BSR/ASHRAE Addendum q
to ANSI/ASHRAE Standard 15-2024

Second Public Review Draft

Proposed Addendum q to Standard 15-2024, Safety Standard for Refrigeration Systems

Second Public Review (June 2026)
(Draft shows Proposed Independent Substantive Changes to Previous Public Review Draft)

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FOREWORD

This second public review ISC adds clarification and units to the constant "1000" in equation 7-3, 7-7b, 7-8, 7-11a and 7-11b. Additionally, informative language including an example are added to appendix A.

PPR1 Forward:
This proposed Addendum q is the product of an internal review of all symbols in this standard. Upon review, it was discovered that in many instances, the same symbol was being used for multiple purposes. This draft establishes unique symbols. It also creates an informative Appendix H, which lists all symbols, as well as their units of measure and where they appear in the standard. The intent of this addendum is not to change technical requirements, but rather to provide greater clarity of the standard. As such, most of these changes are editorial in nature.

Note: This public review makes proposed independent substantiative changes to the previous public review draft. These substantive changes to the previous public review draft are indicated by underlining (for additions) 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 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.

Addendum q to Standard 15-2024

Modify Section 7 as follows. The remainder of Section 7 remains unchanged.

7.3.1 EDVC Calculation. The maximum charge permitted for an *effective dispersal volume shall* be calculated using Equation ~~7-3a or 7-3b~~ 7-3, except for *refrigeration systems* covered by Section 7.3.1.1:

~~$EDVC = RCL \times V_{eff} \times F_{occ}$~~ ~~(7-3a [I-P])~~
~~$EDVC = RCL \times V_{eff} \times F_{occ} / 1000$~~ ~~(7-3b [SI])~~
$EDVC = RCL \times V_{eff} \times F_{occ} / 1000$ (7-3)

where
EDVC = *effective dispersal volume charge*, lb (kg)
RCL = *refrigerant concentration limit*, lb/1000 ft^3 (g/m^3)
V_{eff} = *effective dispersal volume*, ft^3 (m^3), established using Sections 7.2.1 through 7.2.3
F_{occ} = *occupancy* adjustment factor (~~For all *occupancies* other than institutional, F_{occ} has a value of 1.~~ For *institutional occupancies*, F_{occ} has a value of 0.5. For all other *occupancies*, F_{occ} has a value of 1.)
1000 = a constant with units of, ft^3/1000ft^3 (g/kg)

[…]

7.5.1.2 Corridors and Lobbies. […]

c. *Refrigeration systems* containing Class 2L, 2, or 3 *refrigerants shall* be *listed*, and the *refrigerant* charge *shall* be limited for each *unit system*, calculated in accordance with Equation 7-7a or 7-7b:

$m_s = 0.106 \times LFL$ (7-7a [I-P])
$m_s = 3 \times LFL / 1000$ (7-7b [SI])

where
m_s = *system refrigerant charge*, lb (kg)

LFL = lower flammability limit per ASHRAE Standard 34,[3] lb/1000 ft^3 (~~k~~g/m^3)
0.106 = a constant with units of 1000 ft^3
3 = a constant with units of m^3
1000 = a constant with units of g/kg

[…]

7.6.1.1* Refrigeration Systems with Air Circulation. […]

$$EDVC = V_{eff} \times LFL \times \text{~~CF~~}CF \times F_{occ} \text{ / 1000} \quad (7\text{-}8)$$

where
EDVC = effective dispersal volume charge, lb (kg)
V_{eff} = *effective dispersal volume*, ft^3 (m^3)
LFL = lower flammability limit, lb/1000 ft^3 (~~k~~g/m^3)
~~CF~~*CF* = concentration factor, value of 0.5
F_{occ} = *occupancy* adjustment factor; (~~For all *occupancies* other than institutional, F_{occ} has a value of 1.~~ For *institutional occupancies*, *Focc* has a value of 0.5. For all other *occupancies*, *Focc* has a value of 1.)
1000 = a constant with units of, ft^3/1000ft^3 (g/kg)

[...]

7.6.4* Mechanical Ventilation. […]

$$Q_{req} = \frac{m_s - EDVC}{4 \times LFL} \times 1000 \times \text{~~SF~~}SF_{vent} \quad (7\text{-}11a\ [I\text{-}P])$$

$$Q_{req} = \frac{m_s - EDVC}{4 \times LFL} \times 1000 \times \text{~~SF~~}SF_{vent} \times 60 \quad (7\text{-}11b\ [SI])$$

where
Q_{req} = required minimum mechanical ventilation airflow rate, ft^3/min (m^3/h)
m_s = ~~largest~~ *system refrigerant charge* ~~from *independent circuit*~~, lb (kg)
EDVC = effective dispersal volume charge, lb (kg)
LFL = lower flammability limit, lb/1000 ft^3 (~~k~~g/m^3)
4 = assumed leak time (4 minutes)
~~SF~~SF_{vent} = safety factor, value of 2
60 = conversion of minutes to hours
1000 = a constant with units of, ft^3/1000ft^3 (g/kg)

[…]

Modify Informative Appendix A as follows. The remainder of Informative Appendix A remains unchanged.

INFORMATIVE APPENDIX A
EXPLANATORY MATERIAL

Sections of the standard with associated explanatory information in this appendix are marked with an asterisk "*" after

the section number.

[…]

Section 7.3.1

Equation 7-3: The equation is intended to be used by inserting numerical values when using the units of measure defined in the explanation of variables. This example demonstrates the calculation and how the equation is dimensionally correct.

Example:

The *refrigerant* is R-744. The *occupancy* type is not institutional. The space consists of a single rectangular room with dimensions of:

$11.00\ [ft] \times 12.00\ [ft] \times 8.00\ [ft] = 1056\ [ft^3]$

$3.35\ [m] \times 3.66\ [m] \times 2.44\ [m] = 29.9\ [m^3]$

	[I-P]	**[SI]**
RCL (from Table 4-1 of ASHRAE Standard 34-2024)	$3.4\ \left[\frac{lb}{1000\ ft^3}\right]$	$54\ \left[\frac{g}{m^3}\right]$
V_{eff} (effective volume of the example space)	$1056\ [ft^3]$	$29.9\ [m^3]$
F_{occ} (other than institutional occupancy) (dimensionless)	$1.0\ [-]$	$1.0\ [-]$
1000 (a constant for unit of measure conversions)	$1000\ \left[\frac{ft^3}{1000\ ft^3}\right]$	$1000\ \left[\frac{g}{kg}\right]$
$EDVC = \frac{RCL \times V_{eff} \times F_{occ}}{1000}$	$= \frac{3.4\ \left[\frac{lb}{1000\ ft^3}\right] \times 1056\ [ft^3] \times 1.0\ [-]}{1000\ \left[\frac{ft^3}{1000\ ft^3}\right]}$ $= \frac{3.4 \times 1056 \times 1.0\ \left[\frac{lb}{1000\ ft^3}\right][ft^3][-]}{1000\ \left[\frac{ft^3}{1000 ft^3}\right]}$ $= \frac{3.4 \times 1056 \times 1.0}{1000}\ \left[\frac{lb}{1000\ ft^3}\right]\left[\frac{1000\ ft^3}{ft^3}\right]\frac{[ft^3]}{}$ $= 3.5904\ \left[\frac{lb}{1000\ ft^3}\right]\left[\frac{1000\ ft^3}{ft^3}\right]\frac{[ft^3]}{}$ $= 3.5904\ \left[\frac{lb}{-}\right]\left[\frac{-}{ft^3}\right]\frac{[ft^3]}{}$ $= 3.5904\ \left[\frac{lb}{-}\right]\left[\frac{-}{-}\right]\frac{[-]}{}$ $= 3.5904\ [lb]$	$= \frac{54\ \left[\frac{g}{m^3}\right] \times 29.9\ [m^3] \times 1.0\ [-]}{1000\ \left[\frac{g}{kg}\right]}$ $= \frac{54 \times 29.9 \times 1.0\ \left[\frac{g}{m^3}\right]\ [m^3]\ [-]}{1000\ \left[\frac{g}{kg}\right]}$ $= \frac{54 \times 29.9 \times 1.0}{1000}\ \left[\frac{kg}{g}\right]\left[\frac{g}{m^3}\right]\frac{[m^3]}{}\ [$ $= 1.6146\ \left[\frac{kg}{g}\right]\left[\frac{g}{m^3}\right]\frac{[m^3]}{}$ $= 1.6146\ \left[\frac{kg}{-}\right]\left[\frac{-}{m^3}\right]\frac{[m^3]}{}$ $= 1.6146\ \left[\frac{kg}{-}\right]\left[\frac{-}{-}\right]\frac{[-]}{}$ $= 1.6146\ [kg]$

(rounding to same precision as the RCL)	$= 3.6\ [lb]$	$= 1.61\ [kg]$