



Low GWP Refrigerants

UL is helping clients reduce their environmental impact

Empowering Trust™

A disruptive change is currently underway in the HVAC-R refrigerant market.

Driven by environmental concerns, global promoters are advocating the phase-out of traditional refrigerants in favor of new alternatives with a lower global warming potential (GWP).





The impact of these new rules will dramatically alter heating and cooling in a wide range of industries over the course of the coming years.

While this is hardly the first time the refrigerants market has seen significant changes, the current shift differs from past experiences in the sheer number of options that are now available.

Today, reality is much more complicated. Regulatory guidelines mean that businesses face different requirements depending on where and how they operate. A large number of new refrigerants have emerged, along with new technology to support them, but solutions that work well for some applications may not adequately support other demands.

Simply put, there is not a one-size-fits-all answer; however, UL can help demystify the confusing process of selecting the best and safest alternate refrigerant for your application. You want to invest in the development of equipment and systems that reduce your environmental impact. UL is prepared for the future of low-GWP refrigerants, and we want to help prepare you to drive innovation.



Unitary systems

We are committed to:

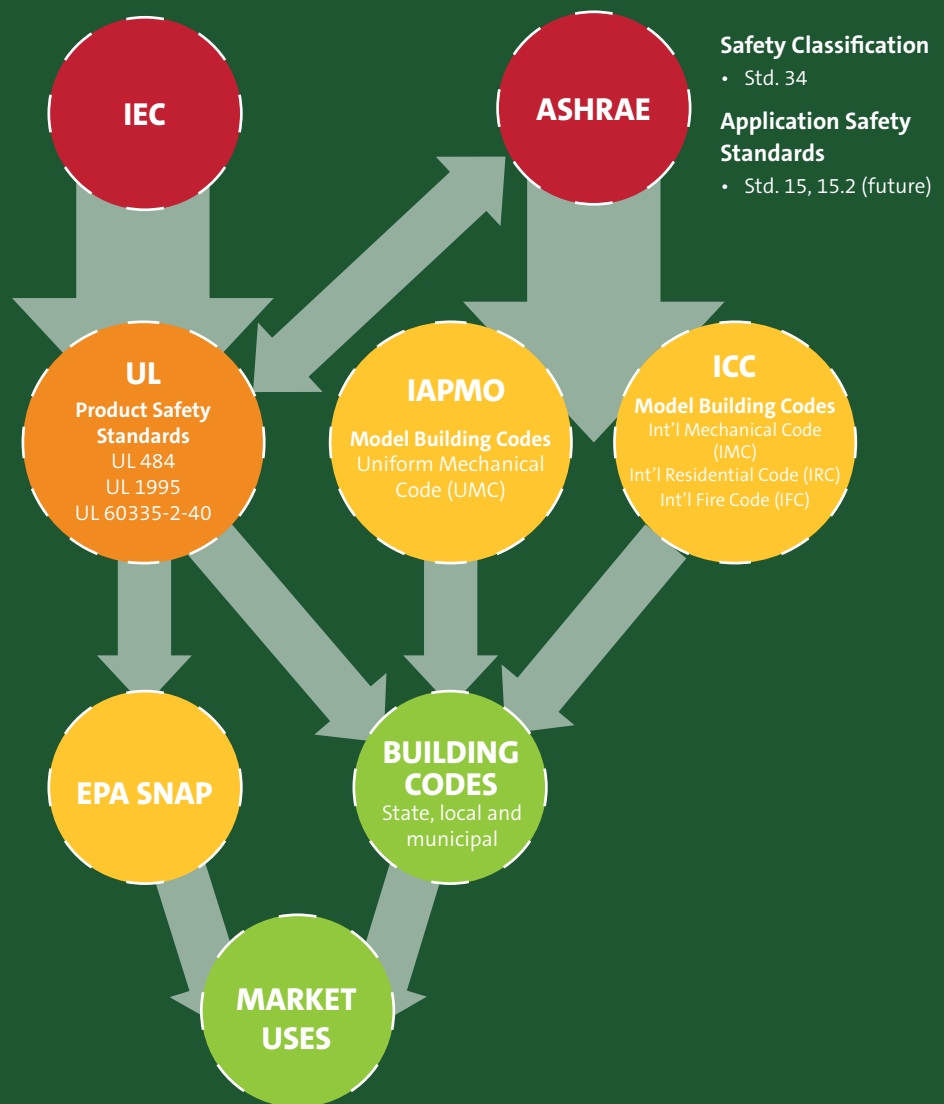
- Work to complete safety standards and strongly support adoption into building codes as quickly as possible
- Support other states and municipalities adopting HFC prohibitions similar to California
- Support CARB working with CEC to encourage proper installation, commissioning, maintenance and servicing of HVACR systems

Market confusion

Understanding the tangled web of HVAC mechanical safety requirements in the US, as it relates to flammable refrigerants.

In 2011 UL created a UL JTG on flammable refrigerants and hosted a meeting during the Winter ASHRAE meetings in Las Vegas, NV. Out of that meeting, March of 2011, WG1 for air-conditioning equipment decided to join the newly formed IEC SC 61D WG 9 to harmonize the requirements globally. Earlier in 2009 ASHRAE 15 started an A2L working group to look at revising ASHRAE 15. IEC SC61D WG9, CANENA THSC61D WG10, and ASHRAE 15 A2L WG and ASHARE 15.2 have been collaborating to develop requirements for UL and IEC 60335-2-40, ASHRAE 15, and 15.2. As you can see the UL requirements feeds into ASHRAE 15 and 15.2. The ASHRAE 15 and 15.2 requirements feed into the ICC and IAPMO model codes.

STANDARDS AND BUILDING CODE PROCESS



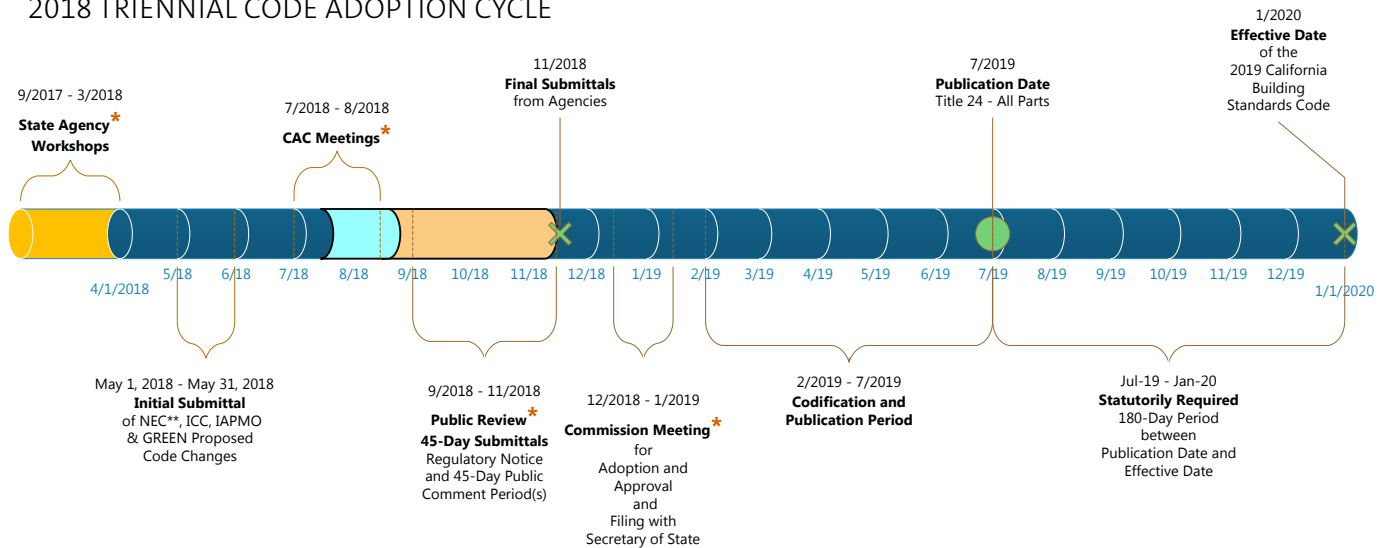
Common Low GWP refrigerants

Refrigerant Name	Trade or Common Name	Global Warming Potential*
R-744	CO2	1
R-290	Propane	4
R-600a	Isobutane	5
R-1234yf	HFO-1234yf	4
R-1234ze	HFO-1234ze	<1
R-152a	HFC-152a	124
R-124	HCFC-124	609
R-32	HFC-32	675
R-452B	HFC -45B	675
R-454B	Opteon™ XL41	466

CA Title 24

2019 California Building Standards Code, Title 24 (Effective January 1, 2020), Building codes State/municipality adoption acceptance

2018 TRIENNIAL CODE ADOPTION CYCLE



Code Advisory Committees (CAC):

- SDLF – Structural Design/ Lateral Forces
- PEME – Plumbing, Electrical, Mechanical & Energy
- HF – Health Facilities
- GREEN – Green Building
- BFO – Building, Fire & Other
- ACCESS - Accessibility

*Public Participation Opportunity
 **NEC resubmittal if necessary
 All dates are subject to change

California Building Standards Commission



Rev. 10/17
 (916) 263-0916
 www.bsc.ca.gov



Field conversions

(Excerpt from ASHRAE 15)

5.3 Changing Refrigerant

Changes of refrigerant in an existing system to a refrigerant with a different *refrigerant designation* shall only be allowed where in accordance with Sections 5.3.1 through 5.3.4.

5.3.1 The change of refrigerant shall be approved by the owner.

5.3.2 The change of refrigerant shall be in accordance with one of the following:

1. Written instructions of the original equipment manufacturer.
2. An evaluation of the system by a registered design professional or by an approved nationally recognized testing laboratory that validates safety and suitability of the replacement refrigerant.
3. Approved by the AHJ.

5.3.3 Where the replacement refrigerant is classified into the same safety group, requirements that were applicable to the existing system shall continue to apply.

5.3.4 Where the replacement refrigerant is classified into a different safety group, the system shall comply with the requirements of this standard for a new installation, and the change of refrigerant shall require AHJ approval.

CARB

- Industry Agrees to Lower GWP AC beginning 2023
- Signed by; American Heating & Refrigeration Institute (AHRI) national trade group representing equipment and chemical manufacturers; Natural Resources Defense Council (NRDC); six major manufacturers; and two major chemical companies
- Prohibit refrigerants with a **GWP \geq 750** in all new air conditioners beginning **January 1, 2023**.
- Based on date of manufacture
- 6 month sell through period
- Allow distribution through California to other states
- Exclude chillers— Implement the SB 1013 bans on certain HFCs in chillers (2024)
- States to follow CA include NY, CT and MD. More expected



No other compliance organization speaks with more authority and integrity or can add more value to your brand.

UL is here to help you understand flammable refrigerant requirements and bring safe products to market

We are also available to collaborate with your team to provide information early in the design and development process. Members from UL's engineering staff participate on both national and international technical committees.

Our extensive knowledge of the upcoming requirements puts us in a unique position to help you navigate the flammable-refrigerant landscape. Whether you are familiar with these requirements or are new to flammable refrigerants, a conversation with UL's technical experts will ensure that your organization understands the impact of these refrigerants.

Since UL's beginning in 1894, we have been one of the most recognized and trusted resources for product safety testing, certification and information, and choosing to work with UL says something important about your own commitment to the highest levels of safety and quality. Our integrated service teams deliver what you need when you need it to help you bring safer products to market faster. When your success is at stake, leave nothing to chance—put UL's vast expertise, thoroughness, broad capabilities, widespread acceptance and world-class reputation to work for you.





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