MADISON AIR

# Regulatory Update

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## Deciphering the Refrigerant Phaseout Rules for Dehumidifiers

**Executive Summary**

There has been significant confusion in the HVAC industry around the effective phaseout dates of the refrigerants used in dehumidifiers. Much of it stems from three separate regulations with different effective dates: California, Washington, and EPA.

Dehumidifiers can be broken down into four basic classifications:

**Portable dehumidifiers** – units designed to be placed in the basement or a crawlspace of a home to dehumidify that area. These are typically units in the range of 30 – 120 ppd where the condensate could be piped away or collected in the unit for the owner to empty. (Full definition found in 10CFR430.2)

**Whole-home dehumidifiers** – units designed to be integrated into the HVAC ductwork of a home to provide dehumidification to the entire house's occupied areas. These are typically units in the range of 70 – 200 ppd with the condensate hard piped to a drain. (Full definition found in 10CFR430.2)

**Commercial, Industrial, and Agricultural (CIA) –** These are dehumidifiers that are not manufactured, sold or certified as Consumer Products. They are stationary units built to be hung in a CIA space or be integrated into the HVAC system. They are typically units in the range of 155 - 1,000 ppd with the condensate hard piped to a drain.

**Remediation/Restoration –** These are dehumidifiers that are not manufactured, sold or certified as Consumer Products. They are portable units designed to be temporarily placed in a space that has been saturated due to flooding or water used to extinguish a fire. They are typically units in the range of 80 – 300 ppd with the condensate hard piped to a drain.

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The effective date of the refrigerant phaseout depends on the classification of the unit:

| Type of Dehumidifier | CA (CARB) | WA (Dept of Ecology) | AIM Act (EPA) |
|---|---|---|---|
| Residential Dehumidifier (i.e. Portable) | 1/1/2023 | 1/1/2024 | 1/1/2025 |
| Whole-home, Commercial, Industrial, Agricultural, Remediation/Restoration Dehumidifier | 1/1/2025 | 1/1/2026 | 1/1/2025 |

Prior to the phaseout, R-410A (2,090 GWP) is/was the most common refrigerant used by U.S. manufacturers of dehumidifiers, especially the larger whole-home and non-consumer product units.

The new regulations do not specify a particular refrigerant that must be used. Rather the California and Washington regulations prohibit the use of refrigerants with a GWP of 750 or greater. The EPA drops that level to 700 GWP or less. Federal regulation also states that refrigerants used in the U.S. must receive SNAP (Significant New Alternative's Policy) approval from the EPA to be used. The following table provides a list of SNAP approved refrigerants that meet the new refrigerant requirements.

| Refrigerant | Trade Name(s) | GWP | ASHRAE Designation |
|---|---|---|---|
| R-454B | Opteon™ XL41 | 466 | A2L |
| R-513A* | Opteon® XP 10 | 630 | A2L |
| HFC-32 (R-32) | | 675 | A2L |
| R-452B | Opteon™ XL55 | 698 | R-452B |

* Only SNAP approved for "Residential Dehumidifiers".

Madison Air companies that build dehumidifiers have selected R-454B as the refrigerant for residential and commercial dehumidifiers. R-454B is a blend of 69% R-32 and 31% R-1234yf. The combination of lower GWP, operating characteristics similar to R-410A and inherently efficient properties made it an easy choice.

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**Introduction**

Most in our industry are familiar with the EPA's AIM Act, passed on December 27, 2020, and the subsequent Technology Transition Program that limits the use of climate-damaging hydrofluorocarbons (HFCs) in specific technology sectors and subsectors such as foam, aerosols, and refrigeration, air conditioning, and heat pumps. While these regulations will impact the entire United States, there was also legislation passed in California and Washington that phaseouts out some classifications of dehumidifiers prior to the AIM Act.

This article explains how dehumidifiers fit into the phaseout plans of California's final regulation order (Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 5, Sections 95371-95379 of the California Code of Regulations) and Washington State Department of Ecology's new rule (WAC 173-433) that was modeled after California's regulation. Both mandate the phaseout of residential dehumidifiers using refrigerants with a GWP higher than 750.

**Dehumidifier Classifications**

All dehumidifiers are not considered equal. The most common definition of a dehumidifier comes from the U.S.'s regulation *Energy Conservation Program for Consumer Products* (10 CFR 430) definitions section:

> ***Dehumidifier*** *means a product, other than a portable air conditioner, room air conditioner, or packaged terminal air conditioner, that is a self-contained, electrically operated, and mechanically encased assembly consisting of -*
>
> > *(1) A refrigerated surface (evaporator) that condenses moisture from the atmosphere;*
> >
> > *(2) A refrigerating system, including an electric motor;*
> >
> > *(3) An air-circulating fan; and*
> >
> > *(4) A means for collecting or disposing of the condensate.*

The units described by this regulation could be anything from the 50 ppd (pint per day) dehumidifier for your basement, with a bucket that must be emptied daily, up to 800 ppd units that Madison Air's *Quest* brand manufactures for industrial and agricultural facilities. Though they may all be dehumidifiers, regulations do not treat them the same. The following

is a sample of the different classifications given to dehumidifiers by various governmental agencies.

***Energy Efficiency Regulations Based on Unit Classification***

The small dehumidifiers that are made for residential use must meet the efficiency requirements of the aforementioned *Energy Conservation Program for Consumer Products* (10 CFR 430) regulation. If the dehumidifier is manufactured and sold as a consumer product for final sale to a residential homeowner, the unit falls under these requirements. (Full definition of "consumer product" found in 10CFR430.2)

Within the consumer product regulations, dehumidifiers are further broken into two (2) categories:

**Whole-Home dehumidifiers** – units designed to be integrated into the HVAC ductwork of a home to provide dehumidification to the entire house's occupied areas. These are typically units in the range of 70 – 200 ppd with the condensate hard piped to a drain. (Full definition found in 10CFR430.2)

Examples: Santa Fe Ultra120, Broan 98

**Portable dehumidifiers** – units designed to be placed in the basement or a crawlspace of a home to dehumidify that area. These are typically units in the range of 30 – 120 ppd where the condensate could be piped away or collected in the unit for the owner to empty. (Full definition found in 10CFR430.2)

Examples: Santa Fe Compact 70, Santa Fe Oasis 105

Conversely, stand-alone dehumidifiers that are not manufactured and sold as consumer products do not have any energy efficiency requirements imposed on them by the U.S. federal government, ASHRAE Standard 90.1: *Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings*, or any other national efficiency standard.

Commercial/industrial/agricultural dehumidifier's efficiency is only regulated in a few states when they are used in the Controlled Environment Horticulture/Agriculture

industry, in particular when used in cannabis facilities. The most prominent of these regulations is section 120.6 (h) of the 2022 Energy Code for California's Title 24.

Examples: Quest 506, Quest 225

Restoration and remediation industry dehumidifiers are exempt from all efficiency requirements. These are units that are used to dry out a residential, commercial, or industrial facility that has been saturated due to flooding or water used to extinguish a fire.

Examples: Phoenix DryMAX XL Pro, Phoenix R250 LGR

***Classification for Acceptable Refrigerant Selection***

Section 612 of the Clean Air Act allowed the EPA to establish the SNAP (Significant New Alternative's Policy) to identify and evaluate substitutes for ozone-depleting refrigerants. The EPA has broken the HVAC industry into sectors and approves refrigerants individually for each sector.

Dehumidifiers break over two of these sectors:

**Residential Dehumidifiers** – includes all dehumidifiers that would be considered "consumer products", "portable", and typically installed without the approval of a building inspector. This would include all dehumidifiers purchased through big box retailers and dehumidifiers placed in the unoccupied basement or crawlspace intended to dehumidify that space. Basically, all dehumidifiers that are governed by 10CFR430 and classified as "portable".

**Residential and Light Commercial Air Conditioning and Heat Pumps** – includes all commercial/industrial/agricultural dehumidifiers and "consumer product" dehumidifiers that are typically installed by a contractor using ductwork to integrate it into the building/home's HVAC system. Basically, all dehumidifiers that are not governed by 10CFR430 or classified as "whole-home" under said federal regulation.

***CA & WA Dehumidifier Classifications***

Understanding that refrigerants with SNAP approval for "Residential Dehumidifiers" may not be the same as dehumidifiers that fall under the SNAP sector "Residential and Light Commercial Air Conditioning and Heat Pumps", California modified the definition

of "dehumidifier" to "residential dehumidifier" for clarity. The definition modified by California and adopted by Washington is as follows, with added words underlined for emphasis:

> ***Residential* Dehumidifier** *means a residential air-conditioning product, other than a "portable air conditioner," "room air conditioner," or "packaged terminal air conditioner (PTAC)," that is a self-contained, electrically operated, portable, and mechanically encased assembly consisting of:*
>
> *(1) A refrigerated surface (evaporator) that condenses moisture from the atmosphere;*
>
> *(2) A refrigerating system, including an electric motor;*
>
> *(3) An air-circulating fan; and*
>
> *(4) A means for collecting or disposing of the condensate.*

The key words in this new definition are "residential" and "portable". The word "residential" implies the dehumidifier was built to certified and sold as a consumer product under the rules of 10 CFR 430.

The word "portable" implies that the unit can be carried by hand to and from the location it will operate. There is no need for the use of tools, ductwork, or intensive construction methods in the unit's installation nor would its installation typically need to be inspected by a building code official.

**SNAP Approved Refrigerant Options for Dehumidifiers**

Regulations in California and Washington both prohibit the use of refrigerants with a GWP of 750 or greater. The EPA's AIM Act drops that prohibition level to 700 GWP or above.

Refrigerants selected for use in dehumidifiers of all classifications mentioned previously in this article must use a refrigerant that has SNAP approval for their designated sector to be sold in the U.S. Below are tables showing several commonly used refrigerants that have been approved in both sectors and have GWP's less than 700.

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| Residential Dehumidifiers | | | |
|---|---|---|---|
| Refrigerant | Trade Name(s) | GWP | ASHRAE Designation |
| HFO-1234yf | | <4 | A2L |
| R-454B | Opteon™ XL41 | 466 | A2L |
| R-513A | Opteon® XP 10 | 630 | A2L |
| HFC-32 (R-32) | | 675 | A2L |
| R-452B | Opteon™ XL55 | 698 | R-452B |

Examples: Any dehumidifier bought through a retail outlet that simply plugs in without installation or any unit certified as a "portable" (i.e. crawlspace, basement) dehumidifier such as the Santa Fe Compact 70 or Santa Fe Oasis 105.

| Residential and Light Commercial Air Conditioning and Heat Pumps | | | |
|---|---|---|---|
| Refrigerant | Trade Name(s) | GWP | ASHRAE Designation |
| R-290 (Propane) | | 3 | A3 |
| HFO-1234yf | | <4 | A2L |
| R-454B | Opteon™ XL41 | 466 | A2L |
| HFC-32 (R-32) | | 675 | A2L |
| R-452B | Opteon™ XL55 | 698 | R-452B |

Examples: Any dehumidifier certified as "whole home" or any unit constructed for use in the commercial, industrial, agricultural or restoration/remediation industries such as Santa Fe Oasis 105, Quest 506, or Phoenix DryMAX XL Pro.

Madison Air companies that build dehumidifiers have selected R-454B as the refrigerant for residential and commercial dehumidifiers. R-454B is a blend of 69% R-32 and 31% R-1234yf. The combination of lower GWP, operating characteristics similar to R-410A and inherently efficient properties made it an easy choice.

**CA & WA Phaseout Effective Dates**

The refrigerant phaseout legislation passed in both California and Washington was introduced well before the AIM Act was brought before Congress. Therefore, some of their effective dates precede those of the AIM act, while most coincide or are after those of the AIM Act.

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These two tables show the effective dates for refrigerant phaseout for the two categories of dehumidifiers for California and Washington:

| Washington (173-443-040 WAC: Table 3) | | | |
|---|---|---|---|
| End-Use | Criteria | Prohibited Substances | Effective Date |
| Room air conditioners and residential dehumidifiers (New) | New air conditioning equipment | Refrigerants with a GWP of 750 or greater | January 1, 2024 |
| Room air conditioners and residential dehumidifiers (Retrofit) | Retrofit air conditioning equipment | Refrigerants with a GWP of 750 or greater | January 1, 2029 |
| Other types of air conditioning equipment used in residential and nonresidential applications (New) | New air conditioning equipment | Refrigerants with a GWP of 750 or greater | January 1, 2026* |
| Other types of air conditioning equipment used in residential and nonresidential applications (Retrofit) | Retrofit air conditioning equipment | Refrigerants with a GWP of 750 or greater | January 1, 2029 |

**January 1, 2026, if UL 60335-2-40 Edition 4 is adopted by the Washington state building code council by December 31, 2023; otherwise 24 months following adoption of the updated code*

| California (§ 95374. List of Prohibited Substances: Table 3) | | | |
|---|---|---|---|
| General End-Use | Specific End-Use | Prohibited Substances | Effective Date |
| Air-conditioning Equipment | Room/wall/window air-conditioning equipment, PTACs, PTHPs, portable air-conditioning equipment, and residential dehumidifiers | Refrigerants with a GWP of 750 or greater | Prohibited as of January 1, 2023 |
| Air-conditioning Equipment | Other air-conditioning (new) equipment, residential and nonresidential | Refrigerants with a GWP of 750 or greater | Prohibited as of January 1, 2025 |

Pulling together the phaseout schedule for both states and EPA's timeline, you can see by this table that January 1, 2025 is the effective date of refrigerant phaseout for all dehumidifiers except the portable, residential units.

| Type of Dehumidifier | CA | WA | AIM Act |
|---|---|---|---|
| Residential Dehumidifier (i.e. Portable) | 1/1/2023 | 1/1/2024 | 1/1/2025 |
| Whole-home, Commercial, Industrial, Agricultural, Remediation/Restoration Dehumidifier | 1/1/2025 | 1/1/2026 | 1/1/2025 |

**Summary**

The multitude of regulations implemented at the state and federal level has made it confusing for those in the HVAC industry, as well as their customers, to determine when the phaseout of their dehumidifier is effective. We hope this article has clarified the existing regulations and it will be updated as other states (e.g. New York) pass further legislation on this topic.

We encourage any Madison Air company or customer to reach out to the Madison Air regulatory team with any questions or concerns.