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ANSI/ASHRAE Standard 33-2016 (RA2026), Methods of Testing Forced-Circulation Air-Cooling and Air-Heating Coils

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Online Supporting Files: http://www.ashrae.org/XXXXX

Preview

NOTE

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

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(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 33 presents a method of test for use in laboratory testing of forced circulation air-heating and air-cooling coils. The 2016 edition of this standard was updated with assistance from the members of the product subsection Forced Circulation Air-Cooling & Air-Heating Coils (ACHC) at Air-Conditioning, Heating and Refrigeration Institute (AHRI). This method of test is used in conjunction with the performance metrics in AHRI Standard 410 as part of AHRI's ACHC certification program. This standard was prepared by ASHRAE Standard Project Committee (SPC) 33. The cognizant technical committee is ASHRAE TC 8.4, Air-to-Refrigerant Heat Transfer Equipment.

Standard 33 includes access to fluid type test data forms, which can be found online at http://www.ashrae.org/XXXXXX.

This is a reaffirmation of Standard 33-2016. This standard was prepared under the auspices of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). It may be used, in whole or in part, by an association or government agency with due credit to ASHRAE. Adherence is strictly on a voluntary basis and merely in the interests of obtaining uniform guidelines throughout the industry. This version of the reaffirmation has no changes

1. PURPOSE

1.1 The purposes of this standard are to:

a. Describe and specify testing instruments and apparatus.
b. Describe and specify laboratory test methods and procedures.
c. Describe and specify test data to be recorded.
d. Describe and specify calculations to be made from test data.
e. Define terms used in testing.
f. Specify standard thermodynamic properties.

1.2 It is not the purpose of this standard to specify the types of tests used for production or field testing.

2. SCOPE

2.1 This standard prescribes laboratory methods of testing forced-circulation air-cooling coils, for application under nonfrosting conditions, and forced-circulation air-heating coils to ensure uniform performance information for establishing ratings.

3. DEFINITIONS

3.1 General. A *forced-circulation air-cooling or air-heating coil* is a coil used in an airstream whose circulation is caused by a difference in pressure produced by a fan or blower.

3.1.1 Forced-circulation air-cooling coil. A heat exchanger, with or without extended surfaces, through which either chilled water, chilled aqueous glycol solution, or volatile refrigerant is circulated for the purpose of total cooling (sensible cooling plus latent cooling) of a forced-circulation airstream.

3.1.2 Forced-circulation air-heating coil. A heat exchanger, with or without extended surfaces, through which either hot water, hot aqueous glycol solution, or steam is circulated for the purpose of sensible heating of a forced-circulation airstream.

3.2 Coil Dimensions (See Figure 3.1)

3.2.1 Coil Depth. The depth of a coil is the number of rows of tubes or the dimension in the direction of airflow.

3.2.2 Coil Length. The length of a coil is the dimension of the face of the coil in the direction of the tubes exposed to the flow of air. (See Dimension *L*, Figure 3.1.)

3.2.3 Coil Height. The height of the coil is the dimension of the face of the coil perpendicular to the direction of the tubes and includes only the height over tubes and fins exposed to the flow of air. (See Dimension *H*, Figure 3.1.)

3.2.4 Coil Face Area. The face area of a coil is the product of the length and the height of the coil,

$$L \times H/10^6 \quad \text{(SI)}$$

$$[L \times H/144] \quad \text{(I-P)}$$

Note: Here and throughout this document the use of [ ] signifies items evaluated in I-P units. If I-P units are used, the immediately preceding item, which applies to SI units, is not required to also be used.

3.3 Testing Terminology

3.3.1 Equilibrium. *Equilibrium*, for the purpose of this standard, is a steady-state condition during which the fluctuations of variables being measured remain within stated limits as given in Section 9.

3.3.2 Test. A *test* is the recorded group of readings of test variables taken while equilibrium is maintained and used in the computation of results.

3.3.3 Test Run. A *test run* is the complete group of readings of test variables, which includes the following:

a. Those observed or recorded during a sufficient period to indicate that equilibrium was attained prior to the actual test.
b. Those recorded during the period of the test.

4. COIL CLASSIFICATION

Air-cooling and air-heating coils may be classified, with regard to their cooling or heating function, by identifying the heating or cooling fluid as follows:

4.1 Volatile Refrigerant Coils. Liquid-vapor mixtures used for air cooling controlled by a thermal expansion valve.

4.2 Steam. Used for air heating.

a. Single tube (standard) type
b. Steam distributing tube type

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