(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

This proposed standard is the “residential” companion to the existing ANSI/ASHRAE Standard 15, Safety Standard for Refrigeration Systems. As the title implies, this standard is focused for residential applications. SSPC 15 and the Standard 15.2 subcommittee notes the following aspects of the proposed standard. Historically, residential HVAC systems have not been subjected to as rigorous application safety requirements as commercial HVAC systems related to accidental refrigerant release primarily due to: a) only refrigerants classified as A1 by ASHRAE Standard 34 have been permitted by product safety standards such as UL 1995 and UL 60335-2-40 and b) acute toxicity exposure limit (ATEL) limits of the pertinent refrigerants in residential applications would typically not be exceeded in the event of a catastrophic leak. The current movement towards refrigerants having lower global warming potential (GWP) – many of which are classified as A2L by ANSI/ASHRAE Standard 34, Designation and Safety Classification of Refrigerants – has resulted in the need for an application safety standard on which building codes could rely. The primary objective of this proposed Standard 15.2 is to craft a stakeholder document that can be utilized to seek changes in the model building codes. It is the intention that this standard can be understood and applied by manufacturers, installers, contractors, service technicians, building code officials and any other stakeholder.

North American product safety standards for residential products have been modified to address flammable refrigerants. UL/CSA 60335-2-40 3rd edition was released in December 2019. This proposed ASHRAE application safety standard was developed in parallel and is more conservative than the UL standard in several places.

The fourth (independent substantive change) public review draft for this standard received 33 comments. For this (independent substantive change) public review draft, six comments have been incorporated to improve the draft standard. The changes from these six comments are summarized below:

Section 5.3: Manufacturer’s Refrigerant Detection System Requirements
- Added an option to use safety shut-off valves to all systems
- Corrected dispersal floor area section reference
- Added ductless system requirements

Section 9: REFRIGERANT CHARGE LIMITS
- Modified Sections 9.5.1 and 9.5.2 to have a maximum refrigerant charge in a space up to 50% of LFL when there is continuous circulation, or circulation initiated by a refrigerant detection system
- Modified the title of Section 9.6.4 removing references to multi-split systems, as it now applies to all systems
- Modified Section 9.6.4.2 to allow safety shut-off valves to be indoors with no special provisions, since a brazed joint is not considered a leak source when following the piping provisions in this draft standard.

Note to Reviewers: This public review makes proposed independent substantive changes to the previous public review draft. These changes are indicated in the text by underlining (for additions) and strikethrough (for deletions), except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the previous public review draft are open for review and comment at this time. Additional material is provided for context only and is not open for comment, except as related to the proposed substantive changes.

Modify Section 5 as shown. The remainder of Section 5 is unchanged.

5. GENERAL REQUIREMENTS

[...]

5.3 *Manufacturer’s Refrigerant Detection System Requirements. Refrigeration systems using an A2L refrigerant with more than m1 refrigerant charge shall have an integral refrigerant detection system, unless the
The following refrigeration systems using an A2L refrigerant shall have an integral refrigerant detection system:

a. Ducted HVAC systems with the equipment and all duct openings located 5.9 ft (1.8 m) or greater above the finished floor with a system refrigerant charge ($m_s$) less than the maximum refrigerant charge ($m_{max}$), as determined by Sections 9.5 and 9.6 using the dispersal floor area as determined by Section 9.4.2.2; or a system refrigerant charge ($m_s$) more than $m_1$, with any duct openings less than 5.9 ft (1.8 m) above the finished floor;

b. Ducted HVAC systems with a system refrigerant charge ($m_s$) less than the maximum refrigerant charge ($m_{max}$) as determined by Sections 9.5 and 9.6 and with the indoor equipment located 3.9 ft (1.2 m) or greater above the finished floor; or using Section 9.4.2.1, “Spaces Connected by Ducted HVAC System with Refrigerant Detection System” for dispersal floor area calculation;

c. Refrigeration systems other than those covered in (a) or (b), with a system refrigerant charge ($m_s$) less than the maximum refrigerant charge ($m_{max}$) as determined by Sections 9.5 and 9.6. Any other refrigeration system with a system refrigerant charge ($m_s$) greater than maximum refrigerant charge ($m_{max}$) as determined by Section 9.6, “Releasable Charge ($m_r$)”

Modify Section 9 as shown. The remainder of Section 9 is unchanged.

9. REFRIGERANT CHARGE LIMITS

9.5 Maximum Allowable Refrigerant Charge. The maximum refrigerant charge ($m_{max}$) allowed for the dispersal volume identified using Section 9.4 shall be determined as follows:

9.5.1 For A2L refrigeration systems without ventilation:

\[ m_{max} = C \times M \times AF \]

where:

\[ C = LFL \text{ Conversion Factor, as given in Table 9.5.1} \]
\[ M = \text{Refrigerant allowed in a dispersal volume based on 25% LFL, as given in Table 9.5.2 in kg (lb}_m) \]
\[ AF = 2 \text{ for systems with continuous circulation or circulation initiated by the refrigerant detection system} \]
\[ 1 \text{ for all other systems} \]

9.5.2 For A2L refrigeration systems with ventilation:

\[ m_{max} = C \times (M + MV) \times AF \]

where:

\[ C = LFL \text{ Conversion Factor, as given in Table 9.5.1} \]
\[ M = \text{Refrigerant allowed in a dispersal volume based on 25% LFL, as given in Table 9.5.2 in kg (lb}_m) \]
\[ MV = \text{Additional refrigerant mass allowed in a dispersal volume based on dilution using ventilation, as given in Table 9.5.3 in kg (lb}_m) \]
\[ AF = 2 \text{ for systems with continuous circulation or circulation initiated by the refrigerant} \]
detection system

1 for all other systems

[ … ]

9.6.4 Safety Shut-Off Valves for Multi-Split Systems Using A2L Refrigerants

[ … ]

9.6.4.2 Safety Shut-Off Valve Location. Safety shut-off valves shall be located outdoors, in a plenum vented to the outdoors, or in a space where the dispersal volume and total system charge complies with Section 9.5. Shut-off valve connections located in a space shall comply with Sections 8.2 through 8.5.3. Access shall be provided to safety shut-off valves.