SPECIAL NOTE

This American National Standard (ANS) is a national voluntary consensus standard developed under the auspices of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). *Consensus* is defined by the American National Standards Institute (ANSI), of which ASHRAE is a member and which has approved this standard as an ANS, as "substantial agreement reached by directly and materially affected interest categories. This signifies the concurrence of more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that an effort be made toward their resolution." Compliance with this standard is voluntary until and unless a legal jurisdiction makes compliance mandatory through legislation.

ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

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The Manager of Standards of ASHRAE should be contacted for:

a. interpretation of the contents of this Standard,
b. participation in the next review of the Standard,
c. offering constructive criticism for improving the Standard, or
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CONTENTS

ANSI/ASHRAE Standard 15-2010, Safety Standard for Refrigeration Systems

NOTE

Approved addenda, errata, or interpretations for this standard can be downloaded free of charge from the ASHRAE Web site at www.ashrae.org/technology.

(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

ASHRAE Standard 15-2010 is the most recent edition of one of ASHRAE's oldest standards. It removes Appendices B and G from and incorporates Addenda a, b, c, d, e, f, g, h, and i into ASHRAE Standard 15-2007. The current Informative Appendix G describes how the standard has been affected by each addendum and lists its ASHRAE and ANSI approval dates.

While ASHRAE Standard 15 is generally written as a self-sufficient document, it does normatively reference several other standards (see Normative Appendix C). One of those standards is ANSI/ASHRAE Standard 34, Designation and Safety Classification of Refrigerants,[1] *which prescribes the Refrigerant Classification System as well as refrigerant concentration limits that are vitally important in the context of this standard. Although changes to ASHRAE Standard 15 are closely coordinated with those to ASHRAE Standard 34, users of ASHRAE Standard 15 should also review the most recent version of ASHRAE Standard 34 and its associated addenda for the latest information related to refrigerant designations and safety classifications.*

Presently, Table 1 in ASHRAE Standard 15 shows the amount of refrigerant in a given space that, when exceeded, requires a machinery room. When a refrigerant is not classified in ASHRAE Standard 34 or its addenda or not shown in Table 1, it is the responsibility of the owner of a refrigerating system to make this judgment. For blends, Informative Appendix A is offered to aid in determining allowable concentrations.

This standard is directed toward the safety of persons and property on or near the premises where refrigeration facilities are located. It includes specifications for fabrication of tight systems but does not address the effects of refrigerant emissions on the environment. For information on the environmental effects of refrigerant emissions, see ANSI/ASHRAE Standard 147, Reducing the Release of Halogenated Refrigerants from Refrigerating and Air-Conditioning Equipment and Systems.[2]

While the user of this document should be familiar with the entire standard, its organization into the following sections allows faster location of information. The topics included in these sections are:

GENERAL (Sections 1-6): *Purpose, Scope, Definitions, Occupancy Classification, Refrigerating System Classification, Refrigerant Classification, Precedence with Conflicting Requirements, Listed Equipment.*

RESTRICTIONS (Sections 7-8): *Restrictions on Refrigerant Use, Installation Restrictions.*

DESIGN AND CONSTRUCTION (Section 9): *Materials, System Design Pressure, Refrigerant-Containing Pressure Vessels, Pressure Relief Protection, Setting of Pressure-Relief Devices, Marking of Pressure-Relief Devices and Fusible Plugs, Pressure Vessel Protection, Positive Displacement Compressor Protection, Pressure-Limiting Devices, Refrigerant Piping, Valves, Fittings and Related Parts, Components Other than Pressure Vessels and Piping, Service Provisions, Fabrication, Factory Tests, and Nameplate.*

OPERATION AND TESTING (Section 10): *Field Tests, General Requirements.*

The terms "authority having jurisdiction (AHJ)" and "jurisdictional authority" used herein refer to the organization or individual responsible for enforcing the requirements of this standard.

The hazards of refrigerants are related to their physical and chemical characteristics as well as to the pressures and temperatures occurring in refrigerating and air-conditioning systems. Personal injury and property damage from inadequate precautions may occur from a number of origins, such as:

- *Rupture of a part or an explosion with risk from flying debris or from structural collapse.*
- *Release of refrigerant from a fracture, due to a leaking seal or incorrect operation.*
- *Fire resulting from or intensified by burning or deflagration of escaping refrigerant or lubricant.*

Personal injury resulting from the accidental release of refrigerants may also occur from:

- *Suffocation from heavier-than-air refrigerants in inadequately ventilated spaces.*
- *Narcotic and cardiac sensitization effects.*
- *Toxic effects of vapor or the decomposition products due to vapor contact with flames or hot surfaces.*
- *Corrosive attack on the eyes, skin, or other tissue.*
- *Freezing of tissue by contact with liquid.*

Care should be taken to avoid stagnant pockets of refrigerant vapors by proper location of ventilation inlet and exhaust openings (all commonly used refrigerants except ammonia [R-717] and water [R-718] are heavier than air). All machinery rooms are required to have detectors that will activate on alarm and mechanical ventilation at a value not greater than the corresponding TLV-TWA (or toxicity measure consistent therewith). Informative Appendix F provides guidance on integrating the requirements of this standard with occupational health and safety programs.

The following short publishing history of this code traces the origins of these safety provisions. In 1919, the American Society of Refrigerating Engineers (ASRE) proposed a Tentative Code for the Regulation of Refrigerating Machines and Refrigerants. Over the next 11 years, representatives from the American Gas Association, American Institute of Electrical Engineers, American Institute of Refrigeration, American Chemical Society, American Society of Heating and Ventilation