

Emma Gonzalez-Laders, representing New York State Dept of State (emma.gonzalez-laders@dos.ny.gov)

2024 International Energy Code [RE] [RE Project] R3

SLEEPING UNIT. A single unit that provides rooms or spaces for one or more persons, includes permanent provisions for sleeping and can include provisions for living, eating and either sanitation or kitchen facilities but not both. Such rooms and spaces that are part of a dwelling unit

water gauge (50 Pa). 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* have been sealed.

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.
- 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 intee

grade plane in height, *building thermal envelope* tightness and insulation installation shall be considered acceptable where the items in Table R402.5.1.1, applicable to the method of construction, are field verified. Where required by the *code official*, an *approved*

attached private garage space and heated; detached private garage space shall be thermally isolated from all other habitable, conditioned spaces in accordance with Sections R402.2.13 and R402.4.5, as applicable.

2.Where tested in accordance with Section R402.5.1.2.1, testing of each *dwelling unit* or *sleeping unit* is not required.

R402.5.1.2.1 Dwelling unit Unit

For buildings with eight or more *dwelling units or sleeping units*, seven or 20 percent of the *dwelling units or sleeping units*, whichever is greater, shall be tested. Tested units shall include a top floor unit, a ground floor unit, a middle floor unit, and the *dwelling unit or sleeping unit* with the largest *dwelling unit testing enclosure area*. Where the air leakage rate of a tested unit is greater than the maximum permitted rate, corrective actions shall be taken and the unit re-tested until it passes. For each tested *dwelling unit or sleeping unit* with an air leakage rate greater than the maximum permitted rate, three additional units, including the corrected unit, shall be tested. Where buildings have fewer than eight *dwelling units or sleeping units*, each *dwelling unit* shall be tested.

R402.5.1.3 Maximum air leakage rate.

Where tested in accordance with Section R402.5.1.2, the air leakage rate for *buildings, or dwelling units, or sleeping units* shall be as follows:

1. Where complying with Section R401.2.1, the *building, or the dwelling units or sleeping units* in the *building* shall have an air leakage rate not greater than 4.0 air changes per hour in Climate Zones 0, 1 and 2; 3.0 air changes per hour in Climate Zones 3 through 5; and 2.5 air changes per hour in Climate Zones 6 through 8.
2. Where complying with Section R401.2.2 or R401.2.3, the *building or the dwelling units or sleeping units* in the *building* shall have an air leakage rate not greater than 4.0 air changes per hour, or 0.22 cfm/ft² (1.1 L/s x m²) of the *building thermal envelope area* or the *dwelling unit testing enclosure area*, as applicable.

1. Where *dwelling units or sleeping units* are attached or located in an R-2 occupancy, and are tested without simultaneously testing adjacent *dwelling units or sleeping units*, the air leakage rate is permitted to be not greater than 0.27 cfm/ft² (1.35 L/s x m²) of the *dwelling testing unit enclosure area*. Where adjacent *dwelling units* are simultaneously tested in accordance with ASTM E779, the air leakage rate is permitted to be not greater than 0.27 cfm/ft² (1.35 L/s x m²) of the *dwelling unit testing enclosure area* that separates *conditioned space* from the exterior.
2. Where *buildings* have 1,500 square feet (139.4 m²) or less of *conditioned floor area*, the air leakage rate is permitted to be not greater than 0.27 cfm/ft² (1.35 L/s x m²).

R403.3.1 Duct system design.

Duct systems serving one or two *dwelling units or sleeping units* shall be designed and sized in accordance with ANSI/ACCA Manual D. *Duct systems* serving more than two *dwelling units or sleeping units* shall be sized in accordance with the ASHRAE Handbook of Fundamentals, ANSI/ACCA Manual D, or other equivalent computation procedure.

R403.3.9 Dwelling unit Unit sampling.

For *buildings* with eight or more *dwelling units or sleeping units* the *duct systems* in the greater of seven, or 20 percent of the *dwelling units or sleeping units* in the *building* shall be tested, including a top floor unit, a ground floor unit, a middle floor unit, and the unit with the largest *conditioned floor area*. Where buildings have fewer than eight *dwelling units or sleeping units*, the *duct systems* in each unit shall be tested. Where the leakage of a *duct system* is greater than the maximum permitted *duct system leakage*, corrective actions shall be made to the *duct system* and the *duct system* shall be system re-tested until it passes. For each tested *dwelling unit or sleeping unit* that has a greater total *duct system leakage* than the maximum permitted *duct system leakage*, an additional three *dwelling units or sleeping units*, including the corrected unit, shall be tested.

R403.6.4 Dwelling unit Unit sampling.

For *buildings* with eight or more *dwelling units or sleeping units* the mechanical *ventilation systems* in seven, or 20 percent of the *dwelling units or sleeping units*, whichever is greater shall be tested. Tested systems shall include a systems in a top floor unit, systems in a ground floor unit, systems in a middle floor unit, and the systems in the *dwelling unit or sleeping unit* with the largest *conditioned floor area*. Where *buildings* have fewer than eight *dwelling units or sleeping units*, the mechanical *ventilation systems* in each unit shall be tested. Where the *ventilation flow rate* of a mechanical *ventilation system* is less than the minimum permitted rate, corrective actions shall be taken and the system retested until it passes. For each tested *dwelling unit or sleeping unit* system with a *ventilation flow rate* lower than the minimum permitted three additional systems, including the corrected system, shall be tested.

R403.8 Systems serving multiple dwelling units.

Except for systems complying with Section R403.9, systems serving multiple *dwelling units* or *sleeping units* shall comply with Sections C403 and C404 of the *Internaw*

Mechanical ventilation fan energy	<p>The mechanical ventilation system type shall be the same as in the <i>proposed design</i>. Heat recovery or energy recovery shall be modeled for mechanical ventilation where required by Section R403.6.1. Heat recovery or energy recovery shall not be modeled for mechanical ventilation where not required by Section R403.6.1. Where mechanical ventilation is not specified in the <i>proposed design</i>:</p> <p>None</p> <p>Where mechanical ventilation is specified in the proposed design, the annual vent fan energy use, in units of kWh/yr, shall equal $(8.76 \times B \times M)/e_f$ where:</p> <p>B and M are determined in accordance with the Mechanical Ventilation Rate row of this table.</p> <p>e_f = the minimum fan efficacy, as specified in Table 403.6.2, corresponding to the system type at a flow rate of $B \times M$.</p> <p>CFA = conditioned floor area, ft².</p> <p>N = number of bedrooms.</p>	As proposed
Internal gains	<p>I_{Gain}, in units of Btu/day per dwelling unit, shall equal $17,900 + 23.8 \times CFA + 4,104 \times N$ where:</p> <p>CFA = conditioned floor area, ft .</p> <p>N = number of bedrooms.</p>	Same as <i>standard reference design</i> .
Internal mass	Internal mass for furniture and contents: 8 pounds per square foot of floor area.	Same as <i>standard reference design</i> , plus any additional mass specifically designed as a thermal storage element but not integral to the <i>building thermal envelope</i> or structure.
Structural mass	For masonry floor slabs: 80 percent of floor area covered by R-2 carpet and pad, and 20 percent of floor directly exposed to room air.	As proposed
	For masonry basement walls: as proposed, but with insulation as specified in Table R402.1.3, located on the interior side of the walls.	As proposed
	For other walls, ceilings, floors, and interior walls: wood frame construction.	As proposed
Heating systems	Fuel Type/Capacity: Same as proposed design	As proposed
	Product class: Same as proposed design	As proposed
	Efficiencies:	As proposed
	Heat pump: Complying with 10 CFR §430.32	As proposed
	<i>Fuel gas</i> and <i>liquid fuel</i> furnaces: Complying with 10 CFR §430.32	As proposed
	<i>Fuel gas</i> and <i>liquid fuel</i> boilers: Complying with 10 CFR §430.32	As proposed
Cooling		

Dehumidistat	<p>Where a mechanical ventilation system with latent heat recovery is not specified in the proposed design: None. Where the proposed design utilizes a mechanical ventilation system with latent heat recovery:</p> <p>Dehumidistat type: manual, setpoint = 60% relative humidity.</p> <p>Dehumidifier: whole-dwelling with integrated energy factor = 1.77 liters/kWh.</p>	Same as <i>standard reference design</i> .

For SI: 1 square foot = 0.93 m², 1 British thermal unit = 1055 J, 1 pound per square foot = 4.88 kg/m², 1 gallon (US) = 3.785 L, °C = (°F-32)/1.8, 1 degree = 0.79 rad.

h. For residences with conditioned basements, R-2 and R-4 residences, and for townhouse units, the following formula shall be used to determine glazing area:

$$AF = A_s \times FA \times F$$

where:

AF = Total glazing area.

A_s = *Standard reference design* total glazing area.

FA = (Above-grade thermal boundary gross wall area)/(above-grade boundary wall area + 0.5 × below-grade boundary wall area).

F = (above-grade thermal boundary wall area)/(above-grade thermal boundary wall area + common wall area) or 0.56, whichever is greater.

and

where:

- Thermal boundary wall is any wall that separates conditioned space from unconditioned space or ambient conditions.
- Above-grade thermal boundary wall is any thermal boundary wall component not in contact with soil.
- Below-grade boundary wall is any thermal boundary wall in soil contact.
- Common wall area is the area of walls shared with an adjoining dwelling unit.

i. The factor for the compactness of the hot water distribution system is the ratio of the area of the rectangle that bounds the source of hot water and the fixtures that it serves (the “hot water rectangle”) divided by the floor area of the dwelling.

1. Sources of hot water include water heaters, or in multiple-family buildings with central water heating systems, circulation loops or electric heat traced pipes.
2. The hot water rectangle shall include the source of hot water and the points of termination of all hot water fixture supply piping.
3. The hot water rectangle shall be shown on the floor plans and the area shall be computed to the nearest square foot.
4. Where there is more than one water heater and each water heater serves different plumbing fixtures and appliances, it is permissible to establish a separate hot water rectangle for each hot water distribution system and add the area of these rectangles together to determine the compactness ratio.
5. The basement or attic shall be counted as a story when it contains the water heater.
6. Compliance shall be demonstrated by providing a drawing on the plans that shows the hot water distribution system rectangle(s), comparing the area of the rectangle(s) to the area of the dwelling and identifying the appropriate compactness ratio and *HWDS* factor.

j. For a *proposed design* with electric resistance heating, a split system heat pump complying with 10 CFR §430.32 (2021) shall be assumed modeled in the *standard reference design*.

k. For heating systems, cooling systems, or water heating systems not included in Table R405.4.2(1), the *standard reference design* shall be the same as *proposed design*.

l. Only sections of *ductwork* that are installed in accordance with Items 1 or 2 of Section R403.3.4, are assumed to be located completely inside *conditioned space*. All other sections of *ductwork* are not assumed to be located completely inside *conditioned space*.

m. Sections of *ductwork* installed in accordance with Section R403.3.5.1, are assumed to have an effective duct insulation R-value of R-25.

A problem was created when the term “sleeping unit” was introduced in the Residential provisions of the Energy Code. By mentioning “sleeping units” in some code sections but not others, an ambiguity was created regarding whether certain provisions that only mention “dwelling units” should also apply to “sleeping units.”

This is intended to be an editorial proposal offered as a clarification consistent with the intent of existing code provisions. It adds a definition for the term “sleeping unit” but it neither adds new sections nor deletes existing sections. For simplicity and to avoid unnecessarily repetitive language, we’ve modified the term “~~dwelling~~ unit enclosure area” to read “testing unit enclosure area” in Chapter 2 and wherever it’s mentioned. We also corrected some punctuation mistakes.

The code change proposal will neither increase nor decrease the cost of construction.

This proposal is editorial.