



Haskris Company  
776 N Oaklawn Ave  
Elmhurst, IL 60126  
847-956-6420

March 5, 2024

California Air Resources Board  
Hydrofluorocarbon Reduction  
1001 I Street, Sacramento, CA 95814  
HFCReduction@arb.ca.gov  
916-322-3984

Re: Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4

Dear California Air Resources Board,

Haskris Company appreciates your consideration of this application for a variance to Final Regulation Order, California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4, Section 95374. List of Prohibited Substances, Table 3: End-Use and Prohibited Substances, Chillers – Industrial Process Refrigeration, Chillers (new) designed for chilled fluid leaving the chiller at temperatures > +35°F (2°C), Refrigerants with a GWP of 750 or greater, Prohibited as of January 1, 2024.

Haskris Company is located in Elmhurst, IL. Haskris manufactures specialized refrigeration chillers for niche applications including electron microscopy, x-ray analytical chemistry, radiation therapy for cancer treatment, MRI (magnetic resonance imaging), CT (computed tomography), and many others. These applications are widely used in medical diagnostic imaging, clinical medical treatment, pharmaceutical production, border security, port customs administration, food safety, rocket component manufacturing, semiconductor chip manufacturing, concrete quality control, cutting-edge higher education research, transportation safety regulation, and national research laboratories.

**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 2 of 24

Haskris manufactures a wide range of specialized, custom, and individually designed chillers to support these applications and industries. In 2023, Haskris manufactured 365 unique refrigerated chiller designs.

Haskris was founded in 1944. Throughout our history, Haskris always complied with regulations regarding allowable substances in our products. Examples include the Kigali Amendment to the Montreal Protocol, RoHS, and EU legislation to control F-gases. In alignment with the American Innovation and Manufacturing Act of 2020, Haskris has been actively preparing to transition to low-GWP refrigerants since early 2022. This California Code of Regulations is the only case in which Haskris has had to seek a variance to a regulation.

This application contains information that is trade secret as defined in [California Government Code Title 1 Division 10 Part 5 Chapter 3 Article 2 Section 7924.510](#). Haskris shall identify those trade secrets and respectfully requests that these trade secrets be protected from disclosure to the public.

Thank you for reviewing this application. Please contact me if you need additional information or clarification.

Sincerely,

*Chris Schulte*

Chris Schulte  
Research and Development Engineering Manager  
Haskris Company  
[chris.s@haskris.com](mailto:chris.s@haskris.com)  
847-956-6420

**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 3 of 24

**95378 (c) (1) (A) Applicant name, ownership status (e.g., parent, subsidiary), address, telephone number, and email address**

Name: Haskris Company  
Ownership: Privately held  
Address: 776 N Oaklawn Ave, Elmhurst, IL 60126  
Phone: 847-956-6420  
Email: [chris.s@haskris.com](mailto:chris.s@haskris.com)

**95378 (c) (1) (B) Description of business activity or product description**

Haskris is a family-owned, US-based, manufacturer of specialized refrigeration chillers for niche applications including electron microscopy, x-ray analytical chemistry, radiation therapy for cancer treatment, MRI (magnetic resonance imaging), CT (computed tomography), and many others. These applications are widely used in medical diagnostic imaging, clinical medical treatment, pharmaceutical production, border security, port customs administration, food safety, rocket component manufacturing, semiconductor chip manufacturing, refining, mining, concrete quality control, cutting-edge higher education research, transportation safety regulation, and national research laboratories.

Haskris manufactures a wide range of specialized, custom, and individually designed chillers to support these applications and industries. In 2023 alone, Haskris manufactured more than 360 unique refrigerated chiller designs.



**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 4 of 24

**95378 (c) (1) (C) Relationship to the product**

Haskris Company manufactures and sells Haskris chillers.

**95378 (c) (1) (D) The specific section(s) of this subarticle from which a variance is being requested**

Section 95374. List of Prohibited Substances, Table 3: End-Use and Prohibited Substances, Chillers – Industrial Process Refrigeration, Chillers (new) designed for chilled fluid leaving the chiller at temperatures > +35°F (2°C), Refrigerants with a GWP of 750 or greater, Prohibited as of January 1, 2024.

**95378 (c) (1) (E) Explanation and description of the reasons for seeking a variance**

Haskris seeks a temporary variance for the use of R407c in positive displacement chillers used for industrial process refrigeration applications where the leaving fluid temperatures are > +35°F (2°C).

R134a and R407c are the most commonly used refrigerants in Haskris chillers for industrial process refrigeration. R134a and R407c both have a GWP greater than 750. Haskris is ready to use R513a instead of R134a. R513a has a GWP of 630 per US EPA SNAP. The transition from R134a to R513a can proceed because components are commercially available, the components are designed and rated for use with R513a, and R513a is not an A2L refrigerant.

Haskris is actively developing chillers to use R454b instead of R407c. R454b has a GWP of 466 per US EPA SNAP. At this time, UL approved industrial refrigeration components that Haskris requires for manufacturing chillers are not commercially available. Component suppliers have some products compatible with R454b, but these components cannot be used for Haskris chillers.



**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 5 of 24

Haskris must simultaneously comply with CARB and with US EPA. At the time of the submission of this application, the US EPA [SNAP list of refrigerants for Industrial Process Refrigeration](#), R454b is not listed as acceptable. US EPA Proposed Rule 26 contains revisions to the list of alternative refrigerants. If this rule is made final in its current form, the SNAP list of refrigerants for Industrial Process Refrigeration will list R454b as acceptable. Per EPA definitions, Haskris chillers are chillers used to cool industrial processes. Haskris expects that the Proposed Rule 26 will imminently be made a Final Rule. But until that time, the US EPA as well as other state and local codes that refer to the EPA exclude R454b for Haskris chillers.

Also Haskris must simultaneously comply with CARB and local codes in California. At this time building codes for AC and Refrigeration are not updated to permit the use of R454b. There is a trigger clause in California legislation AB 209 that states "no state or local building code provision shall prohibit the use of a refrigerant listed as acceptable under Section 761k of the federal Clean Air Act (42 U.S.C. Sec. 7401 et seq.)". This trigger takes effect July 1, 2024. Prior to this trigger clause taking effect, R454b is prohibited according to local codes in California.

**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 6 of 24

Certain components are also not available on the market making producing compliant products impossible at this time. Haskris is a relatively small, specialty manufacturer that depends on components that are generally available.

- Primarily this impacts refrigerant leak sensor availability for industrial applications, with some impact on industrial compressor availability as well.
- The industry as a whole has developed products in the order that the general market transition requires.
  - Both CARB and the EPA require HVAC transitions in 2025, with the EPA transitioning the industrial refrigeration in 2026
  - This has led the market as a whole to develop HVAC rated leak sensors and compressors before industrial refrigeration versions
  - Initial leak sensors were listed for the UL 60335-2-40 standard based on HVAC, but were not listed for UL 60335-2-89 which is the required industrial standard applicable for Haskris products.
  - Suppliers will not sell their components to use until they meet the safety standards for the industry.
- At this time, we have reached out to every major supplier we can find that manufactures complete leak sensor systems, as well as all of our distributor network contacts, and have been told sensors are either:
  - Not yet released for industrial standards
  - Only available in quantities larger than 10,000 pieces
- With total Haskris product being shipped into California in 2024 being less than 100 units, we are not physically able to purchase leak sensors that will be required per industrial safety standards at this time.
- While larger manufacturers are able to develop dedicated technology, this is not feasible for Haskris. We must wait until the market can provide products that are required for our installations.



**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 7 of 24

Haskris' OEM customers have challenging technical requirements. Currently available chillers with low-GWP refrigerants cannot meet these technical requirements. Additionally, these customers require rigorous and long-term validation testing of mature production chillers before confidently releasing new chillers for critical applications.

- Haskris chillers are specialized, custom, and individually designed according to OEM specifications. Haskris' customers are OEM manufacturers of mission-critical applications and instruments used in industries including:
  - Medical diagnostic imaging
  - Clinical medical treatment
  - Pharmaceutical production
  - Border security
  - Port customs administration
  - Food safety
  - Rocket component manufacturing
  - Semiconductor chip manufacturing
  - Concrete quality control
  - Cutting-edge higher education research
  - Transportation safety regulation
  - National research laboratories
- Due to the sensitive nature of these applications, OEM system validation testing cannot begin until Haskris chiller designs for R454b are complete.
- See examples below of the specialized technical requirements that Haskris chillers must achieve.

[REDACTED]

**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 8 of 24

**95378 (c) (1) (F) Identification of whether the variance requested is pursuant to section 95378(b)(1), 95378(b)(2), or both; and provide the following:**

- 1. Clear and convincing evidence demonstrating how the variance criteria specified in section 95378(b) has been met; and**
- 2. Supporting documentation for attributing noncompliance to Impossibility or a Force Majeure Event**

Impossibility (the Applicant exercised best efforts but still was unable to comply with the regulatory requirements of the regulation for reasons beyond his or her control despite exercising foresight to prevent the noncompliance.)

Force Majeure Event (a sudden and unforeseeable event involving a clear danger, demanding action to prevent or mitigate the loss of, or damage to, life, health, property, or essential public services, arising from causes beyond the control of the Applicant, which delays or prevents the performance of any obligation under the regulation, despite the Applicant's best efforts to fulfill the obligation. This includes events where the local government, State of California, or federal government issues a declaration of emergency, such as war, wildfires, floods, hurricanes, tornadoes, earthquakes, volcanic eruptions, and pandemics. This does not include negligent acts or the Applicant's financial inability to perform that is unrelated to an event as defined in this section.)

Both Impossibility and Force Majeure Event



**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 9 of 24

CRITERIA (A) A lower risk substitute is not currently or potentially available.

Haskris is actively developing chillers for use with R454b instead of R407c. R454b has a GWP of 466. At this time, several critical components specifically designed for R454b, that are necessary for the manufacture of Haskris chillers, are not commercially available.

Additionally, Haskris considered using R454c, R32, propane (R290), ammonia (NH<sub>3</sub>), and CO<sub>2</sub>. Each of these substitutes presents different technical challenges and deficiencies. For some refrigerants, the flammability and toxicity exceeds acceptable levels for use in most Haskris chiller applications including locations such as healthcare and laboratory applications. For some refrigerants, components exist, but they do not meet design requirements for Haskris customer applications. These substitute refrigerants and associated components would violate certain standards such as "Copy-Exact Process" (CEP) in the semiconductor industry because they significantly alter the size, layout, and/or function of the Haskris chillers. Of the available potential low-GWP solutions, R454b is the best substitute for R407c that meets Haskris requirements, as well as providing the most expedient avenue for implementation.

**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 10 of 24

CRITERIA (B) An exemption will not increase the overall risk to human health or the environment.

Haskris chillers with R407c are hermetically sealed, packaged systems. Leaks should be near zero. Haskris minimizes common leak points in the refrigeration circuit by never using flange connections, rarely using flares, and primarily using pressure-tested braze connections. Haskris performs a minimum of 3 tests to ensure the leak-tight refrigeration circuit and the refrigeration circuit is factory charged with refrigerant by Haskris prior to shipment. Haskris chillers are designed with no requirement to add charge over the life of those systems (approximately 20 years). R407c is non-toxic and non-flammable.

Regarding safety, Haskris prioritizes the safety of customers using our chillers. Most Haskris chillers carry NRTL label per UL safety standards, and all manufacturing follows UL safety practices. Currently, UL approved industrial refrigeration components for R454b that that Haskris requires for manufacturing chillers are not all available yet. Haskris considers acquiring UL approved components and manufacturing with those components to be an important step toward ensuring user safety.



**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 11 of 24

CRITERIA (C) Haskris has used best efforts to anticipate and address the impossibility and any potential noncompliance.

Please see the details below described in 95378 (c) (1) (G).

Please see the list below of supporting documents.

- 01 – █████ COMPRESSOR AVAILABILITY
- 02 – █ COMPRESSOR AVAILABILITY
- 03 – █████ COMPRESSOR AVAILABILITY
- 04 – █████ MOST RECENT WEEKLY OPEN ACTIVITY REPORT
- 05 – EXAMPLE ORDER AND RECEIPT TRANSACTION ILLUSTRATING EXTENDED PROTOTYPE LEAD TIMES
- 06 – █████ COMMUNICATION ABOUT LACK OF INTEREST AND DEVELOPMENT FOR R454C
- 07 – █████ COMMUNICATION ABOUT LACK OF DEVELOPMENT FOR R454C
- 08 – EPA - FINAL RULE - PHASEDOWN OF HFCs
- 09 – COMPARISON OF EPA AND CARB DEADLINES FOR CHILLERS
- 10 – EPA - SNAP PROPOSED RULE 26

**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 12 of 24

**95378 (c) (1) (G) Description of all efforts made to timely fulfill the requirements of the section(s) from which a variance is being requested**

The timeline below describes the efforts past and present that Haskris has made to anticipate and address the issues related to the transition to low-GWP refrigerants.

Early 2022

- Haskris attended seminars and trade shows regarding A2L refrigerants.
- Haskris attended seminars and trade shows regarding industry plans for transitioning to low-GWP refrigerants.
- Haskris began investigating how to comply with low-GWP regulations in partnership with our suppliers including:

[REDACTED]

Mid to Late 2022

- Haskris contacted all our existing refrigeration component suppliers to discuss technical considerations regarding multiple low-GWP refrigerants.
- At this time, components had not yet been designed by the component manufacturers and the industry was unclear which low-GWP refrigerants would be favored by the broader refrigeration industry.
- Some manufacturers contacted Haskris engineers for guidance on component design decisions.

Early 2023

- Haskris attended seminars and trade shows.
- Component manufacturers provided lists of test sample components.
- Haskris ordered components from multiple suppliers. This was done proactively to simultaneously consider all supplier options and qualify multiple component options.
- Lead times for sample components were up to [REDACTED].



**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 13 of 24

Mid 2023

- Haskris inquired with multiple manufacturers regarding if components could be produced early for Haskris. This was an attempt to move more quickly to meet regulatory timelines.

[REDACTED]

Late 2023

- Haskris received sample components.
- Haskris engineers inspected sample components and manufactured prototype units for initial testing.
- Suppliers notified Haskris that the component manufacturing supply chain was focused on comfort cooling components because the comfort cooling industry was targeting a major implementation date for the EPA of January 1, 2025. As a result, planning and scaling production for industrial process refrigeration components was made a lower priority.

**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 14 of 24

January 2024

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

- Haskris attended seminars and trade shows for additional coordination with the industry.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

- Specifically, the following components are the primary concern. For each component, Haskris is actively working with several suppliers. These are the only suppliers Haskris found that meet the technical requirements. Each supplier has acknowledged similar limitations including [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 15 of 24

**95378 (c) (1) (H) Length of variance requested as well as the earliest date when compliance will be achieved**

Haskris requests a Variance to January 1, 2025 all chillers.

Haskris hopes to have production components delivered, NRTL listing per UL complete, and production processes implemented by these dates.

**95378 (c) (1) (I) A compliance plan that describes in detail how, if a variance is granted, compliance will be achieved as expeditiously as possible, including the method by which compliance will be achieved, milestone dates, and milestone achievements**

For indoor-rated chillers with capacities of 1 refrigeration ton and smaller that currently use R134a, Haskris is immediately transitioning to R513a. By the end of February 2024, this transition will be effective and ongoing through 2024. This transition will eliminate the use of R134a in Haskris chillers.



**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 16 of 24

**Haskris Product Group #1:** For outdoor-rated chillers with capacities larger than 5 refrigeration tons, the milestone dates to achieve compliance would be as follows, with the understanding that all the component receipt dates are estimates over which Haskris has no direct control:

[REDACTED]

**Haskris Product Group #2:** For outdoor-rated chillers with capacities of 5 refrigeration tons or smaller and all indoor-rated chillers that currently use R407c, the milestone dates to achieve compliance would be as follows, with the understanding that all the component receipt dates are estimates over which Haskris has no direct control:

[REDACTED]

**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 17 of 24

**95378 (c) (1) (J) Description of the damage or harm that will result to the Applicant from immediate compliance with the regulatory requirements, including if compliance would result in an extraordinary economic hardship, such as closure of the entire facility or loss of a large portion of the revenue**

If no variance is allowed and Haskris immediately complies, Haskris conservatively estimates ██████████ in lost revenue. This is due to immediate cessation of deliveries to California. Additionally, a lack of variance can also negatively impact revenue associated with deliveries to other states. This is an extraordinary economic hardship for a family-owned, US-based manufacturer.

**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 18 of 24

**95378 (c) (1) (K) For variance requests based on impossibility, quantification of current GHG emissions resulting from normal business-as-usual operations as it directly relates to the continued use of any substance in end-uses listed in Table 1, section 95374(a); Table 2, section 95374(b); Table 3, section 95374(c); or Table 4, section 95374(d). This includes quantification of the direct GHG emissions resulting from refrigerant leaks or HFC emissions and indirect GHG emissions resulting from energy use (where applicable), with all calculations, based on the average lifetime of the equipment or product that will continue to use prohibited substances. Applicant must include all calculations used to calculate GHG emissions estimates, including emission factors (i.e., charge size as defined in section 95373, leak rate as defined in 40 C.F.R. Part 82.152, and refrigerant used over the average lifetime of the equipment, system, or product);**

Haskris chillers with R407c are hermetically sealed, packaged systems. Leaks should be near zero. Haskris minimizes common leak points in the refrigeration circuit by never using flange connections, rarely using flares, and primarily using pressure-tested braze connections. Haskris performs a minimum of 3 tests to ensure the leak-tight refrigeration circuit and the refrigeration circuit is factory charged with refrigerant by Haskris prior to shipment. Haskris chillers are designed with no requirement to add charge over the life of those systems (approximately 20 years).

- Per above, the chillers do not need a recharge over the life of the systems.
- Haskris equipment is installed in laboratory, medical, and industrial facilities. These are distinct and separate from any residential or commercial facilities. These facilities use equipment and licensed technicians to reclaim refrigerants at end-of-life according to EPA and CARB regulations. This prevents the emission of refrigerant into the atmosphere.
- Haskris chillers have an operational charge tolerance of [REDACTED] to continue normal operation. This means that a system can lose up to [REDACTED] of its charge over the course of [REDACTED] and still operate properly until end of life.



**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 19 of 24

- According to title 40 subpart C.F.R. Part 82.152, that gives an annualized leak rate of 0.25%. Below calculations show total GHG emissions.

[REDACTED]

[REDACTED]

[REDACTED]

Product Family	Model	Group	Typ. R407c Charge	Qty of Units	Exp. R407c Charge
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]				[REDACTED]	[REDACTED]
					[REDACTED]
					[REDACTED]

**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 20 of 24

[REDACTED]

**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 21 of 24

- Tables below show:
  - The “worst case” scenario impact of R407c assuming all refrigerant charge is lost is 227.2 MTCO2e
  - The “leakage only” scenario impact of R407c is 0.6 MTCO2e annually. As previously mentioned the refrigerant in Haskris medical, laboratory, and industrial equipment is fully reclaimed at the end-of-life in compliance with EPA and CARB regulations.
  - The “difference” noted reflects how much CO2 equivalent would be emitted if the variance is approved. This is the amount of emissions that must be mitigated per 95378 (c) (1) (M).

**Worst Case 2024 - R407c MTCO2e Impact for California**

A	B	C	D	E	F
Refrigerant	GWP	Pounds Per Year	Loss Rate %	Pounds CO2e	MTCO2e
█	█	█	█	█	█
█	█	█	█	█	█

**Leakage Only 2024 - R407c MTCO2e Impact for California**

A	B	C	D	E	F
Refrigerant	GWP	Pounds Per Year	Loss Rate %	Pounds CO2e	MTCO2e
█	█	█	█	█	█
█	█	█	█	█	█

EQ1: B x C x (D/100) = E

EQ2: E / 2204.62 = F

EQ3: (a) - (b) = (c)

NOTE: R454b is the Haskris low GWP alternate for R407c



**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 22 of 24

**95378 (c) (1) (L) Description of any negative impacts to human health or the environment that may result from the granting of a variance**

Haskris chillers with R407c are hermetically sealed, packaged systems. Leaks should be near zero. Haskris minimizes common leak points in the refrigeration circuit by never using flange connections, rarely using flares, and primarily using pressure-tested braze connections. Haskris performs a minimum of 3 tests to ensure the leak-tight refrigeration circuit and the refrigeration circuit is factory charged with refrigerant by Haskris prior to shipment. Haskris chillers are designed with no requirement to add charge over the life of those systems (approximately 20 years). R407c is non-toxic and non-flammable.

**95378 (c) (1) (M) A mitigation plan that demonstrates how the Applicant will reduce excess GHG emissions to a level equal to or below what would have been emitted had the Applicant been in compliance and how the Applicant will mitigate any negative impacts to human health or the environment. The Applicant must include all calculations used to calculate GHG emissions estimates, including emission factors (i.e., charge size as defined in section 95373, leak rate as defined in 40 C.F.R. Part 82.152, and refrigerant used over the average lifetime of the equipment, system, or product). This may include an analysis of options to minimize usage of prohibited substances, efforts to reduce leaks or venting of prohibited substances, and options to recycle or destroy high-GWP refrigerant(s)**

Haskris will reduce excess GHG emissions that may result from the granting of this variance by expanding the Haskris refrigerant recycling program at the Haskris factory. When used chillers are refurbished at the Haskris factory, we will use recycled refrigerant in lieu of virgin refrigerant.

[REDACTED]

**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 23 of 24

[REDACTED]

Product Family	Model	Typ. R134a Charge	Qty of Units	Exp. R134a Charge
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]			[REDACTED]	[REDACTED]

**Section 95378. Variance per Final Regulation Order California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4**

Page 24 of 24

- Tables below show:
  - On a monthly basis, the Haskris transition to low-GWP R513a early will save 46.6 MTCO2e per month
  - 10 months worth of this savings is a significant offset to Haskris' estimated emissions
    - Worst Case 2024 - R407c MTCO2e Impact for California: 227.2 MTCO2e
    - 10 Months of R513a Conversion Offset Impact: 465.7 MTCO2e
    - Haskris' accelerated transition to R513a more than offsets the estimated emissions from R407c that could result from the variance approval.

**10 Months of R513a Conversion Offset Impact**

A	B	C	E	F
Refrigerant	GWP	Pounds Per Year	Pounds CO2e	MTCO2e
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]				[REDACTED]
[REDACTED]				[REDACTED]

EQ1: B x C x (D/100) = E  
 EQ2: E / 2204.62 = F  
 EQ3: (a) - (b) = (c)  
 EQ4: (c) x 10 / 12 = (d)  
 NOTE: R513a is the Haskris low GWP alternate for R134a

- If the Haskris carbon offsets through voluntary refrigerant transitions are deemed insufficient by the CARB Executive Officer and decision-making team, Haskris will procure additional carbon offsets from a reputable, certified, provider in order to satisfy compliance with 95378 (c) (1) (M).

**95378 (c) (1) (N) A detailed explanation of efforts that may be implemented to curtail noncompliance in lieu of obtaining a variance**

Haskris has made all efforts to comply, but we are fully dependent on component manufacturers and supply chain constraints. Haskris is prepared to perform all necessary validation testing, transition production to low-GWP refrigerants, and comply with regulations as soon as supply chain constraints are resolved. In lieu of a variance, due to the nature of our application requirements, no alternate solutions exist at this time.





# Technology Transitions Program

## FACT SHEET

### Final Rule - Phasedown of Hydrofluorocarbons: Restrictions on the Use of Certain Hydrofluorocarbons under Subsection (i) of the American Innovation and Manufacturing Act of 2020

The American Innovation and Manufacturing (AIM) Act was enacted on December 27, 2020. The AIM Act authorizes the U.S. Environmental Protection Agency (EPA) to address hydrofluorocarbons (HFCs) in three main ways: (1) phasing down their production and consumption, (2) promulgating certain regulations for purposes of maximizing reclamation and minimizing releases of HFCs from equipment and ensuring the safety of technicians and consumers, and (3) facilitating the transition to next-generation technologies through sector-based restrictions. This final rule focuses on the third area – the transition to substitutes through sector-based restrictions.

Under the AIM Act, the United States is phasing down HFCs. In 2023, HFC production and consumption are limited to 90 percent of their historical baseline levels. In 2024, the total quantity of allowed HFC production and consumption will drop by a further 30 percent – to 60 percent of the historic baseline. In 2029, these quantities will decline to 30 percent of historic baseline. Thus, most of the HFC phasedown will occur within the next six years. This final rule supports the HFC phasedown in the United States by transitioning sectors or subsectors to lower-GWP substitutes where those substitutes are, or soon will be, available.

#### Overview of this Final Rule

This final rule, signed on Oct 5, 2023, restricts the use of higher-GWP HFCs in new aerosol, foam, and refrigeration, air conditioning, and heat pump (RACHP) products and equipment. These restrictions address [petitions](#) from industry, environmental organizations, and state governments that EPA granted on October 7, 2021, and September 19, 2022.

In most subsectors, EPA has set a maximum GWP limit on HFCs or HFC blends that can be used. In a few subsectors, EPA has listed the specific HFCs or HFC blends that are restricted.

#### About HFCs

HFCs are potent greenhouse gases intentionally developed as replacements for ozone-depleting substances in the refrigeration and air conditioning, aerosols, fire suppression, foam blowing, and other sectors. They have global warming potentials (GWPs; a measure of the relative climate impact of a greenhouse gas) that can be hundreds to thousands of times greater than that of carbon dioxide.

The rule operates by:

- prohibiting the manufacture and import of products that use higher-GWP HFCs;
- prohibiting the sale, distribution, and export of those products three years after the manufacture and import restriction; and
- prohibiting the installation of new RACHP systems that use higher-GWP HFCs.

Compliance dates and GWP limits vary based on sector and subsector and appear in the tables at the end of this document. To support compliance with these prohibitions, EPA is also requiring that all new products and components using HFCs be labeled and that companies that manufacture or import such products or components using HFCs report certain information to EPA.

## Benefits of The Final Rule

This rule will result in greenhouse gas emissions reductions benefits while providing savings to American consumers and industry through energy efficiency gains and lower cost substitutes. EPA estimates that this rule will result in emission reductions of up to 876 million metric tons carbon dioxide equivalent through 2050. EPA estimates that the monetized climate change mitigation benefits alone may be as much as \$50.4 billion in 2020 dollars. In addition to the climate benefits from avoided emissions of HFCs, EPA estimates that this rule provides up to \$4.5 billion in cost savings to consumers and businesses. This benefit is largely driven by the lower cost of HFC substitutes and increased energy efficiency of products using lower-GWP substitutes.

## Entities Affected by This Rule

Entities that manufacture, import, export, sell, distribute, or install systems or products that use HFCs in refrigeration and air-conditioning equipment systems, heat pumps, foams, and aerosols may be affected by this rule. Restrictions apply to original equipment manufacturers, product distributors, retailers, and companies that direct the installation of new RACHP systems.

## RACHP Systems versus Products

The final rule makes a distinction between RACHP *products* and *systems*. The rule restricts the manufacture and import of certain RACHP products and the installation of certain RACHP systems.

A *product* is functional upon leaving a factory. Examples of products include window air conditioning units, refrigerators, and stand-alone ice machines. EPA is restricting the sale, distribution, and export of products containing higher-GWP HFCs three years after the manufacture/import restriction dates.

A *system* is assembled and charged in the field using multiple components. Examples include supermarket refrigeration systems that include a centralized compressor room and mini-split air conditioners. Components include equipment such as compressors, condensers, and display cabinets. In this rule, EPA is not restricting the manufacture, import, sale, distribution, or export of components that are used to repair existing RACHP systems.

## Compliance Dates

The final rule restricts the sale, distribution, import, and export of products containing higher-GWP HFCs three years after the manufacture and import restriction dates. The sales restriction does not apply to components that are used to repair legacy RACHP. This rule also restricts the installation of certain RACHP systems.

Restrictions on the manufacture and import of products and installation of RACHP systems take effect on different dates varying by subsector. The earliest restrictions start January 1, 2025, (or model year 2025, but no earlier than one year after publication of the final rule, for some motor vehicle air conditioners). The latest restrictions start January 1, 2028. EPA set these dates by considering the availability of substitutes and other factors prescribed in the AIM Act. A list of restrictions in each of the covered sectors and associated compliance dates appears at the end of this document.

## Maintenance of Legacy Systems

This rule does not restrict the continued use of any existing products or RACHP systems. Allowing existing systems to continue to operate to the end of their useful life is important to ensuring a smooth transition in the phasedown of HFCs. A product or system may be serviced and repaired throughout its useful life; this includes replacing components, as needed. Components needed to repair existing RACHP equipment may continue to be manufactured, imported, sold, distributed, or exported.

In this rule, EPA defines the distinction between maintenance of a system and installation of a new system. Specifically, the following actions, upon charging the system to full charge, are considered a new installation of a RACHP system and thus subject to the relevant HFC use restrictions:

- Assembling a system for the first time from used or new components;
- Increasing the cooling capacity, in BTU per hour, of an existing system; or
- Replacing 75 percent or more of evaporators (by number) and 100 percent of the compressor racks, condensers, and connected evaporator loads of an existing system.

## Labeling

To support compliance with the prohibitions in this rule, EPA is requiring that all new products and components using HFCs be labeled and that companies that manufacture or import such products or components using HFCs report certain information to EPA.



All aerosols, foams, and RACHP products, components, and systems must be labeled if they continue to use an HFC. This requirement takes effect on the same date as the manufacture and import restriction (i.e., 2025–2028). The label must indicate the HFC being used along with other information, including date of manufacture for products and components. New RACHP replacement components using higher-GWP HFCs must have a label indicating they are for servicing existing equipment only.

## Reporting

EPA is requiring annual online reporting from manufacturers and importers of products and specified components of RACHP equipment covered by this rule. This requirement takes effect for all sectors and subsectors beginning with calendar year 2025 data. Reports are due to EPA 90 days after the end of each calendar year. Thus, the first reports submitted by manufacturers and importers under this rule will be due March 31, 2026. EPA intends to conduct a series of trainings and stakeholder outreach as we plan for implementation of the reporting provisions.

## Import and Export Provisions

The restrictions in this rule apply equally to domestically manufactured and imported products and the restrictions on import and manufacture of new products containing higher-GWP HFCs take effect on the same dates. Products restricted under this rule from using certain HFCs cannot be manufactured in the U.S. and then exported.

The rule allows for continued import and domestic manufacture of components for servicing legacy RACHP systems. Components manufactured for the purpose of servicing legacy RACHP systems may be domestically manufactured and then exported.

## Subsectors Exempt from This Rule

The restrictions do not apply to any product or system for which application-specific HFC allowances are provided under subsection (e)(4)(B) of the AIM Act. As such, this action currently does not restrict use of HFCs in the following applications:

- As a propellant in metered dose inhalers
- In the manufacture of defense sprays
- In the manufacture of structural composite preformed polyurethane foam for marine use and trailer use
- Etching of semiconductor material or wafers and the cleaning of chemical vapor deposition chambers within the semiconductor manufacturing sector
- Mission-critical military end uses
- Onboard aerospace fire suppression

## For More Information

For more information, please visit the [Technology Transitions website](#).

## Sector Reference Tables

For each regulated technology sector, the reference tables below provide information on the GWP limits and/or prohibited substances, as well as compliance dates.

- [Aerosols](#)
- [Foams](#)
- [Self-contained Refrigeration, Air Conditioning, and Heat Pump Products](#)
- [Refrigeration, Air Conditioning, and Heat Pump Systems](#)

## Restricted Products by Sector and Subsector

Aerosol Products*		
Subsector	Global Warming Potential Limit or Prohibited Substances	Manufacture and Import Compliance Date <sup>1</sup>
Consumer aerosol products	150	January 1, 2025
Technical aerosol products <sup>2</sup>	150	January 1, 2028

Foam Products*		
Subsector	Global Warming Potential Limit or Prohibited Substances	Manufacture and Import Compliance Date <sup>1</sup>
Polyurethane <sup>3</sup> (rigid, flexible, integral skin, laminated boardstock)	150	January 1, 2025
Polystyrene extruded boardstock and billet and extruded sheet	150	January 1, 2025
Phenolic insulation board and bunstock	150	January 1, 2025
Polyisocyanurate laminated boardstock	150	January 1, 2025
Polyolefin	150	January 1, 2025

<b>Self-contained Refrigeration, Air Conditioning, and Heat Pump Products*</b>			
<b>Subsector</b>	<b>Products</b>	<b>Global Warming Potential Limit or Prohibited Substances</b>	<b>Manufacture and Import Compliance Date<sup>1</sup></b>
Stationary residential and light commercial air conditioning and heat pumps	Stationary residential and light commercial air conditioning and heat pumps (e.g., window units, portable room air conditioning)	700	January 1, 2025
Residential dehumidifiers	Residential dehumidifiers	700	January 1, 2025
Household refrigerators and freezers	Household refrigerators and freezers	150	January 1, 2025
Vending machines	Vending machines	150	January 1, 2025
Motor vehicle air conditioning	Light-duty passenger vehicles	150	Model Year 2025, and no earlier than one year after publication in the Federal Register
	Medium-duty passenger vehicles, heavy-duty pick-up trucks, complete heavy-duty vans	150	Model Year 2028
	Listed nonroad vehicles (agricultural tractors greater than 40 horsepower; self-propelled agricultural machinery; compact equipment; construction, forestry, and mining equipment; and commercial utility vehicles)	150	January 1, 2028
Chillers (as a stand-alone product)	Industrial process refrigeration with exiting fluid below -50 °C (-58 °F)	Not covered	Not covered
	Industrial process refrigeration with exiting fluid greater than or equal to -50 °C (-58 °F) and less than -30 °C (-22 °F)	700	January 1, 2028
	Industrial process refrigeration with exiting fluid equal to or above -30 °C (-22 °F)	700	January 1, 2026
	Comfort cooling	700	January 1, 2025
	Ice rinks	700	January 1, 2025



<b>Self-contained Refrigeration, Air Conditioning, and Heat Pump Products*</b>			
<b>Subsector</b>	<b>Products</b>	<b>Global Warming Potential Limit or Prohibited Substances</b>	<b>Manufacture and Import Compliance Date<sup>1</sup></b>
Data centers, computer room air conditioning, and information technology equipment cooling	Data centers, computer room air conditioning, and information technology equipment cooling	700	January 1, 2027
Industrial process refrigeration (not using chillers)	With refrigerant entering the evaporator below -50 °C (-58 °F)	Not covered	Not covered
	With refrigerant entering the evaporator equal to or above -50 °C (-58 °F) and less than -30 °C (-22 °F)	700	January 1, 2028
	High temperature side of cascade system and temperature of the refrigerant entering the evaporator equal to or above -30 °C (-22 °F)	300	January 1, 2026
	With less than 200 lb refrigerant charge and temperature of the refrigerant entering the evaporator equal to or above -30 °C (-22 °F)	300	January 1, 2026
	With 200 or more lb refrigerant charge excluding high temperature side of cascade system and temperature of the refrigerant entering the evaporator equal to or above -30 °C (-22 °F)	150	January 1, 2026
Retail food - refrigeration stand-alone units	Retail food - refrigeration stand-alone units	150	January 1, 2025

<b>Self-contained Refrigeration, Air Conditioning, and Heat Pump Products*</b>			
<b>Subsector</b>	<b>Products</b>	<b>Global Warming Potential Limit or Prohibited Substances</b>	<b>Manufacture and Import Compliance Date<sup>1</sup></b>
Retail food - refrigerated food processing and dispensing equipment	500 g of refrigerant or less and outside scope of UL 621, edition 7	150	January 1, 2027
	More than 500 g of refrigerant and outside scope of UL 621, edition 7	R-402A, R-402B, R-404A, R-407A, R-407B, R-407C, R-407F, R-407H, R-408A, R-410A, R-410B, R-411A, R-411B, R-417A, R-417C, R-420A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-426A, R-427A, R-428A, R-434A, R-437A, R-438A, R-507A, HFC-134a, HFC-227ea, R-125/290/134a/600a (55/1/42.5/1.5), RB-276, RS-24 (2002 formulation), RS-44 (2003 formulation), GHG-X5, Freeze 12	January 1, 2027
	Ice cream makers within the scope of UL 621, edition 7	R-402A, R-402B, R-404A, R-407A, R-407B, R-407C, R-407F, R-407H, R-408A, R-410A, R-410B, R-411A, R-411B, R-417A, R-417C, R-420A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-426A, R-427A, R-428A, R-434A, R-437A, R-438A, R-507A, HFC-134a, HFC-227ea, R-125/290/134a/600a (55/1/42.5/1.5), RB-276, RS-24 (2002 formulation), RS-44 (2003 formulation), GHG-X5, Freeze 12	January 1, 2028

<b>Self-contained Refrigeration, Air Conditioning, and Heat Pump Products*</b>			
<b>Subsector</b>	<b>Products</b>	<b>Global Warming Potential Limit or Prohibited Substances</b>	<b>Manufacture and Import Compliance Date<sup>1</sup></b>
Self-contained automatic commercial ice machines	Batch type: harvest rate <=1,000 lb ice per 24 hours	150	January 1, 2026
	Continuous type: harvest rate <=1,200 lb ice per 24 hours	150	January 1, 2026
	Batch type: harvest rate above 1,000 lb ice per 24 hours	R-402A, R-402B, R-404A, R-407A, R-407B, R-407C, R-407F, R-408A, R-410A, R-410B, R-411A, R-411B, R-417A, R-417C, R-420A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-426A, R-428A, R-434A, R-437A, R-438A, R-442A, R-507, R-507A, HFC-134a, R-125/290/134a/600a (55/1/42.5/1.5), RB-276, RS-24 (2002 formulation), RS-44 (2003 formulation), GHG-X5, G2018C, Freeze 12	January 1, 2027
	Continuous type: harvest rate above 1,200 lb ice per 24 hours	R-402A, R-402B, R-404A, R-407A, R-407B, R-407C, R-407F, R-408A, R-410A, R-410B, R-411A, R-411B, R-417A, R-417C, R-420A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-426A, R-428A, R-434A, R-437A, R-438A, R-442A, R-507, R-507A, HFC-134a, R-125/290/134a/600a (55/1/42.5/1.5), RB-276, RS-24 (2002 formulation), RS-44 (2003 formulation), GHG-X5, G2018C, Freeze 12	January 1, 2027
Cold storage warehouses	With 200 or more lb refrigerant charge, excluding high temperature side of cascade system	150	January 1, 2026
	With less than 200 lb refrigerant charge	300	January 1, 2026
	High temperature side of cascade system	300	January 1, 2026



<b>Self-contained Refrigeration, Air Conditioning, and Heat Pump Products*</b>			
<b>Subsector</b>	<b>Products</b>	<b>Global Warming Potential Limit or Prohibited Substances</b>	<b>Manufacture and Import Compliance Date<sup>1</sup></b>
Refrigerated transport <sup>4</sup>	Intermodal containers with refrigerant temperature entering the evaporator below -50 °C (-58 °F)	Not covered	Not covered
	Intermodal containers with refrigerant temperature entering the evaporator equal to or above -50 °C (-58 °F)	700	January 1, 2025
	Road—self-contained products	R-402A, R-402B, R-404A, R-407B, R-408A, R-410B, R-417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-428A, R-434A, R-438A, R-507A, R-125/290/134a/600a (55/1/42.5/1.5), RS-44 (2003 formulation), GHG-X5	January 1, 2025
	Marine—self-contained products	R-402A, R-402B, R-404A, R-407B, R-408A, R-410B, R-417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-428A, R-434A, R-438A, R-507A, R-125/290/134a/600a (55/1/42.5/1.5), RS-44 (2003 formulation), GHG-X5	January 1, 2025

Refrigeration, Air Conditioning, and Heat Pump Systems*			
Sector	Systems	Global Warming Potential Limit or Prohibited Substances	Installation Compliance Date <sup>5</sup>
Stationary air conditioning and heat pumps	Residential and light commercial air conditioning and heat pump systems (e.g., mini-splits, unitary systems)	700	January 1, 2025
	Variable refrigerant flow systems	700	January 1, 2026
Chillers	Industrial process refrigeration with exiting fluid below -50 °C (-58 °F)	Not covered	Not covered
	Industrial process refrigeration with exiting fluid from -50 °C (-58 °F) to -30 °C (-22 °F)	700	January 1, 2028
	Industrial process refrigeration with exiting fluid above -30 °C (-22 °F)	700	January 1, 2026
	Comfort cooling	700	January 1, 2025
Ice rinks	Ice rinks	700	January 1, 2025
Data centers, computer room air conditioning, and information technology equipment cooling	Data centers, computer room air conditioning, and information technology equipment cooling	700	January 1, 2027
Industrial process refrigeration (not using chillers)	With 200 or more lb refrigerant charge excluding high temperature side of cascade system and temperature of the refrigerant entering the evaporator above -30 °C (-22 °F)	150	January 1, 2026
	With less than 200 lb refrigerant charge and temperature of the refrigerant entering the evaporator above -30 °C (-22 °F)	300	January 1, 2026
	High temperature side of cascade systems and temperature of the refrigerant entering the evaporator above -30 °C (-22 °F)	300	January 1, 2026
	Temperature of the refrigerant entering the evaporator from -50 °C (-58 °F) to -30 °C (-22 °F)	700	January 1, 2028
	Temperature of the refrigerant entering the evaporator below -50 °C (-58 °F)	Not covered	Not covered

Refrigeration, Air Conditioning, and Heat Pump Systems*			
Sector	Systems	Global Warming Potential Limit or Prohibited Substances	Installation Compliance Date <sup>5</sup>
Cold storage warehouses	With 200 or more lb refrigerant charge, excluding high temperature side of cascade system	150	January 1, 2026
	With less than 200 lb refrigerant charge	300	January 1, 2026
	High temperature side of cascade system	300	January 1, 2026
Retail food - supermarkets	With 200 or more lb refrigerant charge, excluding high temperature side of cascade system	150	January 1, 2027
	With less than 200 lb refrigerant charge	300	January 1, 2027
	High temperature side of cascade systems	300	January 1, 2027
Retail food - remote condensing units	With 200 or more lb refrigerant charge, excluding high temperature side of cascade system	150	January 1, 2026
	With less than 200 lb refrigerant charge	300	January 1, 2026
	High temperature side of cascade system	300	January 1, 2026
Remote automatic commercial ice machines	Retail food - remote refrigerated food processing and dispensing equipment	R-402A, R-402B, R-404A, R-407A, R-407B, R-407C, R-407F, R-407H, R-408A, R-410A, R-410B, R-411A, R-411B, R-417A, R-417C, R-420A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-426A, R-427A, R-428A, R-434A, R-437A, R-438A, R-507A, HFC-134a, HFC-227ea, R-125/290/134a/600a (55/1/42.5/1.5), RB-276, RS-24 (2002 formulation), RS-44 (2003 formulation), GHG-X5, Freeze 12	January 1, 2027
	Remote automatic commercial ice machines	R-402A, R-402B, R-404A, R-407B, R-408A, R-410B, R-417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-428A, R-434A, R-438A, R-507A, R-125/290/134a/600a (55/1/42.5/1.5), RS-44 (2003 formulation), GHG-X5	January 1, 2027



Refrigeration, Air Conditioning, and Heat Pump Systems*			
Sector	Systems	Global Warming Potential Limit or Prohibited Substances	Installation Compliance Date <sup>5</sup>
Refrigerated transport	Intermodal containers with exiting fluid temperature from a chiller below -50 °C (-58 °F)	Not covered	Not covered
	Intermodal containers with exiting fluid temperature from a chiller equal to or above -50 °C (-58 °F)	700	January 1, 2025
	Road systems	R-402A, R-402B, R-404A, R-407B, R-408A, R-410B, R-417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-428A, R-434A, R-438A, R-507A, R-125/290/134a/600a (55/1/42.5/1.5), RS-44 (2003 formulation), GHG-X5	January 1, 2025
	Marine systems	R-402A, R-402B, R-404A, R-407B, R-408A, R-410B, R-417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-428A, R-434A, R-438A, R-507A, R-125/290/134a/600a (55/1/42.5/1.5), RS-44 (2003 formulation), GHG-X5	January 1, 2025

\*These tables are for informational purposes only and should not be relied on for compliance purposes. Please refer to 40 CFR Part 82, Subpart B for full details.

<sup>1</sup>Sale, distribution, and export of these products is prohibited three years after the manufacture and import compliance date.

<sup>2</sup>See regulatory text for specific types of aerosol products subject to the later compliance date. Excludes metered dose inhalers using HFC-134a or HFC-227ea or defense sprays using HFC-134a as a propellant.

<sup>3</sup>Includes blown foam, products incorporating blown foam, and pre-blended polyol products. Excludes composite structural preformed polyurethane foam for trailer use and for marine use.

<sup>4</sup>New products only; does not apply to equipment that is operational during transport.

<sup>5</sup>EPA is restricting the installation of new field-assembled systems. Components used to repair existing systems are not subject to these restrictions.

# CARB & EPA COMPARISON

2/6/24

**CARB and EPA are aligned regarding compliance timeline for small air-conditioning equipment.**

- Per Final Rule - Phasedown of Hydrofluorocarbons: Restrictions on the Use of Certain Hydrofluorocarbons under Subsection (i) of the American Innovation and Manufacturing Act of 2020

<b>Self-contained Refrigeration, Air Conditioning, and Heat Pump Products*</b>			
<b>Subsector</b>	<b>Products</b>	<b>Global Warming Potential Limit or Prohibited Substances</b>	<b>Manufacture and Import Compliance Date<sup>1</sup></b>
Stationary residential and light commercial air conditioning and heat pumps	Stationary residential and light commercial air conditioning and heat pumps (e.g., window units, portable room air conditioning)	700	January 1, 2025

- Per Final Regulation Order, California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4, Section 95374 (c) Table 3: End-Use and Prohibited Substances.

<b><u>New Air-conditioning Equipment, Stationary</u></b>			
<u>Air-conditioning Equipment</u>	<u>Other air-conditioning (new) equipment, residential and non-residential</u>	<u>Refrigerants with a GWP of 750 or greater</u>	<u>Prohibited as of January 1, 2025</u>

**Industry agrees with this timeline and is prepared to deliver components for these systems based on January 1, 2025 compliance date.**

**Haskris chillers must comply with a compliance date of January 1, 2024 compliance date because of CARB product classification.**

- Per Final Regulation Order, California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4, Section 95374 (c) Table 3: End-Use and Prohibited Substances.

<b><u>New Chillers</u></b>			
<b><u>Chillers – Industrial Process Refrigeration</u></b>	<b><u>Chillers (new) designed for chilled fluid leaving the chiller at temperatures &gt; +35 °F (2 °C)</u></b>	<b><u>Refrigerants with a GWP of 750 or greater</u></b>	<b><u>Prohibited as of January 1, 2024</u></b>

**Haskris chillers use components designed for air-conditioning equipment which will be ready for the January 1, 2025 compliance date. This is primarily due to the size of the components involved in these industries.**

**Because of this discrepancy, the industry is not ready to supply components needed for Haskris chillers. This makes meeting the compliance date of January 1, 2024 impossible for Haskris chillers that will need to use R454b.**

**For comparison, Haskris chillers are subject to a compliance date of January 1, 2026 for the EPA.**

- Per Final Rule - Phasedown of Hydrofluorocarbons: Restrictions on the Use of Certain Hydrofluorocarbons under Subsection (i) of the American Innovation and Manufacturing Act of 2020

<b><u>Self-contained Refrigeration, Air Conditioning, and Heat Pump Products*</u></b>			
<b><u>Subsector</u></b>	<b><u>Products</u></b>	<b><u>Global Warming Potential Limit or Prohibited Substances</u></b>	<b><u>Manufacture and Import Compliance Date<sup>1</sup></u></b>
Chillers (as a stand-alone product)	Industrial process refrigeration with exiting fluid below -50 °C (-58 °F)	Not covered	Not covered
	Industrial process refrigeration with exiting fluid greater than or equal to -50 °C (-58 °F) and less than -30 °C (-22 °F)	700	January 1, 2028
	Industrial process refrigeration with exiting fluid equal to or above -30 °C (-22 °F)	700	January 1, 2026



May 2023

[www.epa.gov/ozone/snap](http://www.epa.gov/ozone/snap)

## FACT SHEET

# Proposed Rule 26 – Protection of Stratospheric Ozone: Listing of Substitutes under the Significant New Alternatives Policy Program in Commercial and Industrial Refrigeration

### Significant New Alternatives Policy (SNAP) Program

Under section 612 of the Clean Air Act (CAA), EPA reviews substitutes in a comparative risk framework. EPA lists these substitutes as acceptable, acceptable subject to use conditions, acceptable subject to narrowed use limits, or unacceptable (prohibited) for specific uses. Section 612 requires EPA to list as acceptable those substitutes that do not present a significantly greater risk to human health and the environment as compared with other substitutes that are currently or potentially available.

As part of the evaluation of overall risk to human health and the environment, EPA considers many criteria, including the flammability and toxicity of a substitute, worker and consumer exposure, and environmental risks such as impacts on ecosystems, local air quality, and on the global atmosphere.

### Today's Action

Under this proposed rule, 10 refrigerants would be listed as acceptable, subject to use conditions, in the Refrigeration & Air Conditioning sector. Consistent with CAA section 612 as it has historically been interpreted under the SNAP Program, EPA is proposing to issue these listings and modifications based on evaluation of the substitutes addressed in this action using the SNAP criteria for review and considering other available and potentially available substitutes. EPA is proposing use conditions that would reflect the Underwriters Laboratory (UL) Standard 60335-2-89, 2<sup>nd</sup> Edition, and the 2022 edition of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 15 standard.

### Final Rule

#### *What is proposed in the Rule?*

- Lists 10 refrigerants as acceptable, subject to use conditions
- Modifies use conditions for R-290 (propane)
- References latest version of UL 60335-2-89, ASHRAE 15-2022, and ASHRAE 34-2022
- Exempts R-290 in refrigerated food processing and dispensing equipment from the CAA section 608 venting prohibition

#### *Which industrial sectors are included?*

- Refrigeration & Air Conditioning

#### *Who would be affected?*

- Chemical producers
- Equipment manufacturers
- Commercial and consumer end users of equipment and products using refrigerants
- Service technicians



### AIM Act

The United States is phasing down hydrofluorocarbons (HFCs) consistent with the American Innovation and Manufacturing (AIM) Act’s schedule and has recently proposed to restrict the use of certain higher-global warming potential (GWP) HFCs in specific sectors and subsectors (December 15, 2022, 87 FR 76738). These proposed listings support the transitions from HFCs.

This action also proposes to modify use conditions for the refrigerant R-290 (propane) in certain refrigeration end uses. EPA previously listed R-290 acceptable, subject to use conditions, in new self-contained commercial ice machines and stand-alone equipment in SNAP Rules 21 (81 FR 86779; December 1, 2016) and 17 (76 FR 78837; December 20, 2011), respectively. This proposed action would modify those use conditions to reflect the UL Standard 60335-2-89, 2<sup>nd</sup> Edition, in place of UL Standards 563 and 471, and would apply to equipment manufactured after the effective date of a final rule based on this proposal. In addition to proposing to list propane as acceptable, subject to use conditions, as a refrigerant in new refrigerated food processing and

dispensing equipment, EPA is also proposing to exempt propane in that end-use from the venting prohibition under CAA section 608.

## Summary of Proposed Rule

### ACCEPTABLE ALTERNATIVES, WITH USE CONDITIONS

End-Use	Substitutes	Conditions <sup>1</sup>
<b>Refrigeration &amp; Air Conditioning</b>		
Commercial Ice Machines (New)	HFC-32, HFO-1234yf, R-454A, R-454B, R-454C, R-455A, R-457A, R-516A	Acceptable Subject to Use Conditions
Industrial Process Refrigeration (New)	HFC-32, <sup>2</sup> HFO-1234yf, HFO-1234ze(E), R-454A, <sup>3</sup> R-454B, <sup>2</sup> R-454C, R-455A, R-457A, R-516A	Acceptable Subject to Use Conditions
Cold Storage Warehouses (New)	HFO-1234yf, HFO-1234ze(E), R-454A, <sup>4</sup> R-454C, R-455A, R-457A, R-516A	Acceptable Subject to Use Conditions
Ice Skating Rinks (New)	HFO-1234yf, HFO-1234ze(E), R-454C, R-455A, R-457A, R-516A	Acceptable Subject to Use Conditions
Retail Food Refrigeration (New)—Refrigerated Food Processing and Dispensing Equipment and Stand-alone Units	HFO-1234yf, HFO-1234ze(E), R-454C, R-455A, R-457A, R-516A	Acceptable Subject to Use Conditions
Retail Food Refrigeration (New)—Refrigerated Food Processing and Dispensing Equipment	R-290 (propane)	Acceptable Subject to Use Conditions
Retail Food Refrigeration (New)—Supermarket Systems and Remote Condensing Units	HFO-1234yf, HFO-1234ze(E), R-454A, <sup>4</sup> R-454C, R-455A, R-457A, R-516A	Acceptable Subject to Use Conditions

<sup>1</sup> For specific use conditions for substitutes listed as Acceptable Subject to Use Conditions, consult the proposed rule.

<sup>2</sup> HFC-32 and R-454B may only be used in chillers for Industrial Process Refrigeration.

<sup>3</sup> R-454A may only be used in chillers, in equipment with a refrigerant charge capacity less than 200 pounds, or in the high-temperature side of a cascade system, for Industrial Process Refrigeration.

<sup>4</sup> R-454A may only be used in equipment with a refrigerant charge capacity less than 200 pounds, or in the high-temperature side of a cascade system for Cold Storage Warehouses and for Retail Food Refrigeration—Supermarket Systems and Remote Condensing Units.

## ACCEPTABLE ALTERNATIVES, WITH MODIFIED USE CONDITIONS

End-Use	Substitutes	Conditions <sup>1</sup>
<b>Refrigeration &amp; Air Conditioning</b>		
Commercial Ice Machines (New)—Self-contained Units	R-290	Acceptable only for use in new equipment <sup>2</sup> specifically designed for the refrigerant, including conditions requiring use consistent with UL Standard 60335-2-89, 2 <sup>nd</sup> Edition, including testing, charge sizes, ventilation, usage space requirements, and certain hazard warnings and markings
Retail Food Refrigeration (New)—Stand-alone Units		

<sup>1</sup> For specific use conditions, consult the proposed rule.

<sup>2</sup> Applies to new equipment manufactured after the effective date of a final rule based on this proposal.