

Variable Exhaust Flow Control

Draft Code Language

Last Updated: February 24, 2017

1. INTRODUCTION

The California Statewide Utility Codes and Standards Team actively supports the California Energy Commission in developing revisions to the 2019 California Building Energy Efficiency Standards (Title 24, Part 6). Our joint intent is to achieve significant energy savings through the development of reasonable, responsible, and cost-effective code change proposals for the 2019 Title 24 code change cycle.

The Statewide Utility Team is proposing code change to establish a new prescriptive requirement for power consumption of fan systems serving lab exhaust systems. The code change dictates that the fan system must meet the discharge requirements in ANSI Z9.5. The primary prescriptive requirement specifies that fan system power must be below a specific watts per CFM of exhaust air that has yet to be determined. If the prescriptive fan power limit cannot be met, numerous pathways towards compliance will be provided that builders can elect instead of the primary option:

- Fan speed controls with contaminant sensors
- Fan speed controls with wind sensors
- Staging of multiple fans

This code change will affect prescriptive requirements for covered processes for new construction, additions and alterations. In practice, the proposed measure will impact the selection and implementation of laboratory exhaust systems.

To provide feedback, please email us at info@title24stakeholders.com or contact the measure lead at:

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For more information about the California Statewide Utility Codes and Standards Team's 2019 Title 24, Part 6 advocacy efforts, and the latest information on this code change proposal please visit: www.title24stakeholders.com.

2. DRAFT CODE LANGUAGE

The proposed changes to the Standards, Reference Appendices, and the ACM Reference Manuals are provided below. Changes to the 2016 documents are marked with underlining (new language) and ~~strikethroughs~~ (deletions).

2.1 Standards

SECTION 140.9 – PRESCRIPTIVE REQUIREMENTS FOR COVERED PROCESSES

(c) Prescriptive Requirements for Laboratory and Process Facility exhaust systems.

1. **Fan System Power Consumption.** The fan system for a laboratory or process facility exhaust system shall meet the discharge requirements in ANSI Z9.5 and meet at least one of the requirements of Items A, B, C, or D. Exhaust fan system power demand equals the sum of the power demand of all fans in the exhaust system that are required to operate at design conditions in order to exhaust air from the conditioned space to the outdoors. Exhaust air does not include bypass air or entrained air, but does include all exhaust air from fume hoods, hazardous exhaust flows, or other manifolded exhaust streams.
 - A. The allowable exhaust fan system power demand shall not exceed xx watts per cfm of exhaust air; or
 - B. The motor speed shall vary based on measuring wind speed taken from a calibrated local station; or
 - C. The motor speed shall vary based on measuring contaminants in the exhaust plenum from a calibrated contaminant sensor; or
 - D. The fan system shall have no bypass and shall utilize staging of multiple exhaust fans.
2. **Airflow Reduction Requirements.** 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. Variable exhaust and makeup airflow shall be coordinated to achieve the required space pressurization at varied levels of demand and fan system capacity.

SECTION 1401.1 –REQUIREMENTS FOR COVERED PROCESSES IN ADDITIONS, ALTERATIONS, TO EXISTING BUILDINGS THAT WILL BE NONRESIDENTIAL, HIGH-RISE RESIDENTIAL

(f) Lab and Process Facility Exhaust Systems. Lab and process facility exhaust systems comply with this section if they comply with the applicable requirements of Sections 140.9(c).

2.2 Reference Appendices

An acceptance test for fan-speed control and contaminant concentration control will need to be added to section NA7.

Section 5.7.3.4 Exhaust Fan Systems of the ACM Reference Manual will need to be updated to establish a primary prescriptive path to be used as the performance method baseline for this measure. Within Section 5.7.3.4, the subsections that will need revisions include control method, exhaust fan brake horsepower, and exhaust fan motor horsepower.