
SECTION 140.9 – PRESCRIPTIVE REQUIREMENTS FOR COVERED PROCESSES

(a) Prescriptive Requirements for Computer Rooms.

A computer room complies with this section by being designed with and having constructed and installed a cooling system that meets the requirements of Subsections 1 through 6.

- 1. Economizers.** Each individual cooling fan system primarily serving computer room(s) shall include either:
 - A. An integrated air economizer capable of providing 100 percent of the expected system cooling load as calculated in accordance with a method approved by the Commission, at outside air temperatures of 55°F dry-bulb/50°F wet-bulb and below; or**
 - B. An integrated water economizer capable of providing 100 percent of the expected system cooling load as calculated in accordance with a method approved by the Commission, at outside air temperatures of 40°F dry-bulb/35°F wet-bulb and below.**

EXCEPTION 1 to Section 140.9(a)-1: Individual computer rooms under 5 tons in a building that does not have any economizers.

EXCEPTION 2 to Section 140.9(a)-1: New cooling systems serving an existing computer room in an existing building up to a total of 50 tons of new cooling equipment per building.

EXCEPTION 3 to Section 140.9(a)-1: New cooling systems serving a new computer room in an existing building up to a total of 20 tons of new cooling equipment per building.

EXCEPTION 4 to Section 140.9(a)-1: A computer room may be served by a fan system without an economizer if it is also served by a fan system with an economizer that also serves non-computer room(s) provided that all of the following are met:

- a. The economizer system is sized to meet the design cooling load of the computer room(s) when the non-computer room(s) are at 50% of their design load; and-**
 - b. The economizer system has the ability to serve only the computer room(s), e.g. shut off flow to non-computer rooms when unoccupied; and-**
 - c. The non-economizer system does not operate when the cooling load of the non-computer room(s) served by the economizer system is less than 50% of design load.**
- 2. Reheat.** Each computer room zone shall have controls that prevent reheating, recooling, and simultaneous provisions of heating and cooling to the same zone, such as mixing or simultaneous supply of air that has been previously mechanically heated and air that has been previously cooled, either by cooling equipment or by economizer systems.
 - 3. Humidification.** Non-adiabatic humidification (e.g. steam, infrared) is prohibited. Only adiabatic humidification (e.g. direct evaporative, ultrasonic) is permitted.
 - 4. Power Consumption of Fans.** The total fan power at design conditions of each fan system shall not exceed 27 W/kBtu-h of net sensible cooling capacity.
 - 5. Fan Control.** Each unitary air conditioner with mechanical cooling capacity exceeding 60,000 Btu/hr and each chilled water fan system shall be designed to vary the airflow rate as a function of actual load and shall have controls and/or devices (such as two-speed or variable speed control) that will result in fan motor demand of no more than 50 percent of design wattage at 66 percent of design fan speed.
 - 6. Containment.** Computer rooms with air-cooled computers in racks and with a design load exceeding 175 kW/room shall include air barriers such that there is no significant air path for computer discharge air to recirculate back to computer inlets without passing through a cooling system.

EXCEPTION 1 to Section 140.9(a)-6: Expansions of existing computer rooms.

EXCEPTION 2 to Section 140.9(a)-6: Computer racks with a design load less than 1 kW/rack.

EXCEPTION 3 to Section 140.9(a)-6: Equivalent energy performance based on computational fluid dynamics or other analysis.

(b) Prescriptive Requirements for Commercial Kitchens.

1. Kitchen exhaust systems.

A. Replacement air introduced directly into the hood cavity of kitchen exhaust hoods shall not exceed 10% of the hood exhaust airflow rate.

B. For kitchen/dining facilities having total Type I and Type II kitchen hood exhaust airflow rates greater than 5,000 cfm, each Type I hood shall have an exhaust rate that complies with Table 140.9-A. If a single hood or hood section is installed over appliances with different duty ratings, then the maximum allowable flow rate for the hood or hood section shall not exceed the Table 140.9-A values for the highest appliance duty rating under the hood or hood section.

EXCEPTION to Section 140.9(b)1B: 75% of the total Type I and Type II exhaust replacement air is transfer air that would otherwise be exhausted.

TABLE 140.9-A MAXIMUM NET EXHAUST FLOW RATE, CFM PER LINEAR FOOT OF HOOD LENGTH

<u>Type of Hood</u>	<u>Light Duty Equipment</u>	<u>Medium Duty Equipment</u>	<u>Heavy Duty Equipment</u>	<u>Extra Heavy Duty Equipment</u>
<u>Wall-mounted Canopy</u>	<u>140</u>	<u>210</u>	<u>280</u>	<u>385</u>
<u>Single Island</u>	<u>280</u>	<u>350</u>	<u>420</u>	<u>490</u>
<u>Double Island</u>	<u>175</u>	<u>210</u>	<u>280</u>	<u>385</u>
<u>Eye brow</u>	<u>175</u>	<u>175</u>	<u>Not Allowed</u>	<u>Not Allowed</u>
<u>Backshelf / Passover</u>	<u>210</u>	<u>210</u>	<u>280</u>	<u>Not Allowed</u>

2. Kitchen ventilation.

A. Mechanically cooled or heated makeup air delivered to any space with a kitchen hood shall not exceed the greater of:

- i.** The supply flow required to meet the space heating and cooling load; or
- ii.** The hood exhaust flow minus the available transfer air from adjacent spaces. Available transfer air is that portion of outdoor ventilation air serving adjacent spaces not required to satisfy other exhaust needs, such as restrooms, not required to maintain pressurization of adjacent spaces, and that would otherwise be relieved from the building.

B. A kitchen/dining facility having a total Type I and Type II kitchen hood exhaust airflow rate greater than 5,000 cfm shall have one of the following:

- i.** At least 50% of all replacement air is transfer air that would otherwise be exhausted; or
- ii.** Demand ventilation system(s) on at least 75% of the exhaust air. Such systems shall:
 - a.** Include controls necessary to modulate airflow in response to appliance operation and to maintain full capture and containment of smoke, effluent and combustion products during cooking and idle; and
 - b.** Include failsafe controls that result in full flow upon cooking sensor failure; and
 - c.** Allow occupants the ability to temporarily override the system to full flow; and
 - d.** Be capable of reducing exhaust and replacement air system airflow rates to the larger of:

(i) 50% of the total design exhaust and replacement air system airflow rates; or

(ii) The ventilation rate required per Section 120.1.

C. Listed energy recovery devices with a sensible heat recovery effectiveness of not less than 40% on at least 50% of the total exhaust airflow; and

D. A minimum of 75% of makeup air volume that is:

i. Unheated or heated to no more than 60°F; and

ii. Uncooled or cooled without the use of mechanical cooling.

3. **Kitchen Exhaust System Acceptance.** Before an occupancy permit is granted for a commercial kitchen subject to 140.9(b), the following equipment and systems shall be certified as meeting the Acceptance Requirements for Code Compliance, as specified by the Reference Nonresidential Appendix NA7. A Certificate of Acceptance shall be submitted to the enforcement agency that certifies that the equipment and systems meet the acceptance requirements specified in NA7.11.

(c) **Prescriptive Requirements for Laboratory exhaust systems.**

For buildings with laboratory exhaust systems where the minimum circulation rate to comply with code or accreditation standards is 10 ACH or less, the design exhaust airflow shall be capable of reducing zone exhaust and makeup airflow rates to the regulated minimum circulation rate, or the minimum required to maintain pressurization requirements, whichever is larger.

Exception to Section 140.9(c): Laboratory exhaust systems serving zones where constant volume is required by the Authority Having Jurisdiction, facility Environmental Health & Safety department or other applicable code.