



**BSR/ASHRAE/IES Addendum cm
to ANSI/ASHRAE/IES Standard 90.1-2022**

Public Review Draft

Proposed Addendum cm to Standard 90.1-2022, Energy Standard for Sites and Buildings Except Low- Rise Residential Buildings

**First Public Review (April 2025)
(Draft Shows Proposed Changes to Current Standard)**

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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

Addendum “q” added pad-type (wetted media) adiabatic fluid coolers along with a minimum efficiency and the CTI Acceptance Test Code to Table 6.8.1-7 Heat Rejection Equipment. A definition for pad-type adiabatic fluid coolers was also being added to Section 3 for clarity and the new test code for adiabatic fluid coolers, CTI ATC-105 Adiabatic, was added to Section 13, Normative References. This follow-on Addendum proposes modifying the thermal rating point for pad-type adiabatic fluid coolers.

The reason for this change is based on analyses by several heat rejection equipment manufacturers. During development of the new CTI rating standard for adiabatic fluid coolers, it was found that at the temperature conditions currently listed in Table 6.8.7-1 (as added by Addendum “q”), the process fluid velocity and corresponding pressure drop for many heat-exchanger configurations will be very high and beyond the typical application range for these devices. This is especially pronounced in models with a higher number of rows, fewer circuits, and / or long coil lengths. Therefore, it would not be appropriate to use a rating condition where a substantial number of models would not be able to be rated at the standard rating condition.

A new thermal duty has been selected (105°F inlet / 95°F outlet / 95°F dry bulb / 75°F wet bulb) to replace the original thermal duty in Addendum “q” (110°F inlet / 100°F outlet / 95°F dry bulb / 75°F wet bulb). This updated thermal condition is more challenging thermally and will allow the vast majority of models currently on the market to be rated for comparison purposes.

As there currently are no performance requirements for adiabatic fluid coolers, Addendum “q” provided a minimum efficiency along with a test code to confirm the thermal performance of pad-type adiabatic fluid coolers. This new Addendum simply updates the thermal condition for Table 6.8.1-7. Based on this, no cost impact is anticipated at this time but compliance with industry performance expectations will improve relative to adiabatic fluid coolers. Note that the Cooling Technology Institute is currently working on extending its thermal certification program to include adiabatic fluid coolers, anticipated for late 2026. Finally, adiabatic systems that result in a wetted heat exchange surface continue to be outside of the scope of the listed CTI test code and should be evaluated as closed-circuit fluid coolers.

This proposal was developed at the request of the CTI Adiabatic Certification Committee and submitted by the ASHRAE TC8.6 Subcommittee on Codes and Standards, who both unanimously support this modification to the Standard.

[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~striketrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.]

Addendum cm to 90.1-2022

Update Table 6.8.1-7 as shown (IP):

Table 6.8.1-7 Performance Requirements for Heat Rejection Equipment—Minimum Efficiency Requirements

| Equipment Type | Total System Heat-Rejection Capacity at Rated Conditions | Subcategory or Rating Condition ^h | Performance Required ^{a,b,c,f,g,i} | Test Procedure ^{d,e} |
|---|--|---|---|-------------------------------|
| Propeller or axial fan <i>adiabatic fluid coolers, integral pad type</i> | All | 44 <u>105</u> °F entering water 100 <u>95</u> °F leaving water 95°F entering db 75°F entering wb | ≥6.2 gpm/hp | CTI ATC-105 Adiabatic |

Update Table 6.8.1-7 as shown (SI):

Table 6.8.1-7 Performance Requirements for Heat Rejection Equipment—Minimum Efficiency Requirements

| Equipment Type | Total System Heat-Rejection Capacity at Rated Conditions | Subcategory or Rating Condition ^h | Performance Required ^{a,b,c,f,g,i} | Test Procedure ^{d,e} |
|---|--|---|---|-------------------------------|
| Propeller or axial fan <i>adiabatic fluid coolers, integral pad type</i> | All | 43.3 <u>40.6</u> °C entering water 37.8 <u>35.0</u> °C leaving water 35.0°C entering db 23.9°F entering wb | ≥0.52 L/(s·kW) | CTI ATC-105 Adiabatic |

Note: As Addendum “q” has been published, only the changes proposed by this new Addendum are shown above.