

Christopher Jessup

Who is commenting? (*choose the best fit*)

Representative of a product manufacturer(s)

If you are commenting as a representative, what is the name of the entity you are commenting on behalf of?

Sub-Zero Group, Inc.

If you represent a product manufacturer or industry group, what industry(ies) do you represent?

Sub-Zero Group, Inc. is an Original Equipment Manufacturer within the residential appliance industry and member of the appliance industry's trade association, Association of Home Appliance Manufacturers (AHAM).

If you represent a product manufacturer, what types of components, products, or product categories do you manufacture that you will be requesting a CUU determination for?

Sub-Zero Group, Inc. supports the intent to protect consumers against all unreasonable risks, including those associated with the exposure to potentially harmful chemicals. Sub-Zero Group, Inc. also firmly supports the appropriate use of PFAS chemicals in appliances.

Together with industry design practices, test requirements, and redundant safety mechanisms, PFAS chemicals play an important role in the safety of household appliances. PFAS chemicals are used in a variety of materials found in appliances including wires and cords, nonstick coatings, printed circuit boards, batteries, and hydrofluoroolefins (HFOs) which are climate friendly alternatives for use as refrigerator insulation foam blowing agents. These components are often deeply embedded within the product and do not present a high risk of direct human exposure.

Sub-Zero Group, Inc. will be requesting a CUU determination specifically for our refrigeration products under the Sub-Zero brand name. Sub-Zero Group, Inc. employs an HFO foam blowing agent for its high insulating properties to meet efficiency standards while offering an environmental and safety benefit via its ultra-low Global Warming Potential (GWP) and non-flammable/combustible properties. HFO blowing agents are a key technology option used by Sub-Zero Group, Inc. and other manufacturers to meet existing U.S. Department of Energy (DOE) appliance energy conservation standards. Sub-Zero Group, Inc. produces a very exclusive refrigeration product that the DOE refers to as the Built-In product class. A Built-In product must fit within conventional kitchen cabinetry width and depth; as a result, a Built-In product is more limited in the design for insulating foam volume to provide the consumer with the requisite utility and performance of the appliance. This limitation requires manufacturers like Sub-Zero Group, Inc. to use an HFO foam verses an alternative like Cyclopentane, which is much less energy efficient. Forcing Sub-Zero Group, Inc. to redesign over 1,100 different refrigeration models/SKUs of product by 2032 would require a

herculean effort of enormous expense and ultimately result in diminishing our product offerings in the market due to energy efficiency standards. We strenuously believe regulations need to take into consideration the amount of effort and cost on companies like Sub-Zero Group, Inc. who are small, family owned businesses that have manufactured exclusively in the U.S., in Wisconsin and Arizona, respectively, for over eighty years.

Do you have any recommended changes or other considerations that you think the MPCA should take into account when defining the term "essential for health, safety, or the functioning of society"? *(Please review the proposed definitions in the rule concept document prior to answering)*

Sub-Zero Group, Inc. fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question #5.

Do you have any recommended changes or other considerations that you think the MPCA should take into account when defining the term "alternative"? *(Please review the proposed definitions in the rule concept document prior to answering)*

Sub-Zero Group, Inc. fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question #6.

Do you have any recommended changes or other considerations that you think the MPCA should take into account when defining the term "reasonably available"? *(Please review the proposed definitions in the rule concept document prior to answering)*

Sub-Zero Group, Inc. fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question #7; however, Sub-Zero Group, Inc. would like to emphasize the fact that "reasonably available" must take into consideration the utility, performance, and efficiency of a Built-In residential refrigerator.

When considering the proposed definition of "product category", how broadly should the agency group product categories? *(Examples: "vehicles" versus "sedans, SUV's, vans, trucks, RV's" or "printers" versus "receipt printers, thermal printers, label printers, residential printers, commercial printers, etc.")*

Sub-Zero Group, Inc. fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question #8.

Should each request for a CUU determination be limited to a single product category, or should applicants be allowed to submit a request for a CUU determination for multiple product categories?

Sub-Zero Group, Inc. fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question #9.

What safety or other standards require the use of PFAS in a product? *(Please include the specific citation)*

Sub-Zero Group, Inc. fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question #10; however, Sub-Zero Group, Inc. would like to emphasize the fact that HFO foam provides the requisite level of energy efficiency for Built-In residential refrigerators to meet the energy efficiency standards established by the U.S. DOE, which is a requirement for accessing the U.S. market. Furthermore, HFO foam is inherently safer to handle and process in a manufacturing environment given that it is not a flammable substance like Cyclopentane.

The agency is seeking feedback on the potential that the initial positive CUU determination duration for existing products will expire eight years from the date of issuance regardless of product category. This is intended to stagger renewal deadlines and ease the administrative burden of processing renewals.

- Do you have any concerns about unintended consequences with this proposal?
- Do you have any alternative recommendations to stagger renewal deadlines?

Sub-Zero Group, Inc. fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question #11.

The MPCA has developed a preliminary list of potentially eligible data categories that may be considered for trade secret requests. *(Please review the rule concept document for the list of potentially eligible data)*

- Do you have any concerns about unintended consequences with this proposal?
- Do you have any alternative recommendations for data that should or should not be eligible for trade secret requests?

Sub-Zero Group, Inc. fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question #12.

What are the potential ongoing costs to society if the commissioner issues a positive currently unavoidable use determination for the continued use of PFAS within a product or product category? *(For example: environmental, human health, or remediation costs)*

Sub-Zero Group, Inc. fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question #13.

For manufacturers: Administrative cost of requesting a CUU determination (Part 1 of 2). *Please provide your best estimates or rough orders of magnitude (for example "approx. 200 hours"). Precise accounting data is not necessary to answer this question.*

If your company currently possesses information regarding intentionally added PFAS (to

the CAS number level) for all components in your product lines, please estimate the number of technical staff hours that were required to establish this baseline.

Other (please specify)

For manufacturers: Administrative cost of requesting a CUU determination (Part 2 of 2). *Please provide your best estimates or rough orders of magnitude (for example "approx. 200 hours"). Precise accounting data is not necessary to answer this question.*

If your company does not possess information regarding intentionally added PFAS (to the CAS number level) for all components in your product lines, please estimate the number of technical staff hours needed to obtain this data from your Tier 2 or 3 suppliers for a single product line.

More than 500 hours

For manufacturers: Expenditure considerations when seeking non-PFAS alternatives (Part 1 of 2). *Please provide your best estimates or rough orders of magnitude (for example "primary cost is CapEx"). Precise accounting data is not necessary to answer this question.*

If you have identified a technically viable non-PFAS alternative for one of your products that contains intentionally added PFAS, does implementing this alternative require Capital Expenditure (such as purchasing new molds, retooling machinery) or primarily Operational Expenditure (such as purchasing more expensive raw materials)?

- Please estimate the ratio of Capital Expenditure to Operational Expenditure (or indicate which category is the dominant cost driver).

Sub-Zero Group, Inc. fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question #16. Sub-Zero's best estimate for implementing Cyclopentane as a PFAS-free insulating foam is \$270,000,000. This estimated cost includes transitioning our three manufacturing facilities over to new foaming machines and installing all of the necessary safety equipment for using a flammable/combustible foam material. It also includes all of the internal and external (supply chain partners) tooling and processing equipment required to effectively produce new refrigeration designs that meet all of the product safety and energy standards.

For manufacturers: Expenditure considerations when seeking non-PFAS alternatives (Part 2 of 2).

If you have not identified a technically viable non-PFAS alternative for one of your products that contains intentionally added PFAS, have you conducted a Research &

Development (R&D) feasibility study?

- If so, what was the cost of that study?

Sub-Zero Group, Inc. estimates the cost of converting all of our refrigeration models from HFO to Cyclopentane will be in the area of \$26,400,000. This is an exhaustive cost estimate that includes such things as engineering and development resource time, prototype builds, testing, agency certification for safety and efficiency standards as well as relative supply chain partner non-recurring engineering costs.

For manufacturers: Research and development safety validation cycles.

What is the typical duration of the R&D and safety validation cycle for a reformulated product in your sector (from concept to market entry)?

Does this cycle align with the 5-year renewal period typically associated with regulatory exemptions?

- If not, please explain the specific technical barriers that would require a longer validation period.

Sub-Zero Group, Inc. fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question #18; moreover, Sub-Zero Group, Inc.'s best estimate for transitioning all 1,100+ models away from HFO will require between 48-66 months.

Please provide any additional information or documentation needed to support your answers to any of the questions posed.

Sub-Zero Group, Inc. fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question #19.

Do you have any additional questions or comments regarding the PFAS in products: Currently unavoidable use rule? *(Please note that we may be unable to respond to specific questions regarding rule content in this phase of the rulemaking process)*

Sub-Zero Group, Inc. fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question #20.



SUB·ZERO GROUP, INC.

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March 24, 2026

Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155

To Whom It May Concern:

I write today providing feedback to the Minnesota Pollution Control Agency's (MPCA) request for feedback on proposed rule concepts for PFAS in products: Currently unavoidable use under Minn. Stat. 116.943.

1. Who is commenting?

Representative of a product manufacturer(s)

2. If you are commenting as a representative, what is the name of the entity you are commenting on behalf of?

Sub-Zero Group, Inc.

3. If you represent a product manufacturer or industry group, what industry(ies) do you represent?

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4. If you represent a product manufacturer, what types of components, products, or product categories do you manufacture that you will be requesting a CUU determination for?

Sub-Zero Group supports the intent to protect consumers against all unreasonable risks, including those associated with the exposure to potentially harmful chemicals. Sub-Zero Group also firmly supports the appropriate use of PFAS chemicals in appliances. Together with industry design practices, test requirements, and redundant safety mechanisms, PFAS chemicals play an important role in the safety of household appliances. PFAS chemicals are used in a variety of materials found in appliances including wires and cords, nonstick coating, printed circuit boards, batteries and hydrofluoroolefins (HFOs) which are climate friendly alternatives for use as refrigerator insulation foam blowing agents. These components are often deeply embedded within the product and do not present a high risk of direct human exposure.

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5. Do you have any recommended changes or other considerations that you think the MPCA should take into account when defining the term "essential for health, safety, or the functioning of society" (Please review the proposed definitions prior to answering)

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 5.

6. Do you have any recommended changes or other considerations that you think the MPCA should take into account when defining the term "alternative"? (Please review the proposed definitions prior to answering)

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 6.

7. Do you have any recommended changes or other considerations that you think the MPCA should take into account when defining the term "reasonably available"? (Please review the proposed definitions prior to answering)

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 7; however, Sub-Zero Group would like to emphasize the fact that "reasonably available" must take into consideration the utility, performance and efficiency of a Built-In residential refrigerator.

8. When considering the proposed definition of "product category", how broadly should the agency group product categories? (Examples: "vehicles" versus "sedans, SUV's,



vans, trucks, RV's" or "printers" versus "receipt printers, thermal printers, label printers, residential printers, commercial printers, etc.")

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 8.

9. Should each request for a CUU determination be limited to a single product category, or should applicants be allowed to submit a request for a CUU determination for multiple product categories?

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 9.

10. What safety or other standards require the use of PFAS in a product? (Please include the specific citation)

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 10; however, Sub-Zero Group would like to emphasize the fact that HFO foam provides the requisite level of energy efficiency for Built-In residential refrigerators to meet the energy efficiency standards established by the U.S. DOE, which is a requirement for accessing the U.S. market. Furthermore, HFO foam is inherently safer to handle and process in a manufacturing environment given it is not a flammable substance like Cyclopentane.

11. The agency is seeking feedback on the potential that the initial positive CUU determination duration for existing products will expire eight years from the date of issuance regardless of product category. This is intended to stagger renewal deadlines and ease the administrative burden of processing renewals. Do you have any concerns about unintended consequences with this proposal?

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 11.

12. The MPCA has developed a preliminary list of potentially eligible data categories that may be considered for trade secret requests. (Please review the list of potentially eligible data prior to answering) Do you have any concerns about unintended consequences with this proposal?

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 12.



13. What are the potential ongoing costs to society if the commissioner issues a positive currently unavoidable use determination for the continued use of PFAS within a product or product category? (For example: environmental, human health, or remediation costs)

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 13.

14. For manufacturers: Administrative cost of requesting a CUU determination (Part 1 of

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 14; moreover, an initiative for investigating every material, component and assembly within the entirety of our product portfolio would require an unreasonable amount of time to properly discern PFAS content at the CAS verification level for a small, very limited in resources company like Sub-Zero Group.

15. For manufacturers: Administrative cost of requesting a CUU determination (Part 2 of 2). Please provide your best estimates or rough orders of magnitude (for example "approx. 200 hours"). Precise accounting data is not necessary to answer this question.

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 15. It is very difficult to estimate the number of hours an effort like this would take for a small company like us, but with limited Supply Chain resources to reach out to hundreds of tier-1 supply chain partners, who must await responses from the second and tertiary levels of our supply chain, for the necessary material disclosures and then validate the accuracy of the responses via third party testing for high risk materials would likely take several thousands of hours.

16. For manufacturers: Expenditure considerations when seeking non-PFAS alternatives (Part 1 of 2). Please provide your best estimates or rough orders of magnitude (for example "primary cost is CapEx"). Precise accounting data is not necessary to answer this question

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 16. Sub-Zero's best estimate for implementing Cyclopentane as a PFAS-free insulating foam is \$270,000,000. This estimated cost includes transitioning our three manufacturing facilities over to new foaming machines and installing all of the necessary safety equipment for using a flammable/combustible foam material. It also includes all of the internal and external (supply chain partners) tooling and processing equipment required to effectively produce new refrigeration designs that meet all of the product safety and energy standards.



17. For manufacturers: Expenditure considerations when seeking non-PFAS alternatives

Sub-Zero Group estimates that the cost of converting all of our refrigeration models from HFO to Cyclopentane will be in the area of \$26,400,000. This is an exhaustive cost estimate that includes such things as engineering and development resource time, prototype builds, testing, agency certification for safety and efficiency standards as well as relative supply chain partner non-recurring engineering costs.

18. For manufacturers: Research and development safety validation cycles. What is the typical duration of the R&D and safety validation cycle for a reformulated product in your sector (from concept to market entry)?

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 18; moreover, Sub-Zero Group's best estimate for transitioning all 1,100+ models away from HFO will require between 48-66 months.

19. Please provide any additional information or documentation needed to support your answers to any of the questions posed.

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 19.

20. Do you have any additional questions or comments regarding the PFAS in products: Currently unavoidable use rule? (Please note that we may be unable to respond to specific questions regarding rule content in this phase of the rulemaking process).

Sub-Zero fully supports the comments submitted by our trade association, AHAM, regarding MPCA's question # 20.



Thank you for considering our views. Please contact me at Christopher.Jessup@subzero.com if you would like to discuss in more detail.

Respectfully submitted,

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