

21 CRR-NY 458.2  
NY-CRROFFICIAL COMPILATION OF CODES, RULES AND REGULATIONS OF THE STATE OF NEW YORK  
TITLE 21. MISCELLANEOUS  
CHAPTER X. POWER AUTHORITY OF THE STATE OF NEW YORK  
PART 458. MINIMUM INSULATION AND HEATING SYSTEM STANDARDS21 CRR-NY 458.2  
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## 458.2 Minimum insulation and heating system standards for existing buildings or mobile homes converting to electric heat.

(a) *Definitions.* The following words and phrases as used in this Part shall have the following meanings, unless a different meaning is plainly required by the context:

- (1) *Building.* A combination of any materials, whether portable or fixed, forming a structure in which energy usage takes place in the normal course, affording shelter for persons or property.
- (2) *Dwelling.* A building other than a mobile home, designed or used as a living unit for one or more families.
- (3) *Living unit.* A dwelling or portion thereof, providing complete living facilities for one family, including permanent provision for living, sleeping, eating, cooking and sanitation.
- (4) *Commercial building.* Any building that cannot be classified as a dwelling or mobile home.
- (5) *Insulation.* Any material which has a relatively high resistance to heat flow, and which is used principally to retard the flow of heat.
- (6) *Btuh.* British thermal units per hour.
- (7) *Heat transmission.* The amount of heat, measured in Btuh, transferred from one location to another location as a result of the temperature difference in the two locations.
- (8) *Coefficient of heat transmission.* The amount of heat transfer through a material or arrangement of material expressed in Btuh per square foot per degree Fahrenheit temperature difference. For outside surfaces, the wind velocity is 15 miles per hour. The coefficient of heat transmission is represented by the symbol "U". For wood frame construction, the effect of normal framing members may be neglected in the determination of U values.
- (9) *Basement.* A space of full-story height below the first floor of a building which is not designed or used primarily for living accommodations.
- (10) *Unheated basement.* A basement in a dwelling which is not provided with a heat source sufficient to maintain a minimum temperature of 50°F.
- (11) *Crawl space.* Any unfinished, accessible space below the first floor which is less than full-story height.
- (12) *Unheated crawl space.* A crawl space in a one- or two-family dwelling or multifamily dwelling which is not provided with a heat source sufficient to maintain a minimum temperature of 50°F.
- (13) *Heated space.* Any space within the building which is provided with a heat source sufficient to meet the design dry bulb temperature, but which is neither a heated basement nor heated crawl space as determined by application of the definitions in this section.
- (14) *Mobile home.* This means a structure, transportable in one or more sections, which is 8 body feet or more in width and is 32 body feet or more in length, and which is built on a permanent chassis, and designed to be used as a dwelling, with or without permanent foundation, when connected to the required utilities, and includes the plumbing, heating, air-conditioning and electrical systems contained therein.
- (15) *Utility.* A municipal electric or rural electric cooperative system which receives its full power requirements from the Power Authority.

(16) *Power Authority*. The Power Authority of the State of New York.

(17) *Combined thermal transmittance*. An overall coefficient of heat gain expressed in units or Btuh per square foot as calculated using Equation 1.

(18) *System*. A combination of central or terminal equipment or components and/or controls, accessories, interconnecting means, and terminal devices by which energy is transformed so as to perform a specific function, such as HVAC, service water heating or illumination.

(19) *Automatic*. Self-acting, operating by an internal mechanism when actuated by some impersonal influence, as for example, a change in current strength, pressure, temperature or mechanical configuration.

(20) *Automatic setback thermostat*. An automatic control device actuated by temperature and designed to be responsive to temperature capable of automatically reducing its set-point temperature during a predesignated period.

(21) *Setback controller*. An automatic control device capable of reducing the set-point temperature of several thermostats during a predesignated period.

(22) *Hydronic heating system*. A heating system using primarily liquid or gaseous water to distribute heating energy throughout the building.

(23) *Zone*. A space or group of spaces within a building with heating and/or cooling requirements sufficiently similar so that comfort conditions can be maintained throughout by a single controlling device.

(24) *Thermostatic control valve*. An automatic control valve designed to be responsive to room air temperature.

(25) *Energy audit*. An engineering analysis which shall consider all possible energy conservation measures and shall identify the estimated costs and energy cost savings likely to be realized from their implementation.

(b) *Standards for existing dwellings*. Existing residential dwellings converting to electric heat shall meet the following requirements:

(1) Minimum insulation standards shall be as follows:

(i) The maximum coefficient of heat transmission, U-value, through roof and ceiling assemblies adjacent to heated space shall be as follows:

<i>Heating degree days</i>	<i>U-value</i>
5,000	0.05
6,000	0.04
7,000	0.04
8,000	0.03
9,000	0.03

The degree days to be used to determine the required U-value shall be those in Table 1.

(ii) The maximum coefficient of heat transmission of floors over an unheated basement shall be 0.08.

(iii) The dwelling shall have storm windows or thermal windows with multiple glazing with a maximum U-value of 0.69.

(iv) The entrances to the dwelling shall have storm doors or thermal doors with a maximum U-value of 0.40.

(v) Vapor barriers, weather-stripping and window caulking shall be used where applicable and practical.

(2) Minimum heating systems standards shall be as follows:

(i) For systems using baseboard radiation, one of the following control methods is required:

(a) A separate automatic setback thermostat shall be installed in each room (provided that no more than one such thermostat need be installed in any two-room living unit).

(b) A central setback controller connected to individual room thermostats shall be installed.

(ii) For the conversion from a fossil-fueled hydronic heating system to electric heat, the following is required:

(a) Conversion of an existing fossil-fuel boiler to an electric resistance boiler is prohibited.

(b) An electric boiler specifically designed for use as a heating boiler with the appropriate American Society of Mechanical Engineers (ASME) approvals shall be installed.

(c) One of the following control methods is required:

(1) a separate zone with an automatic setback thermostat for each floor, or for each living unit, if there is more than one living unit on a floor;

(2) thermostatic control valves be installed on each radiator and an automatic setback thermostat be installed for the boiler.

(iii) For the installation of an electric resistance warm air system or the conversion of a fossil-fueled warm air heating system to electric resistance heat, the following is required:

(a) A separate duct heater or furnace is provided for each floor, or for each living unit, if there is more than one living unit on a floor.

(b) For each duct heater or furnace, a separate automatic setback thermostat shall be required.

(iv) For heat pump systems, an automatic setback thermostat shall be required.

(v) For all electric heating system conversions, existing fireplaces shall be equipped with a tight-fitting shutoff damper. Where applicable, a source of combustion air ducted from the outdoors of sufficient quantity to support combustion shall be installed. This source shall be equipped with a damper capable of being fully closed.

(3) In unusual circumstances, when the application of these standards appears impracticable or inequitable, the utility or the applicant will refer the matter to the Power Authority for special ruling or for the approval of special conditions which may be mutually agreed upon.

(c) *Standards for existing commercial buildings.* Existing commercial buildings converting to electric heat shall meet the following requirements:

(1) Minimum insulation standards shall be as follows:

(i) The maximum combined thermal transmittance value for exterior wall systems,  $U_o$  as calculated using Equation 1 shall be as follows:

<b>Heating degree days</b>	<b><math>U_o</math></b>
5,000	0.36
6,000	0.33
7,000	0.31
8,000	0.28
9,000	0.28

The degree days to be used to determine  $U_o$  shall be those listed in Table 1.

(ii) The maximum coefficient of heat transmission, U-value, for roof and ceiling assemblies adjacent to heated space shall be as follows:

<b>Heating degree days</b>	<b>U-value</b>
5,000	0.08
6,000	0.08
7,000	0.07
8,000	0.06
9,000	0.06

The degree days to be used to determine U-value shall be those in Table 1.

(iii) The maximum coefficient of heat transmission of floors over an unheated basement shall be 0.08.

(iv) Vapor barriers, weather-stripping and window caulking shall be used where applicable and practical.

(2) Minimum heating system standards shall be as follows:

(i) The system shall have at least one independent zone per floor.

(ii) One of the following control methods is required:

(a) A separate automatic setback thermostat shall be installed for each zone.

(b) A central setback controller connected to individual zone thermostats shall be installed.

(iii) For the conversion from a fossil-fueled hydronic heating system to electric heat, the following is required:

(a) Conversion of an existing fossil-fuel boiler to an electric resistance boiler is prohibited.

(b) An electric boiler specifically designed for use as a heating boiler with the appropriate American Society of Mechanical Engineers (ASME) approvals shall be installed.

(iv) Where electric heating is to be used for zone temperature control in heating, ventilating and air conditioning (HVAC) systems, the following control methods are required:

(a) Reheat systems. Systems employing reheat and serving multiple zones (other than those employing variable air volume for temperature control) shall be provided with controls that will automatically reset the system cold air supply to the highest temperature level that will satisfy the zone requiring the coolest air. Single-zone reheat systems shall be controlled to sequence reheat and cooling.

(b) Dual duct and multizone systems. These systems shall be provided with controls to reset the cold deck air supply to the highest temperature that will satisfy the zone requiring the coldest air and to reset the hot deck air supply to the lowest temperature that will satisfy the zone requiring the warmest air.

(3) In unusual circumstances, when the application of these provisions appears impractical or inequitable, the utility or applicant will refer the matter to the Power Authority for special ruling or for the approval of special conditions which may be mutually agreed upon. The applicant will submit, along with the request for special ruling or for the approval of special conditions, a copy of an energy audit performed on the building by a registered architect or professional engineer.

**(d) Standards for mobile homes.**

Existing mobile homes converting to electric heat (built prior to the effective date of the Department of Housing and Urban Development (HUD) "Mobile Home Construction and Safety Standards"), shall meet the following requirements:

(1) glazing  $U = 0.69$

(2) entrance doors  $U = 0.40$

Unusual circumstances. In unusual circumstances when the application of these standards appears impracticable or inequitable, the utility or applicant will refer the matter to the Power Authority for special ruling or for the approval of special conditions which may be mutually agreed upon.

**(e) Effective date.**

The standards specified herein shall be effective on and after September 1, 1981 as a precondition for the expansion of existing electric service for the purpose of providing electric heat to all existing buildings and to existing mobile homes not subject to HUD "Mobile Home Construction and Safety Standards".

**(f) Relationship to other standards.**

The requirements imposed by these standards represent the minimum standards for existing buildings and mobile homes for which utilities may provide electric service. However, some utilities may require a greater degree of thermal protection than these standards impose. These standards, are not intended to supersede more stringent municipal requirements or standards nor are they intended in any way to contravene the State Energy Conservation Construction Code Act. The thermal protection for mobile homes is controlled by the Department of Housing and Urban Development "Mobile Home Construction and Safety Standards". In accordance with the Housing and Community Development Act of 1974, Title VI (cited as the National Mobile Home Construction and Safety Standards Act of 1974), the Federal standards take precedence over all State or local standards.

**(g) Certificate of compliance.**

A form of certificate of compliance, included as Appendix 10-B of this Title, shall be provided to the builder or contractor when the builder/contractor first contacts the utility concerning electrical service for conversion to electric heat of existing buildings or of existing mobile homes covered by these standards. The applicable form shall be completed before the utility supplies permanent new or expanded electric service. In addition, an inspection of the premises by an employee of the municipal electric department, building code enforcement inspector, or qualified representative of the municipal government is required to verify compliance with these standards.

**TABLE 1**

**HEATING DEGREE DAYS—NEW YORK STATE**

(For use in selecting required U-values)

<b>Counties</b>	<b>Degree days</b>
Albany	7,000
Allegany	7,000
Bronx	5,000
Broome	7,000
Cattaraugus	7,000
Cayuga	7,000
Chautauqua	7,000
Chemung	7,000
Chenango	8,000
Clinton	8,000
Columbia	7,000
Cortland	8,000

Delaware	7,000
Dutchess	7,000
Erie	7,000
Essex	9,000
Franklin	8,000
Fulton	8,000
Genesee	7,000
Greene	7,000
Hamilton	9,000
Herkimer (Adirondack Park Boundary)	N. 9,000  S. 8,000
Jefferson	7,000
Kings	5,000
Lewis	8,000
Livingston	7,000
Madison	8,000
Monroe	7,000
Montgomery	7,000
Nassau	5,000
New York	5,000
Niagara	7,000
Oneida	8,000
Onondaga	7,000
Ontario	7,000
Orange	6,000
Orleans	7,000
Oswego	7,000
Otsego	8,000
Putnam	6,000
Queens	5,000
Rensselaer	7,000
Richmond	5,000
Rockland	6,000
St. Lawrence	8,000
Saratoga	7,000
Schenectady	7,000
Schoharie	7,000
Schuyler	7,000
Seneca	7,000
Steuben	7,000
Suffolk	6,000
Sullivan	7,000
Tioga	7,000
Tompkins	7,000
Ulster	7,000
Warren	9,000
Washington	9,000
Wayne	7,000
Westchester	6,000
Wyoming	7,000
Yates	6,000

**EQUATION 1**

$$U_o = \frac{U_w A_w + U_g A_g + U_d A_d \dots}{A_o}$$

Where:

$U_o$  = the average or combined transmittance of the gross exterior wall area in Btu/hr/sq ft/°F.

$A_o$  = the gross exterior wall assembly area in square feet.

$U_w$  = the coefficient of heat transmission of the components of the opaque wall area in square feet.

Aw = opaque wall area in square feet.

Ug = the coefficient of heat transmission of the glazing area. The Ug of glazing shall be the average value of the window, including frames and glazing areas.

Ag = glazing area (shall be the area of the finished opening), in square feet.

Ud = the coefficient of heat transmission of the door, or similar opening.

Ad = door area (shall be the area of the finished opening), in square feet.

**Note:**

Where more than one type of wall, window or door is used, the U and A terms for those items shall be expanded into subelements as:

$Uw1Aw1 + Uw2Aw2 + Uw3Aw3 + \text{etc.}$

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