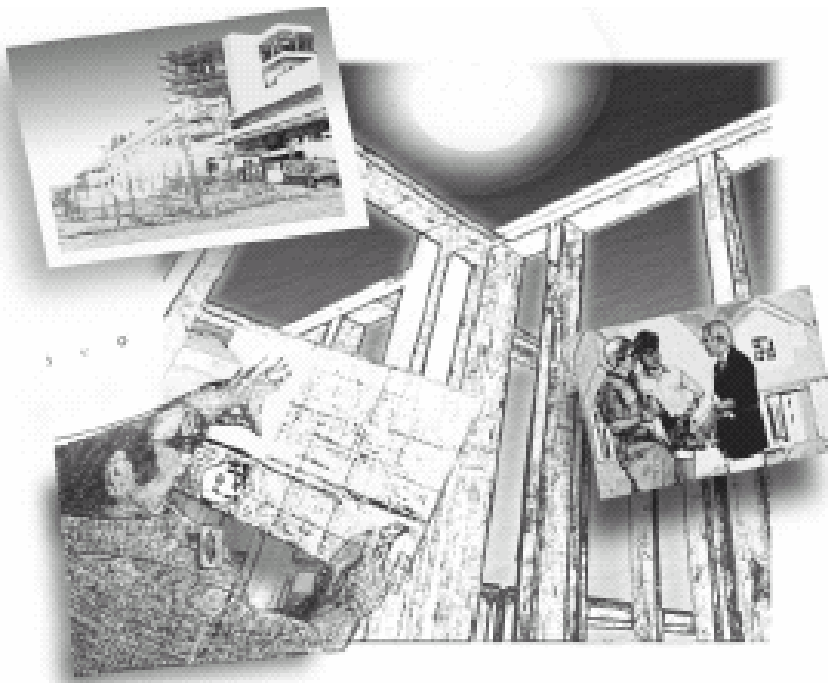


CALIFORNIA ENERGY
COMMISSION

2005 BUILDING ENERGY EFFICIENCY STANDARDS FOR RESIDENTIAL AND NONRESIDENTIAL BUILDINGS

STANDARDS/REGULATIONS



Effective Date October 1, 2005

September 2004
P400-03-001F



Arnold Schwarzenegger, *Governor*

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SUBCHAPTER 3
NONRESIDENTIAL, HIGH-RISE RESIDENTIAL, AND HOTEL/MOTEL
OCCUPANCIES—MANDATORY REQUIREMENTS FOR SPACE-
CONDITIONING AND SERVICE WATER-HEATING SYSTEMS AND
EQUIPMENT

SECTION 120 – SPACE-CONDITIONING AND SERVICE WATER-HEATING SYSTEMS AND EQUIPMENT — GENERAL

Sections 121 through 129 establish requirements for the design and installation of space-conditioning and service water-heating systems and equipment in nonresidential, high-rise residential, and hotel/motel buildings subject to Title 24, Part 6. All such buildings shall comply with the applicable provisions of Sections 121 through 129.

SECTION 121 – REQUIREMENTS FOR VENTILATION

(a) General Requirements.

1. All enclosed spaces in a building that are normally used by humans shall be ventilated in accordance with the requirements of this section and the CBC.
2. The outdoor air-ventilation rate and air-distribution assumptions made in the design of the ventilating system shall be clearly identified on the plans required by Section 10-103 of Title 24, Part 1.

(b) Design Requirements for Minimum Quantities of Outdoor Air. Every space in a building shall be designed to have outdoor air ventilation according to Item 1 or 2 below:

1. **Natural ventilation.**

- A. Naturally ventilated spaces shall be permanently open to and within 20 feet of operable wall or roof openings to the outdoors, the openable area of which is not less than 5% of the conditioned floor area of the naturally ventilated space. Where openings are covered with louvers or otherwise obstructed, openable area shall be based on the free unobstructed area through the opening.

EXCEPTION to Section 121 (b) 1. A: Naturally ventilated spaces in high-rise residential dwelling units and hotel/motel guest rooms shall be open to and within 25 feet of operable wall or roof openings to the outdoors.

- B. The means to open required operable openings shall be readily accessible to building occupants whenever the space is occupied.

2. **Mechanical ventilation.** Each space that is not naturally ventilated under Item 1 above shall be ventilated with a mechanical system capable of providing an outdoor air rate no less than the larger of:

- A. The conditioned floor area of the space times the applicable ventilation rate from TABLE 121-A; or
- B. 15 cfm per person times the expected number of occupants.

For meeting the requirement in Section 121 (b) 2 B for spaces without fixed seating, the expected number of occupants shall be either the expected number specified by the building designer or one half the maximum occupant load assumed for egress purposes in the CBC, whichever is greater. For spaces with fixed seating, the expected number of occupants shall be determined in accordance with the CBC.

EXCEPTION to Section 121 (b) 2: Transfer air. The rate of outdoor air required by Section 121 (b) 2 may be provided with air transferred from other ventilated spaces if:

- A. None of the spaces from which air is transferred have any unusual sources of indoor air contaminants; and

B. Enough outdoor air is supplied to all spaces combined to meet the requirements of Section 121 (b) 2 for each space individually.

(c) **Operation and Control Requirements for Minimum Quantities of Outdoor Air.**

1. **Times of occupancy.** The minimum rate of outdoor air required by Section 121 (b) 2 shall be supplied to each space at all times when the space is usually occupied.

EXCEPTION 1 to Section 121 (c) 1: Demand control ventilation. In intermittently occupied spaces that do not have processes or operations that generate dusts, fumes, mists, vapors or gasses and are not provided with local exhaust ventilation (such as indoor operation of internal combustion engines or areas designated for unvented food service preparation), the rate of outdoor air may be reduced if the ventilation system serving the space is controlled by a demand control ventilation device complying with 121 (c) 4.

EXCEPTION 2 to Section 121 (c) 1: Temporary reduction. The rate of outdoor air provided to a space may be reduced below the level required by Section 121 (b) 2 for up to five minutes each hour if the average rate each hour is the required rate.

NOTE: VAV must comply with Section 121 (c) 1 at minimum supply airflow.

2. **Pre-occupancy.** The lesser of the minimum rate of outdoor air required by Section 121 (b) 2 or three complete air changes shall be supplied to the entire building during the one-hour period immediately before the building is normally occupied.
3. **Required Demand Control Ventilation.** HVAC single zone systems with the following characteristics shall have demand ventilation controls complying with 121 (c) 4:

- A. They have an outdoor air economizer; and
- B. They serve a space with a design occupant density, or a maximum occupant load factor for egress purposes in the CBC, greater than or equal to 25 people per 1000 ft² (40 square foot per person).

EXCEPTION 1 to Section 121 (c) 3 B: Classrooms are not required to have demand control ventilation.

EXCEPTION 2 to Section 121 (c) 3 B: Where space exhaust is greater than the design ventilation rate specified in 121 (b) 2 B minus 0.2 cfm per ft² of conditioned area.

EXCEPTION 3 to Section 121 (c) 3 B: Spaces that have processes or operations that generate dusts, fumes, mists, vapors, or gases and are not provided with local exhaust ventilation (such as indoor operation of internal combustion engines or areas designated for unvented food service preparation).

4. **Demand Control Ventilation Devices.**

- A. For each system with demand control ventilation, CO₂ sensors shall be installed in each room that meets the criteria of 121 (c) 3 B;
- B. CO₂ sensors shall be located in the room between 1 ft and 6 ft above the floor;
- C. Demand ventilation controls shall maintain CO₂ concentrations less than or equal to 600 ppm plus the outdoor air CO₂ concentration in all rooms with CO₂ sensors;

EXCEPTION to Section 121 (c) 4 C: The outdoor air ventilation rate is not required to be larger than the design outdoor air ventilation rate required by Section 121 (b) 2 regardless of CO₂ concentration.

- D. Outdoor air CO₂ concentration shall be determined by one of the following:
- i. CO₂ concentration shall be assumed to be 400 ppm without any direct measurement; or
 - ii. CO₂ concentration shall be dynamically measured using a CO₂ sensor located near the position of the outdoor air intake.
- E. When the system is operating during hours of expected occupancy, the controls shall maintain system outdoor air ventilation rates no less than the rate listed in TABLE 121-A times the conditioned floor area for spaces with CO₂ sensors, plus the rate required by 121 (b) 2 for other spaces served by the system, or the exhaust air rate whichever is greater;

- F. CO₂ sensors shall be certified by the manufacturer to have an accuracy of no less than 75 ppm, factory calibrated or calibrated at start-up, and certified by the manufacturer to require calibration no more frequently than once every 5 years.
- 5. **Demand Control Ventilation Acceptance.** Before an occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all demand control ventilation devices serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance. A Certificate of Acceptance shall be submitted to the building department that:
 - A. Certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of Part 6.
 - B. Certifies that the demand control ventilation devices meet the requirements of Section 121 (c) 4.
- (d) **Ducting for Zonal Heating and Cooling Units.** Where a return plenum is used to distribute outdoor air to a zonal heating or cooling unit which then supplies the air to a space in order to meet the requirements of Section 121 (b) 2, the outdoor air shall be ducted to discharge either:
 - 1. Within five feet of the unit; or
 - 2. Within 15 feet of the unit, substantially toward the unit, and at a velocity not less than 500 feet per minute.
- (e) **Design and Control Requirements for Quantities of Outdoor Air.** All mechanical ventilation and space-conditioning systems shall be designed with and have installed ductwork, dampers and controls to allow outside air rates to be operated at the larger of (1) the minimum levels specified in Section 121 (b) 2; or (2) the rate required for make-up of exhaust systems that are required for a process, for control of odors, or for the removal of contaminants within the space.
- (f) **Ventilation System Acceptance.** Before an occupancy permit is granted for a newly constructed building or space, or a new ventilating system serving a building or space is operated for normal use, all ventilation systems serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance. A Certificate of Acceptance shall be submitted to the building department that:
 - 1. Certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of Part 6; and
 - 2. Certifies plans and specifications meet the requirements of Section 121 (b) 2; and
 - 3. Certifies measured outside air is within ten (10) percent of the minimum ventilation rate specified in the plans and specifications.

TABLE 121-A MINIMUM VENTILATION RATES

TYPE OF USE	CFM PER SQUARE FOOT OF CONDITIONED FLOOR AREA
Auto repair workshops	1.50
Barber shops	0.40
Bars, cocktail lounges, and casinos	0.2
Beauty shops	0.40
Coin-operated dry cleaning	0.30
Commercial dry cleaning	0.45
High-rise residential	Ventilation Rates Specified by the CBC
Hotel guest rooms (less than 500 sq. ft.)	30 cfm/guest room
Hotel guest rooms (500 sq. ft. or greater)	0.15
Retail stores	0.20
All others	0.15

SECTION 121 – REQUIREMENTS FOR VENTILATION

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SECTION 122 – REQUIRED CONTROLS FOR SPACE-CONDITIONING SYSTEMS

Space-conditioning systems shall be installed with controls that comply with the applicable requirements of Subsections (a) through (h).

- (a) **Thermostatic Controls for Each Zone.** The supply of heating and cooling energy to each space-conditioning zone or dwelling unit shall be controlled by an individual thermostatic control that responds to temperature within the zone and that meets the applicable requirements of Subsection (b).

EXCEPTION to Section 122 (a): An independent perimeter heating or cooling system may serve more than one zone without individual thermostatic controls if:

- A. All zones are also served by an interior cooling system;
- B. The perimeter system is designed solely to offset envelope heat losses or gains;
- C. The perimeter system has at least one thermostatic control for each building orientation of 50 feet or more; and
- D. The perimeter system is controlled by at least one thermostat located in one of the zones served by the system.

- (b) **Criteria for Zonal Thermostatic Controls.** The individual thermostatic controls required by Subsection (a) shall meet the following requirements as applicable:

1. Where used to control comfort heating, the thermostatic controls shall be capable of being set, locally or remotely, by adjustment or selection of sensors, down to 55°F or lower.
2. Where used to control comfort cooling, the thermostatic controls shall be capable of being set, locally or remotely, by adjustment or selection of sensors, up to 85°F or higher.
3. Where used to control both comfort heating and comfort cooling, the thermostatic controls shall meet Items 1 and 2 and shall be capable of providing a temperature range or dead band of at least 5°F within which the supply of heating and cooling energy to the zone is shut off or reduced to a minimum.

EXCEPTION to Section 122 (b) 3: Systems with thermostats that require manual changeover between heating and cooling modes.

EXCEPTION to Section 122 (b): Systems serving zones that must have constant temperatures to prevent degradation of materials, a process, or plants or animals.

- (c) **Hotel/Motel Guest Room and High-rise Residential Dwelling Unit Thermostats.** Hotel/motel guest room thermostats shall have:

1. Numeric temperature setpoints in °F; and
2. Setpoint stops accessible only to authorized personnel, to restrict over-heating and over-cooling.

High-rise residential dwelling unit thermostats shall meet the control requirements of Section 150 (i).

- (d) **Heat Pump Controls.** All heat pumps with supplementary electric resistance heaters shall be installed with controls that comply with Section 112 (b).

- (e) **Shut-off and Reset Controls for Space-conditioning Systems.** Each space-conditioning system shall be installed with controls that comply with Items 1 and 2 below:

1. The control shall be capable of automatically shutting off the system during periods of nonuse and shall have:
 - A. An automatic time switch control device complying with Section 119 (c), with an accessible manual override that allows operation of the system for up to four hours; or
 - B. An occupancy sensor; or
 - C. A four-hour timer that can be manually operated.

EXCEPTION to Section 122 (e) 1: Mechanical systems serving retail stores and associated malls, restaurants, grocery stores, churches, and theaters equipped with 7-day programmable timers.

2. The control shall automatically restart and temporarily operate the system as required to maintain:

SECTION 122 – REQUIRED CONTROLS FOR SPACE-CONDITIONING SYSTEMS

- A. A setback heating thermostat setpoint if the system provides mechanical heating; and

EXCEPTION to Section 122 (e) 2 A: Thermostat setback controls are not required in areas where the Winter Median of Extremes outdoor air temperature determined in accordance with Section 144 (b) 4 is greater than 32°F.

- B. A setup cooling thermostat setpoint if the system provides mechanical cooling.

EXCEPTION to Section 122 (e) 2 B: Thermostat setup controls are not required in areas where the Summer Design Dry Bulb 0.5 percent temperature determined in accordance with Section 144 (b) 4 is less than 100°F.

EXCEPTION 1 to Section 122 (e): Where it can be demonstrated to the satisfaction of the enforcing agency that the system serves an area that must operate continuously.

EXCEPTION 2 to Section 122 (e): Where it can be demonstrated to the satisfaction of the enforcing agency that shutdown, setback, and setup will not result in a decrease in overall building source energy use.

EXCEPTION 3 to Section 122 (e): Systems with full load demands of 2 kW or less, if they have a readily accessible manual shut-off switch.

EXCEPTION 4 to Section 122 (e): Systems serving hotel/motel guest rooms, if they have a readily accessible manual shut-off switch.

- (f) **Dampers for Air Supply and Exhaust Equipment.** Outdoor air supply and exhaust equipment shall be installed with dampers that automatically close upon fan shutdown.

EXCEPTION 1 to Section 122 (f): Where it can be demonstrated to the satisfaction of the enforcing agency that the equipment serves an area that must operate continuously.

EXCEPTION 2 to Section 122 (f): Gravity and other nonelectrical equipment that has readily accessible manual damper controls.

EXCEPTION 3 to Section 122 (f): At combustion air intakes and shaft vents.

EXCEPTION 4 to Section 122 (f): Where prohibited by other provisions of law.

- (g) **Isolation Area Devices.** Each space-conditioning system serving multiple zones with a combined conditioned floor area of more than 25,000 square feet shall be designed, installed, and controlled to serve isolation areas.

1. Each zone, or any combination of zones not exceeding 25,000 square feet, shall be a separate isolation area.
2. Each isolation area shall be provided with isolation devices, such as valves or dampers, that allow the supply of heating or cooling to be setback or shut-off independently of other isolation areas.
3. Each isolation area shall be controlled by a device meeting the requirements of Section 122 (e) 1.

EXCEPTION to Section 122 (g): A zone need not be isolated if it can be demonstrated to the satisfaction of the enforcement agency that the zone must be heated or cooled continuously.

- (h) **Space Conditioning Controls Acceptance.** Before an occupancy permit is granted for a newly constructed building or space, or a new space-conditioning or ventilating system serving a building or space is operated for normal use, all space-conditioning controls serving the building or space, which is the subject of the building permit, shall be certified as meeting the Acceptance Requirements for Code Compliance. A Certificate of Acceptance shall be submitted to the building department that:

1. Certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of Part 6.
2. Certifies that the space-conditioning system meets the requirements of Sections 121 (c) 1 and 121 (c) 2.
3. Certifies that space-conditioning controls meet the requirements of Section 122 (a) through Section 122 (g).

SECTION 123 – REQUIREMENTS FOR PIPE INSULATION

The piping for all space-conditioning and service water-heating systems with fluid temperatures listed in TABLE 123-A shall have the amount of insulation specified in Subsection (a) or (b). Insulation conductivity shall be determined in accordance with ASTM C 335 at the mean temperature listed in TABLE 123-A, and shall be rounded to the nearest 1/100 Btu-inch per hour per square foot per °F.

Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind, including but not limited to, the following:

Insulation exposed to weather shall be suitable for outdoor service e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space shall include a vapor retardant located outside the insulation (unless the insulation is inherently vapor retardant), all penetrations and joints of which shall be sealed.

EXCEPTION 1 to Section 123: Factory-installed piping within space-conditioning equipment certified under Section 111 or 112.

EXCEPTION 2 to Section 123: Piping that conveys fluids with a design operating temperature range between 60°F and 105°F.

EXCEPTION 3 to Section 123: Piping that serves process loads, gas piping, cold domestic water piping, condensate drains, roof drains, vents, or waste piping.

EXCEPTION 4 to Section 123: Where the heat gain or heat loss to or from piping without insulation will not increase building source energy use.

EXCEPTION 5 to Section 123: Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration. Metal piping that penetrates metal framing shall use grommets, plugs, wrapping or other insulating material to assure that no contact is made with the metal framing.

- (a) For insulation with a conductivity in the range shown in TABLE 123-A for the applicable fluid temperature range, the insulation shall have the applicable thickness shown in TABLE 123-A.
- (b) For insulation with a conductivity outside the range shown in TABLE 123-A for the applicable fluid temperature range, the insulation shall have a minimum thickness as calculated with EQUATION 123-A:

EQUATION 123-A INSULATION THICKNESS EQUATION

$$T = PR \left[\left(1 + \frac{t}{PR} \right)^{\frac{K}{k}} - 1 \right]$$

WHERE:

- T* = Minimum insulation thickness for material with conductivity *K*, inches.
- PR* = Pipe actual outside radius, inches.
- t* = Insulation thickness from TABLE 123-A, inches.
- K* = Conductivity of alternate material at the mean rating temperature indicated in TABLE 123-A for the applicable fluid temperature range, in Btu-inch per hour per square foot per °F.
- k* = The lower value of the conductivity range listed in TABLE 123-A for the applicable fluid temperature range, Btu-inch per hour per square foot per °F.

TABLE 123-A PIPE INSULATION THICKNESS

FLUID	CONDUCTIVITY RANGE	INSULATION	NOMINAL PIPE DIAMETER (in inches)
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SECTION 123 – REQUIREMENTS FOR PIPE INSULATION

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TEMPERATURE RANGE, (°F)	(in Btu-inch per hour per square foot per °F)	MEAN RATING TEMPERATURE (°F)	Runouts up to 2	1 and less	1.25-2	2.50-4	5-6	8 and larger
			INSULATION THICKNESS REQUIRED (in inches)					
Space heating systems (steam, steam condensate and hot water)								
Above 350	0.32-0.34	250	1.5	2.5	2.5	3.0	3.5	3.5
251-350	0.29-0.31	200	1.5	2.0	2.5	2.5	3.5	3.5
201-250	0.27-0.30	150	1.0	1.5	1.5	2.0	2.0	3.5
141-200	0.25-0.29	125	0.5	1.5	1.5	1.5	1.5	1.5
105-140	0.24-0.28	100	0.5	1.0	1.0	1.0	1.5	1.5
Service water-heating systems (recirculating sections, all piping in electric trace tape systems, and the first 8 feet of piping from the storage tank for nonrecirculating systems)								
Above 105	0.24-0.28	100	0.5	1.0	1.0	1.5	1.5	1.5
Space cooling systems (chilled water, refrigerant and brine)								
40-60	0.23-0.27	75	0.5	0.5	0.5	1.0	1.0	1.0
Below 40	0.23-0.27	75	1.0	1.0	1.5	1.5	1.5	1.5

SECTION 124 – REQUIREMENTS FOR AIR DISTRIBUTION SYSTEM DUCTS AND PLENUMS

- (a) **CMC Compliance.** All air distribution system ducts and plenums, including, but not limited to, building cavities, mechanical closets, air-handler boxes and support platforms used as ducts or plenums, shall be installed, sealed and insulated to meet the requirements of the 2001 CMC Sections 601, 602, 603, 604, 605, and Standard 6-5, incorporated herein by reference. Connections of metal ducts and the inner core of flexible ducts shall be mechanically fastened. Openings shall be sealed with mastic, tape, aerosol sealant, or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used.

Portions of supply-air and return-air ducts conveying heated or cooled air located in one or more of the following spaces shall be insulated to a minimum installed level of R-8:

1. Outdoors, or
2. In a space between the roof and an insulated ceiling, or
3. In a space directly under a roof with fixed vents or openings to the outside or unconditioned spaces, or
4. In an unconditioned crawlspace; or
5. In other unconditioned spaces.

Portions of supply-air ducts that are not in one of these spaces shall be insulated to a minimum installed level of R-4.2 (or any higher level required by CMC Section 605) or be enclosed in directly conditioned space.

- (b) **Duct and Plenum Materials.**

1. **Factory-fabricated duct systems.**

- A. All factory-fabricated duct systems shall comply with UL 181 for ducts and closure systems, including collars, connections and splices, and be UL labeled.
- B. All pressure-sensitive tapes, heat-activated tapes, and mastics used in the manufacture of rigid fiberglass ducts shall comply with UL 181.
- C. All pressure-sensitive tapes and mastics used with flexible ducts shall comply with UL 181 or UL 181B.
- D. Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and drawbands.

2. **Field-fabricated duct systems.**

SECTION 124 – REQUIREMENTS FOR AIR DISTRIBUTION SYSTEM DUCTS AND PLENUMS

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- A. Factory-made rigid fiberglass and flexible ducts for field-fabricated duct systems shall comply with UL 181. All pressure-sensitive tapes, mastics, aerosol sealants, or other closure systems used for installing field-fabricated duct systems shall meet the applicable requirements of UL 181, UL 181A, or UL 181B.
 - B. Mastic sealants and mesh.
 - i. Sealants shall comply with UL 181, UL 181A, or UL 181B, and be nontoxic and water resistant.
 - ii. Sealants for interior applications shall pass ASTM tests C 731 (extrudability after aging) and D 2202 (slump test on vertical surfaces), incorporated herein by reference.
 - iii. Sealants for exterior applications shall pass ASTM tests C 731, C 732 (artificial weathering test), and D 2202, incorporated herein by reference.
 - iv. Sealants and meshes shall be rated for exterior use.
 - C. Pressure-sensitive tape. Pressure-sensitive tapes shall comply with UL 181, UL 181A, or UL 181B.
 - D. Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and drawbands.
 - E. Drawbands used with flexible duct.
 - i. Drawbands shall be either stainless-steel worm-drive hose clamps or UV-resistant nylon duct ties.
 - ii. Drawbands shall have a minimum tensile strength rating of 150 pounds.
 - iii. Drawbands shall be tightened as recommended by the manufacturer with an adjustable tensioning tool.
 - F. Aerosol-sealant closures.
 - i. Aerosol sealants shall meet the requirements of UL 723 and be applied according to manufacturer specifications.
 - ii. Tapes or mastics used in combination with aerosol sealing shall meet the requirements of this section.
- (c) All duct insulation product R-values shall be based on insulation only (excluding air films, vapor barriers, or other duct components) and tested C-values at 75°F mean temperature at the installed thickness, in accordance with ASTM C 518 or ASTM C 177, incorporated herein by reference, and certified pursuant to Section 118.
- (d) The installed thickness of duct insulation used to determine its R-value shall be determined as follows:
1. For duct board, duct liner, and factory-made rigid ducts not normally subjected to compression, the nominal insulation thickness shall be used.
 2. For duct wrap, installed thickness shall be assumed to be 75 percent (25 percent compression) of nominal thickness.
 3. For factory-made flexible air ducts, the installed thickness shall be determined by dividing the difference between the actual outside diameter and nominal inside diameter by two.
- (e) Insulated flexible duct products installed to meet this requirement must include labels, in maximum intervals of 3 feet, showing the thermal performance R-value for the duct insulation itself (excluding air films, vapor barriers, or other duct components), based on the tests in Section 124 (c) and the installed thickness determined by Section 124 (d) 3.
- (f) **Protection of Insulation.** Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind but not limited to the following: Insulation exposed to weather shall be suitable for outdoor service e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

SECTION 125 – REQUIRED NONRESIDENTIAL MECHANICAL SYSTEM ACCEPTANCE

(a) **Air Distribution System Duct and Plenum Acceptance.** Before an occupancy permit is granted for a newly constructed building or space, or a new space-conditioning or ventilating system serving a building or space is operated for normal use, all air distribution system ducts and plenums serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance, as specified by the Nonresidential ACM Manual. A Certificate of Acceptance shall be submitted to the building department that:

1. Certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of Part 6.
2. Certifies that air distribution ducts and plenums meet the requirements of Section 124 (a) through Section 124 (f).
3. Certifies that air distribution ducts meet the requirements of Section 144 (k) for duct sealing to comply with the Prescriptive Approach or to comply with Section 141.

EXCEPTION to Section 125(a): Variable air volume (VAV) systems, multiple zone heating and air conditioning equipment, and single zone air conditioners, furnaces and heat pumps for which the criteria in Section 144 (k) 1, 2, and 3 do not apply.

(b) **Economizer Acceptance.** Before an occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all economizers serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance, as specified by the Nonresidential ACM Manual. A Certificate of Acceptance shall be submitted to the building department that:

1. Certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of Part 6, and
2. Certifies that the economizers meet the requirements of Section 144 (e) for economizers installed to comply with the Prescriptive Approach or to comply with Section 141.

EXCEPTION to Section 125(b): Air economizers installed by the HVAC system equipment manufacturer and certified to the commission as being factory calibrated and tested.

(c) **Variable Air Volume System Acceptance.** Before an occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all variable speed fans serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance, as specified by the Nonresidential ACM Manual. A Certificate of Acceptance shall be submitted to the building department that:

1. Certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of Part 6.
2. Certifies that the fans meet:
 - A. the requirements of Section 144 (c) 2 for variable air volume systems installed to comply with the Prescriptive Approach; or
 - B. the requirements of Sections 144 (c) 2 B, 144 (c) 2 C and 144 (c) 2 D for variable air volume systems installed to comply with Section 141.

(d) **Hydronic System Controls Acceptance.** Before an occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all hydronic systems serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance, as specified by the Nonresidential ACM Manual. A Certificate of Acceptance shall be submitted to the building department that:

1. Certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of Part 6.
2. Certifies that the fans meet the requirements of Section 144 (j) for hydronic systems installed to comply with the Prescriptive Approach or to comply with Section 141.

SECTION 125 – REQUIRED NONRESIDENTIAL MECHANICAL SYSTEM ACCEPTANCE