(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 standard was written at the request of the Air Conditioning Heating & Refrigeration Institute (AHRI) to provide a standard method of test for the capacity of refrigerant pressure regulators. AHRI Standard 770, Performance Rating of Refrigerant Pressure Regulating Valves (I-P/2014) *and AHRI Standard 771,* Performance Rating of Refrigerant Pressure Regulating Valves (SI/2014)*, require that this standard be used as a method of test for capacity. AHRI will continue to maintain Standard 770/771 as it relates to standard methods of rating refrigerant service pressure regulators. Standard 770/771 may also include information concerning other refrigerant pressure regulator performance characteristics.*

This standard provides a means of accurately measuring the refrigerant mass flow capacity of regulators. The flow capacity may be expressed in terms of refrigerating effect with various refrigerants by performing simple thermodynamic computations. Examples of the computations necessary to express regulator capacity in kilowatts (tons) or other appropriate units are included in Informative Appendix C of this standard for the user's convenience.

The basis for the method of testing and calculation of capacity for flow through regulators is a research project (PRF 5233) performed at Ray W. Herrick Laboratories, Purdue University, Lafayette, IN, and sponsored by AHRI. This research followed a study performed at Herrick Laboratories, under the auspices of AHRI, by R.T. McKenzie, J.B. Chaddock, and W.E. Fontaine between September 1963 and September 1966.

1. PURPOSE

This standard provides methods of determining the mass flow capacity of refrigerant pressure regulators with sufficient accuracy to facilitate proper engineering application of the device in systems operating at various conditions with various refrigerants by

a. prescribing a method of measuring key flow and gradient characteristics of refrigerant pressure regulators using air or water as the working fluid and
b. prescribing computational means to enable reliable prediction of refrigerant vapor and liquid mass flow capacity based on the measured flow and gradient characteristics.

2. SCOPE

2.1 This standard applies to *refrigerant pressure regulators* that meet the definition found in Section 3 and that are intended for refrigerant service in applications where only single-phase flow occurs within the regulator.

2.2 This standard is applicable to refrigerant pressure regulators

a. for use in either liquid or vapor refrigerant applications and
b. for use with refrigerants deemed suitable according to ANSI/ASHRAE Standard 15, *Safety Standard for Refrigeration Systems* [1] and ANSI/ASHRAE Standard 34, *Designation and Safety Classification of Refrigerants* [2].

2.3 This standard specifies procedures, apparatus, and instrumentation that will produce capacity and gradient information with sufficient accuracy to support the proper application of the tested regulator.

2.4 This standard does not

a. specify rating conditions or electrical or mechanical design requirements (rating conditions may be found in ARI Standard 770, *Refrigerant Pressure Regulating Valves* [3]),
b. make recommendations for safety, or
c. specify tests for production, specification compliance, or field testing of regulators.

3. DEFINITIONS AND SYMBOLS

3.1 Definitions

capacity: the mass flow rate of a selected refrigerant that will pass through the regulator at specified conditions.

certified standard instrument: an instrument calibrated by the manufacturer or other reliable agency and certified traceable to the National Institute for Standards and Technology (NIST).

controlled parameter: as used in this standard, this term refers to the system pressure that is regulated by the regulator under test.

controlled parameter change (CPC): the difference between the set point and regulated pressure when the regulator is operating at a specified capacity [4]. (See Informative Appendix A, Figure A-1.)

differential pressure regulator (DPR): a regulator that opens or closes in response to a change in the difference between its inlet and outlet pressures.

direct-operated pressure regulator: a throttling valve of any size that responds directly to changes in its regulated pressure. A change in regulated pressure (CPC) provides all the work necessary to position the closure member of the valve.

flowmeter: a device for determining the mass flow rate through the regulator under test.

gradient: the change in regulated pressure (controlled parameter) required to cause the closure member of a refrigerant pressure regulator to move from its opening point (set point) to a specified flow capacity [4].

inlet pressure regulator (IPR): a regulator that opens or closes in response to a change in its inlet or upstream pressure.

outlet pressure regulator (OPR): a regulator that opens or closes in response to a change in its outlet or downstream pressure.