



**CSA
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Z316.5-15

Fume hoods and associated exhaust systems

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Standards Update Service

Z316.5-15

September 2015

Title: *Fume hoods and associated exhaust systems*

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Z316.5-15
***Fume hoods and associated exhaust
systems***



TMA trade-mark of the Canadian Standards Association, operating as "CSA Group"

*Published in September 2015 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3*

*To purchase standards and related publications, visit our Online Store at shop.csa.ca
or call toll-free 1-800-463-6727 or 416-747-4044.*

ISBN 978-1-4883-0090-5

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Preface

This is the third edition of CSA Z316.5, *Fume hoods and associated exhaust systems*. It supersedes the previous editions, published in 2004 and 1994.

This Standard is intended to assist designers, maintenance personnel, and end-users in ensuring that a fume hood will provide the necessary containment. This Standard is a key resource for professionals because it sets out minimum requirements and best practices for organizations and individuals involved in all aspects of fume hood design, maintenance, and use.

This Standard covers various factors, including

- a) fume hood design and construction;
- b) selection criteria;
- c) fume hood placement;
- d) commissioning;
- e) field testing; and
- f) user education and training.

This edition of the Standard has been redesigned to improve flexibility in the testing regime to allow for variations in the intended use of the fume hood. Understanding that facilities differ in size and complexity across the country, this Standard is designed to provide a common management framework that organizations can use as they develop their policies and procedures, hire and train staff, and manage their day-to-day operations. The goal is for everyone involved in designing labs or using and maintaining fume hoods to understand their responsibilities and to manage them in a consistent and organized way.

This Standard was prepared by the Subcommittee on Fume Hoods, under the jurisdiction of the Technical Committee on Medical Laboratory Quality Systems and the Strategic Steering Committee on Health Care Technology & Systems, and has been formally approved by the Technical Committee.

Notes:

- 1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
- 2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*
- 3) *This Standard was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.*
- 4) *To submit a request for interpretation of this Standard, please send the following information to inquiries@csagroup.org and include “Request for interpretation” in the subject line:*
 - a) *define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;*
 - b) *provide an explanation of circumstances surrounding the actual field condition; and*
 - c) *where possible, phrase the request in such a way that a specific “yes” or “no” answer will address the issue.*

Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are available on the Current Standards Activities page at standardsactivities.csa.ca.
- 5) *This Standard is subject to review five years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include “Proposal for change” in the subject line:*
 - a) *Standard designation (number);*
 - b) *relevant clause, table, and/or figure number;*
 - c) *wording of the proposed change; and*
 - d) *rationale for the change.*

Z316.5-15

Fume hoods and associated exhaust systems

0 Introduction

A fume hood is a mechanically ventilated, partially enclosed ducted workstation where harmful materials can be handled safely. The primary function of a fume hood is to capture, contain, and exhaust gases, vapours, and aerosols generated within the fume hood enclosure, thereby protecting the user. At the correct height, the sash also provides a physical barrier, an important component of user protection. Fume hoods are used in manufacturing, research, medical, and university workplaces.

Most fume hoods use ducts. In a ducted fume hood, ducts and a fan ensure that the fume hood will capture heat and airborne contaminants, transport them out of the work area, and eventually discharge them into the atmosphere outside the building where the fume hood is located. Dilution provides protection for those outside the building. A ducted fume hood is usually constructed of non-combustible materials. Airflow into the fume hood is achieved by an exhaust fan that draws air from the workspace into the duct system. Contaminated air is then conveyed through the duct system and discharged into the atmosphere outside the building. In some cases, a pollution control device is part of the system.

Some fume hoods are designed to protect workers from specific reagents or chemicals such as perchloric acid or nuclear substances. For these fume hoods, additional requirements are necessary.

This Standard was developed using CSA Group's Standards development process, which relies on the expert judgment and consensus of a Technical Committee of engineers, manufacturers, occupational health professionals, fume hood testing specialists, lab design architects, and governmental representatives, as well as extensive consultation with the user community.

1 Scope

1.1

This Standard applies to all types of laboratory fume hoods, except for ductless fume hoods.

Note: *Ductless fume hoods should not be considered acceptable substitutes for ducted fume hoods. Some jurisdictions prohibit use of ductless fume hoods with certain chemicals. For these reasons, ductless fume hoods have not been included in this Standard.*

1.2

This Standard specifies

- a) safety requirements for fume hoods, their users, and service personnel;
- b) test methods for assessing fume hood performance;
- c) requirements for the selection, use, and maintenance of fume hoods;
- d) requirements for the education of fume hood users and maintenance personnel; and

- e) requirements regarding information to be exchanged between suppliers and users of fume hoods to ensure that installation, function, and maintenance are compatible with the intended use.

Notes:

- 1) *Users of this Standard should note that fume hood requirements are also established by authorities having jurisdiction.*
- 2) *Other fume hood requirements can be found in, e.g., the National Building Code of Canada, the National Fire Code of Canada, the Canadian Environmental Protection Act, and the Nuclear Safety and Control Act.*

1.3

This Standard does not address detailed design considerations, such as hood design, fan selection, and duct/stack velocities.

This Standard does not apply to biological safety cabinets.

Notes:

- 1) *Requirements applicable to the installation and field testing of biological safety cabinets are found in NSF/ANSI 49.*
- 2) *This Standard is not intended to be used by manufacturers for the certification of their fume hoods.*

1.5

In this Standard, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (nonmandatory) to define their application.

1.6

The values given in SI units are the units of record for the purposes of this Standard. The values given in parentheses are for information and comparison only.

2 Reference publications

This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below, including all amendments published thereto.

CSA Group

C22.1-15

Canadian Electrical Code, Part I

CAN/CSA-C22.2 No. 61010-1-12

Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 1: General requirements