ADDENDA

ANSI/ASHRAE Addendum a to
ANSI/ASHRAE Standard 84-2013

Method of Testing Air-to-Air Heat/Energy Exchangers

This addendum was approved by the ASHRAE Standards Committee on June 22, 2013; by the ASHRAE Board of Directors on June 26, 2013; and by the American National Standards Institute on June 27, 2013.

This addendum is for an ASHRAE Standard scheduled to be updated on a five-year cycle; the date following the standard number is the year of ASHRAE Board of Directors approval.

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SPECIAL NOTE

This American National Standard (ANS) is a national voluntary consensus standard developed under the auspices of 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.

ASHRAE Standards are prepared by a Project Committee appointed specifically for the purpose of writing the Standard. The Project Committee Chair and Vice-Chair must be members of ASHRAE; while other committee members may or may not be ASHRAE members, all must be technically qualified in the subject area of the Standard. Every effort is made to balance the concerned interests on all Project Committees.

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
d. permission to reprint portions of the Standard.

(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 addendum clarifies the standard in three areas. Equation 14 is modified to clarify for which airstream the specific heat C_p is evaluated. Text near Equations 22 and 23 is rearranged for clarity. Two sets of uncertainty limits had been provided for Equations 24, 25, and 26; in this addendum each equation is provided with a single, unambiguous uncertainty limit.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum a to Standard 84-2013

In Section 6.1, replace the current Equation 14 as shown below. The remainder of Section 6.1 is unchanged.

$$\frac{\dot{n}_1 C_{p1} t_1 - \dot{m}_2 C_{p2} t_2 + \dot{m}_3 C_{p3} t_3 - \dot{m}_4 C_{p4} t_4}{(\dot{m} C_p)_{\text{minimum}(1,3)} |t_1 - t_3|} < 0.20 \quad (14)$$

~~$$\frac{\dot{m}_1 C_p t_1 - \dot{m}_2 C_p t_2 + \dot{m}_3 C_p t_3 - \dot{m}_4 C_p t_4}{\dot{m}_{\text{minimum}(1,3)} C_p |t_1 - t_3|} < 0.20 \quad (14)$$~~

…

Revise Section 7.1 as shown below. The remainder of Section 7.1 is unchanged.

7.1 Laboratory Testing

For testing of effectiveness, pretest and post-test uncertainties shall satisfy the following equations:

$$U(\varepsilon_s) < \pm 5\% \quad (19)$$

$$U(\varepsilon_l) < \pm 7\% \quad (20)$$

$$U(\varepsilon_t) < \pm \frac{|\varepsilon_l - \varepsilon_t| 5\% + |\varepsilon_t - \varepsilon_s| 7\%}{|\varepsilon_l - \varepsilon_s|} \quad (21)$$

Otherwise, the results do not satisfy this standard and cannot be reported. Equation 21 ensures that

$$\pm 5\% > U(\varepsilon_s) \le U(\varepsilon_t) < U(\varepsilon_l) < \pm 7\% \quad (22)$$

~~and~~ If $\varepsilon_s = \varepsilon_t$ or when ε_l is not calculated because $U(\varepsilon_l)$ is too large based on the findings of an uncertainty analysis, then Equation 22 cannot be used and instead,

$$U(\varepsilon_t) = U(\varepsilon_s) \quad (23)$$

~~in either of the following situations: when $\varepsilon_s = \varepsilon_t$ or when ε_l is not calculated because $U(\varepsilon_l)$ is too large based on the findings of an uncertainty analysis.~~

For RER testing, the pretest and post-test uncertainties shall satisfy the following equations:

$$\frac{U(\text{RER})}{\text{RER}} < 0.10 \quad (24)$$

~~$$\frac{U(\text{RER})}{\text{RER}} < 0.10 \quad \text{or} \quad \frac{4U(\text{pressure transducer})}{(\Delta p_s + \Delta p_e)} \quad (24)$$~~

For pressure drop testing, the pretest and post-test uncertainties shall satisfy Equations 25–26:

$$\frac{U(\Delta p_s)}{\Delta p_s} < 0.10 \quad (25)$$

~~$$\frac{U(\Delta p_s)}{\Delta p_s} < 0.10 \quad \text{or} \quad \frac{2U(\text{pressure transducer})}{\Delta p_s} \quad (25)$$~~

and

$$\frac{U(\Delta p_e)}{\Delta p_e} < 0.10 \quad (26)$$

~~and~~

~~$$\frac{U(\Delta p_e)}{\Delta p_e} < 0.10 \quad \text{or} \quad \frac{2U(\text{pressure transducer})}{\Delta p_e} \quad (26)$$~~

POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the standards and guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive technical committee structure, continue to generate up-to-date standards and guidelines where appropriate and adopt, recommend, and promote those new and revised standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating standards and guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.