FLORIDA BUILDING CODE, ENERGY CONSERVATION
Residential Building Thermal Envelope Approach
R-Value Computation Method

FORM R402—2023 **Florida Climate Zone**

PROJECT NAME AND ADDRESS:	**BUILDER:**
	PERMITTING OFFICE:
	JURISDICTION NUMBER:
OWNER:	**PERMIT NUMBER:**
PERMIT TYPE:	**NUMBER OF UNITS:**
WORST CASE?	**CONDITIONED FLOOR AREA:**

Scope: Compliance with Section R402.1.2 of the *Florida Building Code, Energy Conservation*, shall be demonstrated by the use of Form R402 for single- and multiple-family residences of three stories or less in height, additions to existing residential buildings, alterations, renovations and building systems in existing buildings, as applicable. To comply, a building must meet or exceed all of the energy efficiency requirements and applicable mandatory requirements summarized on this form. If a building does not comply with this method, or by the UA Alternative method, it may still comply under Section R405 or R406 of the *Florida Building Code, Energy Conservation*.

General Instructions:

1. **Fill in all the applicable spaces of the "INSTALLED" row in the INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT table with the information requested. All "INSTALLED" values must be equal to or more efficient than the required levels. "AVG" indicates an area weighted average is allowed; "LOWEST" indicates the lowest *R*-value to be installed must be entered.**
2. **Complete the tables for air infiltration and installed equipment.**
3. **Read the MANDATORY REQUIREMENTS table and check each box to indicate your intent to comply with all applicable items.**
4. **Read, sign and date the "Prepared By" certification statement at the bottom of this form. The owner or owner's agent must also sign and date the form.**

INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[1]

REQUIREMENTS	FENESTRATION *U*-FACTOR[2, 3, 4]	SKYLIGHT[2] *U*-FACTOR	GLAZED FENESTRATION SHGC[2, 3]	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE[5]	MASS WALL *R*-VALUE[5, 6]	FLOOR *R*-VALUE	BASEMENT WALL *R*-VALUE	SLAB[7] *R*-VALUE & DEPTH	CRAWL SPACE WALL *R*-VALUE
CLIMATE ZONE 1	NR	0.75	0.25	30	13	3/4	13	0	0	0
CLIMATE ZONE 2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
VALUE	AVG	AVG	AVG	LOWEST	LOWEST	LOWEST	LOWEST	LOWEST	LOWEST	LOWEST
INSTALLED:										

***R*-Value Calculation Method - [PASS / FAIL]**

For SI: 1 foot = 304.8 mm; NR = No requirement.
(1) *R*-values are minimums. *U*-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed *R*-value of the insulation shall not be less than the *R*-value specified in the table.
(2) The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration. Exception: Skylights may be excluded from glazed fenestration SHGC requirements in Climate Zones 1 through 3 where the SHGC for such skylights does not exceed 0.30.
(3) For impact rated fenestration complying with Section R301.2.1.2 of the *Florida Building Code, Residential* or Section 1609.1.2 of the *Florida Building Code, Building*, the maximum U-factor shall be 0.65 in Climate Zone 2. An area-weighted average of *U*-factor and SHGC shall be accepted to meet the requirements, and up to 15 square feet of glazed fenestration area are exempted from the *U*-factor and SHGC requirement based on Section R402.3.1, R402.3.2 and R402.3.3.
(4) One side-hinged opaque door assembly up to 24 square feet is exempted from this *U*-factor requirement based on Section R402.3.4.
(5) *R*-values are for insulation material only as applied in accordance with manufacturer's installation instructions.
(6) The second R-value applies when more than half the insulation is on the interior of the mass wall.
(7) R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Climate Zones 1 through 3 for heated slabs.

Air infiltration:	Blower door test is required on the building envelope to verify leakage ≤ 7 ACH50; test report must be provided to code official before CO is issued. *Florida Building Code, Energy Conservation* Section R402.4.1.2 testing exception may apply for additions, alterations, or renovations.

(continued)

FORM R402—continued
EQUIPMENT REQUIREMENTS AND INSTALLED VALUES

Fill in the "INSTALLED EFFICIENCY LEVEL" column with the information requested. For multiple systems of the same type, indicate the minimum efficient system. All "INSTALLED" values must be equal to or more efficient than the required level. If a listed "SYSTEM TYPE" is not to be installed, write in "N/A" for not applicable.

SYSTEM TYPE	MINIMUM EFFICIENCY LEVEL REQUIRED	INSTALLED EFFICIENCY LEVEL
Air distribution system[1]	Not allowed in attic	Location:
Air handling unit	Factory Sealed	Factory Sealed? Y/N
Duct *R*-value	= R-8 (Ducts in unconditioned attics, Diameter ≥ 3 in.)	*R*-Value (In unc. attic) =
	= R-6 (Ducts in unconditioned non attics, Diam. ≥ 3 in.)	*R*-Value (In unc. non attics) =
	= R-6 (Ducts in unconditioned attics, Diameter < 3 in.)	*R*-Value (Small ducts in attic) =
	= R-4.2 (Ducts in unconditioned not attics, Diam. < 3 in.)	*R*-Value (Small ducts in unc) =
	All ducts are in conditioned space (No minimum)	All in conditioned space ? Y/N
Air leakage/Duct test	Air handler installed: Total leakage = 4 cfm/100 s.f.	
	Air handler not installed: Total leakage = 3 cfm/100 s.f.	Total leakage = _____ cfm/100 s.f.
		Air handler installed? Y/N
Duct testing	Test not required if all ducts and AHU are within the building thermal envelope and for additions or alterations where ducts extended from existing heating and cooling system through unconditioned space are < 40 linear ft.	Test report required? Y/N
Air conditioning systems:	Minimum federal standard required by NAECA[2]:	
Central system < 45,000 Btu/h	SEER2 = 14.3	Cap. (Btu/h) =
Central system ≥ 45,000 Btu/h	SEER2 = 13.8	SEER2 (Min) =
Central heat pump	SEER2 = 14.3	SEER2 (Min) =
PTAC, PTHP, SPVAC or SPVHP	EER [from Table C403.2.3(3)]	Type =
		Cap. (Btu/h) =
		EER (Min) =
Other	See Tables C403.2.3(1)–(11)	Type =
		Effic. (min) =
Heating systems:	Minimum federal standard required by NAECA[2]:	
Electric resistance	Not allowed in Climate Zone 2	
Heat pump	HSPF2 ≥ 7.5	HSPF2 (Min) =
Gas furnace, non-weatherized	AFUE ≥ 80%	AFUE (Min) =
Oil furnace, non-weatherized	AFUE ≥ 83%	AFUE (Min) =
PTHP or SPVHP	COP_H [from Table C403.2.3(3)]	Type =
		Cap. (Btu/h) =
		COP_H (Min) =
Other:	See Tables C403.2.3(1)-(16)	Type =
		Effic. (min) =
Water heating system (storage type):	Minimum federal standard required by NAECA[2]:	Capacity =
Electric[3, 6]	UEF: 40 gal.; 0.931; 50 gal.: 0.930; 60 gal.: 2.176	UEF (Min) =
Gas fired[4, 6]	UEF: 40 gal.; 0.64; 50 gal.: 0.627; 60 gal.: 0.789	UEF (Min) =
Other (describe)[5, 6]:		Type =
		Effic. (min) =

Equipment Efficiency—[PASS / FAIL]

(1) Ducts & AHU installed "substantially leak free" per Section R403.3.2. Test required by either individuals as defined in Section 553.993(5) or (7), *Florida Statutes*, or individuals licensed as set forth in Section 489.105(3)(f), (g), or (i), *Florida Statutes*. The total leakage test is not required for ducts and air handlers located entirely within the building thermal envelope, and for additions where ducts from an existing heating and cooling system extended to the addition through unconditioned space are less than 40 linear ft.
(2) Minimum efficiencies are those set by the *National Appliance Energy Conservation Act* of 1987 for typical residential equipment and are subject to NAECA rules and regulations. For other types of equipment, see Tables C403.2.3 (1)-(11) of the Commercial Provisions of the *Florida Building Code, Energy Conservation*.
(3) For electric storage volumes ≤ 55 gallons, minimum UEF = 0.9349 – (0.0001 * volume). For electric storage volumes > 55 gallons, minimum UEF = 2.2418 – (0.0011 * volume).
(4) For natural gas storage volumes ≤ 55 gallons, minimum UEF = 0.692 – (0.0013 * volume). For natural gas storage volumes > 55 gallons, minimum UEF = 0.8072 – (0.0003 * volume).
(5) For electric tankless, min. UEF = 0.92. For natural gas tankless, min. UEF = 0.81.
(6) Referenced UEFs shown are for high draw pattern value provided by manufacturer.

(continued)

FORM R402—continued

OTHER REQUIREMENTS			
Component	**Section**	**Summary of Requirements**	**Check**
Air leakage	R402.4	To be caulked, gasketed, weatherstripped or otherwise sealed per Table R402.4.1.1. Recessed lighting IC-rated as having ≤ 2.0 cfm tested to ASTM E283. Windows and doors: 0.3 cfm/sq.ft (swinging doors: 0.5 cfm/sf) when tested to NFRC 400 or AAMA/WDMA/CSA 101/I.S. 2/A440. Fireplaces: Tight-fitting flue dampers & outdoor combustion air	
Programmable thermostat	R403.1.2	A programmable thermostat is required for the primary heating or cooling system.	
Air distribution system	R403.3.2 R403.3.4	Ducts shall be tested as per Section R403.3.2 by either individuals as defined in Section 553.993(5) or (7), *Florida Statutes*, or individuals licensed as set forth in Section 489.105(3) (f), (g) or (i), *Florida Statutes*. Air handling units are not allowed in attics.	
Water heaters	R403.5	Comply with efficiencies in Table C404.2. Hot water pipes insulated to ≥ R-3 to kitchen outlets, other cases. Circulating systems to have an automatic or accessible manual OFF switch. Heat trap required for vertical pipe risers.	
Cooling/heating equipment	R403.7	Sizing calculation performed & attached. Special occasion cooling or heating capacity requires separate system or variable capacity system.	
Swimming pools & spas	R403.10	Spas and heated pools must have vapor-retardant covers or a liquid cover or other means proven to reduce heat loss except if 70% of heat from site-recovered energy. Off/timer switch required. Gas heaters minimum thermal efficiency is 82%. Heat pump pool heaters minimum COP is 4.0.	
Lighting equipment	R404.1	All permanently installed luminaires, excluding those in kitchen appliances, shall have an efficacy of at least 45 lumens-per-watt or shall utilize lamps with an efficacy of not less than 65 lumens-per-watt.	

I hereby certify that the plans and specifications covered by this form are in compliance with the *Florida Building Code, Energy Conservation.*
PREPARED BY: _____ **Date:** _____

PREPARED BY SIGNATURE: _____

I hereby certify that this building is in compliance with the *Florida Building Code, Energy Conservation*.

OWNER/AGENT: _____ **Date:** _____

OWNER/AGENT SIGNATURE: _____

Review of plans and specifications covered by this form indicate compliance with the *Florida Building Code, Energy Conservation*. Before construction is complete, this building will be inspected for compliance in accordance with Section 553.908, F.S.
CODE OFFICIAL: _____ **Date:** _____

CODE OFFICIAL SIGNATURE: _____

FORM [R402, TOTAL UA, R405, or R406]—2023

RESIDENTIAL ENERGY CONSERVATION CODE DOCUMENTATION CHECKLIST

Florida Department of Business and Professional Regulation
[Compliance Method]

Applications for compliance with the 2023 Florida Building Code, Energy Conservation via the [compliance method] shall include:

- ☐ This checklist
- ☐ Form [R402, TOTAL UA, R405 or R406] report
- ☐ Input summary checklist that can be used for field verification (usually four pages/may be greater)
- ☐ Energy Performance Level (EPL) Display Card (one page)
- ☐ HVAC system sizing and selection based on ACCA Manual S or per exceptions provided in Section R403.7
- ☐ Mandatory Requirements (five pages)

Required prior to CO:

- ☐ Air Barrier and Insulation Inspection Component Criteria checklist (Table R402.4.1.1—one page)
- ☐ A completed Envelope Leakage Test Report (usually one page)
- ☐ If Form R405 or R406 duct leakage type indicated anything other than “default leakage,” then a completed Duct Leakage Test Report (usually one page)

ENERGY PERFORMANCE LEVEL (EPL) DISPLAY CARD

ESTIMATED ENERGY PERFORMANCE INDEX* = ____

The lower the Energy Performance Index, the more efficient the home.

1.	New home or, addition		
2.	Single-family or multiple-family	-family	
3.	No. of units (if multiple-family)	[#]	
4.	Number of Bedrooms	[#]	
5.	Is this a worst case? (yes/no)		
6.	Conditioned floor area (sq. ft.)		
7.	Windows**	Description	Area
	a) *U*-factor:	*U*-factor:	ft^2
	SHGC:	SHGC:	
	b) *U*-factor:	[Type or N/A], U =	ft^2
	SHGC:	SHGC:	
	c) *U*-factor:	[Type or N/A], U =	ft^2
	SHGC:		
	d) *U*-factor:	[Type or N/A], U =	ft^2
	SHGC:		
	Area Weighted Average Overhang Depth:		ft
	Area Weighted Average SHGC:		
8.	Skylights	Description	Area
	a) *U*-factor	*U*-factor:	ft^2
	SHGC:	SHGC:	
9.	Floor type, insulation level:	Insulation	Area
	a) [Type]	R=	ft^2
	b) [Type or N/A]	R=	ft^2
	c) [Type or N/A]	R=	ft^2

10.	Wall type and insulation:	Insulation	Area
	a) [Type]	R=	ft^2
	b) [Type or N/A]	R=	ft^2
	c) [Type or N/A]	R=	ft^2
	d) [Type or N/A]	R=	ft^2
11.	Ceiling type and insulation level	Insulation	Area
	a) [Type]	R=	ft^2
	b) [Type or N/A]	R=	ft^2
	c) [Type or N/A]	R=	ft^2
12.	Ducts, location & insulation level		
	a) Sup: [loc.], Ret: [loc.], AH: [loc.]	R	ft^2
	b) Sup, Ret, AH: [or N/A]		
13.	Cooling systems:	kBtu/hr	Efficiency
	a) [Type]		
	b) [Type or N/A]		
	c) [Type or N/A]		
14.	Heating systems	kBtu/hr	Efficiency
	a) [Type]		
	b) [Type or N/A]		
	c) [Type or N/A]		
15.	Water heating system		
	a) [Type]	Cap: [#] gallons	
	b) Conservation features	UEF:	
	Use medium draw pattern UEF provided by manufacturer.		
	Credits (Performance method)		

I certify that this home has complied with the *Florida Building Code, Energy Conservation*, through the above energy saving features which will be installed (or exceeded) in this home before final inspection. Otherwise, a new EPL Display Card will be completed based on installed Code compliant features.

Builder Signature:_____ Date:_____

Address of New Home: _____ City/FL Zip: _____

*Note: This is not a Building Energy Rating. If your Index is below 70, your home may qualify for energy efficient mortgage (EEM) incentives if you obtain an Energy Rating. For information about the *Florida Building Code, Energy Conservation*, contact the Florida Building Commission's support staff.

**Label required by Section R303.1.3 of the *Florida Building Code, Energy Conservation*, if not DEFAULT.

[Date and time] [Software version and code compliance statement] [Page # of #]

FORM R400—2023
DESUPERHEATER, HEAT RECOVERY UNIT (HRU) WATER HEATER EFFICIENCY CERTIFICATION
TESTS CONDUCTED IN ACCORDANCE WITH AHRI STANDARD 470

Laboratory:_____ **Date of Test:** _____

Report Approved By: _____ **Report No:** _____

Manufacturer: _____ **Model No:**_____

Construction Type: _____

Recommended for use with refrigeration system capacities of _____ **tons.**

Design Pressure: _____ **Water side:** _____ **psig**

Refrigerant side: _____ **psig**

Test results at Standard Conditions:

Test refrigerant designation: _____

Tested at system capacity: _____ **tons**

Total system hot gas superheat: _____ **Btu/h**

Total useful heat exchange effect: _____ **Btu/h**

Water pump input: _____ **watts**

NET SUPERHEAT RECOVERY: _____ **%**