

**_*_*DRAFT*_*_*_*_

***2021 Arkansas Energy Code
Amendments and Supplements***

DRAFT

3/3/2021

Anticipated effective date: January 1, 2024

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Contents

| | |
|--|-------------------------------------|
| Introduction | 2 |
| Overview | 2 |
| How to use this draft | Error! Bookmark not defined. |
| Arkansas Amendments and Supplements | 4 |
| Commercial Provisions..... | 4 |
| CHAPTER C1 SCOPE AND ADMINISTRATION..... | 4 |
| CHAPTER C2 DEFINITIONS..... | 4 |
| CHAPTER C3 GENERAL REQUIREMENTS | 5 |
| CHAPTER C4 COMMERCIAL ENERGY EFFICIENCY | 7 |
| APPENDIX CA SOLAR-READY ZONE—COMMERCIAL..... | 11 |
| Residential Provisions | 12 |
| CHAPTER R1 SCOPE AND ADMINISTRATION..... | 12 |
| CHAPTER R2 DEFINITIONS..... | 12 |
| CHAPTER R3 GENERAL REQUIREMENTS | 13 |
| CHAPTER R4 RESIDENTIAL ENERGY EFFICIENCY | 16 |
| CHAPTER R5 EXISTING BUILDINGS..... | 20 |
| APPENDIX RB AIR SEALING AND INSULATION KEY POINTS..... | 21 |

Introduction

The Arkansas Energy Office created this draft after community feedback and discussions with stakeholders.

The code is based on the 2018 International Energy Code (IECC). The IECC code is part of the 2018 International Building Code (IBC) and 2018 International Residential Code (IRC).

Subscribe to the [energy code stakeholder email list](#) for details on this meeting and future announcements. Contact energyinfo@adeq.state.ar.us with any questions or comments.

Overview

These amendments modify, add, or delete sections of the referenced building standard *2018 International Energy Conservation Code*, published by the International Code Council. Any sections not

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included in the Amendments and Supplements document are to be adopted as originally written. The Arkansas Amendments and Supplements, incorporated with the International standard, make up the Arkansas Energy Code.

There are several changes in the proposed code compared to the current 2014 Arkansas Energy Code. Specifically, this draft improves energy performance in the following areas:

1. Windows
2. Ceilings/Roofs
3. Walls
4. Air sealing
5. Duct sealing
6. Lighting
7. Thermostat
8. Hot water pipe
9. Vent fans

Changes are expected to go into effect January 1, 2024, with a few exceptions.

Arkansas Amendments and Supplements

Commercial Provisions

CHAPTER C1 SCOPE AND ADMINISTRATION

C101.1 Title.

This code shall be known as the ~~Energy Conservation Code of [NAME OF JURISDICTION]~~ Arkansas Energy Code for New Building Construction and shall be cited as such. It is referred to herein as "this Code" or "the Arkansas Energy Code."

C101.6 Adoption.

All counties, cities or municipalities that issue building permits for new building construction are required to adopt this Code.

C101.6.1 Modification. A local jurisdiction may exercise other administrative and enforcement procedures that it deems necessary to affect the purposes of this Code. A local jurisdiction may promulgate or adopt rules or regulations that are more stringent than this Code, however the local jurisdiction shall not in any way reduce the energy conservation standards in this Code or promulgate or adopt rules or regulations that are less stringent than this Code.

C101.6.2 Effective Date. Buildings for which a permit is issued on or after the effective date of this Code shall be subject to the provisions of this Code. This code shall be effective on January 1, 2024.

CHAPTER C2 DEFINITIONS

C202 GENERAL DEFINITIONS

BIOGAS. A mixture of hydrocarbons that is a gas at 60 degrees Fahrenheit and 1 atmosphere of pressure that is produced through the anaerobic digestion of organic matter.

BIOMASS. Non-fossilized and biodegradable organic material originating from plants, animals and/or micro-organisms, including products, by-products, residues and waste from agriculture, forestry and related industries as well as the non-fossilized and biodegradable organic fractions of industrial and municipal wastes, including gases and liquids recovered from the decomposition of non-fossilized and biodegradable organic material.

ON-SITE RENEWABLE ENERGY. Energy derived from solar radiation, wind, waves, tides, landfill gas, biogas, biomass or the internal heat of the earth. The energy system providing on-site renewable energy shall be located on the project site. renewable energy resources harvested at the building site.

RENEWABLE ENERGY RESOURCES. Energy derived from solar radiation, wind, waves, tides, landfill gas, biogas, biomass or extracted from hot fluid or steam heated within the earth.

CHAPTER C3 GENERAL REQUIREMENTS

C301.1 General.

Climate zones from Figure C301.1 or Table C301.1 shall be used for determining the applicable requirements from Chapter 4. Locations not indicated in Table C301.1 shall be assigned a climate zone in accordance with Section C301.3.

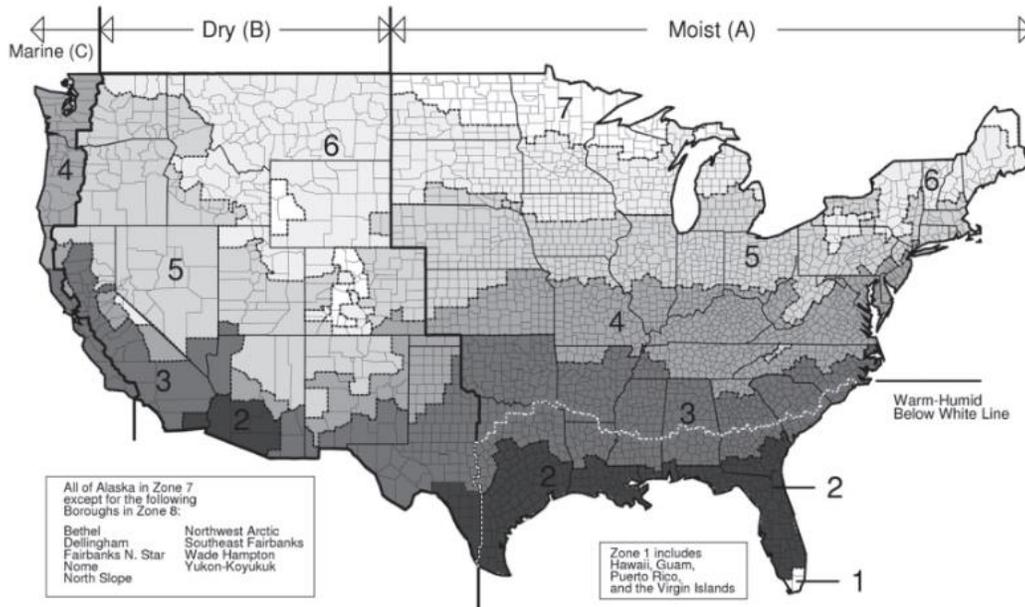


FIGURE C301.1
CLIMATE ZONES

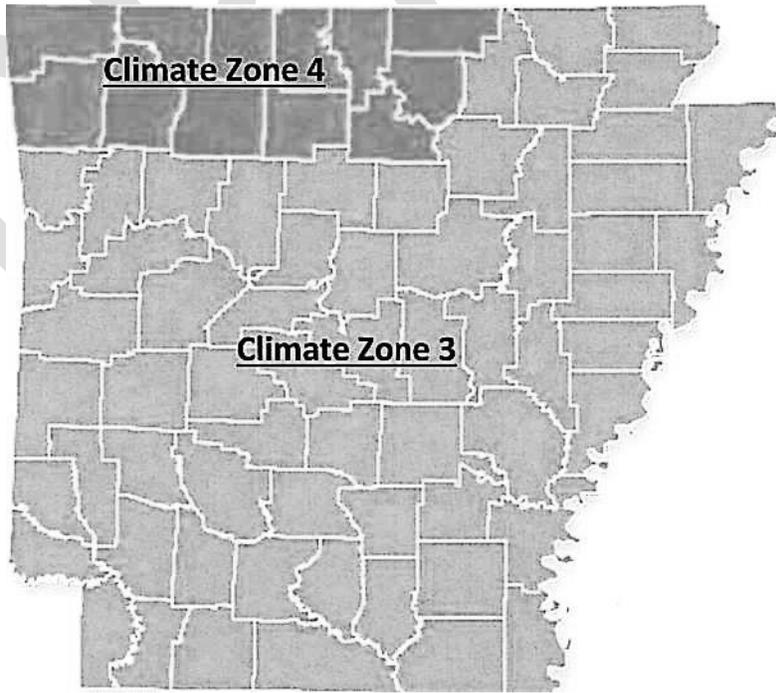


FIGURE C301.2

ARKANSAS CLIMATE ZONES

TABLE C301.1

CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

US STATES

ALABAMA-(and delete the counties within each state or territory)

ALASKA

ARIZONA

ARKANSAS

- 3A Arkansas
- 3A Ashley
- 4A Baxter
- 4A Benton
- 4A Boone
- 3A Bradley
- 3A Calhoun
- 4A Carroll
- 3A Chicot
- 3A Clark
- 3A Clay
- 3A Cleburne
- 3A Cleveland
- 3A Columbia*
- 3A Conway
- 3A Craighead
- 3A Crawford
- 3A Crittenden
- 3A Cross
- 3A Dallas
- 3A Desha
- 3A Drew
- 3A Faulkner
- 3A Franklin
- 4A Fulton
- 3A Garland

- 3A Grant
- 3A Greene
- 3A Hempstead*
- 3A Hot Spring
- 3A Howard
- 3A Independence
- 4A Izard
- 3A Jackson
- 3A Jefferson
- 3A Johnson
- 3A Lafayette*
- 3A Lawrence
- 3A Lee
- 3A Lincoln
- 3A Little River*
- 3A Logan
- 3A Lonoke
- 4A Madison
- 4A Marion
- 3A Miller*
- 3A Mississippi
- 3A Monroe
- 3A Montgomery
- 3A Nevada
- 4A Newton
- 3A Ouachita
- 3A Perry
- 3A Phillips
- 3A Pike
- 3A Poinsett
- 3A Polk
- 3A Pope
- 3A Prairie

- 3A Pulaski
- 3A Randolph
- 3A Saline
- 3A Scott
- 4A Searcy
- 3A Sebastian
- 3A Sevier*
- 3A Sharp
- 3A St. Francis
- 4A Stone
- 3A Union*
- 3A Van Buren
- 4A Washington
- 3A White
- 3A Woodruff
- 3A Yell

CALIFORNIA

COLORADO

CONNECTICUT

DELAWARE

DISTRICT OF COLUMBIA

FLORIDA

GEORGIA

HAWAII

IDAHO

ILLINOIS

INDIANA

IOWA

KANSAS

KENTUCKY

LOUISIANA

MAINE

| | | |
|----------------------|-----------------------|-------------------------|
| MARYLAND | NORTH CAROLINA | VIRGINIA |
| MASSACHUSETTS | NORTH DAKOTA | WASHINGTON |
| MICHIGAN | OHIO | WEST VIRGINIA |
| MINNESOTA | OKLAHOMA | WISCONSIN |
| MISSISSIPPI | OREGON | WYOMING |
| MISSOURI | PENNSYLVANIA | US TERRITORIES |
| MONTANA | RHODE ISLAND | AMERICAN SAMOA |
| NEBRASKA | SOUTH CAROLINA | GUAM |
| NEVADA | SOUTH DAKOTA | NORTHERN MARIANA |
| NEW HAMPSHIRE | TENNESSEE | ISLANDS |
| NEW JERSEY | TEXAS | PUERTO RICO |
| NEW MEXICO | UTAH | VIRGIN ISLANDS |
| NEW YORK | VERMONT | |

C301.3 International Climate Zones. (Deleted in its entirety)

C301.4 Tropical climate zone. (Deleted in its entirety)

CHAPTER C4 COMMERCIAL ENERGY EFFICIENCY

C403.8.5 Low-capacity ventilation fans (Mandatory). Mechanical ventilation system fans with motors less than 1/12 horsepower in capacity shall meet the efficacy requirements of Table C403.8.5 at one or more rating points.

Exceptions:

1. Where ventilation fans are a component of a listed heating or cooling appliance.
2. Dryer exhaust duct power ventilators, domestic range hoods, and domestic range booster fans that operate intermittently.

**TABLE C403.8.5
LOW-CAPACITY VENTILATION FAN EFFICACY^a**

| FAN LOCATION | AIR FLOW RATE MINIMUM (CFM) | MINIMUM EFFICACY (CFM/WATT) | AIR FLOW RATE MAXIMUM (CFM) |
|---------------------|--|--|--|
| <u>HRV or ERV</u> | <u>Any</u> | <u>1.2 cfm/watt</u> | <u>Any</u> |
| <u>In-line fan</u> | <u>Any</u> | <u>3.8 cfm/watt</u> | <u>Any</u> |

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| | | | |
|------------------------|----|--------------|------|
| Bathroom, utility room | 10 | 2.8 cfm/watt | < 90 |
| Bathroom, utility room | 90 | 3.5 cfm/watt | Any |

a. Air flow shall be tested in accordance with HVI Standard 916 and listed. Efficacy shall be listed, or shall be derived from listed power and air flow. Fan efficacy for fully ducted HRV, ERV, balanced, and in-line fans shall be determined at a static pressure not less than 0.2 in. w.c. Fan efficacy for fully ducted HRV, ERV, balanced, and in-line fans shall be determined at a static pressure not less than 0.2 in. w.c. Fan efficacy for ducted range hoods, bathroom, and utility room fans shall be determined at a static pressure not less than 0.1 in. w.c.

C405.1 General (Mandatory). ~~This section covers lighting~~ Lighting system controls, the maximum lighting power for interior and exterior applications and electrical energy consumption shall comply with this section. Dwelling units within multifamily buildings shall comply with Section R404.1. All other dwelling units shall comply with Section R404.1, or with Sections C405.2.4 and C405.3. Sleeping units shall comply with Section C405.2.4, and with Section R404.1 or C405.3. Lighting installed in walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers shall comply with the lighting requirements of Section C403.10.1 or C403.10.2. Sleeping units shall comply with Section C405.2.4, and with Section C405.1.1 or C405.3.

C405.1.1 Lighting for dwelling units. No less than 90 percent of the permanently installed lighting, excluding kitchen appliance lighting, serving dwelling units shall be provided by lamps with an efficacy of not less than 65 lm/W or luminaires with an efficacy of not less than 45 lm/W, or shall comply with Sections C405.2.4 and C405.3.

C405.1.2 Lighting for refrigerated applications. Lighting installed in walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers shall comply with the lighting requirements of Section C403.10.1 or C403.10.2.

C406.1 Requirements. Buildings shall comply with one or more of the following:

1. More efficient HVAC performance in accordance with Section C406.2.
2. Reduced lighting power in accordance with Section C406.3.
3. Enhanced lighting controls in accordance with Section C406.4.
4. On-site supply of renewable energy in accordance with Section C406.5.
5. Provision of a dedicated outdoor air system for certain HVAC equipment in accordance with Section C406.6.
6. High-efficiency service water heating in accordance with Section C406.7.
7. Enhanced envelope performance in accordance with Section C406.8.
8. Reduced air infiltration in accordance with Section C406.9.
9. Controlled receptacles in accordance with Section C406.10.
10. Extra area daylight responsive controls in accordance with C406.11.

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11. Efficient Kitchen Equipment in accordance with Section C406.12.

C406.10 Controlled Receptacles. At least 50 percent of all 125 volt 15- and 20-ampere receptacles installed in private offices, open offices, conference rooms, breakrooms, individual workstations, and classrooms, including those installed in modular partitions and modular office workstation systems, shall be controlled as required by this section. Either split receptacles shall be provided, with the top receptacle(s) controlled, or a controlled receptacle shall be located within 12 inches (0.3 M) of each uncontrolled receptacle. Alternatively, non-controlled receptacles in a single modular workstation located not more than 72 inches from a controlled receptacle serving that workstation. Controlled receptacles shall be visibly differentiated from standard receptacles and shall be controlled by one of the following automatic control devices:

1. An occupant sensor that turns receptacle power off when no occupants have been detected for a maximum of 20 minutes.
2. A time-of-day operated control device that turns receptacle power off at specific programmed times and can be programmed separately for each day of the week. The control device shall be capable of providing an independent schedule for each portion of the building not to exceed 5,000 square feet (460 m²) and not to exceed one full floor. The device shall be capable of being overridden for periods of up to two hours by an override switch accessible to occupants. Any individual override switch shall control the controlled receptacles for a maximum area of 5,000 square feet (460 m²).

Exception: Receptacles designated for specific equipment requiring 24-hour operation, for building maintenance functions, or for specific safety or security equipment.

C406.11 Extra Area Daylight Responsive Controls. Building shall not use the energy efficiency credits for Section C406.7, enhanced lighting control, and shall provide continuous dimming *daylight responsive controls* for 150 percent of the area required to have *daylight responsive controls* in toplit zones and sidelit zones in Section C405.2.3 or as required by Section C402.4.1.1. Toplit and sidelit zones as defined in Sections C405.2.3.2 and C405.2.3.3 shall be controlled separately from adjacent daylight zones.

C406.12 Efficient Kitchen Equipment. For buildings and spaces designated as Group A-2, or facilities that include a commercial kitchen with at least one gas or electric fryer, all fryers, dishwashers, steam cookers and ovens shall comply with all of the following:

1. Achieve performance levels in accordance with the equipment specifications listed in Tables C406.12 (1) through (4) when rated in accordance with the applicable test procedure.
2. Be installed prior to the issuance of the Certificate of Occupancy.
3. Have associated performance levels listed on the construction documents submitted for permitting.

| | | | |
|--|---|-------------------------|-----------------------|
| This draft is a working document. All information contained herein is subject to change and may differ substantially from the final document. The information contained in this document should not be considered the position or views of the agency or the Governor. | <u>Heavy-Load Cooking Energy Efficiency</u> | <u>Idle Energy Rate</u> | <u>Test Procedure</u> |
|--|---|-------------------------|-----------------------|

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| | | | |
|--|-------------|----------------------|-------------------------------|
| <u>Standard Open Deep-Fat Gas Fryers</u> | $\geq 50\%$ | $\leq 9,000$ Btu/hr | <u>ASTM Standard F1361-07</u> |
| <u>Standard Open Deep-Fat Electric Fryers</u> | $\geq 83\%$ | ≤ 800 watts | |
| <u>Large Vat Open Deep-Fat Gas Fryers</u> | $\geq 50\%$ | $\leq 12,000$ Btu/hr | <u>ASTM Standard F2144-17</u> |
| <u>Large Vat Open Deep-Fat Electric Fryers</u> | $\geq 80\%$ | $\leq 1,100$ watts | |

Table C406.12 (1)**Minimum Efficiency Requirements: Commercial Fryers****Table C406.12 (2)****Minimum Efficiency Requirements: Commercial Steam Cookers**

| <u>Fuel Type</u> | <u>Pan Capacity</u> | <u>Cooking Energy Efficiency^a</u> | <u>Idle Rate</u> | <u>Test Procedure</u> |
|-----------------------|-------------------------|--|---------------------|-------------------------------|
| <u>Electric Steam</u> | <u>3-pan</u> | <u>50%</u> | <u>400 watts</u> | <u>ASTM Standard F1484-18</u> |
| | <u>4-pan</u> | <u>50%</u> | <u>530 watts</u> | |
| | <u>5-pan</u> | <u>50%</u> | <u>670 watts</u> | |
| | <u>6-pan and larger</u> | <u>50%</u> | <u>800 watts</u> | |
| <u>Gas Steam</u> | <u>3-pan</u> | <u>38%</u> | <u>6,250 Btu/h</u> | |
| | <u>4-pan</u> | <u>38%</u> | <u>8,350 Btu/h</u> | |
| | <u>5-pan</u> | <u>38%</u> | <u>10,400 Btu/h</u> | |
| | <u>6-pan and larger</u> | <u>38%</u> | <u>12,500 Btu/h</u> | |

- a. Cooking Energy Efficiency is based on heavy load (potato) cooking capacity

Table C406.12 (3)**Minimum Efficiency Requirements: Commercial Dishwashers**

| <u>Machine Type</u> | <u>High Temp Efficiency Requirements</u> | | <u>Low Temp Efficiency Requirements</u> | | <u>Test Procedure</u> |
|------------------------------------|--|--------------------------------------|---|--------------------------------------|--|
| | <u>Idle Energy Rate^a</u> | <u>Water Consumption^b</u> | <u>Idle Energy Rate^a</u> | <u>Water Consumption^b</u> | |
| <u>Under Counter</u> | ≤ 0.50 kW | ≤ 0.86 GPR | ≤ 0.50 kW | ≤ 1.19 GPR | <u>ASTM Standard F1696-18</u> <u>ASTM Standard F1920-15</u> |
| <u>Stationary Single Tank Door</u> | ≤ 0.70 kW | ≤ 0.89 GPR | ≤ 0.60 kW | ≤ 1.18 GPR | |
| <u>Pot, Pan, and Utensil</u> | ≤ 1.20 kW | ≤ 0.58 GPR | ≤ 1.00 kW | ≤ 0.58 GPSF | |
| <u>Single Tank Conveyor</u> | ≤ 1.50 kW | ≤ 0.70 GPR | ≤ 1.50 kW | ≤ 0.79 GPR | |
| <u>Multiple Tank Conveyor</u> | ≤ 2.25 kW | ≤ 0.54 GPR | ≤ 2.00 kW | ≤ 0.54 GPR | |
| <u>Single Tank Flight Type</u> | <u>Reported</u> | $\text{GPH} \leq 2.975x + 55.00$ | <u>Reported</u> | $\text{GPH} \leq 2.975x + 55.00$ | |
| <u>Multiple Tank Flight Type</u> | <u>Reported</u> | $\text{GPH} \leq 4.96x + 17.00$ | <u>Reported</u> | $\text{GPH} \leq 4.96x + 17.00$ | |

^a Idle results should be measured with the door closed and represent the total idle energy consumed by the machine including all tank heater(s) and controls. Booster heater (internal or external) energy consumption should not be part of this measurement unless it cannot be separately monitored.

^b GPR = gallons per rack; GPSF = gallons per square foot of rack; GPH = gallons per hour; x = sf of conveyor belt (i.e., W*L) /min (max conveyor speed).

Table C406.12 (4)
Minimum Efficiency Requirements: Commercial Ovens

| <u>Fuel Type</u> | <u>Classification</u> | <u>Idle Rate</u> | <u>Cooking-Energy Efficiency, %</u> | <u>Test Procedure</u> |
|--------------------------|------------------------|-------------------------------------|-------------------------------------|------------------------|
| Convection Ovens | | | | |
| <u>Gas</u> | <u>Full-Size</u> | $\leq 12,000 \text{ Btu/h}$ | ≥ 46 | <u>ASTM F1496 - 13</u> |
| <u>Electric</u> | <u>Half-Size</u> | $\leq 1.0 \text{ Btu/h}$ | ≥ 71 | |
| | <u>Full-Size</u> | $\leq 1.60 \text{ Btu/h}$ | | |
| Combination Ovens | | | | |
| <u>Gas</u> | <u>Steam Mode</u> | $\leq 200P^a + 6,511 \text{ Btu/h}$ | ≥ 41 | <u>ASTM F2861 - 17</u> |
| | <u>Convection Mode</u> | $\leq 150P^a + 5,425 \text{ Btu/h}$ | ≥ 56 | |
| <u>Electric</u> | <u>Steam Mode</u> | $\leq 0.133P^a + 0.6400 \text{ kW}$ | ≥ 55 | |
| | <u>Convection Mode</u> | $\leq 0.080P^a + 0.4989 \text{ kW}$ | ≥ 76 | |
| Rack Ovens | | | | |
| <u>Gas</u> | <u>Single</u> | $\leq 25,000 \text{ Btu/h}$ | ≥ 48 | <u>ASTM F2093 - 18</u> |
| | <u>Double</u> | $\leq 30,000 \text{ Btu/h}$ | ≥ 52 | |

- a. P = Pan Capacity: The number of steam table pans the combination oven is able to accommodate as per the ASTM F – 1495 – 14a standard specification.

APPENDIX CA SOLAR-READY ZONE—COMMERCIAL

CA103.6 Interconnection pathway. Construction documents shall indicate pathways for routing of conduit or piping raceways or cable from the solar-ready zone to the electrical service panel and electrical energy storage system area, or service hot water system.

CA103.7 Electrical energy storage system-ready area. The floor area of the electrical energy storage system-ready area shall be not less than 2 feet in one dimension and 4 feet in another dimension, and located in accordance with Section 1206.2.8 of the *International Fire Code* and Section 110.26 of NFPA 70. The location and layout diagram of the electrical energy storage system-ready area shall be indicated on the construction documents.

CA103.7 CA103.8 Electrical service reserved space. The main electrical service panel shall have a reserved space to allow installation of a dual two-pole circuit breaker for future solar electric installation and a dual-pole circuit breaker for future electrical energy storage system installation. These spaces shall be labeled “For Future Solar Electric and Storage.” The reserved spaces shall be positioned at the end of the panel that is opposite from the panel supply conductor connection.

Residential Provisions

CHAPTER R1 SCOPE AND ADMINISTRATION

R101.1 Title.

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R101.6.2 Effective Date. Buildings for which a permit is issued on or after the effective date of this Code shall be subject to the provisions of this Code. This code shall be effective on January 1, 2024.

CHAPTER R2 DEFINITIONS

R202 GENERAL DEFINITIONS

BIOGAS. A mixture of hydrocarbons that is a gas at 60 degrees Fahrenheit and 1 atmosphere of pressure that is produced through the anaerobic digestion of organic matter.

BIOMASS. Non-fossilized and biodegradable organic material originating from plants, animals and/or micro-organisms, including products, by-products, residues and waste from agriculture, forestry and related industries as well as the non-fossilized and biodegradable organic fractions of industrial and municipal wastes, including gases and liquids recovered from the decomposition of non-fossilized and biodegradable organic material.

CAVITY INSULATION. Insulating material located between framing members.

CERTIFIED DUCT AND ENVELOPE TIGHTNESS (DET) VERIFIER. A certified DET verifier shall have successfully completed a certification from one of the DET verifier courses approved by the Arkansas Energy Office, or a certified DET verifier shall be approved by the code official. A certified DET verifier shall be allowed to self-test their company's own work.

ENVELOPE LEAKAGE RATIO. The leakage rate as a fraction of the total surface area of the building envelope which includes walls, floors, and ceilings.

HIGH-EFFICACY LAMPS. Compact fluorescent lamps, light-emitting diode (LED) lamps, T-8 or smaller diameter linear fluorescent lamps, or other lamps Any lamps with an efficacy of not less than 70 lumens per watt the following:

1. 60 lumens per watt for lamps over 40 watts.

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- 2. 50 lumens per watt for lamps over 15 watts to 40 watts.
- 3. 40 lumens per watt for lamps 15 watts or less.

ON-SITE RENEWABLE ENERGY. Energy from renewable energy resources harvested at the building site.

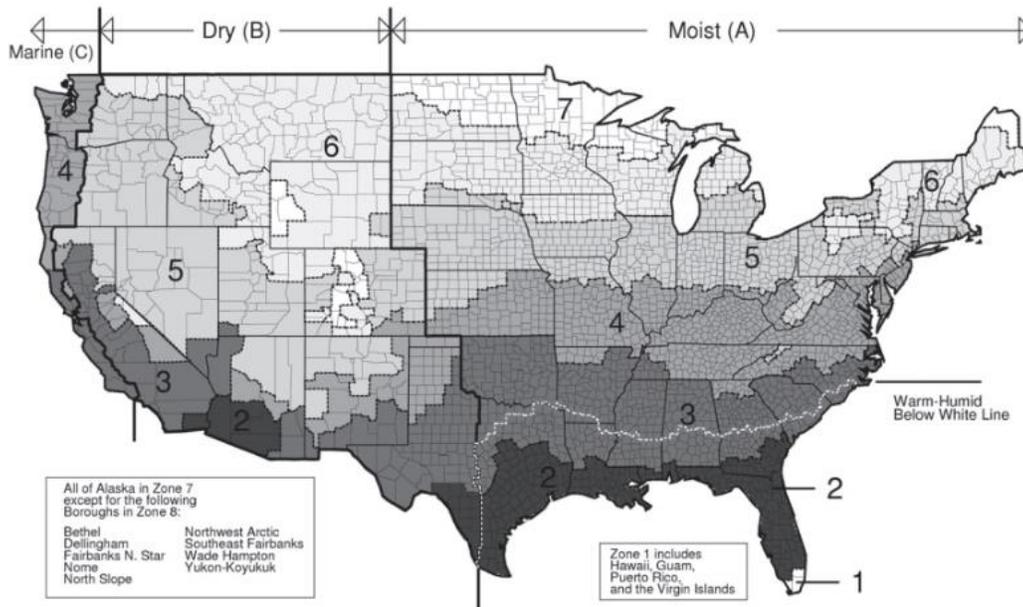
RENEWABLE ENERGY CERTIFICATE (REC). An instrument that represents the environmental attributes of one megawatt hour of renewable energy; also known as an energy attribute certificate (EAC).

RENEWABLE ENERGY RESOURCES. Energy derived from solar radiation, wind, waves, tides, landfill gas, biogas, biomass or extracted from hot fluid or steam heated within the earth.

CHAPTER R3 GENERAL REQUIREMENTS

R301.1 General.

Climate zones from Figure R301.1 or Table R301.1 shall be used for determining the applicable requirements from Chapter 4. Locations not indicated in Table R301.1 shall be assigned a climate zone in accordance with Section R301.3.



**FIGURE R301.1
CLIMATE ZONES**

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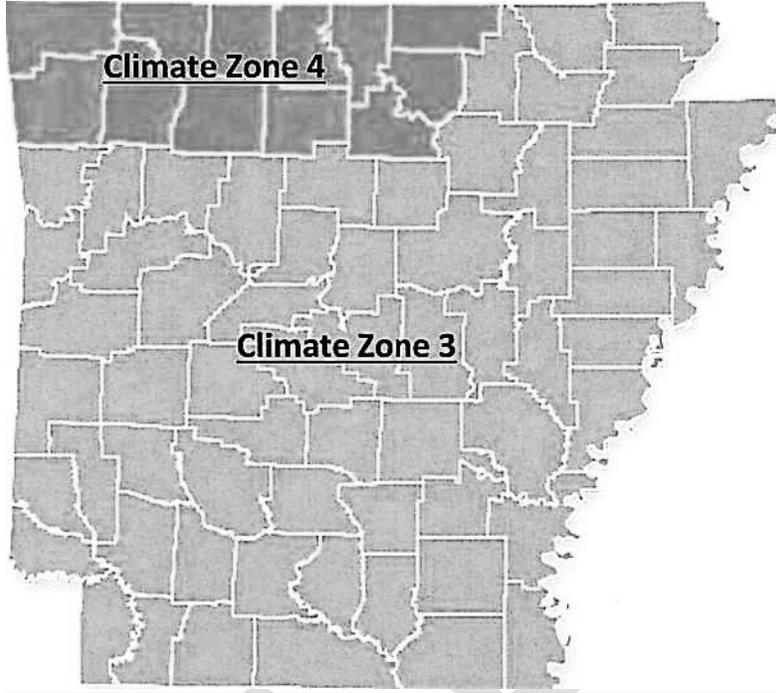


FIGURE R301.2
ARKANSAS CLIMATE ZONES

TABLE R301.1

CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

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ARIZONA

ARKANSAS

- 3A Arkansas
- 3A Ashley
- 4A Baxter
- 4A Benton
- 4A Boone
- 3A Bradley
- 3A Calhoun
- 4A Carroll
- 3A Chicot

- 3A Clark
- 3A Clay
- 3A Cleburne
- 3A Cleveland
- 3A Columbia*
- 3A Conway
- 3A Craighead
- 3A Crawford
- 3A Crittenden
- 3A Cross
- 3A Dallas
- 3A Desha
- 3A Drew
- 3A Faulkner
- 3A Franklin
- 4A Fulton

- 3A Garland
- 3A Grant
- 3A Greene
- 3A Hempstead*
- 3A Hot Spring
- 3A Howard
- 3A Independence
- 4A Izard
- 3A Jackson
- 3A Jefferson
- 3A Johnson
- 3A Lafayette*
- 3A Lawrence
- 3A Lee
- 3A Lincoln
- 3A Little River*

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| | | |
|----------------|-----------------------------|-------------------------|
| 3A Logan | 4A Washington | NEW HAMPSHIRE |
| 3A Lonoke | 3A White | NEW JERSEY |
| 4A Madison | 3A Woodruff | NEW MEXICO |
| 4A Marion | 3A Yell | NEW YORK |
| 3A Miller* | | NORTH CAROLINA |
| 3A Mississippi | CALIFORNIA | NORTH DAKOTA |
| 3A Monroe | COLORADO | OHIO |
| 3A Montgomery | CONNECTICUT | OKLAHOMA |
| 3A Nevada | DELAWARE | OREGON |
| 4A Newton | DISTRICT OF COLUMBIA | PENNSYLVANIA |
| 3A Ouachita | FLORIDA | RHODE ISLAND |
| 3A Perry | GEORGIA | SOUTH CAROLINA |
| 3A Phillips | HAWAII | SOUTH DAKOTA |
| 3A Pike | IDAHO | TENNESSEE |
| 3A Poinsett | ILLINOIS | TEXAS |
| 3A Polk | INDIANA | UTAH |
| 3A Pope | IOWA | VERMONT |
| 3A Prairie | KANSAS | VIRGINIA |
| 3A Pulaski | KENTUCKY | WASHINGTON |
| 3A Randolph | LOUISIANA | WEST VIRGINIA |
| 3A Saline | MAINE | WISCONSIN |
| 3A Scott | MARYLAND | WYOMING |
| 4A Searcy | MASSACHUSETTS | US TERRITORIES |
| 3A Sebastian | MICHIGAN | AMERICAN SAMOA |
| 3A Sevier* | MINNESOTA | GUAM |
| 3A Sharp | MISSISSIPPI | NORTHERN MARIANA |
| 3A St. Francis | MISSOURI | ISLANDS |
| 4A Stone | MONTANA | PUERTO RICO |
| 3A Union* | NEBRASKA | VIRGIN ISLANDS |
| 3A Van Buren | NEVADA | |

~~R301.3 International Climate Zones.~~ (Deleted in its entirety)

~~R301.4 Tropical climate zone.~~ (Deleted in its entirety)

~~R401.2.1 Tropical zone.~~ (Deleted in its entirety)

CHAPTER R4 RESIDENTIAL ENERGY EFFICIENCY

R401.3 Certificate (Mandatory).

A permanent certificate shall be completed by the builder or other *approved* party and posted on a wall in the space where the furnace is located, a utility room or an approved location inside the building. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall indicate the predominant R-values of insulation installed in or on ceilings, roofs, walls, foundation components such as slabs, basement walls, crawl space walls and floors and ducts outside conditioned spaces; U-factors of fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any required duct system and building envelope air leakage testing performed on the building. Where there is more than one value for each component, the certificate shall indicate the value covering the largest area. The certificate shall indicate the types and efficiencies of heating, cooling, and service water heating equipment. Where a gas-fired unvented room heater, electric furnace or baseboard electric heater is installed in the residence, the certificate shall indicate “gas-fired unvented room heater,” “electric furnace” or “baseboard electric heater,” as appropriate. An efficiency shall not be indicated for gas-fired unvented room heaters, electric furnaces and electric baseboard heaters.

R401.3.1 Certificate Template.

Any individual or party may create and maintain a unique certificate template, provided it complies with the minimum requirements in this section. The certificate may include additional energy related information if desired. The Arkansas Department of Energy and Environment - Energy Office shall create and maintain a certificate template and make it available to the public on its website, through E-mail and by other means. Alterations made to this certificate, by the Arkansas Energy Office or by others, cannot increase or decrease the stringency of the standards reflected in this Code.

R402.1.2 Insulation and fenestration criteria.

The *building thermal envelope* shall meet the requirements of Table R402.1.2, based on the *climate zone* specified in Chapter 3.

**TABLE R402.1.2
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT**

| CLIMATE ZONE | FENESTRATION U-FACTOR | SKYLIGHT U-FACTOR | GLAZED FENESTRATION SHGC | CEILING R-VALUE | WOOD FRAME WALL R-VALUE | MASS WALL R-VALUE | FLOOR R-VALUE | BASEMENT WALL R-VALUE | SLAB R-VALUE AND DEPTH | CRAWL SPACE WALL R-VALUE |
|-----------------|-----------------------|-------------------|--------------------------|-----------------|-------------------------|-------------------|---------------|-----------------------|------------------------|--------------------------|
| 3 | 0.32 | 0.55 | 0.25 | 38 | 20 or 13+5 13 | 8/13 | 19 | 5/13 | 0 | 5/13 |
| 4 except Marine | 0.32 | 0.55 | 0.40 | 49 | 20 or 13+5 13 | 8/13 | 19 | 10/13 | 10, 2 ft 0 | 10/13 |

| CLIMATE ZONE | FENESTRATION U-FACTOR | SKYLIGHT U-FACTOR | CEILING U-FACTOR | FRAME WALL U-FACTOR | MASS WALL U-FACTOR | FLOOR U-FACTOR | BASEMENT WALL U-FACTOR | CRAWL SPACE WALL U-FACTOR |
|-----------------------|-----------------------|-------------------|------------------|---------------------|--------------------|----------------|------------------------|---------------------------|
| 3 | 0.32 | 0.55 | 0.030 | 0.084 | 0.098 | 0.047 | 0.091 | 0.136 |
| 4 except Marine | 0.32 | 0.55 | 0.026 | 0.084 | 0.098 | 0.047 | 0.059 | 0.065 |

R402.2.14 Unvented attics.

As an alternative to ceiling insulation installed with the thermal performance of Table R402.1.2 or Table 402.1.4, insulation shall be permitted to be installed at the roof deck with a reduced R-value or increased U-factor, provided it meets all of the following requirements:

1. One-hundred percent (100%) of the roof area is unvented,
2. Insulation is installed with a minimum R-value of R-20 + R-5ci or maximum U-factor of U-0.042 in climate zone 3 or R-26 + R-5ci or maximum U-factor of U-0.034 in climate zone 4,
3. All ducts and air handling equipment are completely inside the building thermal envelope,
4. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding three air changes per hour at 0.2 inch w.g. (50 Pascals),
5. The fresh air ventilation system is not exhaust-based, and
6. The unvented attic meets the requirements of Section 806.5 of the 2018 International Residential Code in addition to the requirements under this section.

R402.4.1.2 Testing.

This section R402.4.1.2 Testing shall not be enforced until after January 1, 2023. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding five air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with RESNET/ICC 380, ASTM E779 or ASTM E1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals). **Where required by the code official, testing shall be conducted by an approved third party.** A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after creation of all penetrations of the building thermal envelope. Testing shall be conducted by a certified duct and envelope tightness (DET) verifier.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures.

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2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.
3. Interior doors, where installed at the time of the test, shall be open.
4. Exterior or interior terminations for continuous ventilation systems shall be sealed.
5. Heating and cooling systems, where installed at the time of the test, shall be turned off.
6. Supply and return registers, where installed at the time of the test, shall be fully open.

Alternative Air Leakage Rate: The building or dwelling unit shall be tested and verified as having an envelope leakage ratio not exceeding 0.30 cubic feet per minute per square foot of building envelope at a pressure of 0.2 inch w.g. (50 Pascals).

R403.3.1 Insulation (Prescriptive).

Supply and return ducts in attics shall be insulated to an R-value of not less than R-8 **R-6. Note, ducts must be properly sealed and insulated to prevent condensation. Duct systems shall be installed in accordance with the Arkansas Mechanical Code and the appropriate SMACNA or NAIMA standards.** for ducts 3 inches (76 mm) in diameter and larger and not less than R-6 for ducts smaller than 3 inches (76 mm) in diameter. Supply and return ducts in other portions of the building shall be insulated to not less than R-6 for ducts 3 inches (76 mm) in diameter and not less than R-4.2 for ducts smaller than 3 inches (76 mm) in diameter.

Exception: Ducts or portions thereof located completely inside the building thermal envelope.

R403.3.4 Duct leakage (Prescriptive).

Sections R403.3.3 Duct Testing (Mandatory) and R403.3.4 Duct leakage (Prescriptive) shall not be enforced until after January 1, 2023. The total leakage of the ducts, where measured in accordance with Section R403.3.3, shall be less than or equal to 6 cubic feet per minute (169.9 L/min) per 100 square feet (9.29 m²) of conditioned floor area, or less than 60 cubic feet per minute, whichever is greater. Testing shall be conducted by a *certified duct and envelope tightness (DET) verifier*, as follows:

1. ~~Rough in test: The total leakage shall be less than or equal to 4 cubic feet per minute (113.3 L/min) per 100 square feet (9.29 m²) of conditioned floor area where the air handler is installed at the time of the test. Where the air handler is not installed at the time of the test, the total leakage shall be less than or equal to 3 cubic feet per minute (85 L/min) per 100 square feet (9.29 m²) of conditioned floor area.~~
2. ~~Postconstruction test: Total leakage shall be less than or equal to 4 cubic feet per minute (113.3 L/min) per 100 square feet (9.29 m²) of conditioned floor area.~~

R406.2 Mandatory requirements

Compliance with this section requires that the provisions identified in Section R401 through R404 indicated as "Mandatory" and section R403.5.3 be met. The *building thermal envelope* shall be greater than or equal to levels of efficiency and *Solar Heat Gain Coefficients* in Table 402.1.1 or 402.1.3 of the

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2009 International Energy Conservation Code 2014 Arkansas Energy Code for New Building Construction.

Exception: Supply and return ducts not completely inside the building thermal envelope shall be insulated to an R-value of not less than R-6.

**TABLE R406.2.1
ENERGY RATING INDEX COMPLIANCE ALTERNATIVE
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT
(EXCERPT FROM TABLE 402.1.1 OF THE 2014 ARKANSAS ENERGY CODE)**

| <u>CLIMATE ZONE</u> | <u>FENESTRATION U-FACTOR</u> | <u>SKYLIGHT U-FACTOR</u> | <u>GLAZED FENESTRATION SHGC</u> | <u>CEILING R-VALUE</u> | <u>WOOD FRAME WALL R-VALUE</u> | <u>MASS WALL R-VALUE</u> | <u>FLOOR R-VALUE</u> | <u>BASEMENT WALL R-VALUE</u> | <u>SLAB R-VALUE AND DEPTH</u> | <u>CRAWL SPACE WALL R-VALUE</u> |
|------------------------|------------------------------|--------------------------|---------------------------------|------------------------|--------------------------------|--------------------------|----------------------|------------------------------|-------------------------------|---------------------------------|
| <u>3</u> | <u>0.50</u> | <u>0.65</u> | <u>0.30</u> | <u>30</u> | <u>13</u> | <u>5/8</u> | <u>19</u> | <u>5/13</u> | <u>0</u> | <u>5/13</u> |
| <u>4 except Marine</u> | <u>0.50</u> | <u>0.65</u> | <u>0.40</u> | <u>30</u> | <u>13</u> | <u>5/10</u> | <u>19</u> | <u>10/13</u> | <u>0</u> | <u>5/13</u> |

**TABLE R406.2.2
ENERGY RATING INDEX COMPLIANCE ALTERNATIVE
EQUIVALENT U-FACTORS^a
(EXCERPT FROM TABLE 402.1.3 OF THE 2014 ARKANSAS ENERGY CODE)**

| <u>CLIMATE ZONE</u> | <u>FENESTRATION U-FACTOR</u> | <u>SKYLIGHT U-FACTOR</u> | <u>CEILING U-FACTOR</u> | <u>WOOD FRAME WALL U-FACTOR</u> | <u>MASS WALL U-FACTOR</u> | <u>FLOOR U-FACTOR</u> | <u>BASEMENT WALL U-FACTOR</u> | <u>CRAWL SPACE WALL R-VALUE</u> |
|------------------------|------------------------------|--------------------------|-------------------------|---------------------------------|---------------------------|-----------------------|-------------------------------|---------------------------------|
| <u>3</u> | <u>0.50</u> | <u>0.65</u> | <u>0.035</u> | <u>0.082</u> | <u>0.141</u> | <u>0.047</u> | <u>0.091</u> | <u>0.136</u> |
| <u>4 except Marine</u> | <u>0.50</u> | <u>0.65</u> | <u>0.035</u> | <u>0.082</u> | <u>0.141</u> | <u>0.047</u> | <u>0.059</u> | <u>0.065</u> |

R406.4 ERI-based compliance.

Compliance based on an ERI analysis requires that the rated design be shown to have an ERI less than or equal to the appropriate value indicated in Table R406.4 when compared to the ERI reference design.

**TABLE R406.4
MAXIMUM ENERGY RATING INDEX**

| <u>CLIMATE ZONE</u> | <u>ENERGY RATING INDEX 1/1 /2024-12/31/2026</u> | <u>ENERGY RATING INDEX 1/1/2027 ONWARD</u> |
|---------------------|---|--|
| <u>1</u> | <u>57</u> | <u>—</u> |
| <u>2</u> | <u>57</u> | <u>—</u> |
| <u>3</u> | <u>57 70</u> | <u>65</u> |
| <u>4</u> | <u>62 75</u> | <u>70</u> |
| <u>5</u> | <u>61</u> | <u>—</u> |
| <u>6</u> | <u>61</u> | <u>—</u> |
| <u>7</u> | <u>58</u> | <u>—</u> |
| <u>8</u> | <u>58</u> | <u>—</u> |

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- a. Where on-site renewable energy is included for compliance using the ERI analysis of Section R406.4, the building shall meet the mandatory requirements of Section R406.2, and the building thermal envelope shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or Table R402.1.4 of the 2015 International Energy Conservation Code.
- b. The dates shown indicate the period that the ERI score is effective. Refer to Section R103.3.2 of this Code regarding previous approvals.

R406.6.3 Renewable energy certificates (RECs) documentation. Where onsite renewable energy is included in the calculation of an ERI, one of the following forms of documentation shall be provided to the code official:

1. Substantiation that the RECs associated with the onsite renewable energy are owned by, or retired on behalf of, the homeowner.
2. A contract that conveys to the homeowner the RECs associated with the onsite renewable energy, or conveys to the homeowner an equivalent quantity of RECs associated with other renewable energy.

CHAPTER R5 EXISTING BUILDINGS

R502.1.1.5 Certificate.

Additions greater than twenty percent (20%) of existing conditioned floor area shall include a new certificate in compliance with Section R401.3.

R503.1.5 Certificate.

An alteration project that includes systems in compliance with R503.1.1 through R503.1.4 shall update the relevant information on the building Certificate in compliance with Section R401.3. Exception: Buildings that did not contain a Certificate before the alteration shall not require a new or updated certificate.

APPENDIX RB AIR SEALING AND INSULATION KEY POINTS

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