.1 months (0.8 years), and a first and third quartile of 2.3 months (0.2 years) and 31.3 months (2.6 years).

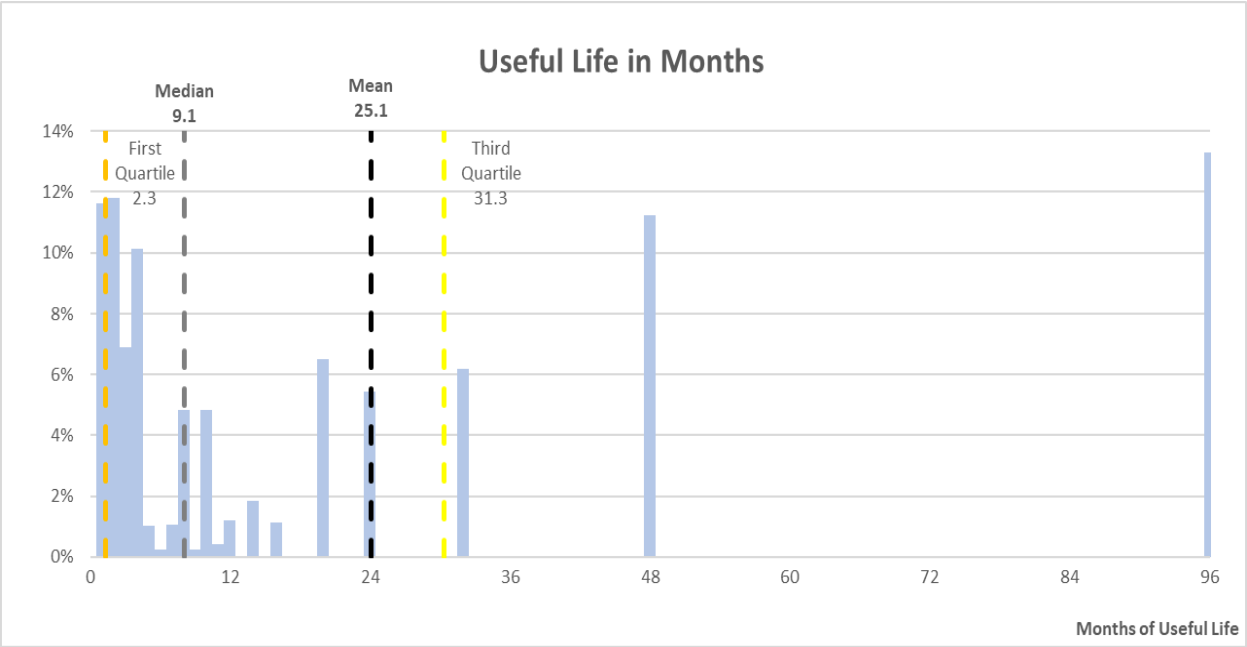

Figure 3: Useful Life of Aerosol Duster Products in Months

To estimate the number of units in-use in each year throughout the 30-year study period, staff used the forecasted sales as the stream of new products into the product population. Then, staff modeled the aerosol duster product time to failure using a Weibull distribution to estimate the total time a consumer uses the product until it is no longer available for use. The Weibull distribution was defined by a scale parameter of 1.57[14], and a shape parameter of 2.[15] Staff then uses a cumulative Weibull distribution function[16] to estimate the number of products in use in each year of the 30-year study period.

Figure 4 displays the baseline projected number of sales (dashed lines) and in-use units (bars) of aerosol dusters from 2026 through 2055 for both the entire aerosol duster market and for aerosol dusters used as inhalants. In 2026, the number of aerosol dusters sold and in use are expected to be 18.31 million and 33.9 million, respectively. By 2055, the number of aerosol dusters sold is expected to reach 35.8 million units, while the number of products in use would reach 66.8 million. Staff assumes the portion of the

[14] The scale parameter of the Weibull distribution represents the variability in the distribution. Staff use NSDUH data to derive the average useful life of aerosol duster canisters as discussed above, and then estimated the 63.2 percentile of the distribution of useful lives to determine a shape parameter of 1.57 (a property of the Weibull distribution is that 63.2 percent of the values in the distribution are lower than the shape parameter).

[15] The shape parameter affects the shape of the distribution. Staff utilized a conservative shape parameter of 2 consistent with higher probabilities of product failure in the earlier years.

[16] A complementary cumulative distribution function to the Weibull distribution is estimated as 1 – F(t), where F(t) is the cumulative Weibull distribution. In the case of aerosol dusters, the cumulative Weibull distribution produces the cumulative probability that a product has failed "t" years after introduction. The complementary cumulative Weibull distribution is equivalent to a survival function and produces the cumulative probability that a product is still in use "t" years after first purchased.

aerosol duster market used for inhalation is 7.88 percent of the total sales and products in use, growing through 2055 to 2.8 million in sales (from 1.44 million in 2026) and to 5.3 million products in use (from 2.8 million in 2026), respectively.

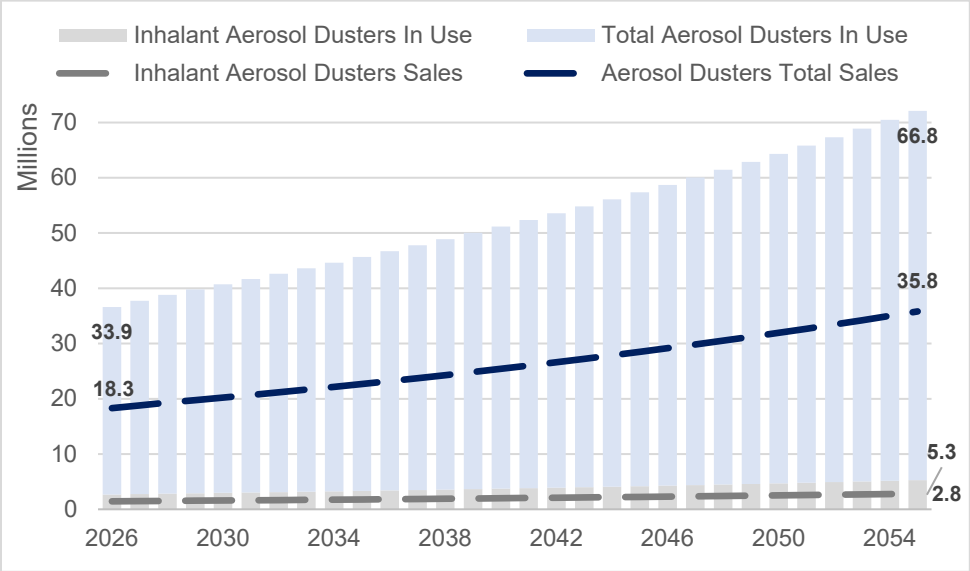

Figure 4: Forecast of Sales and In-Use Units, 2026 – 2055

Staff recommends the Commission request public comments regarding any information or data on future market trends, including projected sales, size of the market, growth of firms in the market, forthcoming innovation, or any other information that would inform CPSC of the future for the aerosol duster market both for legitimate users and for abusers.

3. Cost Analysis

This section discusses the costs the draft proposed rule would impose on industry, consumers, and the market. This cost analysis assumes that manufacturers and importers that remain in the market would comply with the rule by replacing the propellants HFC-152a and HFC-134a with HFO-1234ze. However, a black market for noncompliant products (i.e., canisters with HFC-152a and HFC-134a) would likely be created after the implementation of the proposed rule.

This black market would likely be supplied by noncompliant products originally shipped to other countries where HFC-152a and HFC-134a are not limited, or potentially from aerosol duster products manufactured for commercial purposes. Some importers and individuals, in search of large profits, may supply noncompliant products to consumers in the U.S. who use them as inhalants at a price that is significantly higher than the pre-regulation price of these products.

Staff assessed the cost of the draft proposed rule by estimating the change in social surplus (i.e., consumer and producer surplus) in the market from the baseline scenario to the alternative scenario with the draft proposed rule in effect. The draft proposed rule would significantly disrupt the market in its baseline scenario, and experience loss in social surplus in three components: (1) the creation of deadweight loss (DWL), (2) loss of a portion of baseline consumer surplus, and (3) loss of a portion of baseline producer surplus. DWL reflects consumer and producer surplus that no longer occur in the market due to lost transactions from regulation. The loss of consumer surplus is the net loss in social surplus that was consumer surplus in the baseline. The loss of producer surplus is the net loss in social surplus that was producer surplus in the baseline.

Some consumers who exit the aerosol duster market after the regulation may purchase a substitute, after which some of their surplus could be recovered if the substitute product price is less than a consumer's willingness-to-pay. However, staff cannot forecast this behavior accurately and therefore did not estimate this offset for the purpose of this analysis.

The cost analysis covers a 30-year period that starts in 2026, which is the calendar year when staff expects the rule to be in effect. This cost analysis presents all cost estimates in 2023 dollars, and discounts costs in the future to their present value using a 2 percent discount rate.[17]

While the cost analysis captures the change in the primary market for aerosol duster products from the draft proposed rule, there are potential ripple effects from the draft proposed rule to secondary markets or consumers that staff were not able to capture. Most notably, staff could not quantify all the impacts from the creation of a black market for noncompliant aerosol duster products post regulation. As with most black markets, staff expects there to be negative externalities and additional costs. Additionally, staff did not quantify additional harm from use of other substances that some consumers may seek to replace aerosol duster products as inhalants. Staff also did not account for recovered surplus from consumers buying substitutes, like corded dusters, that would reduce the costs quantified in this section. Finally, staff did not include externalities from a severe contraction in the aerosol duster market, or consequential expansions of other markets. A fuller description of these unquantified costs is in section 5.2.

This section first covers the expected impact on the price and volume of aerosol dusters, then it calculates costs for each category over the 30-year study period, and finally it presents total cost from the draft proposed rule in annualized terms.

3.1. Impact on the Proposed Rule on the Market Price and the Volume of Aerosol Dusters

In the aerosol duster market, products are sold at various sizes and sometimes contain multiple propellants. To measure the price increase from HFC-152a[18] and HFC-134a to HFO-1234ze, staff performed a regression analysis using 280 observed products with prices, can size, and contents, to estimate a price per 9.75-ounce can for each propellant. Staff used sales prices per oz and the price elasticity to estimate the relative quantities sold for each observed product. These quantities were then used as weights within a linear regression to predict a price for aerosol duster canisters using each propellant. Staff then took the ratio of the predicted price of an HFO-1234ze propellant can over the weighted average price of HFC-152a and HFC-134a propellant cans. Staff used this ratio to estimate an average price increase from this draft proposed rule. Table 1 presents the predicted prices per 9.75-ounce aerosol duster product based on the type of propellant and the ratio. It is important to note that these do not represent industry average prices, which are less than these predicted amounts.

[17] Discounting future estimates to the present allows staff not only to consider the time value of money, but also the opportunity cost of the investment, that is, the value of the best alternative use of funds.

[18] HFC-152a is the propellant used by a large majority of manufacturers prior to the implementation of the proposed rule.

Table 1: Predicted Price Increase per Aerosol Duster Product

Propellant	Cost per 9.75 oz can	Estimated Shares	Calculated Ratio[19]
Unnamed Propellant	$9.56	14.7%	2.49
HFC-134a (CAS No. 811-97-2)	$21.24	12.3%	
HFC-134a/HFC-152a blend (CAS No. 811-97-2 and 75-37-6)	$14.86	0.8%	
HFC-152a (CAS No. 75-37-6)	$8.96	71.1%	
HFO-1234ze (CAS No. 29118-24-9)	$26.48	1.1%	

Table 1 estimates that the propellant HFO-1234ze is 2.49 times more expensive than HFC-152a or HFC-134a. As previously mentioned, the overall average price is less than the prices in Table 1. This is likely due to bulk discounts, pricing strategy or other market factors not accounted for in the regression analysis performed to create the results in Table 1. This can be seen when comparing the estimated sales revenue by Maia Research for 2025 ($148.59M) to units sold (17.64 M), which calculates to an average revenue per product of $8.42. Staff adjusted this price to 2023 dollars by removing the impacts of inflation for two years.[20] Staff estimated this adjusted price to be $8.00.[21]

To estimate the real price of a compliant aerosol duster product with the implementation of the draft proposed rule, staff applied the calculated ratio presented in Table 1, as shown in Table 2. Staff also assumed that noncompliant aerosol duster sold in the black market would sell for an average price that is similar to the price of compliant aerosol duster products.

Table 2: Real Prices per Aerosol Duster Product

Real Prices	Price without the Rule	Factor	Price with the Rule
Aerosol Duster Product	$8.00	2.49	$19.95

To estimate the response of the market from this price increase, staff assumed a constant price-elasticity of demand curve[22] and a linear supply curve. The overall demand for aerosol dusters is more price-sensitive than the demand for aerosol dusters used as inhalants (which is encompassed in the overall

[19] 2.49 = $26.48 ÷ [($9.56 × 14.7% + $21.24 × 12.3% + $14.86 × 0.8% + $8.96 × 71.1%) ÷ (14.7% + 12.3% + 0.8% + 71.1%)]

[20] International Monetary Fund, "World Economic Outlook Database", Forecasted Inflation for 2024 (2.759) and 2025(2.433), https://www.imf.org/en/Publications/WEO/weo-database/2023/October/weo-report?c=111,&s=PCPIPCH,&sy=2023&ey=2028&ssm=0&scsm=1&scc=0&ssd=1&ssc=0&sic=0&sort=country&ds=.&br=1

[21] $8.00 = $8.42 ÷ (1.02759 × 1.02433)

[22] A constant price elasticity of demand function has the form: $Q_D = K\,P^{\varepsilon}$, where Q_D is the volume demanded at each price, K is a constant, P is the price, and ε is the price elasticity of demand. A constant price-elasticity of demand is a function for which a change in price leads to a change in the opposite direction in the volume demanded that is ε times the price change. For instance, if the constant elasticity of demand is -2 then a ten percent increase in the price of the good would lead to a reduction of 20 percent in the quantity demand, independently of what the initial price of the good is.

demand). The price elasticities of demand for overall aerosol duster products and aerosol duster products used as inhalants are -2.4614[23] [24] and -1,[25] [26] respectively.

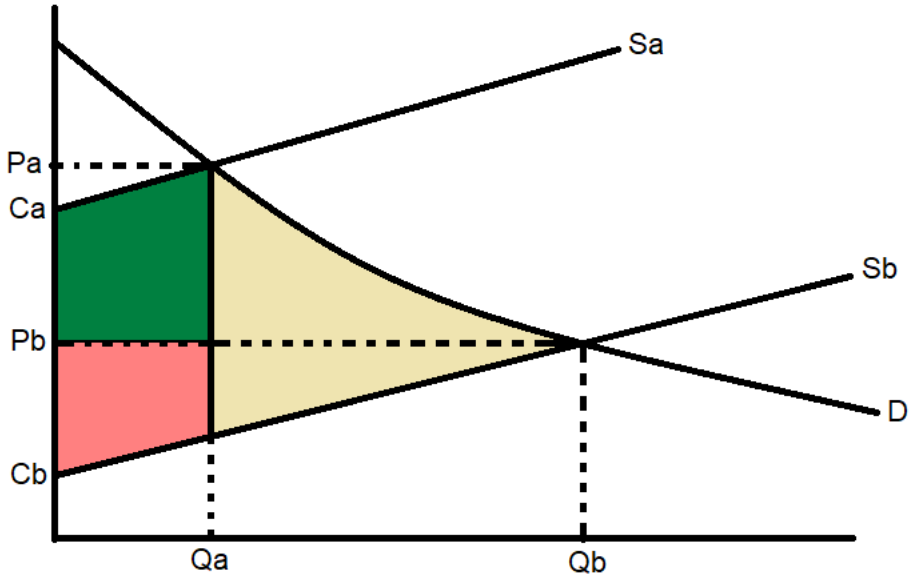

Figure 5: Market Equilibrium Before and After Regulation

Figure 5 illustrates the market change[27] in the aerosol duster market due to the introduction of the draft proposed rule. Using 2026 as an example, the aerosol duster market is in equilibrium in the baseline scenario at a real price of $8.00 per product ($P_b$ in the graph) and a total volume of 18.31 million products sold in 2026 (Q_b in the graph). Out of the 18.31 million products sold, 1.44 million products are used for inhalation. After the implementation of the draft proposed rule, the supply curve would shift (from S_b to S_a) and the real price per product would increase to $19.95 per canister ($P_a$ in the graph), and the market volume would decrease to 1.93 million products sold (Q_a in graph) in 2026 – a 89.5 percent reduction in units sold. C_b and C_a in Figure 5 represent the cost of production for a single canister in the baseline and alternatives scenarios, respectively.

The cost of this draft proposed rule is the net loss in social surplus from moving from equilibrium in the baseline to the equilibrium in the alternative. The net loss in social surplus is represented in Figure 5 as the shaded areas. These shaded areas are the components of loss of social surplus that are:

- Deadweight Loss. Deadweight loss is the yellow area that represents the social welfare lost by the reductions in market transactions from the draft proposed rule.
- Loss of Consumer Surplus. Consumer surplus loss is the green area that represents the social surplus that was previously consumer surplus in the baseline equilibrium.

[23] Taylor, Lester D., and H. S. Houthakker. "Consumer Demand in the United States." Springer Books (2010).
[24] Ibid. Staff estimated the elasticity by taking the average of the elasticity estimates for “Cleaning and polishing preparations and miscellaneous household supplies and paper products” and “Durable goods”. Elasticities selected to account for users who use dusters immediately (i.e., like cleaning products) and those who may use only occasionally and will keep canister for a long time (i.e., acts as durable good).
[25] Payne, Jason, et al. "The price elasticity of demand for illicit drugs: A systematic review." Trends and Issues in Crime and Criminal Justice 606 (2020): 1-19.
[26] Ibid. This paper presents price elasticity distributions for several narcotics, nearly all of which center on 1.
[27] Graph not to scale of estimated impacts to aerosol dusters. Graph provided to describe conceptual framework.

- Loss of Producer Surplus. Producer surplus loss is the red area that represents the social surplus that was previously producer surplus in the baseline equilibrium.

The aerosol duster market shrinks with the draft proposed rule to 1.93 million products in 2026, of which 29.93 percent (0.58 million) represents an unlawful black market for products that are used as inhalants. Staff rounds up to 30 percent as an assumption of noncompliance with the rule.

The equilibrium volume of products in future years, after implementation of the rule, is determined using the same steps as for 2026. Figure 6 presents the forecasted market volume throughout the 30-year study period. Total demand with the draft proposed rule is expected to grow from 1.93 million in 2026 to 3.78 million by 2055 with 30 percent of the total volume each year for noncompliant products.

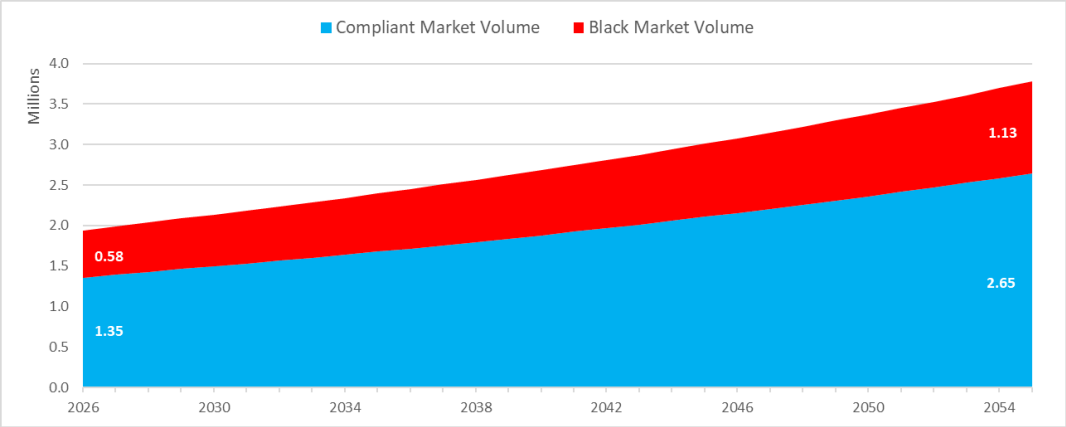

Figure 6: Forecasted Aerosol Duster Volume with the Proposed Rule

The following three sub-sections discuss each cost category in more detail.

3.2. Deadweight Loss

DWL reflects social surplus generated in the baseline market that no longer occurs in the alternative scenario due to lost transactions from regulation. Staff calculates DWL in two steps. First staff calculates the area of the DWL (yellow area in Figure 5) between the horizontal line marking P_b ($8) and the baseline supply curve (S_b in Figure 5). This portion of DWL was producer surplus in the baseline. Next, staff calculates the remaining DWL between the alternative supply curve (S_a in Figure 5) and the horizontal line marking P_b. This portion of DWL was previously consumer surplus in the baseline.

To calculate DWL that was producer surplus, staff assumes a linear supply curve and that the curve intercepts the y-axis at the per-unit production cost of an aerosol duster canister at $6.16 ($C_b$ in Figure 5).[28] This assumption means no producers would produce aerosol duster canisters below cost.

In the first year of the rule (2026), staff calculates the area of the triangle that represents DWL from producer surplus to be $13.53 million[29], undiscounted. The DWL from producer surplus increases to $26.46 million[30] in 2055. Over the 30-year study period, DWL from producer surplus aggregates to $649.91 million undiscounted and $450.46 million discounted at 2 percent.

To measure the DWL from consumer surplus, staff estimated the size of the area under the demand curve between the volume sold pre-regulation (Q_b) and the volume sold post-regulation (Q_a), and above

[28] Staff calculated cost by assuming a 30 percent markup. $6.16 = $8 ÷ (1 + 30%).
[29] $13.53 million = ½ × ($8.00 - $6.35) × (18.31 million – 1.93 million)
[30] $26.46 million = ½ × ($8.00 - $6.35) × (35.81 million – 3.78 million).

the baseline market price (P_b). Given the shape of the assumed demand curve, the estimation of DWL from consumer surplus requires using an integral formula to measure the area under the demand curve.

In the first year of the rule (2026), staff estimated the undiscounted DWL from consumer surplus to be $58.54 million[31] and reach $114.50 million[32] in 2055. Over 30 years, DWL from consumer surplus would aggregate to $2.51 billion undiscounted and $1.74 billion discounted at 2 percent.

Staff added up DWLs to determine the total DWL over the 30-year study period. Staff estimated that in the first year of the rule (2026), the total undiscounted cost would be $72.07 million,[33] and reach $140.96 million[34] in the last year of the rule (2055). Over these 30 years, the costs of DWL aggregate to $3.16 billion undiscounted and $2.19 billion discounted at 2 percent.[35]

3.3. Loss of Consumer Surplus

Consumers surplus is the difference between the use value of the product and the price paid in the market. The use value of a product to a consumer is always equal to or higher than the price of the product; otherwise, the consumer would not buy it. A regulation that reduces the volume of products traded in the market typically also reduces consumer surplus. In the aerosol dusters market, at the new post-regulation equilibrium, consumer surplus decreases.[36]

To measure loss of consumer surplus, staff estimated the area of the green shape in Figure 5. Staff estimated the shape by separating the green area into a rectangle and a triangle and assuming linear curves.[37] The sum of the area of the rectangle and triangle equals the loss of consumer surplus. This area represents loss in net social surplus that was consumer surplus in the baseline.

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[31] Staff estimated the area under the demand curve in 2026 by integrating between the volumes in the baseline (without) and alternative scenarios (with the implementation of the proposed rule). This is $\int_{0.96M}^{18.31M} 7{,}144.2 * {Q_D}^{1/-2.4614} = 7{,}144.2 * \left(\frac{-2.4614}{1-2.4614}\right) * \left[18.31M^{\left(\frac{1-2.4614}{-2.4614}\right)} - 1.93M^{\left(\frac{1-2.4614}{-2.4614}\right)}\right] = \$189.54M$. The aggregated prices consumers would have paid for the aerosol duster canisters they are no longer able to consume is $131.00 million ($8.00 times 16.38 million units not sold with the proposed rule). Therefore, the deadweight loss in 2026 is $58.54 million. ($189.54M - $ 131.00M).

[32] Staff estimated the area under the demand curve in 2055 by integrating between the volumes in the baseline (without) and alternative scenarios (with the implementation of the proposed rule). This is $\int_{1.88M}^{35.81M} 9{,}382.6 * {Q_D}^{1/-2.4614} = 9{,}382.6 * \left(\frac{-2.4614}{1-2.4614}\right) * \left[35.81M^{\left(\frac{1-2.4614}{-2.4614}\right)} - 3.78M^{\left(\frac{1-2.4614}{-2.4614}\right)}\right] = \$370.73M$. The aggregated prices consumers would have paid for the aerosol duster canisters they are no longer able to consume is $256.23 million ($8.00 times 32.03 million units not sold with the proposed rule). Therefore, the deadweight loss in 2055 is $114.50 million. ($370.73M - $256.23M).

[33] $72.07 million = $13.53 million in DWL from producer surplus + $58.54 million in DWL from consumer surplus.

[34] $140.96 million = $26.56 million in DWL from producer surplus + $114.50 million in DWL from consumer surplus.

[35] As detailed in the unquantified cost section, these estimates do not include unquantified recaptured consumer surplus from possible increased sales of alternative products such as handheld electric pumps that blow air through a nozzle for dusting.

[36] This analysis includes loss in consumer surplus for all consumers, including those who use aerosol dusters as inhalants. While there is an argument that the loss of consumer utility for an unhealthy action, such as substance abuse, should not be included as costs, staff decided not to exclude them to present full costs under typical economic theory.

[37] Rectangle and triangle separated by horizontal line of C_a, or cost of product in alternative scenario. Staff calculates C_a as a weighted average of cost between compliant and noncompliant canisters. C_a = $12.59 = [($19.95 ÷ (1 + 30%)) × 70%] + [$6.16 × 30%].

In the first year of the rule, staff estimated undiscounted loss of consumer surplus would be $15.98 million[38] in 2026, and reach $31.26 million[39] in 2055. Over 30 years, loss of consumer surplus would aggregate to $686.27 million undiscounted and $476.03 million discounted at 2 percent.

3.4. Loss of Producer Surplus

Producer surplus represents the difference between what producers are willing to accept for a consumer product and the price they receive in the marketplace. This surplus reflects the additional benefit producers garner over and above their minimum acceptable remuneration for producing a good or service. For example, if an aerosol duster manufacturer has a cost of $7.00 to produce each unit, inclusive of materials, labor, and overheads, but the market price is $8.00, the producer surplus per unit stands at $1.00. This surplus is indicative of the economic advantage that producers secure, arising from market efficiencies, consumer demand, and other factors.

To measure loss of producer surplus, staff estimated the area of the red shape in Figure 5. Staff estimated the shape by separating the red area into a rectangle and a triangle and assuming linear curves. The sum of the area of the rectangle and triangle equals the loss of producer surplus. This area represents loss in net social surplus that was producer surplus in the baseline.

In the first year of the rule, staff estimated undiscounted loss of producer surplus would be $3.38 million,[40] and reach $6.61 million in 2055.[41] Over 30 years, loss of producer surplus would aggregate to $145.21 million undiscounted and $100.73 million discounted at 2 percent.

3.5. 30-Year Aggregate Costs

Staff added up the cost categories to determine the total cost of the draft proposed rule over the 30-year study period. Staff estimated that in the first year of the rule (2026), the total undiscounted cost would be $91.43 million,[42] and reach $178.83 million[43] in the last year of the rule (2055). Over these 30 years, the costs of the rule aggregate to $3.99 billion undiscounted and $2.77 billion discounted at 2 percent.[44] Figure 7 shows the trajectory of the cost categories of the draft proposed rule throughout the study period.

[38] $15.98 million = ($12.59 avg. cost of alternative canister - $8.00 price of baseline canister) × 1.93 million alternative units + ½ × ($19.95 price of alternative canister - $12.59 avg. cost of alternative canister) × 1.93 million alternative units.
[39] $31.26 million = ($12.59 avg. cost of alternative canister - $8.00 price of baseline canister) × 3.78 million alternative units + ½ × ($19.95 price of alternative canister - $12.59 avg. cost of alternative canister) × 3.78 million alternative units.
[40] $3.38 million = ($8.00 price of baseline canister - $6.35 cost on baseline supply curve at Q_R) × 1.93 million alternative units + ½ × ($6.35 cost on baseline supply curve at Q_R - $6.15 avg. cost of baseline canister) × 1.93 million alternative units.
[41] $6.61 million = ($8.00 price of baseline canister - $6.35 cost on baseline supply curve at Q_R) × 3.78 million alternative units + ½ × ($6.35 cost on baseline supply curve at Q_R - $6.15 avg. cost of baseline canister) × 3.78 million alternative units.
[42] $91.43 million = $72.07 million in DWL + $3.38 million in producer surplus + $15.98 million in consumer surplus.
[43] $178.83 million = $140.96 million in DWL + $6.61 million in producer surplus + $31.26 million in consumer surplus.
[45] The timing of costs along the period of study affects the present value of costs when considering the time value of money. Costs incurred several years into the future are discounted more heavily than costs realized in the short-term.

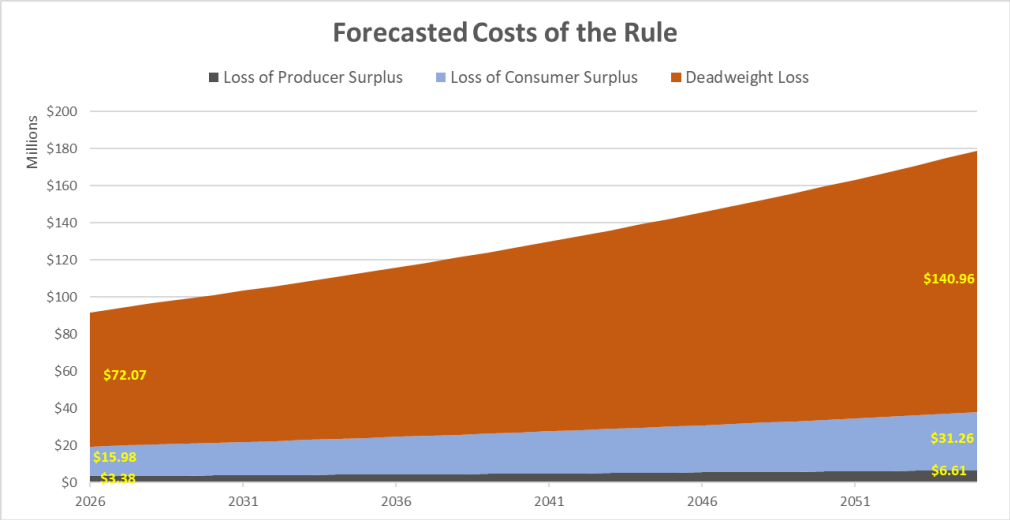

Figure 7: Forecasted Costs of the Rule by Category

3.6. Annualized Cost of Draft Proposed Rule

This section converts the aggregate costs over the 30-year study period into annualized outputs. An annualized output converts the aggregate costs over 30 years into a consistent annual amount while considering the time value of money. This metric is helpful when comparing the costs among different rules or policy alternatives that may have different timelines; or those that have similar timelines but costs for one are front-loaded while the other's maybe backloaded.[45]

The following table summarizes the cost of the draft proposed rule in annualized terms:

Table 3: Annualized Cost of the Draft Proposed Rule

Cost Categories	Annualized Costs ($M)		
	Undiscounted	2% Discount	3% Discount
Deadweight Loss	$105.44	$97.97	$94.50
Loss of Consumer Surplus	$22.88	$21.25	$20.50
Loss of Producer Surplus	$4.84	$4.50	$4.34
Total Costs	**$133.16**	**$123.73**	**$119.34**

4. Benefits Analysis

Staff conducted the preliminary regulatory analysis from a societal perspective that considers significant costs and health outcomes (Gold et al., 1996; Haddix, Teutsch, and Corso, 2003; Neumann et al, 2016). Staff captured expected reduction in societal costs by estimating the number of deaths and injuries that would be prevented by the draft proposed rule. The Directorate for Epidemiology (EP) retrieved casualties reported through the National Electronic Injury Surveillance System (NEISS), a national probability sample of U.S. hospital emergency departments (ED), and the Consumer Product Safety Risk Management System (CPSRMS), a database that houses personal, proprietary, and confidential data on consumer product related incidents. Staff estimated the number of expected deaths and injuries

[45] The timing of costs along the period of study affects the present value of costs when considering the time value of money. Costs incurred several years into the future are discounted more heavily than costs realized in the short-term.

prevented by the draft proposed rule and converted them into monetary terms – specifically, 2023 dollars – using the Value of Statistical Life (VSL) for deaths and CPSC's Injury Cost Model (ICM) for injuries.

Like the cost analysis, staff used a 30-year study period (2026-2055) to assess the benefits of the draft proposed rule. Staff then converted the aggregate benefits over the 30-year study period into annualized terms. An annualized output converts the aggregate benefits over 30 years into a consistent annual amount while considering the time value of money. This metric is helpful when comparing the benefits among different rules or policy alternatives that may have different timelines; or those that have similar timelines but benefits for one are front-loaded while the others are backloaded.[46]

Finally, CPSC staff assessed that the draft proposed rule would be effective, at a rate of 100 percent, in mitigating aerosol duster deaths and injuries from HFC-152a and HFC-134a for compliant products. This is because the draft proposed rule limits the use of HFC-152a (difluoroethane) and HFC-134a (tetrafluoroethane) to inconsequential amounts as propellants. In effect, CPSC would be addressing the abuse hazard by shrinking the supply of a product that is both addictive and deadly.

While the draft proposed rule would effectively eliminate the risk of death and injury from HFC-152a and HFC-134a in compliant products, staff assessed there would likely still be deaths and injuries from noncompliant products. Additionally, the draft proposed rule would likely create a black market for noncompliant aerosol duster products for consumers. Given the euphoric high experienced with HFC-152a and HFC-134a for a significant number of consumers, and the reduced supply caused by the draft proposed rule, the black market is likely to be lucrative and attract individuals to evade compliance. These individuals could deliver noncompliant aerosol duster products to consumers using remnant inventory or from other countries where HFC-152a and HFC-134a is not banned or limited in aerosol duster products. Staff accounted for the presence of noncompliant products throughout the 30-year study period in this benefits analysis.

Like the cost analysis, the benefits analysis captures the reduction is societal costs from deaths injuries, but there are potential benefits that staff were not able to capture. Most notably, staff does not include costs from aerosol duster product inhalation outside of deaths and injuries, like employment loss, stress on families, child neglect, and financial losses. Additionally, staff may be underestimating the benefits of this draft proposed rule because evidence shows that some aerosol duster products may be inhaled while driving, potentially contributing to automotive accidents. A full description of these unquantified benefits is in section 5.2.

Staff recognizes that, due to the supply disruption that is the intended effect of the proposed rule, abusers of HFC-152a and HFC-134a aerosol dusters may substitute other intoxicants outside of CPSC's consumer products jurisdiction for these duster products. Staff is unable to quantify the extent to which this will occur Even if regrettable substitution does occur, other intoxicants may produce less death and injury.

4.1. Deaths Related to Aerosol Dusters

Using CPSRMS, staff identified 1,039 deaths from aerosol duster products with HFC-152a or HFC-134a that occurred from 2012 through 2021. To calculate the death rate, staff only considers the share of aerosol duster products that are potentially used as inhalants. That subset of aerosol duster products is responsible for all the deaths caused by HFC-152a or HFC-134a. According to sales data from Maia Research, from 2018 through 2023 there was an average of 15.75 percent of aerosol duster sales that were categorized as "Other [use]", while the remainder of sales went to a typical application of either "Electronic", "Automotive" or "Instrumental". As explained above, staff assumed the 50 percent of the

[46] The timing of benefits along the period of study affects the present value of benefits when considering the time value of money. Benefits realized several years into the future are discounted more heavily than benefits realized in the short-term.

aerosol dusters in the “Other” category are being used as inhalants, which equates to 7.88 percent (50 percent × 15.75 percent) of all aerosol duster sales are potentially used as inhalants. Staff stresses that 7.88 percent is the share of aerosol duster products sold that could potentially be used for inhalants, not the share of aerosol duster consumers. Consumers who use the product as an inhalant are more likely to purchase a higher number of products than the traditional consumer.

To estimate the number of units in-use, that are potentially used as inhalants, throughout the 30-year study period, staff multiplied the sales data from Maia Research by 7.88 percent and then used a Weibull distribution formula with the same parameters described in Section 2.4. Figure 8 displays both the projected number of sales and in-use units of aerosol dusters that can potentially be used as inhalants from 2026 through 2055. The right axis corresponds to the number of sales units in each year which is represented by the blue line. The left axis corresponds to the number of units in-use in each year which is represented by the orange bars.

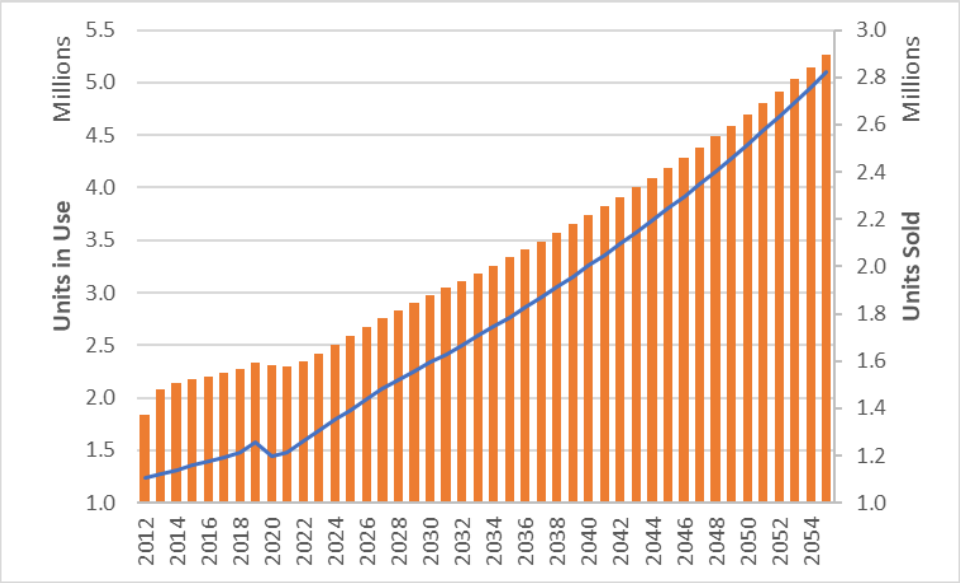

Figure 8: Historical and Forecasted Sales and In-Use Units of Potential Products as Inhalants, 2012 – 2055

Staff divided the number of deaths in each year of observed data with the corresponding number of in-use units in Figure 8 to calculate the death rates over the years. Table 4 shows the calculation of the death rates.

Table 4: Calculation of Death Rates

Year	Deaths	In-Use Units Used as Inhalants	Death Rate per Product
2012	54	1,832,619	2.9466E-05
2013	104	2,076,083	5.00943E-05
2014	90	2,136,128	4.21323E-05
2015	124	2,170,306	5.71348E-05
2016	130	2,203,378	5.90003E-05
2017	127	2,236,909	5.67748E-05
2018	124	2,270,951	5.46027E-05
2019	114	2,330,504	4.89165E-05
2020	89	2,308,567	3.85521E-05
2021	83	2,295,293	3.61610E-05

Staff calculated a trendline[47] based on historical death rates per product which revealed a slight upward trend.

For this prospective benefit analysis with a 30-year study period, staff applied the trend in per-product death rate throughout the study period using the trendline formula. In this formulation, the variable *x* is the year of analysis and *y* is that year's death rate, staff applies the following formula to calculate the death rate for each year:

$$y = 2.15588E\text{-}08x + 3.81016E\text{-}06$$

To estimate the societal costs of deaths, staff applied the VSL. VSL is a widely used parameter in cost-benefit analysis, including regulatory analysis, that represents an individual's willingness to pay for reducing their risk of fatality. VSL values a reduction of fatality risk in monetary terms to be used for cost-benefit analysis; it is not an attempt to place a value on any individual life. In regulatory analysis, economists apply VSL to measure the welfare impact of policies that reduce or increase fatalities.

In accordance with CPSC's *Final Guidance for Estimating the VSL* (89 FR 27740), staff applied a VSL for adults (i.e., individuals 18 years old or older) and for children (i.e., individuals under 18 years old). In accordance with CPSC's VSL guidance, staff used the VSL estimate from the U.S. Department of Health and Human Services (HHS) for its adult VSL. The HHS estimate of the VSL when adjusted for inflation[48] and growth in real income[49] [50], consistent with HHS guidelines[51], is $12.97 million for 2023.[52] While staff kept the VSL in 2023 dollars throughout the 30-year study period – like all monetized values in this analysis – it does allow the VSL to grow during this time to account for growth in real income in accordance with HHS guidelines. This is because VSL is a function of income. Staff applied the

[47] Staff used the SLOPE and INTERCEPT function in Microsoft Excel to determine the linear regression equation for the trendline. These functions use the Ordinary Least Squares method.
[48] Bureau of Labor Statistics, "Consumer Price Index for All Urban Consumers (CPI-U)", Series ID: CUUR0000SA0, 2013 index = 232.957, 2023 index = 304.702.
[49] Bureau of Labor Statistics, "Weekly and hourly earnings data from the Current Population Survey", Series ID: LEU0252881600, 2013 = 333, 2023 = 367.
[50] HHS recommends adjusting the income factor by the income elasticity of VSL. HHS recommends an elasticity value of 1 which effectively leaves the income factor unchanged.
[51] U.S. Health and Human Services, "Appendix D: Updating Value per Statistical Life (VSL) Estimates for Inflation and Changes in Real Income", Figure D.1., April 2021, https://aspe.hhs.gov/sites/default/files/2021-07/hhs-guidelines-appendix-d-vsl-update.pdf
[52] $12.97 million = 2013 VSL of $9.0 million × (304.702 ÷ 232.957) × (367 ÷ 333)[1].

Congressional Budget Office's estimate of 1.10 percent[53] of long-run income growth rate throughout the 30-year study period. This adjustment grows the VSL estimate to $13.41 million in 2026 and to $18.41 million in 2055. For child VSL, staff adjusts the estimates given in the *Final Guidance for Estimating the VSL* to $26.81 million in 2026 and to $36.82 million in 2055. Based on incident data between 2012 and 2021, children (i.e., individuals under 18 years old) were just 1.19 percent of all the deaths from aerosol dusters. Staff assumed this share remains consistent throughout the 30-year study period.

Staff used the VSL estimates with the forecasted number of prevented deaths from the draft proposed rule throughout the 30-year study period to calculate benefits. This method ensures staff accounts for the growth of products in use throughout the 30-year study period. First, staff calculates the number of deaths in the baseline scenario; after which staff calculates the number of deaths in the scenario with the draft proposed rule. The difference between the two scenarios is the forecasted number of prevented deaths from the draft proposed rule throughout the 30-year study period.

For the baseline scenario, staff multiplied the number of in-use units for each year (shown in Figure 8) by the death rate per unit (calculated for a given year using the trendline formula) and by the corresponding VSL for each year. In this scenario, staff estimated there would be 127 deaths from aerosol dusters in the first year of the study period (2026) which equates to $1.72 billion[54] undiscounted. The number of estimated deaths is 253 in the final year of the study period (2055) which equates to $4.72 billion[55] undiscounted.

In the alternative scenario with the draft proposed rule in effect, compliant aerosol duster products have a 100 percent effective rate at mitigating deaths from HFC-152a and HFC-134a. Therefore, the estimated number of deaths from compliant products is zero throughout the 30-year study period. However, even after implementation of the draft proposed rule, there would still be noncompliant products supplied by the black market in circulation. These noncompliant products would have an effective rate of zero. Staff estimates that considering the likely availability of some noncompliant products, the draft proposed rule's overall effective rate would be around 60 percent.[56]

Staff used the number of noncompliant aerosol duster products sold in the alternative scenario (Figure 6) to estimate in-use units in the same scenario. Staff once again used a Weibull distribution using the same parameters described in Section 2.4 to estimate noncompliant in-use units in the alternative scenario. Figure 9 compares the estimated number of units in-use of aerosol duster products that are potentially used as inhalants in the baseline scenario (dashed blue line) to the alternative scenario (solid red line).

[53] Congressional Budget Office, "The Long-Term Budget Outlook: 2024 to 2054", March 2024, Table C-1: Growth of Real Earnings Per Worker 2024-2054, https://www.cbo.gov/publication/59711.
[54] $1.72 billion = (2.67 million potential inhalant canisters in 2026 × 4.75E-05 death rate in 2026) × (98.81% adult share of deaths × $13.41 million adult VSL in 2026 + 1.19% children share of deaths × $26.81 million children VSL in 2026).
[55] $4.72 billion = (5.27 million potential inhalant canisters in 2055 × 4.81E-05 death rate in 2055) × (98.81% adult share of deaths × $18.41 million adults VSL in 2055 + 1.19% children deaths × $36.82 million children VSL in 2055).
[56] Calculated by measuring the monetary reduction of deaths and injuries from the draft proposed rule.

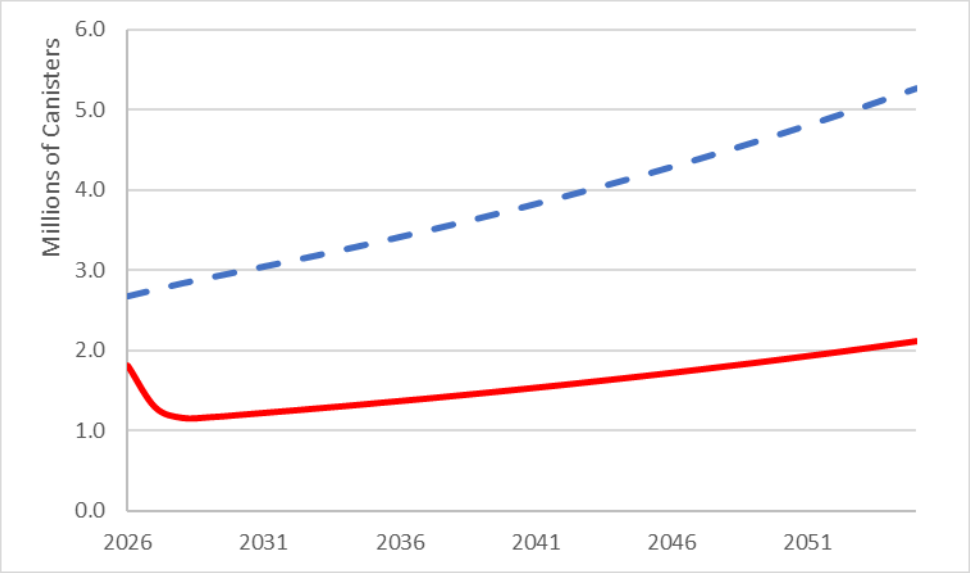

Figure 9: Forecast of Baseline and Alternative Scenarios of In-Use Units that can be Used as Inhalants, 2026-2055

Staff multiplied the number of in-use units in the alternative scenario for each year (solid red line in Figure 9) by the corresponding death rate for each year and by the corresponding VSL for each year. In this scenario, staff estimated there would be 86 deaths from aerosol dusters in the first year of the study period (2026) which equates to $1.17 billion[57] undiscounted. The number of estimated deaths is 102 in the final year of the study period (2055) which equates to $1.89 billion[58] undiscounted.

By taking the difference between the two scenarios, staff estimated that in the first year of the rule (2026), the draft proposed rule would prevent an estimated 41 deaths from HFC-152a and HFC-134a dusters, and the undiscounted benefits would be $556.33 million[59]; in the last year of the study period (2055), the draft proposed rule would prevent an estimated 152 deaths from these products and benefits would reach $2.83 billion[60]. Over 30 years, the draft proposed rule would prevent an estimated 3,266 deaths from HFC 152a and HFC 134a dusters, and those benefits would aggregate to $53.26 billion undiscounted and $36.18 billion discounted at 2 percent. As noted, these estimates do not take account of potential substitution of other harmful intoxicants—particularly those that are not within CPSC's consumer product jurisdiction.

4.2. Injuries Related to Aerosol Dusters

Staff used NEISS to identify 22,216 nonfatal injuries related to inhaling HFC-152a or HFC-134a from aerosol dusters that occurred from 2012 through 2021. Since these injuries represent a probabilistic sample, staff used the ICM with the NEISS-reported injuries to extrapolate and generate national estimates for injuries from inhaling HFC-152a or HFC-134a from aerosol dusters treated in the ED and other settings. The ICM calculated that the aggregate number of nonfatal injuries from the period 2012 to

[57] $1.17 billion = (1.81 million noncompliant products potentially as inhalants in 2026 × 4.75E-05 death rate in 2026) × (98.81% adult share of deaths × $13.41 million adult VSL in 2026 + 1.19% children share of deaths × $26.81 million children VSL in 2026).
[58] $1.89 billion = (2.11 million noncompliant products potentially as inhalants in 2055 × 4.81E-05 death rate in 2055) × (98.81% adult share of deaths × $18.41 million adults VSL in 2055 + 1.19% children share of deaths × $36.82 million children VSL in 2055).
[59] $556.33 million = $1.72 billion in baseline scenario - $1.17 billion in alternative scenario.
[60] $2.83 billion = $4.72 billion in baseline scenario - $1.89 billion in alternative scenario.

2021 was 56,507. Of those injuries, 58.81 percent (33,232) were treated in an outpatient setting (e.g., doctor's office, or clinic), 30.96 percent (17,496) resulted in ED treatment, 8.00 percent (4,520) resulted in hospital admissions via the ED, and 2.23 percent (1,260) resulted in direct hospital admissions.

Next, staff needed to estimate the injury rates from 2012 to 2021 by individual year and by injury category. To do this, staff first had to estimate the number of injuries of each category for each individual year in the historical window of 2012 to 2021. Staff accomplished this by applying the share of injuries for each category (i.e., percentages in the previous paragraph) and the ICM-provided multipliers to nationally scale to each year's recorded number of injuries from NEISS. Table 5 displays the estimated national injuries by each category for every year between 2012-2021.

Table 5: Estimated Historical Injuries in the U.S. by Category

Year	Doctor/Clinic	ED	Direct Hosp Admit	Hosp via ED
2012	1,418	747	54	193
2013	3,026	1,593	115	412
2014	2,207	1,162	84	300
2015	3,970	2,090	151	540
2016	4,633	2,439	176	630
2017	3,976	2,093	151	541
2018	3,091	1,627	117	420
2019	3,071	1,617	116	418
2020	4,539	2,390	172	617
2021	3,300	1,738	125	449

Staff then divided the injury counts for each year by the number of units in-use of aerosol duster products that are potentially used as inhalants (see third column in Table 4) to estimate historical injury rates for each category of injury from 2012 to 2021. Figure 10 shows these estimated injury rates and their trend.

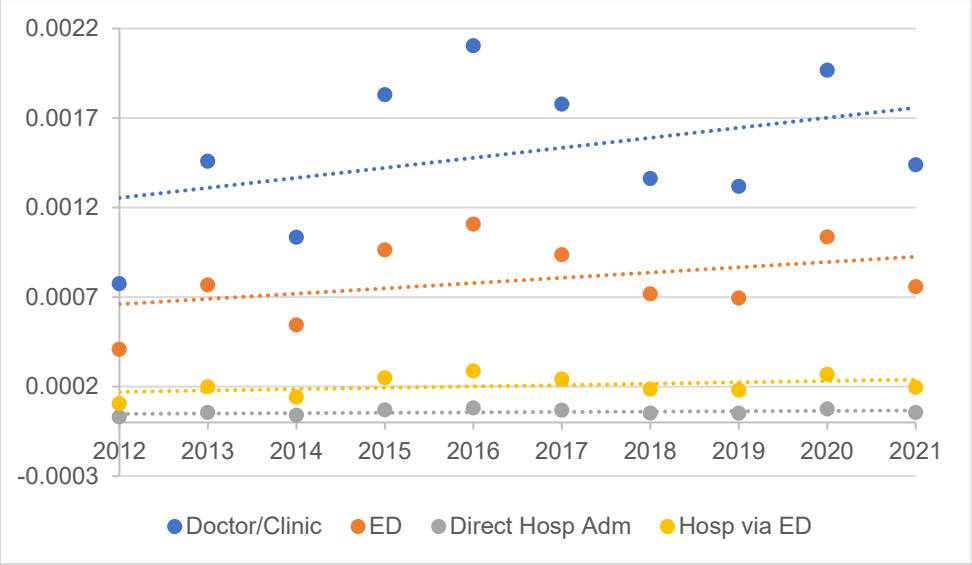

Figure 10: Estimated Historical Injury Rates for Each Injury Type

While there is variance in injury rate from year to year for each injury type, each injury type has an upward trend throughout the period. As was done for death rates, staff carried the trend line for each injury type throughout the 30-year study period. Where the variable *x* is the year of analysis and *y* is that year's death rate, staff applies the following formulas to calculate the injury rates for each year:

Table 6: Trendline Formulas for Each Injury Type

Injury Type	Trendline Formula
Doctor/Clinic	*y = 5.59259E-05x – 0.111268967*
ED Admissions	*y = 2.94446E-05x – 0.058582306*
Direct Hospital Admissions	*y = 2.12017E-06 – 0.004218249*
Hospital Admissions via ED	*y = 7.60617E-06 – 0.015133055*

Staff estimated the societal cost per nonfatal injury using the ICM. The societal cost components provided by the ICM include medical costs, work losses, and the intangible costs associated with pain and suffering (Lawrence et al., 2018).

Medical costs include three categories of expenditures: (1) medical and hospital costs associated with treating the injured victim during the initial recovery period and in the long run, including the costs associated with corrective surgery, the treatment of chronic injuries, and rehabilitation services; (2) ancillary costs, such as costs for prescriptions, medical equipment, and ambulance transport; and (3) costs of health insurance claims processing. The ICM derives cost estimates for these expenditure categories from several national and state databases, including the Medical Expenditure Panel Survey (MEPS), the Nationwide Inpatient Sample of the Healthcare Cost and Utilization Project (HCUP-NIS), the Nationwide Emergency Department Sample (NEDS), the National Nursing Home Survey (NNHS), MarketScan® claims data, and a variety of other federal, state, and private databases.

Work loss estimates include: (1) the forgone earnings of the victim, including lost wage work and household work; (2) the forgone earnings of parents and visitors, including lost wage work and household work; (3) imputed long-term work losses of the victim that would be associated with permanent impairment; and (4) employer productivity losses, such as the costs incurred when employers spend time rearranging schedules or training replacement workers. The ICM bases these estimates on information from the MEPS, the Detailed Claim Information (a workers' compensation database) maintained by the National Council on Compensation Insurance, the National Health Interview Survey, the U.S. Bureau of Labor Statistics, and other sources.

The intangible costs of injury reflect the physical and emotional trauma of injury, as well as the mental anguish of victims and caregivers. Intangible costs are difficult to quantify because they do not represent products or resources traded in the marketplace. Nevertheless, they typically represent the largest component of injury cost and need to be accounted for in any benefit-cost analysis involving health outcomes (Rice et al., 1989; Haddix, Teutsch, and Corso, 2003; Cohen and Miller, 2003; Neumann et al, 2016). The ICM develops a monetary estimate of these intangible costs from jury awards for pain and suffering. Although these awards can vary widely on a case-by-case basis, studies have shown these are systematically related to several factors, including economic losses, the type and severity of injury, and the age of the victim (Viscusi, 1988; Rodgers, 1993; Cohen and Miller, 2003). The ICM derives these estimates from a regression analysis of jury awards in nonfatal product liability cases involving consumer products compiled by Jury Verdicts Research, Inc.

The ICM estimates that the costs (in 2023 dollars) associated with aerosol duster inhalant injuries are: $20,347 for injuries treated at the doctor's office/clinic, $29,560 for injuries treated at the emergency department, $215,103 for injuries that result in direct hospital admissions, and $207,243 for injuries that result in hospital admission via ED.

As with benefits from mitigated deaths, the difference between the baseline and alternative scenarios in societal cost from injuries throughout the 30-year study period is the estimated benefits of mitigated injuries from the draft proposed rule.

For the baseline scenario without a rule, staff multiplied the number of in-use units for each year (shown in Figure 8) by the injury rates (calculated for a given year using the trendline formula in Table 6) and by the cost by injury type for each year. In this scenario, staff estimated that in 2026 there would be 5,443 injuries that were treated in a doctor's or clinic's visit, 2,866 injuries that were treated in an ED, 206 injuries that resulted in a hospital admission directly, and 740 injuries that resulted in hospital admission via the ED. This equates to $393.26 million[61] in undiscounted societal costs. The number of estimated injuries grow to, in the final year of the study period (2055), 19,264 injuries that were treated in a doctor's or clinic's visit, 10,142 injuries that were treated in an ED, 730 injuries that resulted in a hospital admission directly, and 2,620 injuries that resulted in hospital admission via the ED. This equates to $1.39 billion[62] in undiscounted societal costs.

For the alternative scenario in which the proposed rule takes effect in 2026, staff multiplied the number of in-use units for each year (shown in Figure 9) by the injury rates (calculated for a given year using the trendline formula in Table 6) and by the cost by injury type for each year. In this scenario, staff estimated that in the first year of the rule (2026) there would be 3,684 injuries that were treated in a doctor's or clinic's visit, 1,940 injuries that were treated in an ED, 140 injuries that resulted in a hospital admission directly, and 501 injuries that resulted in hospital admission via the ED. This equates to $266.16 million[63] in undiscounted societal costs. The number of estimated injuries grow to, in the final year of the study period (2055), 7,728 injuries that were treated in a doctor's or clinic's visit, 4,069 injuries that were treated in an ED, 293 injuries that resulted in a hospital admission directly, and 1,051 injuries that resulted in hospital admission via the ED. This equates to $558.32 million[64] in undiscounted societal costs.

By taking the difference between the two scenarios, staff estimate that in the first year of the rule (2026), the draft proposed rule would generate undiscounted benefits of $127.10 million[65]; in the last year of the study period (2055), the draft proposed rule would reach $833.53 million[66]. Over 30 years, the draft proposed rule would aggregate to $14.58 billion undiscounted and $9.79 billion discounted at 2 percent.

4.3. Annualized Benefits of Draft Proposed Rule

This section converts the aggregate benefits over the 30-year study period into annualized terms. An annualized output converts the aggregate benefits over 30 years into a consistent annual amount while considering the time value of money. This metric is helpful when comparing the benefits among different rules or policy alternatives that may have different timelines; or those that have similar timelines but benefits for one are front-loaded while the other's maybe backloaded.

The following table summarizes the benefits of the draft proposed rule in annualized terms:

[61] $393.26 million = Σ([15,443 doctor/clinic, 2,866 ED, 206 hospital admissions directly, and 740 hospital admissions via the ED] × [$20,347 doctor's office/clinic, $29,560 ED, $207,243 hospital admission via ED, $215,103 hospital admissions]).
[62] $1.39 billion = Σ([19,264 doctor/clinic, 10,142 ED, 730 hospital admissions directly, and 2,620 hospital admissions via the ED] × [$20,347 doctor's office/clinic, $29,560 ED, $207,243 hospital admission via ED, $215,103 hospital admissions]).
[63] $266.16 million = Σ([3,684 doctor/clinic, 1,940 ED, 140 hospital admissions directly, and 501 hospital admissions via the ED] × [$20,347 doctor's office/clinic, $29,560 ED, $207,243 hospital admission via ED, $215,103 hospital admissions]).
[64] $558.32 million = Σ[7,728 doctor/clinic, 4,069 ED, 293 hospital admissions directly, and 1,051 hospital admissions via the ED] × [$20,347 doctor's office/clinic, $29,560 ED, $207,243 hospital admission via ED, $215,103 hospital admissions].
[65] $127.10 million = $393.26 million in baseline scenario - $266.15 million in alternative scenario.
[66] $833.53 million = $1.39 billion in baseline scenario - $558.32 million in alternative scenario.

Table 7: Annualized Benefits of the Draft Proposed Rule

Prevented Casualties	Annualized Benefits ($M)		
	Undiscounted	2% Discount	3% Discount
Deaths	$1,775.45	$1,615.34	$1,541.22
Injuries	$485.91	$437.18	$414.72
Total Benefits	**$2,261.35**	**$2,052.53**	**$1,955.94**

5. Benefits and Cost Analysis

Staff compared estimated benefits and costs to assess the relationship between benefits and costs of the draft proposed rule. Staff found that the benefits of the rule outweighed the costs by $1.93 billion annualized at 2 percent. This is the estimated net benefit of the draft proposed rule.

Table 8 displays metrics for both the benefits and costs of the draft proposed rule. The table displays both net benefits (difference between benefits and costs) and the benefit-cost ratio (benefits divided by costs) to assess the cost-benefit relationship.

Table 8: Annualized Net Benefits and B/C Ratio

	Benefits Compared to Costs		
Annualized Net Benefits ($M)	Undiscounted	2% Discount	3% Discount
Benefits	$2,261.35	$2,052.53	$1,955.94
Costs	$133.16	$123.73	$119.34
Net Benefits (Benefits – Costs)	$2,128.19	$1,928.80	$1,836.61
B/C Ratio	16.98	16.59	16.39

Overall, the draft proposed rule has a benefit-cost ratio of 16.59 when comparing benefits and costs discounted at 2 percent. For every $1 in cost of the draft proposed rule, there is a return of $16.59 in benefits from mitigated deaths and injuries.

5.1. Sensitivity Analyses

The benefits and costs of the draft proposed rule are estimates that depend upon a relatively high number of inputs and assumptions. The benefits, for instance, are dependent on the different sets of incidents considered in the analysis, the value of a statistical life, and the societal cost of the different type of injuries. Benefits are also influenced by the number of units in use and the expected lifecycle, among other considerations. The costs of the draft proposed rule also depend on inputs and assumptions. The number of units in use, as well as other market variables, drive the costs. Some individual inputs and assumptions have a significant impact on the outcome of the analysis, while others are less significant. In this section, staff examined the impact of using alternate values for some of the key inputs and assumptions of the analysis.

5.1.1. Variations in Inhalant Usage

In the main analysis, staff assumed there would be a significant number of noncompliant products circulating. Given the euphoric high experienced with HFC-152a and HFC-134a, and the reduced supply caused by the draft proposed rule, a black market would likely emerge to service that subset of

consumers. This could entice individuals to evade compliance and deliver noncompliant aerosol duster products to consumers from remaining inventory or other countries where HFC-152a and HFC-134a is not banned or limited in aerosol duster products. The main analysis assumes a disproportionate number of consumers continue to use aerosol duster products as inhalants in the alternative scenario compared to the baseline. In the baseline, staff estimated that 7.88 percent of products are potentially used by consumers as inhalants. In the alternative scenario, while there is an overall reduction in products used as inhalants, the share of product (both compliant and noncompliant) used as inhalants increases to about 30 percent. This sensitivity analysis assumes that the share of noncompliant products remains the same in the alternative scenario as in the baseline at 7.88 percent.

With this change, benefits increase while not affecting the costs. The surge in benefits increases net benefits greatly and boosts the benefit-cost ratio from $16.59 of benefits for every $1 of cost, to $24.78 of benefit for every $1 of cost.

Table 9 displays metrics for both benefits and costs of the draft proposed rule assuming a greater reduction in inhalant usage. The table displays both net benefits (difference between benefits and costs) and the benefit-cost ratio (benefits divided by costs) to assess the cost-benefit relationship.

Table 9: Annualized Net Benefits and B/C Ratio for Sensitivity Analysis of Greater Reduction in Inhalant Usage

	Benefits Compared to Costs		
Annualized Net Benefits ($M)	**Undiscounted**	**2% Discount**	**3% Discount**
Benefits	$3,377.41	$3,065.52	$2,921.27
Costs	$133.16	$123.73	$119.34
Net Benefits (Benefits – Costs)	$3,244.25	$2,941.79	$2,801.94
B/C Ratio	25.36	24.78	24.48

To test the results in the opposite direction, staff doubled the number of inhalant users compared to the number anticipated in the alternative scenario of the main analysis, and the results are as follows:

Table 10: Annualized Net Benefits and B/C Ratio for Sensitivity of Less Reduction in Inhalant Usage

Annualized Net Benefits ($M)	Benefits Compared to Costs		
	Undiscounted	**2% Discount**	**3% Discount**
Benefits	$746.63	$677.68	$645.80
Costs	$133.16	$123.73	$119.34
Net Benefits	$613.47	$553.96	$526.46
B/C Ratio	5.61	5.48	5.41

The results show that modifying this input can have significant impact, the B/C ratio increases to 24.78, when the analysis assumes the draft proposed rule would be more effective at preventing inhalant users, and the B/C ratio decreases to 5.48, when the analysis assumes it is only half as effective. But in either case, benefits remain significantly greater than the cost.

5.1.2. Different VSLs

Most of the benefits in the main analysis derive from prevented deaths due to the draft proposed rule. As described in Section 4, deaths are monetized using a VSL. Following CPSC's *Guidance on Estimating*

VSL, staff used the U.S. Health and Human Services (HHS) recommended estimate for adults and doubled the value to derive a VSL for children. However, there are varying estimates of VSL at different agencies.

HHS has recommended high and low estimates for its VSL. Additionally, HHS and other agencies use a uniform VSL for both adults and children. For comparison, staff re-ran the benefit and cost analyses under scenarios of: (i) a uniform VSL, (ii) high-estimate VSLs for adults and children, and (iii) low-estimate VSLs for adult and children.

These changes in VSL provide unremarkable results. In all scenarios, benefits still outweigh costs by an order of magnitude. Predictably, the high-estimate VSL increases net benefits while the low-estimate VSL decreases net benefits. Because only 1.19 percent of the deaths that the draft proposed rule is focused on mitigating are of children, the switch over to a uniform VSL only decreases net benefits slightly.

Table 11 displays metrics for benefits ("B"), costs ("C"), net benefits ("NB"), and benefit-cost ratios ("B/C") for the three VSL scenarios.

Table 11: Annualized Net Benefits and B/C Ratio for Sensitivity Analysis of Different VSLs

	Annualized Metrics ($M)		
	Undiscounted	**2% Discount**	**3% Discount**
Uniform VSL ($12.97M)	B: $2,240.55	B: $2,033.60	B: $1,937.88
	C: $133.16	C: $123.73	C: $119.34
	NB: $2,107.39	NB: $1,909.87	NB: $1,818.54
	B/C: 16.83	B/C: 16.44	B/C: 16.24
High Estimate VSL (Adult: $19.75M, Child: $39.50M)	B: $3,188.53	B: $2,896.09	B: $2,760.81
	C: $133.16	C: $123.73	C: $119.34
	NB: $3,055.37	NB: $2,772.37	NB: $2,641.47
	B/C: 23.94	B/C: 23.41	B/C: 23.13
Low Estimate VSL (Adult: $6.05M, Child: $12.11M)	B: $1,314.45	B: $1,191.01	B: $1,133.96
	C: $133.16	C: $123.73	C: $119.34
	NB: $1,181.29	NB: $1,067.28	NB: $1,014.62
	B/C: 9.87	B/C: 9.63	B/C: 9.50

5.1.3. Substituting Aerosol Dusters Inhalation with Other Harmful Substances

In the main analysis, staff did not quantify the additional harm from use of alternative substances that some consumers may seek to replace aerosol duster products as inhalants. Staff could not credibly forecast the share of consumers who use aerosol dusters as inhalants that would switch to other substances after the draft proposed rule, or what share of those would substitute to more harmful substances that would create a net cost.

For a sensitivity analysis of the substitution of aerosol duster inhalation with another harmful substance, staff assumes that 50 percent of the benefits in the main analysis would be lost in the substitution to more harmful substances. The following table displays the results of this sensitivity analysis of other substances substitution.

Table 12: Annualized Net Benefits and B/C Ration for Sensitivity Analysis of Other Substances Substitution

Prevented Casualties	Annualized Benefits ($M)		
	Undiscounted	2% Discount	3% Discount
Benefits	$1,130.68	$1,026.26	$977.97
Costs	$133.16	$123.73	$119.34
Net Benefits	$997.52	$902.54	$858.63
B/C Ratio	8.49	8.29	8.19

The results of this sensitivity analysis show that even with an assumed 50 percent loss of benefits due to substitution to other intoxicating substances, the benefits of the rule still greatly outweigh the costs.

5.2. Unquantified Benefits and Costs

While this preliminary regulatory analysis attempted to measure and monetize all benefits and costs of the draft proposed rule, staff could not quantify all benefits and costs. Most notably, staff could not quantify all the impacts from the creation of a black market for noncompliant aerosol duster products post regulation. As with most black markets, staff expects there to be negative externalities and additional costs that cannot be captured in this analysis. Additionally, as noted above, staff did not quantify additional harm from use of alternative substances that some consumers may seek to replace aerosol duster products as inhalants. Any potential harm that results from substitution could also potentially be mitigated through voluntary industry action or government regulation. Next, staff did not quantify offsets to estimated loss of consumer surplus from consumers seeking substitutes to replace aerosol duster products as cleaning items. Finally, staff may also be underestimating the benefits of this draft proposed rule because evidence shows that some aerosol duster products may be inhaled while driving, potentially contributing to automotive accidents.

5.2.1. Negative Externalities from a Black Market

As mentioned throughout this preliminary regulatory analysis, staff assessed that the draft proposed rule would create a black market for noncompliant aerosol duster products. The euphoric high experienced with HFC-152a and HFC-134a makes it likely that many consumers who use aerosol dusters as inhalants would still want to purchase noncompliant products. The inelastic demand and significant reduction in supply of noncompliant products due to the draft proposed rule would increase the price greatly and create a lucrative incentive for individuals to supply those consumers with noncompliant products that remain in circulation or are shipped from other countries. Anyone violating the law by selling violative products, however, would risk civil and criminal penalties for doing so. The creation of a black market can create significant negative externalities such as increased illicit activity, increased crime and subsequently increased spending on law enforcement, and greater health and safety risks to consumers. Staff cannot estimate the magnitude of these externalities with any certainty; however, staff believes their potential magnitude would be significant.

The creation of a black market would have many complex facets, and the reaction to the black market would create a spectrum of potential responses from consumers and law enforcement that staff could not reasonably predict. Staff recommends the Commission seek public comments on the potential of the draft proposed rule creating a black market, what that black market would look like, the negative externalities associated with it, and any other information regarding a potential black market.

5.2.2. Societal Costs of Addiction

While the benefits analysis in the main analysis captures the mitigation of societal costs from deaths and injuries, it does not include the societal costs from continued addiction of inhalant users which present themselves even when there is no death or injury. A person using aerosol duster products as an inhalant can have a severe addiction that may affect long-term behavior that produces negative effects on their social, professional, and familial lives. These potential effects can include, but are not limited to, employment loss, stress on families, child neglect from inhalant users who are parents, and financial losses to the inhalant users' families such as lost wages due to time taken off to care for the user or money spent for their rehabilitation.

Staff cannot assess the breadth and magnitude of these societal costs without more data on these societal impacts. Staff recommends the Commission seek public comments on the potential negative effects from addiction, and the negative externalities associated with it.

5.2.3. Ripple Effects of Market Contraction

This analysis estimates a sharp increase in price to comply with this draft proposed rule from about $8 per product to an estimated $19.95. This analysis also assumes the demand for aerosol dusters in reaction to price is highly elastic. Specifically, staff uses an elasticity of -2.4614 which estimates that the 249 percent increase in price causes an 89.5 percent reduction in demand. Under this assumption, the draft proposed rule dramatically reduces the market for aerosol dusters. While the main analysis accounted for DWL, loss of baseline consumer surplus, and loss of baseline producer surplus, it did not account for the cascading effects from this severe contraction in the market, nor did it account for increases in usage of alternative products such as (corded and cordless) electric powered dusters, vacuum cleaners, or dusters that rely on replaceable disposable carbon dioxide cartridges.

An 89.5 percent reduction in market demand almost certainly means firms ending their product line of aerosol dusters or, for those firms that only produce aerosol duster products, the firm liquidating completely or changing their focus. These impacts can be offset by increased demand for alternative products such as electric powered dusters (or dusters that rely on replaceable disposable carbon dioxide cartridges), and more jobs at firms that produce them.

Staff cannot estimate the impacts of a market contraction precisely given the uncertainty in the magnitude, breadth, and duration of this contraction of the market. However, the ripple effects of a significant market contraction to the relatively small market for aerosol duster products are likely small.

5.2.4. Reduction in Costs from Recovery of Consumer Surplus

In the main analysis, staff includes the loss of all consumer surplus from consumers after the regulation. However, for the consumers who exit the aerosol duster market after regulation and purchase a substitute, some of their surplus would be recovered as the substitute product would provide use value, though less than the aerosol duster and therefore still a net loss overall. If the staff were able to predict the share of consumers who seek a substitute and the use value for that substitute, the staff would be able to net out that substitute consumer utility from the loss from aerosol dusters. Therefore, the cost from loss of consumer surplus in the main analysis is almost certainly an overestimate.

5.2.5. Benefits from Reduced Automotive Accidents

In the 2023 Aerosol Duster Petition Staff Briefing Package, on page 18, staff noted that NEISS data suggest dusters are inhaled in cars and while driving.[67] These data are consistent with the assertion

[67] Of the estimated 2,600 emergency department treated injuries, approximately 9 percent (234 incidents) involved the use of an aerosol duster in a motor vehicle.

made by the petitioner that aerosol duster product inhalation is associated with "auto accident fatalities where inhaling drivers hit pedestrians or other drivers." However, benefits from any reduction in injury or death to pedestrians or other bystanders from this rule are not accounted for in this preliminary regulatory analysis. Currently, CPSC does not have a way of identifying the number of injuries or deaths attributed to automotive accidents caused by aerosol duster product inhalation.

6. Alternatives to the Draft Proposed Rule

Staff analyzed four alternatives to the draft proposed rule: 1) performance requirement, 2) bitterants, 3) labeling, and 4) take no regulatory action and rely upon the voluntary standards process. None of these alternatives would adequately address the inhalation hazard associated with aerosol duster products.

6.1. Performance requirements

Rather than banning hazardous aerosol duster products under the FHSA, the Commission could in principle mandate a performance requirement under sections 7 and 9 of the CPSA, 15 U.S.C. 2056, 2058, aimed at making aerosol duster products using the propellants HFC-152a and HFC-134a less likely to be used for inhalation. This alternative assumes an effective performance standard for preventing aerosol duster abuse could be developed. To date, however, suppliers have been unable to develop a performance standard that would effectively prevent the inhalation or abuse of aerosol duster products while still allowing for use of the product as intended. Staff is not aware of any existing voluntary standard to address the hazard. In March 2024, ASTM considered establishing a task group to develop a standard, but no task group was formed. Incident data indicates that victims of injury and death are primarily adults who purchase aerosol duster products with the intended goal of intentionally inhaling the product. Even assuming a performance requirement could be developed, while such a requirement may be effective in preventing young children from releasing the contents of aerosol duster products by adding child-safe features, it would not be effective in preventing adults from abusing and inhaling aerosol duster products, and notably the overwhelming number of injuries and deaths occur among adults. Thus, it would be very difficult, if not impossible, to develop a performance standard that would be effective in addressing inhalant abuse of aerosol duster products. Therefore, this alternative would not address the unreasonable risk of injury associated with aerosol duster products.

6.2. (Aversive Agents) Bitterants

As FUAIA recommended in its 2021 rulemaking petition, the Commission could adopt a CPSA performance standard to require aversive agents (bitterants) to be used in aerosol duster products. At the petition stage, staff evaluated the use of aversive agents such as bitterants in aerosol duster products and concluded that adding bitterants would not be effective at addressing the inhalant hazard posed by aerosol duster products. Tab B in the July 20, 2022 staff briefing package contains an in-depth analysis regarding the use of bitterants in aerosol duster products.[68] Additionally, many aerosol duster products currently on the market contain bitterants,[69] which appear not to have led to a decline in deaths and injuries associated with inhalant abuse of aerosol duster products. . Therefore, this alternative would not adequately address the unreasonable risk of injury associated with aerosol duster products.[70]

[68] www.cpsc.gov/s3fs-public/Petition-Requesting-Rulemaking-to-Establish-Safety-Standard_0.pdf?VersionId=GNEl7pYZUBOxf1BLSC0f4.X6TlA8gT4f.

[69] According to the Aerosol Duster Study completed by Euromonitor International in July 2023, approximately 70 percent of all aerosol duster sales are of bitterant-containing products. (https://www.cpsc.gov/s3fs-public/Aerosol-Duster-Study-2023-Redacted.pdf?VersionId=idRW1RnIfr_5Jkc9sA9mkss8kTyUmZDD)

[70] See Tab B in *Staff Briefing Package: Aerosol Dusters*, https://www.cpsc.gov/s3fs-public/Petition-Requesting-Rulemaking-to-Establish-Safety-Standard_0.pdf?VersionId=GNEl7pYZUBOxf1BLSC0f4.X6TlA8gT4f

6.3. Labeling

The Commission could require warning and other labels on aerosol duster products. However, most aerosol duster products currently on the market are labeled regarding the inhalation hazard, which appears to have had little impact on deaths and injuries associated with inhalant abuse of aerosol duster products. Additionally, at the petition stage, staff concluded that labeling of aerosol duster products is unlikely to be effective at addressing the inhalation hazard posed by aerosol duster products. In fact, labeling could have the perverse consequence of causing people inclined to abuse inhalants to seek out products with the enhanced warning on the label, thereby, facilitating the problem that the label was intended to avoid. Therefore, this alternative would not adequately address the unreasonable risk of injury associated with aerosol duster products.

6.4. Take no action and rely on the voluntary standards process

The Commission could take no regulatory action and rely upon the voluntary standards process to address the inhalation hazard posed by aerosol duster products. Currently, however, no U.S. voluntary standard exists or is under consideration to address the inhalant hazard posed by aerosol duster products. Therefore, as discussed in section V of the draft Notice of Proposed Rulemaking, this alternative would not adequately address the unreasonable risk of injury associated with aerosol duster products.

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