Risk Management Scope for

1,3,5-Triazine-2,4,6-triamine (Melamine)

Chemical Abstracts Service Registry Number 108-78-1

Health Canada

October 2020

Summary of Proposed Risk Management

This document outlines the risk management options under consideration for melamine, a substance that is part of the Certain Organic Flame Retardants Grouping, which has been proposed to be harmful to human health. In particular, the Government of Canada is considering:

Regulatory or non-regulatory actions to help reduce dermal exposure of infants, toddlers and young individuals (up to 18 years old) to melamine in products made with polymeric foams such as polyurethane foam. These products may include upholstered furniture, mattresses, mattress toppers, and other foam-based products to which prolonged skin contact may be expected.

Stakeholders are requested to provide any information on the following items to the contact specified in section 8 of this document, to inform risk management decision-making:

1) Ongoing and anticipated changes in the use of melamine in upholstered furniture, mattresses, mattress toppers, and other foam-based products available to consumers, whether in response to:

- changes in performance-based flammability requirements and/or standards;
- market forces; and/or
- other reasons (please provide information on these reasons).

2) The use of melamine in textiles, including textile backings in furniture.

3) The use of melamine in polymeric foams other than polyurethane foams, which may be used in products such as furniture, mattresses, mattress toppers, and and other foam-based products to which prolonged skin contact may be expected.

The risk management options outlined in this Risk Management Scope document may evolve through consideration of assessments and risk management options published for other Chemicals Management Plan substances as required to ensure effective, coordinated, and consistent risk management decision-making.

Table of Contents

1. Context

The *Canadian Environmental Protection Act, 1999* (CEPA) (Canada 1999) provides the authority for the Minister of the Environment and the Minister of Health (the Ministers) to conduct assessments to determine if substances are toxic to the environment and/or harmful to human health as set out in section 64 of CEPA[1,2], and if so, to manage the associated risks.

As part of the second phase of the Chemicals Management Plan (CMP), the ministers plan to assess and manage, where appropriate, the potential health and ecological risks associated with approximately 500 substances, in nine substance groupings (Canada 2011). The substance 1,3,5-triazine-2,4,6-triamine, Chemical Abstracts Service Registry Number[3] (CAS RN) 108-78-1, referred to throughout this document as melamine, is included in the Certain Organic Flame Retardants Grouping of the Substance Groupings Initiative of the Chemicals Management Plan (ECCC, HC 2020).

2. Issue

2.1 Updated Draft Screening Assessment Conclusion

In 2016 Health Canada and Environment and Climate Change Canada conducted a joint screening assessment of melamine, Chemical Abstracts Service Registry Number 108-78-1, in Canada. New information was received

[1] Section 64 [of CEPA]: *For the purposes of* [Parts 5 and 6 of CEPA]*, except where the expression "inherently toxic" appears, a substance is toxic if it is entering or may enter the environment in a quantity or concentration or under conditions that*

- *(a) have or may have an immediate or long-term harmful effect on the environment or its biological diversity;*
- *(b) constitute or may constitute a danger to the environment on which life depends; or*
- *(c) constitute or may constitute a danger in Canada to human life or health.*

[2] A determination of whether one or more of the criteria of section 64 are met is based upon an assessment of potential risks to the environment and/or to human health associated with exposures in the general environment. For humans, this includes, but is not limited to, exposures from ambient and indoor air, drinking water, foodstuffs, and the use of products available to consumers. A conclusion under CEPA is not relevant to, nor does it preclude, an assessment against the hazard criteria specified in the *Hazardous Products Regulations*, which are part of the regulatory framework for the Workplace Hazardous Materials Information System for products intended for workplace use. Similarly, a conclusion based on the criteria contained in section 64 of CEPA does not preclude actions being taken under other sections of CEPA or other Acts.

[3] CAS RN: Chemical Abstracts Service Registry Number. The Chemical Abstracts Service information is the property of the American Chemical Society and any use or redistribution, except as required in supporting regulatory requirements and/or for reports to the Government of Canada when the information and the reports are required by law or administrative policy, is not permitted without the prior, written permission of the American Chemical Society.

after that publication that led to a change to the proposed conclusions for this substance. As a result, Health Canada and Environment and Climate Change Canada have updated the draft screening assessment of melamine and a notice summarizing the updated draft screening assessment for this substance was published in the *Canada Gazette*, Part I, on October 17, 2020 (Canada 2020).

Based on the information available, the updated draft screening assessment report proposes to conclude that melamine is harmful to human health under section 64 of CEPA because it is entering the environment in a quantity or concentration or under conditions that constitute or may constitute a danger in Canada to human life or health.

The updated draft assessment also proposes that melamine is not entering the environment in a quantity or concentration or under conditions that have or may have an immediate or long-term harmful effect on the environment or its biological diversity, or that constitute or may constitute a danger to the environment on which life depends (Canada 2020).

The updated draft assessment also proposes that melamine meets the persistence criteria but not the bioaccumulation criteria as set out in the *Persistence and Bioaccumulation Regulations* of CEPA.

The exposure source of concern, identified in the updated draft screening assessment, is dermal exposure to melamine from products made with polyurethane foam (PUF), a type of polymeric foam. Specifically, the potential concern is for children who have prolonged skin contact with certain manufactured products made from PUF that contains melamine (ECCC, HC 2020). These products include upholstered furniture, mattresses, mattress toppers, and other foam-based products to which prolonged skin contact may be expected. As such, this document will focus on exposures to these products.

2.2 Proposed Recommendation Under CEPA

Based on the findings of the updated draft screening assessment conducted as per CEPA, the Ministers propose to recommend that melamine be added to the List of Toxic Substances in Schedule 1 of the Act[4].

The Ministers will take into consideration comments made by stakeholders during the 60-day public comment period on the updated draft screening assessment and Risk Management Scope document in the preparation of the final screening assessment and Risk Management Approach document. If the Ministers finalize the recommendation to add melamine to Schedule 1, risk management

[4] When a substance is found to meet one or more of the criteria under section 64 of CEPA, the ministers can propose to take no further action with respect to the substances, add the substance to the Priority Substances List for further assessment, or recommend the addition of the substance to the List of Toxic Substances in Schedule 1 of the Act.

instrument(s) will be proposed within 24 months from the date on which the final screening assessment is published, and finalized within 18 months from the date on which the risk management instrument(s) are proposed.

3. Proposed Risk Management

3.1 Human Health Objective

Human health objectives are quantitative or qualitative statements of what should be achieved to address human health concerns.

The proposed human health objective is to reduce exposure of children to melamine to levels that are protective of human health.

3.2 Risk Management Objective and Options under Consideration

Risk management objectives set quantitative or qualitative targets to be achieved by the implementation of risk management regulations, instrument(s) and/or tool(s) for a given substance or substances.

The proposed risk management objective is to help reduce dermal exposure of infants, toddlers and young individuals (up to 18 years old) to melamine in products made with polymeric foams, such as polyurethane foam.

To achieve the risk management objective and to work towards achieving the human health objective, the risk management options under consideration are:

Regulatory or non-regulatory actions to help reduce dermal exposure of infants, toddlers and young individuals (up to 18 years old) to melamine in products made with polymeric foams such as polyurethane foam. These products include upholstered furniture, mattresses, mattress toppers, and other foam-based products to which prolonged skin contact may be expected.

Following the publication of this Risk Management Scope document, additional information obtained from the public comment period and from other sources will be considered, along with the information presented in this document, in the instrument selection and development process[5]. The risk management options outlined in this document may evolve through consideration of assessments and

[5] The proposed risk management regulation(s), instrument(s) or tool(s) will be selected using a thorough, consistent and efficient approach and take into consideration available information in line with the Government of Canada's *Cabinet Directive on Regulation* (TBS 2018), Red Tape Reduction Action Plan (TBS 2012) and the *Red Tape Reduction Act* (Canada 2015).

risk management options published for other CMP substances to ensure effective, coordinated, and consistent risk management decision-making.

3.3 Risk Management Information Gaps

In order to make informed decisions on proposed risk management, more information is needed on the following:

1) Ongoing and anticipated changes in the use of melamine in upholstered furniture, mattresses, mattress toppers, and other foam-based products available to consumers, whether in response to:

- changes in performance-based flammability requirements and/or standards;
- market forces; and/or
- other reasons (please provide information on these reasons).

2) The use of melamine in textiles, including textile backings in furniture.

3) The use of melamine in polymeric foams other than polyurethane foams, which may be used in products such as furniture, mattresses, and other foam-based products to which prolonged skin contact may be expected.

4. Background

4.1 General Information on Melamine

Melamine is a discrete organic chemical characterized by a high nitrogen content. It belongs to a chemical subgroup of substances known as triazines. Melamine does not occur naturally; it is produced industrially using urea as a starting material. The name ‘melamine’ is also often used to refer to the thermoset plastic made from melamine (ECCC, HC 2020).

4.2 Current Uses and Identified Sectors

Melamine has a wide variety of uses across industrial sectors. Globally, it is used primarily in the synthesis of melamine-formaldehyde resins. These resins are in turn used to make laminate covers, for instance for household items such as countertops and tabletops; moulding compounds such as those used to make dishware and kitchenware; as well as other plastics and coatings. Melamine is also used in agriculture as a fertilizer (ECCC, HC 2020; WHO 2009). Furthermore, melamine is used as a flame retardant, often in combination with

other substances, including the flame retardants TCPP and Dechlorane Plus (Danish EPA 2016a; EFRA 2007). Melamine can also be used to produce flame retardants such as melamine cyanurate, melamine phosphate, melamine polyphosphate, and melamine pyrophosphate (EFRA 2007). Other global uses of melamine include its application as an impregnating or adhesive resin in wood-based panels for furniture and flooring, and in paper money, glossy magazines, and textiles (DSM 2010; ECCC, HC 2020). Finally, melamine is a metabolic by-product of the insecticide cyromazine, which is registered in Canada for control of insects in potato and greenhouse crops (Health Canada 2012).

In Canada, responses to a CEPA section 71 survey (ECCC 2013-2014) indicated that 10 to 100 million kg of melamine were imported into Canada in 2011, both as the neat substance and in consumer, commercial or industrial products. This estimate may not fully capture quantities of the substance in imported manufactured items. Melamine was not manufactured in Canada above the reporting threshold of 100 kg.

Uses of melamine identified in Canada based on the s. 71 survey (ECCC 2013-2014) include:

- in paints and coatings available to consumers and those used for commercial purposes;
- in polyurethane foam furniture;
- in melamine-formaldehyde resin used for decorative laminates; and
- as a plasticizer in concrete and automobile brake tubes and hoses.

Other identified uses in Canadian products (ECCC, HC 2020) include the following:

- thermally-fused melamine paper and shelves;
- whiteboards and flakeboards;
- paints;
- sealants for mechanical, electrical and plumbing applications; and
- inkjet ink.

Melamine is not listed as an approved food additive in Canada, but it may be found as a component in various food packaging materials. These include (ECCC, HC 2020):

- interior coating of cans (excluding infant formula cans)
- coating of metallic closures of glass jars for baby food;
- glass and plastic bottles for liquid infant formula;
- paper used to package bread or margarine; and
- films for milk packaging.

Melamine is listed in the Natural Health Products Ingredients Database as a Non-Natural Health Product because it is not a naturally occurring substance included in Schedule 1 to the Natural Health Products Regulations. As such, it is not listed in the Licensed Natural Health Products Database as being present in currently

licensed natural health products in Canada (NHPID [modified 2017]; LNHPD [modified 2016]).

5. Exposure Sources and Identified Risks

Exposure of the general population to melamine is primarily from certain products available to consumers and from food, and to a lesser extent from environmental media.

The critical effects associated with exposure to melamine are carcinogenicity and effects on the urinary system. The International Agency for Research on Cancer (IARC) has classified melamine as a Group 2B carcinogen (*possibly carcinogenic to humans*) (IARC 2018). Available information indicates that melamine is not genotoxic (ECCC, HC 2020).

Food:

Various international studies have investigated the migration of melamine into food and beverages from food packaging materials such as can coatings and jar closures. Studies on the migration of melamine from 'melamine' or 'melaware' plastic kitchenware into foods have also been conducted internationally.

Concentrations of melamine in food were also measured in many countries, as the result of the melamine-adulterated infant formula incidents in China in 2008 and animal feed incidents in the US in 2007.

In Canada, surveys to measure levels of melamine in food were conducted by the Canadian Food Inspection Agency (CFIA) from 2008 to 2012, mainly to identify high concentrations from adulteration of food, and to ensure continued compliance with Health Canada's Interim Maximum Levels for melamine in food (See Section 7 for more information on Health Canada's interim levels). Research to measure background levels of melamine in food has also been conducted by Health Canada (ECCC, HC 2020).

Combined dietary and environmental media exposure was estimated in the updated draft screening assessment for all age groups, including infants and was not identified as a concern. Exposure of various age groups to melamine assumed to be migrating into food from plastic 'melaware' products was also estimated, and was not identified as a concern. All food exposure estimates were below the 0.2 mg/kg bw/day tolerable daily intake derived by the World Health Organization (WHO 2009).

Foam-Based Furniture and Mattresses:

Melamine has been identified as being present in foam seating and bedding in Canada at concentrations of up to 29% (ECCC 2013-2014). The US Consumer Product Safety Commission (CPSC) analyzed concentrations of melamine in foam-based furniture and found concentrations of up to 34% by weight. Additionally, melamine has been detected in the polyurethane foam, polypropylene foam, and textile of car seats (Ecology Center 2015). Melamine can migrate from foam-based products, resulting in exposure.

Dermal and oral exposure to melamine from foam-based products was estimated in the updated draft screening assessment, based on extrapolated migration rates (ECCC, HC 2020). Oral exposure – such as mouthing of foam-based products by a child – was not identified as a concern. **However, dermal exposure from prolonged contact with foam-based products such as upholstered furniture mattresses, mattress toppers, and other foam-based products was identified as a concern for infants, and toddlers and young individuals (up to 18 years).**

Other Products Available to Consumers:

Melamine is used in a wide variety of other products available to consumers in Canada. Exposure to melamine in paper and shelves, whiteboards and flakeboards, and inkjet ink were not assessed as exposure is expected to be low.

The updated draft screening assessment did consider inhalation and/or dermal scenarios for one-time per event exposures to melamine from consumer use of airless paint spray equipment, brush and roller paints, and caulking and sealants in the home. These were determined to represent a low to negligible risk for the general Canadian population (ECCC, HC 2020).

Environmental Media:

Limited data on environmental media were available; exposure from environmental media was not identified as a concern in the updated draft screening assessment.

No other sources of exposure to melamine of concern were identified in the updated draft screening assessment (ECCC, HC 2020). Risk characterization based on urinary biomonitoring results from the US National Health and Nutrition Examination Survey (NHANES) (Panuwet et al., 2012) did not identify a concern. However, the biomonitoring data were insufficient to determine risk for age groups less than 12 years.

6. Risk Management Considerations

6.1 Alternatives and Alternate Technologies

Flame retardant substances are generally used to meet performance-based flammability requirements and/or standards. These requirements do not specify that chemical flame retardants need to be used; rather they may require a product or components thereof to pass a laboratory test such as a cigarette smoulder or open flame ignition test. Performance-based flammability requirements exist internationally for various types of products, including electronics, building materials, mattresses and upholstered furniture, among others (UL 2014; ASTM 2014; Canada 2016a; California 2013; US CPSC 2004 & 2006). They can be regulatory, and may exist at different levels of government (Canada 2016a; California 2013). Voluntary standards for flammability are also developed by independent standard development organizations (ASTM 2014; ISO 2014; UFAC 2014; UL 2014; ULC 2017).

Using chemical flame retardants in their products is one means through which companies can help ensure that their products meet performance-based flammability requirements. However, technologies other than chemical flame retardants that allow products to meet performance-based flammability requirements also exist. Products may be made of materials with a low flammability or materials that require lower quantities of flame retardants to meet standards. For example, concentrations of flame retardants tend to be higher in lower density foams, which tend to ignite more easily than higher density foams (CEC 2015b). Materials such as foams may also be covered with a protective barrier made of a material that does not burn easily (US EPA 2005).

Where chemical flame retardants are concerned, a number of factors come into play in determining whether one flame retardant is a good alternative to another. Different flame retardants are appropriate for application to different materials and for different end uses. Their physical and chemical properties affect their ability to meet performance-based flammability requirements as well as the uses in which they can be effective. Flame retardant properties such as pH, viscosity, the ability to mix evenly and stability in exothermic reactions can impact the quality of end products such as foams (CEC, 2015b; Danish EPA 2016a). The potential for effects on health and the environment are key considerations in the selection of alternatives. The United States Environmental Protection Agency updated its ‘Design for the Environment’ report comparing the health and environmental properties of a variety of flame retardants for use in flexible polyurethane foam in 2015 (US EPA 2015). The Danish Environmental Protection Agency (Danish EPA 2016a,b) also recently published a report on some flame retardants which may be used in flexible polyurethane foam. Finally, cost is also a factor companies consider in decisions regarding alternative flame retardants.

6.2 Socio-economic and Technical Considerations

Changes to performance-based flammability requirements are affecting the need for chemical flame retardants, particularly flame retardants used in flexible polyurethane foam. While uncovered polyurethane foam products such as mattress toppers are often excluded from flammability standards for mattresses or furniture (California 2013, US CPSC 2016, Canada 2016a), the standards may nevertheless affect the use of flame retardants in these products, as they can drive the use of flame retardants in flexible foam used for a wide variety of products. Companies producing foam may manufacture their foam so that it can pass the most stringent flammability standards for any product in which it is used, even if many of the end products containing the foam are not subject to those stringent flammability standards. For example, it has been reported that 80% of the foam manufactured in the U.K. contains flame retardants, even though only specific products are subject to flammability standards (EU 2008). Foam-based products containing flame retardants, but not subject to regulatory flammability standards, have been identified in several studies (Stapleton et al. 2011; Danish EPA 2015, 2016a).

Within North America, California standard TB 117 previously required that upholstered furniture in the California marketplace pass an open flame test, creating a market for flexible polyurethane foams containing certain flame retardants (California 2000 Stapleton et al. 2011, Stapleton et al. 2012). The revised standard, California Technical Bulletin 117-2013 (California 2013), which came into effect on January 1, 2015, no longer requires an open flame test, but still requires a cigarette smoulder test. It also allows the use of upholstery cover fabrics and resilient filling materials (such as polyurethane foam) that fail testing if a barrier material that passes testing is used between the cover fabric and the filling. Flexible foam manufacturers and members of related trade associations expect that both the concentrations of flame retardants in the foam, and the percent of foam that contains flame retardants, will be generally reduced as a result of the change in the California standard, according to a study by the Commission for Environmental Cooperation (CEC 2015b).

Two federal flammability rules exist for mattresses in the US: The Standard for the Flammability of Mattresses and Mattress Pads, 16 CFR 1632 (eCFR, 2017); and the Standard for the Flammability (Open Flame) of Mattress Sets,16 CFR 1633 (US CPSC 2006). The Open Flame rule for mattress sets (16 CFR 1633) was recently reviewed and some commenters raised concerns about the possible need for flame retardants to meet either the open flame test or the cigarette smoulder test of 16 CFR 1632. However, in a briefing document (not reviewed or accepted by the US Consumer Product Safety Commission (CPSC)), CPSC staff pointed out that the tests are performance-based (they do not prescribe the use of flame retardants) and indicated that they are aware of several mattress models that do not require the use of flame retardant chemicals to pass the tests. They also pointed to the availability of flame-retardant treated

barrier materials that can help mattresses to pass the tests (US CPSC 2016). The US CPSC Standard for the Flammability (Open Flame) of Mattress Sets (16 CFR 1633) applies to mattresses or mattress sets with resilient material enclosed by a cover material; as such, it does not apply to uncovered foam mattress toppers or pads (US CPSC 2006). The Standard for the Flammability of Mattresses and Mattress Pads (16 CFR 1632; eCFR, 2017) excludes convoluted foam pads which are not totally encased in a cover material.

In the United Kingdom (UK) and Ireland, regulatory requirements such as the Furniture and Furnishings (Fire) (Safety) Regulations 1988 (UK 1988) and the Industrial Research and Standards (Fire Safety) (Domestic Furniture) Order, 1995 (Ireland 1995) may be contributing to the use of flame retardants, including TCPP (EU 2008; Danish EPA 2016). The UK has consulted on proposed changes to its Furniture and Furnishings (Fire) (Safety) Regulations 1988, which could reduce the use of flame retardants and better reflect modern furniture manufacturing processes, while maintaining safety (UK Department for Business, Energy and Industrial Strategy, 2016). New regulations have yet to be published.

Canada has regulations under the *Canada Consumer Product Safety Act* (CCPSA) that set out performance-based flammability requirements for mattresses and other textile products that are manufactured, imported, sold or advertised in Canada (e.g., Canada 2016a, 2016b). As with other performance-based standards, the applicable regulations under the CCPSA do not prescribe how the requirements are to be met. Various options are available to manufacturers to meet the flammability requirements, including the use of materials that are less flammable or that are inherently flame resistant (such as wool), fire barrier systems or chemical flame retardants. It is not expected that Canada's *Mattresses Regulations* (Canada 2016a) drive the flame retardant market as they prescribe a cigarette smoulder test; open flame testing is not required for mattresses marketed in Canada. Foam mattress pads are not considered mattresses, but they are subject to the flammability requirements for bedding under the *Textile Flammability Regulations* (Canada 2016b) if they have a textile cover. There are no flammability requirements for uncovered foam mattress pads. Canada also does not have a federal regulation for the flammability of upholstered furniture.

7. Overview of Existing Risk Management

7.1 Canadian Risk Management Context

- The safety of chemicals used in incidental additives is subject to the provisions of section 4(1)(a) of the *Food and Drugs Act* (Government of Canada 2018b).

- Melamine is not listed as an approved food additive in the Lists of Permitted Food Additives, which have been incorporated by reference into their respective Marketing Authorizations issued under the *Food and Drugs Act* (Health Canada [modified 2017]).

- In Canada, interim maximum levels for melamine have been set at 0.5 mg/kg for infant formula and sole source nutrition products, including meal replacement products, and at 2.5 mg/kg in food products containing milk and milk-derived ingredients (Health Canada 2009, 2016). These interim maximum levels apply to the presence of both melamine and cyanuric acid, often found together, in order to ensure that foods available for sale in Canada have not been contaminated or adulterated with either compound (Health Canada 2009, 2016).

- The safety of chemicals used in food packaging materials is subject to the provisions of section 4(1)(a) of the *Food and Drugs Act* and Division 23 of the *Food and Drug Regulations* (Government of Canada 2018b). Melamine is used in Canada in certain food packaging materials (see Section 4.2 on uses) (personal communication from Food Directorate to Risk Management Bureau, Health Canada; August 2013, unreferenced).

- Natural Health Products (NHPs) are regulated under the *Natural Health Products Regulations* (Government of Canada 2018c). Melamine is listed in the Natural Health Products Ingredients Database with a Non-Natural Health Product role. It is not listed in the Licensed Natural Health Products Database as being present in currently licensed natural health products in Canada (NHPID [modified 2017]; LNHPD [modified 2016]).

7.2 International Risk Management Context

United States:

- Melamine is not approved for direct addition to human food (US FDA 2008).
- Melamine and its analogues below 2.5 ppm in foods other than infant formula do not raise public health concerns (US FDA 2008).
- Melamine may be used in some food packaging applications (US eCFR 2018 a,b,c,d,e,f).

- Maine has passed legislation to prohibit the sale of new residential upholstered furniture containing flame retardants above 1000 ppm starting on January 1st, 2019 (Maine 2017).
- California has passed legislation prohibiting the sale of new covered upholstered furniture, children's products, and mattresses that contain flame retardants above 1000 ppm. The repair of upholstery with foam containing flame retardants above 1000 ppm is also prohibited. The prohibition will take effect on January 1, 2020 (California 2018).

Europe:

- Maximum permitted melamine content of 1 mg/kg in infant formula, and 2.5 mg/kg in other food (EU 2012).
- Migration limit of 2.5 mg melamine per kg food for plastic materials and articles which may come into contact with food (EU 2011a).

Global Standards:

- The World Health Organization has established a Tolerable Daily Intake (TDI) value of 0.2 mg/kg bw/d for exposure to melamine (WHO 2009).
- The Codex Alimentarius international food standard sets out a maximum concentration of melamine of 0.15 mg/kg in liquid infant formula; 1 mg/kg in powdered infant formula; and 2.5 mg/kg in other food (FAO and WHO 2015).

8. Next Steps

8.1 Public Comment Period

Industry and other interested stakeholders are invited to submit comments on the content of this Risk Management Scope or other information that would help to inform decision-making (such as outlined in section 3.3). Please submit additional information and comments prior to December 16, 2020.

Comments and information submissions on the Risk Management Scope should be submitted to the address provided below:

Environment and Climate Change Canada
Gatineau, Quebec K1A 0H3
Telephone: 1-800-567-1999 (in Canada) or 819-938-3232
Fax: 819-938-5212
Email: eccc.substances.eccc@canada.ca

Companies that have a business interest in melamine are encouraged to identify themselves as stakeholders. Stakeholders will be informed of future decisions regarding melamine and may be contacted for further information.

8.2 Timing of Actions

Electronic consultation on the draft screening assessment report and Risk Management Scope: October 17, 2020 to December 16, 2020. This should include the submission of public comments, additional studies or information on melamine.

Publication of responses to public comments on the draft screening assessment report and Risk Management Scope: concurrent to the publication of the screening assessment and, if required, the Risk Management Approach document.

Publication of responses to public comments on the Risk Management Approach, if applicable and if required, the proposed instruments: At the latest, 24-month from the date on which the Ministers recommended that melamine be added to Schedule 1 of CEPA.

Consultation on the proposed instruments, if required: 60-day public comment period starting upon publication of the proposed instrument.

Publication of the final instruments, if required: At the latest, 18-month from the publication of the proposed instrument.

These are planned timelines, and are subject to change. Please consult the schedule of risk management activities and consultations for updated information on timelines.

9. References

[ASTM] ASTM International. 2014. Fire Standards and Flammability Standards.

[California] California Department of Consumer Affairs, 2000. Technical Bulletin 117: Requirements, Test Procedure and Apparatus for Testing The Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture [PDF].

[California] California Department of Consumer Affairs, 2013a. Technical Bulletin 117-2013: Requirements, Test Procedure and Apparatus for Testing the Smolder Resistance of Materials Used in Upholstered Furniture [PDF].

California 2018. Assembly Bill No. 2998, Chapter 924: An act to add Article 5.5 (commencing with Section 19100) to Chapter 3 of Division 8 of the Business and Professions Code, relating to business. [Accessed 2018 November 5].

Canada. 1999. *Canadian Environmental Protection Act, 1999*. SC 1999, c 33.

Canada. 2000. *Persistence and Bioaccumulation Regulations*, SOR/2000-107.

Canada. 2011. *CEPA 1999: Announcement of planned actions to assess and manage, where appropriate, the risks posed by certain substances to the health of Canadians and the environment*. Canada Gazette, Part I, vol. 145, no. 41 – October 8, 2011, p. 3125-3129.

Canada. 2013. CEPA 1999 section 71 Notice with respect to certain organic flame retardant substances. Canada Gazette, Part I: Vol. 147, No. 13. March 30, 2013.

Canada. 2015. *Red Tape Reduction Act*.

Canada. 2016a. *Mattresses Regulations* (*Canada Consumer Product Safety Act*). SOR/2016-183.

Canada. 2016b. *Textile Flammability Regulations* (*Canada Consumer Product Safety Act*). SOR/2016-194.

Canada. 2020. Dept. of the Environment. Canadian Environmental Protection Act, 1999: Notice with respect to certain organic flame retardants. Canada Gazette, Part I, vol. 154, no. 42 – October 17, 2020.

[CEC] Commission for Environmental Cooperation. 2015a. Enhancing Trilateral Understanding of Flame Retardants and Their Use in Manufactured Items: Analysis of Select Flame Retardants in Office and Household Furniture [PDF].

[CEC] Commission for Environmental Cooperation. 2015b. Enhancing Trilateral Understanding of Flame Retardants and Their Use in Manufactured Items: Supply Chain Analysis of Select Flame Retardants Contained in Manufactured Items Used in Indoor Environments [PDF].

Danish EPA. 2015. Chemical substances in car safety seats and other textile products for children [PDF]. Survey of chemical substances in consumer products No. 135.

Danish EPA. 2016a. Chlorinated phosphorous-based flame retardants in children's articles containing foam [PDF]. Background for content and possibilities for prevention in the EU. Environmental project No. 1855.

Danish EPA. 2016b. Environmental and health screening profiles of phosphorous flame retardants: A LOUS follow-up project [PDF].

[DSM] Royal DSM N.V. 2010. Life sciences and materials sciences: Staying the course. Annual Report 2009. Heerlen (NL): Royal DSM N.V. 196 pp.

[ECCC] Environment and Climate Change Canada. 2013-2014. Data for Certain Organic Flame Retardants Substance Grouping collected under the *Canadian Environmental Protection Act, 1999*, section 71: *Notice with respect to certain organic flame retardant substances.* Data prepared by: Environment and Climate Change Canada, Health Canada; Existing Substances Program.

[ECCC, HC] Environment and Climate Change Canada, Health Canada. 2020. Updated Draft Screening Assessment for the Certain Organic Flame Retardants Grouping, 1,3,5-Triazine-2,4,6-triamine (Melamine), Chemical Abstracts Service Registry Number 108-78-1.

Ecology Center. 2015. Hidden passengers: Chemical hazards in children's car seats. A technical report by Healthystuff.org. The Ecology Center, June 2015. Ann Arbor, Michigan, U.S.A. 24 pp.

[EFRA]. European Flame Retardants Association. 2007. Flame retardants; Frequently asked questions [PDF]. Brussels (BE): EFRA. 37 pp. [cited 2014 June 19].

[EU] European Union. 2008. European Union Risk Assessment Report. Tris(2-chloro-1-methylethyl)phosphate (TCPP) [PDF]. Luxembourg: Office for Official Publications of the European Communities. [Internet]. [cited 2014 Jun 18].

[EU]. European Union. 2011a. Commission regulation (EU) No 10/2011 of 14 January 2011 on plastic materials and articles intended to come into contact with food and Commission regulation (EU) No. 1282/2011 of 28 November 2011 amending and correcting Commission regulation (EU) No. 10/2011.

[EU]. European Union. 2011b. COMMISSION REGULATION (EU) No 284/2011 of 22 March 2011 laying down plastic kitchenware originating in or consigned from the People's Republic of China and Hong Kong Special Administrative Region, China. [Accessed 2018 Nov 16].

[EU] European Union. 2012. COMMISSION REGULATION (EU) No 594/2012 of 5 July 2012 amending Regulation (EC) 1881/2006 as regards the maximum levels of the contaminants ochratoxin A, non dioxin-like PCBs and melamine in foodstuffs.

[EU] European Union. 2017. Commission Regulations (EU) 2017/2229 of 4 December 2017 amending Annex I to Directive 2002/32/EC of the European Parliament and of the Council as regards maximum levels for lead, mercury, melamine and decoquinate. [Accessed 2018 Nov 16].

[FAO and WHO] Food and Agriculture Organization and World Health Organization. 2015. Codex Alimentarius: International Food Standards [PDF].

Government of Canada. 2018b. Food and Drug Regulations (C.R.C., c. 870) *(Food and Drug Act)*. [accessed 2018 Sept 5].

Health Canada. 2009. Questions and answers – melamine [Internet]. [updated 2009 June 5; cited 2014 Feb 7].

Health Canada. 2012. Pest Management Regulatory Agency Label transcript service [Internet]. E-label search for cyromazine. [modified 2016 Jan 8; cited 2017 Mar 31]. Ottawa (ON): Health Canada, Consumer Product Safety, Pest Management Regulatory Agency.

Health Canada. 2016. Health Canada's maximum levels for chemical contaminants in foods [Internet]. [updated 2016 May 4; cited 2017 Mar 31].

Health Canada. [modified 2017 May 3]. Lists of Permitted Food Additives. Ottawa (ON): Health Canada Food Directorate. [accessed 2014 April 24].

[IARC] International Agency for Research on Cancer. 2018. Table of Agents classified by the IARC Monographs, Volumes 1-121 [PDF]. Note: Melamine listed as Group 2B, Volume Sup 7, 73, 119. Year: In prep. [accessed 10 May 2018].

Ireland. 1995. *Industrial Research and Standards (Fire Safety) (Domestic Furniture) Order, 1995*. S.I. No. 316/1995.

[ISO] International Organization for Standardization 2014. Standards Catalogue.

[LNHPD] Licensed Natural Health Products Database [database]. [modified 2016 Aug 10]. Ottawa (ON): Government of Canada. [accessed 2014 April 24].

Maine. 2017. An Act to protect firefighters by establishing a prohibition on the sale and distribution of new upholstered furniture containing certain flame-retardant chemicals.

[NHPID] Natural Health Products Ingredients Database [database]. [modified 2017 June 21]. Ottawa (ON): Government of Canada. [accessed 2014 April 24].

Panuwet P, Nguyen JV, Wade EL, D'Souza PE, Ryan PB, Barr DB. 2012. Quantification of melamine in human urine using cation-exchange based high performance liquid chromatography tandem mass spectrometry. J. Chromatogr. B 887-888:48-54.

Stapleton, H.M., Klosterhaus, S., Keller, A. *et al.* 2011. Identification of flame retardants in polyurethane foam collected from baby products. *Environmental Science and Technology* **45**: 5323-5331.

Stapleton, H.M., Sharma, S., Getzinger, G., *et al.* 2012. Novel and high volume use flame retardants in US couches reflective of the 2005 PentaBDE phase out. *Environmental Science and Technology* **24**(24): 13432-13439.

[TBS] Treasury Board of Canada Secretariat. 2018. Cabinet Directive on Regulation. Ottawa (ON): Government of Canada.

[TBS] Treasury Board of Canada Secretariat 2012. Red Tape Reduction Action Plan.

[UFAC] Upholstered Furniture Action Council. 2014. Test methods.

[UK] United Kingdom. 1988. *Furniture and Furnishings (Fire) (Safety) Regulations 1988*, No. 1324.

UK Department for Business, Energy and Industrial Strategy. 2016. Consultation on updating the Furniture and Furnishings (Fire)(Safety) Regulations.

[UL] Underwriters Laboratories. 2014. UL 94: Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.

[ULC] Underwriters Laboratories of Canada. 2017. CAN/ULC-S137, Standard Method of Test for Fire Growth of Mattresses (Open Flame Test) [PDF] (Second Edition).

US eCFR. Electronic Code of Federal Regulations, 2017. Title 16: Commercial Practices, part 1632 – Standard for the Flammability of Mattresses and Mattress Pads (FF4-72, amended).

US eCFR . Electronic Code of Federal Regulations 2018a. Title 21: Food and Drugs. Part 177—Indirect Food Additives: Polymers; Subpart B—Substances for Use as Basic Components of Single and Repeated Use Food Contact Surfaces - §177.1460 Melamine-formaldehyde resins in molded articles. [Accessed 2018 Nov 15].

US eCFR . Electronic Code of Federal Regulations 2018b. Title 21: Food and Drugs. PART 181—Prior-Sanctioned Food Ingredients; Subpart B—Specific Prior-Sanctioned Food Ingredients §181.30 Substances used in the manufacture of paper and paperboard products used in food packaging. [Accessed 2018 Nov 15].

US eCFR . Electronic Code of Federal Regulations 2018c. Title 21: Food and Drugs. PART 177—Indirect Food Additives: Polymers; Subpart C—Substances for Use Only as Components of Articles Intended for Repeated Use.§177.2260 Filters, resin-bonded [Accessed 2018 Nov 16].

US eCFR . Electronic Code of Federal Regulations 2018d. Title 21: Food and Drugs. PART 177—INDIRECT FOOD ADDITIVES: POLYMERS. Subpart C—Substances for Use Only as Components of Articles Intended for Repeated Use §177.2470 Polyoxymethylene copolymer. [Accessed 2018 Nov 16].

US eCFR . Electronic Code of Federal Regulations 2018e. Title 21: Food and Drugs. PART 175—INDIRECT FOOD ADDITIVES: ADHESIVES AND COMPONENTS OF COATINGS Subpart C—Substances for Use as Components of Coatings.§175.300 Resinous and polymeric Coatings, and §175.320 Resinous and polymeric coatings for polyolefin films. [Accessed 2018 Nov 16].

US eCFR . Electronic Code of Federal Regulations 2018f. Title 21: Food and Drugs. PART 175—INDIRECT FOOD ADDITIVES: ADHESIVES AND COMPONENTS OF COATINGS. Subpart B—Substances for Use Only as Components of Adhesives §175.105 Adhesives. [Accessed 2018 Nov 16].

US eCFR . Electronic Code of Federal Regulations 2018g. Title 21: Food and Drugs. PART 573—Food Additives Permitted in Feed and Drinking Water of Animals; Subpart B—Food Additive Listing §573.496 Guanidinoacetic acid. [Accessed 2018 Nov 16].

US FDA Food and Drug Administration. 2008. Interim Safety and Risk Assessment of Melamine and its analogues in Food for Humans. [Accessed 2019 Feb 20].

[US CPSC] United States Consumer Product Safety Commission. 2004. Standard for the Flammability of Mattresses and Mattress Pads – 16 CFR Part 1632.

[US CPSC] United States Consumer Product Safety Commission. 2006. Standard for the Flammability (Open Flame) of Mattress Sets: 16 CFR Part 1633 [PDF].

[US CPSC] Consumer Product Safety Commission. 2016. Staff briefing package: Rule Review of 16 C.F.R. Part 1633 –Standard for the Flammability (Open Flame) of Mattress Sets [PDF].

[US EPA] United States Environmental Protection Agency. 2005. Furniture Flame Retardancy Partnership: Environmental Profiles of Chemical Flame-Retardant Alternatives for Low-Density Polyurethane Foam [PDF].

[US EPA] United States Environmental Protection Agency. 2015. Flame Retardants Used in Flexible Polyurethane Foam: An Alternatives Assessment Update [PDF].

[WHO] World Health Organization. 2009. Toxicological and Health Aspects of Melamine and Cyanuric Acid. Report of a WHO Expert Meeting in Collaboration with FAO (Food and Agriculture Organization of the United Nations). Supported by Health Canada. 66 pp.

[WHO] World Health Organization. 2018. Melamine.