# Requirement for Fume Hood Automatic Sash Closure

## I. Regulatory Driver

- California's 2019 Building Energy Efficiency Standards (aka California Energy Code 2019 Title 24, Part 6, Chapter 5, Section 140.9 (c))

## II. Effective Date

- 2019 Standards went into effect on January 1, 2020.

## III. Applies to

- All buildings for which a building permit or renewal of an existing permit is filed on or after the effective date of the provisions.
- Applies to newly constructed buildings, additions, and alterations

Exception: Does not apply to healthcare facilities

## IV. Measure Description

The measure is a prescriptive requirement for the installation of automatic sash closure systems for vertical sash laboratory fume hoods with variable air volume (VAV). It is intended for spaces where minimum ventilation requirements are dictated by fume hoods(s) rather than general exhaust (i.e.: fume hood intensive labs). The requirement is prescriptive and thus can be displaced by alternative energy savings measures through a performance approach to compliance.

Automatic sash closure systems detect the presence of laboratory workers in front of the fume hood with a presence/occupancy sensor. When no occupancy is detected for a predefined period of time, the sash automatically lowers to its minimum physical setting, thus reducing exhaust and make-up air using the capabilities inherent to a VAV system. The measure aims to reduce the overall amount of conditioned air exhausted through fume hoods over the course of time, which will result in less electricity, hot water, and chilled water use.

## V. Requirements

Variable air volume (VAV) laboratory fume hoods with vertical-only sashes located in fume hood intensive laboratories (see table below) shall have an automatic sash closure system that complies with the following:

A. The automatic sash closure system shall be capable of the following:

i. The automatic sash closure system shall have a dedicated zone presence sensor that detects people in the area near the fume hood sash and automatically closes the sash within five (5) minutes of no detection.

ii. The automatic sash closure system shall have controls to prevent the sash from automatic closing when a force of no more than ten pounds (10 lbs) is detected.

iii. The automatic sash closure system shall be equipped with an obstruction sensor that prevents the sash from automatic closing with obstructions (including transparent materials) in the sash opening.

iv. The automatic sash closure system shall be capable of being configured in a manual open mode where, once the sash is closed, detection of people in the area near the fume hood by the zone presence sensor does not open the fume hood sash[1].

**Table 140.9-B Fume Hood Intensive Laboratories**

| | | | | | | |
|---|---|---|---|---|---|---|
| Occupied Minimum Ventilation (ACH) | ≤4 | ≥4 and ≤6 | ≥6 and ≤8 | ≥8 and ≤10 | ≥10 and ≤12 | ≥12 and ≤14 |
| Hood Density (linear feet per 10,000 ft3 of laboratory space) | ≥6 | ≥8 | ≥10 | ≥12 | ≥14 | ≥16 |

B. Fume Hood Automatic Sash Closure Acceptance.

Before an occupancy permit is granted for the fume hoods, the equipment and systems shall be certified as meeting the Acceptance Requirement 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 NA7.17.

## VI. Impacts on Stanford

A. Economic

The energy cost savings over the lifecycle of the equipment are expected to exceed the expected incremental first cost and lifetime incremental maintenance costs.

B. Users

Fume hood users may experience a brief adjustment period while becoming accustomed to the new system.

C. Occupational Safety and Health

Closure of the hood sash reduces fugitive emissions and provides a safety shield against chemical splashes or sprays, fires, and minor explosions. The use of automatic sash closures is expected to improve sash management and mitigate associated safety and health concerns.

[1] However, making use of this capability is not required. Some users may find an “automatic open mode” appealing since it enables opening the sash while carrying something in both hands.

## VII. Vendors

The following is an incomplete list of vendors that either manufacture fume hoods with built-in automatic sash closing system or automatic sash closer kits to retrofit VAV fume hoods. • Fume Hood Manufacturers: Erlab, Green Energy hoods, Iroquois Hoods, Labconco, Mott Manufacturing, Newtech Waldner

- Fume Hood Controls Integrators: Acco, Aircuity, Air Master Systems, Phoenix

Controls **VIII. For More Information**

The 2019 Revised Energy Code can be found at **https://www.energy.ca.gov/title24/2019standards/rulemaking/documents/2018-05- 09_hearing/2019_Revised_EnergyCode.php** (Chapter 6, page 259)

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