Oklahoma 2018 Energy Code Compliance Guide

This is intended to guide the Building Industry to greater compliance with the prescriptive energy code requirements, in Chapter 11 of the 2018 IRC as amended by the OUBCC (OK 2018 IRC). **Effective September 14, 2022,** the 2018 IRC, as amended, meets the statewide minimum requirements for residential construction for one and two-family dwellings and townhouses pursuant to 59 O.S. § 1000.23, and may be amended or altered to be more stringent, by local jurisdictions. For more details on the OK 2018 IRC or local amendments please contact your local building official.

A simplified table of building envelope requirements is below, which apply to new residential buildings, additions, alterations and repairs/replacements as defined in the OK 2018 IRC.

All Oklahoma counties are in climate zone 3A except Beaver, Cimarron and Texas which are in climate zone 4B.

Table 1102.1.2

Climate Zone	Windows			Insulation				Foundation		
	Fenestration U-factor	Skylight U-factor	SHGC[a]	Ceiling R-value	Wood frame wall R-value	Mass wall R-value[d]	Floor R-value	Basement wall R-value[d]	Slab R-value & depth	Crawl space wall R-value[d]
3	≤0.38[b]	≤0.55	≤0.30[c]	≥30	≥13	≥8/13	≥19	≥5/13	NR	≥5/13
4	≤0.35	≤0.60	NR	≥38	≥13	≥5/10	≥19	≥10/13	≥10, 2ft	≥10/13

a) The solar heat gain value (SHGC) applies to all glazed fenestration
b) For impact rated fenestration complying with R301.2.1.2, the maximum U-factor shall be 0.65 in climate zone 3
c) For impact rated fenestration complying with R301.2.1.2, the maximum SHGC shall be 0.40
d) The second R-value applies when more than half the insulation is on the interior

Fenestration

- **Fenestration (all windows and doors) and skylight U-factor and SHGC values are at maximum acceptable levels. An area weighted average of fenestration products is permitted to satisfy these requirements.**
- U-factor and SHGC values must be determined from a National Fenestration Rating Council (NFRC) rating. Fenestration products lacking an NFRC rating certificate must use the defaults in Tables N1101.10.3(1-3). See NFRC.org for more details on the NFRC rating system.
- Per *dwelling unit u*p to 15 square feet of glazed fenestration & one side-hinged opaque door assembly up to 24 square feet in area are exempted from the U-factor requirements. This exemption shall not apply to the U-factor alternative and Total UA alternative approaches.
- Replacement fenestration **MUST** comply.

Insulation

- **Batt insulation must be installed per the manufacturer's installation instructions which require it to be free from any compressions, gaps or voids.**
- Ceilings without attic spaces – Where Table N1102.1.2 would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space, the minimum required insulation shall be R-30. Where R-30 is required and the design of the roof/ceiling assembly does not allow sufficient space, the minimum required insulation shall be R-19. The reduction in these requirements shall be limited to 500 square feet or 20% of the ceiling area, whichever is less.
- Access doors from conditioned spaces to unconditioned spaces shall be weather-stripped and insulated at least to the required level of the surrounding surfaces. A wood framed or equivalent retainer is required to be provided when loose fill insulation is installed.
- Baffles are installed in each rafter cavity in continuously vented soffits. Insulation shall not block the free flow of air and shall be installed such that blown insulation remains in place. Not less than a 1" air space shall be provided between the insulation and the roof sheathing.

Mechanical Ventilation

- Fans used to provide whole-house mechanical ventilation shall meet the efficacy requirements of **Table N1103.6.1**

Air Infiltration

The primary source of energy loss in a home is due to excessive air infiltration. The OK 2018 IRC requires the building thermal envelope to be durably sealed to limit air infiltration. The sealing methods and materials used between dissimilar materials shall allow for differential expansion and contraction. The inspection of the air barrier may be done by an *approved* independent third-party or by the authority having jurisdiction. The only way to truly know the leakage of a home is to perform a blower door test.

Table 1102.4.1.1 (of the OK 2018 IRC) – Air Barrier and Insulation Installation

Component	Criteria
Air and thermal barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with the building envelope air barrier. **Air-permeable insulation shall not be used as an air barrier and is installed inside the air barrier. The air barrier must be inspected or tested with a blower door.**
Ceiling / attic	Air barrier in dropped ceilings and soffit areas is substantially aligned with insulation and any gaps are sealed. Attic accesses are sealed, insulated properly and weather-stripped.
Walls	Corners and T's allow for insulation. The junction of the foundation and sill plate shall be sealed. Headers shall be insulated where space is available.
Windows and doors	Space between window and door framing and jambs shall be sealed.
Rim joists	Rim joists must be insulated and include an air barrier.
Floors (including above garage and cantilevered)	Insulation is installed to maintain permanent contact with the subfloor. An air barrier is installed at any exposed edge of the floor.
Crawls space walls (unvented space)	For the alternative to insulating floors over unvented crawl spaces, see Section N1102.2.11 for details.
Shafts, penetrations	Duct & flue shafts, utility penetrations & knee walls opening to unconditioned space are sealed.
Narrow cavities	Batts in narrow cavities are cut to fit or they are filled with sprayed or blown insulation.
Garage separation	Air sealing is provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures are airtight, IC rated and sealed to the drywall. See lighting note below.
Plumbing and wiring	Insulation is placed between pipes and outside. **Batt insulation is cut to fit around wiring and plumbing** or sprayed/blown insulation extends behind piping and wiring.
Shower / tub on exterior wall	Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.
Electrical box on exterior wall	An air barrier extends behind boxes or air sealed type boxes are installed.
Common wall	An air barrier is installed in common walls between dwelling units.
HVAC register boots	HVAC register boots that penetrate the thermal envelope are sealed to the subfloor or drywall.
Fireplace	Fireplace walls include an air barrier.

Other required items to check for:

- **At least 90% of the light bulbs installed must be high-efficacy** (efficiency equivalent to CFL, LED or T-8 - smaller fluorescents).
- **Insulation installers shall provide a certificate** listing the type, manufacturer and R-value of installed insulation. For blown insulation the initial settled thickness, settled R-value, installed density, coverage area and number of bags installed shall be listed. The installer shall sign, date and post the certificate in a conspicuous location.
- Insulation markers shall be installed throughout the attic space facing the attic opening (≥1 per 300 ft^2).
- New wood burning fireplaces shall have outdoor combustion air.
- **Supply and Return ducts in attics shall be insulated to ≥R-8.** All other ducts shall be ≥R-6. Ducts inside the thermal envelope are exempt. Building framing cavities shall not be used as supply ducts. Ducts, air handlers, filter boxes and building cavities used as return ducts shall be sealed. **Only liquid applied sealants complying with UL 181 BM shall be used** to seal liners and start collars to plenum, boots, and any other seams in the system.
- Outdoor air intakes and exhausts shall have automatic or gravity dampers.
- HVAC sizing – heating and cooling equipment shall be sized per the IMC **(ACCA manuals J & S must be used).**
- Circulating hot water system piping shall be insulated to ≥R-3 and shall include an automatic or *readily accessible* switch that can turn off the system when not in use.

For questions or the full text of the OK 2018 IRC Energy Chapter
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