



**BSR/ASHRAE/IES Addendum dj  
to ANSI/ASHRAE/IES Standard 90.1-2025**

**Public Review Draft**

# **Proposed Addendum dj to Standard 90.1-2025, Energy Standard for Sites and Buildings Except Low- Rise Residential Buildings**

**Second Public Review (June 2026)  
(Draft Shows Proposed Changes to Current Standard)**

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## FOREWORD

This proposal, based on pool heater requirements proposed for California's 2025 energy code, requires that the primary heating system for pools to be efficient. The heating system must either be a heat pump pool heater, a condensing gas pool heater, a solar thermal water heater, a heating system that derives no less than 60 percent of its annual heating energy from on-site renewable energy or a system that derives no less than 40 percent of its heating energy from one of the above or site-recovered energy during the pool's coldest full month of operation. Natural gas or electric back-up heating systems are allowed in all cases. The proposal also includes mandatory minimum efficiency standards for pool heaters established by the U.S. Department of Energy.

Heat pump pool heaters, solar thermal heaters, condensing gas pool heaters and heaters that utilize site-recovered energy or on-site renewable energy are cost effective primary alternatives to conventional non-condensing gas-fired pool heaters which result in reduced energy use and lower monthly utility costs.

A cost effectiveness analysis was conducted for heat pump pool heaters, solar pool heaters, and condensing gas pool heaters for indoor and outdoor pools heated seasonally and year-round in all climate zones and found that this proposal is cost-effective.

*[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~strikethrough~~ (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 dj to 90.1-2025

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*Add new definitions as follows:*

**power safety cover:** pool cover that is placed over the water area, and is opened and closed with a motorized mechanism activated by a control switch.

**solar-ready-zone:** a section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar thermal system.

**solar thermal pool heater:** an assembly of components designed to heat water converting incident solar radiation into thermal energy at the building site.

**spa:** a structure or product intended for the immersion of persons in temperature-controlled water designed to be heated to no less than 94°F (34°C) for the purpose of relaxing, exercise, therapy or treatment; designed and manufactured to be connected to a circulation system; and not intended to be drained and filled with each use.

Add to Section 3.3 Abbreviations as follows:

TE<sub>I</sub> Integrated Thermal Efficiency

Revise Table 7.4-1 and its footnotes as follows:

**Table 7.4-1 Performance Requirements for Water-Heating Equipment—Minimum Efficiency Requirements (Continued)**

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Performance Required <sup>a</sup>	Test Procedure <sup>a</sup>
Gas-fired pool heaters <sup>k</sup> Commercial pool heaters, gas <sup>m</sup>	All		82% Et <sup>c</sup>	10 CFR 430 Appendix P  ANSI Z21.56-2019
Consumer pool heaters, gas <sup>k, n</sup>	All		On or after 5/30/2028  $\frac{84(Q_{IN} + 491)}{Q_{IN} + 2,536}$ $\left[ \frac{84(Q_{IN} + 144)}{Q_{IN} + 690.5} \right]$ Where Q <sub>IN</sub> is the input capacity, in Btu/h [W]	10 CFR 430 Appendix P
Heat pump pool heaters <sup>k</sup> Commercial heat pump pool heaters <sup>m</sup>	All	50°F [10°C] db 44.2°F [6.78°C] wb outdoor air 80.0°F [26.7°C] entering water  Low Air Temperature-Mid Humidity	4.0 COP	10 CFR 430 Appendix P  AHRI 1160-2022
Consumer electric pool heaters <sup>k</sup>	All	High Air Temperature-Mid Humidity rating condition	On or after 5/30/2028  Integrated Thermal Efficiency not less than the following: $\frac{600(PE)}{PE + 1,619}$ Where PE is the active electrical power, in Btu/h	10 CFR 430 Appendix P

...  
 k. All water heaters or gas-pool heaters in this category or subcategory are regulated as consumer products by the U.S. DOE as defined in 10 CFR 430.

l. Where this standard is being applied to a building outside the U.S. and Canada and water heaters in this subcategory are being installed in that building, those water heaters shall meet the local efficiency requirements. ~~If there are no local~~

~~efficiency standards for residential water heaters, consideration should be given to using the U.S. DOE efficiency requirements shown in this table.~~

m. Performance requirement is for commercial *pool* heaters and for applications outside of the U.S. Commercial *pool* heaters contain additional design modifications related to safety requirements for installation in commercial buildings and are not regulated as consumer products by the U.S. DOE as defined in 10 CFR 430.

n. Gas-fired heat pump *pool* heaters are a type of gas-fired *pool* heater as defined in 10 CFR 430.2.

*Revise text as follows:*

#### **7.4.5 Pools**

**7.4.5.1 Pool Heaters Electric switches and Ignition pilots.** Electric switches and ignition pilots shall comply with Section 7.4.5.1.1 through Section 7.4.5.1.2.

**7.4.5.1.1 Electric switches.** *Pool* heaters shall be equipped with a *readily accessible* on/off switch to allow shutting off the heater without adjusting the *thermostat* setting. Operation of such switch shall not change the setting of the heater thermostat.

**7.4.5.1.2 Ignition pilots.** *Pool* heaters fired by natural gas shall not have continuously burning pilot lights.

*Add new sections as follows:*

**7.4.5.4. Primary heating system efficiency.** Other than supplementary and back-up heating systems, primary *pool* heating systems shall comply with Section 7.4.5.4.1. Supplementary and back-up heating *system* controls shall comply with Section 7.4.5.4.5.

#### **Exception to 7.4.5.4:**

1. *Portable electric spas.*
2. Heating systems for indoor *pools* in Climate Zone 8.
3. Heating systems for fully or partially outdoor *pools* in Climate Zones 3 through 8.
4. Where the total surface area of *pools* is greater than 15,000 ft<sup>2</sup> [1,400 m<sup>2</sup>]
5. *Pool* slides that do not end in a Class D-3 catch pool.
6. Heating systems dedicated to permanent *spas* in buildings where *solar-ready zones* meet one of the following requirements:
  - 6.1. The *solar-ready zone* area is a contiguous area of less than 65% of the permanent *spa* surface area.
  - 6.2. Where no area for a *solar-ready zone* exists.
  - 6.3. Where more than 50% of the *solar-ready zone* is shaded from direct-beam sunlight by natural objects or by structures for more than 2,500 annual hours between 8:00 a.m and 4:00 p.m.
7. Heating systems installed solely to prevent freezing and are not set to heat the water above 50°F [10°C].
8. *Pools* heated with boilers that meet efficiency requirements in Table 6.8.1-6 or Table 7.4-1 or existing *pools* heated by district thermal energy heating systems.
9. *Pools* with a *power safety cover*.

**7.4.5.4.1 Primary heating system.** The primary *pool* heating *system*, or the primary source of heat for the hydronic *system* that heats the *pool*, shall be one of the following.

- a. A heat pump *pool* heater shall be installed. Where provided with a supplemental heater, the primary heat pump *pool* heater shall be sized in accordance with Section 7.4.5.4.2 or Section 7.4.5.4.3.
- b. A *solar thermal pool* heater shall be installed with a solar collector surface area equivalent to 40% or more of the *pool* surface area and 160% or more of the *spa* surface area or shall provide the sole heat for the *pool* or *spa*. The portion of *on-site renewable energy* used to meet this requirement shall not be used to meet the *on-site renewable energy* requirements in Section 10 or to earn *on-site renewable energy* credits in Section 11.
- c. A gas *pool* heater shall be installed with a rating not less than 90% E<sub>r</sub> or a consumer gas *pool* heater with an *equipment* rating not less than 90% TE<sub>r</sub>. Where an outdoor or partially outdoor *pool* is provided with a supplemental heater, the primary gas *pool* heater shall be sized in accordance with 7.4.5.4.3.

- d. A system that derives 60% or more of annual water heating energy from on-site renewable energy. The portion of on-site renewable energy used to meet this requirement shall not be used to meet the on-site renewable energy requirements in Section 10 or to earn on-site renewable energy credits in Section 11.
- e. A system that derives, during the daily average outdoor temperature and humidity conditions corresponding to the mean day during the pool’s coldest full month of operation, not less than 40% of its daily heating energy from one or a combination of heat pump pool heaters, solar thermal pool heaters, on-site renewable energy, or site-recovered energy.
- f. Systems for indoor pools or permanent spas that comply with Section 6.5.6.4.

**7.4.5.4.2 Heat pump pool heater sizing for indoor pools.** Where a supplemental heater is installed, the design loads for the purpose of sizing systems and equipment for heat pump pool heaters serving as primary heating systems for indoor pools shall comply with one of the following:

- a. Heat pump pool heaters comply with the manufacturer’s sizing guidelines, specific to the pool size and temperature conditions being proposed without supplemental heating.
- b. Heat pump pool heaters without manufacturer’s published sizing guidelines shall be sized in accordance with generally accepted engineering standards.

**7.4.5.4.3 Primary heat pump sizing for fully or partially outdoor pools.** Where a supplemental heater is installed, the design loads for the purpose of sizing systems and equipment for heat pump pool heaters serving as primary heating systems for fully or partially outdoor pools shall comply with one or more of the following:

- a. Heat pump pool heaters shall comply with the manufacturer’s sizing guidelines, specific to the pool size and temperature conditions being proposed, without supplemental heating.
- b. Heat pump pool heaters shall be designed to provide a heat output not less than 127 Btu/(hr·ft<sup>2</sup>)[400 W/m<sup>2</sup>] of outdoor pool surface area when the outdoor dry bulb air temperature is 50.0°F[10.0°C], the wet bulb temperature is 44.2°F[6.8°C], and the entering water temperature is 80.0°F[26.7°C].
- c. Heat pump pool heaters shall be designed to provide a heat output of 40% or more of the heat loss calculated for those weather conditions and operating pool water temperature during the daily average outdoor temperature and humidity conditions corresponding to the mean day during the pool’s coldest full month of operation.

**7.4.5.4.4 Primary gas pool heater sizing for outdoor or partially outdoor pools.** Where a supplemental heater is installed, gas pool heaters serving as primary heating systems for outdoor or partially outdoor pools shall be designed to provide a heat output not less than 40% of the heat loss calculated for those weather conditions and operating pool water temperature during the daily average outdoor temperature and humidity conditions corresponding to the mean day during the pool’s coldest full month of operation.

**7.4.5.3.5 Control of supplementary pool heating systems.** Pool heating systems with a supplementary pool heating system shall have controls that prevent supplemental heat operation where the heating load can be met by the primary pool heating system alone. Supplementary heat shall be designed to operate when the water temperature is 0.5°F [0.3°C] or more below the water temperature setpoint.

*Modify Chapter 13 Normative References as follows:*

Reference	Section
<b>Air Conditioning, Heating and Refrigeration Institute (AHRI) □</b> 2311 Wilson Blvd., Suite 400, Arlington, VA 22201	
<u>AHRI 1160 - 2022</u>	<u>Performance Rating of Heat Pump Pool Heaters</u> Table 7.4-1
<b>CSA Group</b> 178 Rexdale Blvd., Etobicoke/Toronto, ON	
<b>5801 E. Pleasant Valley Rd., Independence, OH 44131 (U.S. Headquarters)</b> <u>ANSI Z21.56-2019/CSA 4.7-2019</u>	<u>Gas-Fired Pool Heaters</u> Table 7.4-1