KITCHEN VENTILATION SYSTEMS AND FOOD SERVICE EQUIPMENT FABRICATION AND INSTALLATION GUIDELINES

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION, INC.
www.smacna.org

KITCHEN VENTILATION SYSTEMS AND FOOD SERVICE EQUIPMENT FABRICATION AND INSTALLATION GUIDELINES

FIRST EDITION – APRIL 2001

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION, INC.
4201 Lafayette Center Drive
Chantilly, VA 20151-1209

KITCHEN VENTILATION SYSTEMS AND FOOD SERVICE EQUIPMENT FABRICATION AND INSTALLATION GUIDELINES

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION, INC.

4201 Lafayette Center Drive
Chantilly, VA 20151–1209

Printed in the U.S.A.

FIRST EDITION – APRIL 2001

JOINT FOREWORD

This first edition of SMACNA Kitchen Ventilation Systems and Food Service Equipment Fabrication and Installation Guidelines (Sections I & II) is intended to provide basic reference guidelines as to industry accepted practices for fabrication and installation of kitchen ventilation systems and custom built food preparation, and serving equipment commonly used in non-domestic food facilities.

Section I on Kitchen Ventilation Systems presents information and drawings primarily to illustrate the elements of construction and installation of commercial kitchen ventilation systems. This guide will assist the designer, contractor and code official to understand the complexities of designing, installing, constructing, and balancing both the exhaust and the make-up air systems required in commercial kitchen ventilation.

Section II on Food Service Equipment Fabrication covers custom built food service equipment for specifiers, contractors, regulatory officials, and users of commercial food service facilities with practical guidelines for designing, fabricating, evaluating, and purchasing quality products.

The details shown depict minimum standards for fabricating and installing equipment that should provide owners with years of trouble free usage. The tools and techniques for fabrication are readily available in most sheet metal shops. The recommendations given herein were developed after reviewing the current policy of applicable independent accreditation agencies, reviewing representative model code requirements, and polling the industry experience of participating fabricators who are in various markets across the country.

These recommendations are not intended to assure compliance with the regulations of local public safety or sanitary officials or to prohibit usage of materials or methods that exceed these minimum requirements when such use would improve the integrity or adaptability of any particular equipment item.

SHEET METAL AND AIR CONDITIONING CONTRACTORS'
NATIONAL ASSOCIATION, INC.

KITCHEN VENTILATION SYSTEMS TASK FORCE

Loren Gard, Chairman
Master Air, Inc.
Indianapolis, IN

Doug Walter
Climate Engineers
Woodenville, WA

Matthew Smith
Smith Heating and Air Conditioning, Inc.
Stockton, CA

Eli P. Howard, III, Staff Liaison
SMACNA
Chantilly, VA

Phil Ackland, Technical Writer
Phillip Ackland Holdings, Ltd.
Summerland, BC, Canada

FOOD SERVICE EQUIPMENT TASK FORCE

Joseph R. Kloppenberg, Chairman
Kloppenberg & Company
Englewood, CO

Loren Gard
Master Air, Inc.
Indianapolis, IN

Cliff Mantei
Met-Tec Installations, Ltd.
Port Coquitlam, BC, Canada

Kurt P. Smith
Smith Heating and Air Conditioning, Inc.
Stockton, CA

Bob Wasilewski, Staff Liaison
SMACNA
Chantilly, VA

NOTICE TO USERS OF THIS PUBLICATION

1. DISCLAIMER OF WARRANTIES

a) The Sheet Metal and Air Conditioning Contractor's National Association ("SMACNA") provides its product for informational purposes.

b) The product contains "Data" which is believed by SMACNA to be accurate and correct but the data, including all information, ideas and expressions therein, is provided strictly "AS IS", with all faults. SMACNA makes no warranty either express or implied regarding the Data and SMACNA EXPRESSLY DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.

c) By using the data contained in the product user accepts the Data "AS IS" and assumes all risk of loss, harm or injury that may result from its use. User acknowledges that the Data is complex, subject to faults and requires verification by competent professionals, and that modification of parts of the Data by user may impact the results or other parts of the Data.

d) IN NO EVENT SHALL SMACNA BE LIABLE TO USER, OR ANY OTHER PERSON, FOR ANY INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING, DIRECTLY OR INDIRECTLY, OUT OF OR RELATED TO USER'S USE OF SMACNA'S PRODUCT OR MODIFICATION OF DATA THEREIN. This limitation of liability applies even if SMACNA has been advised of the possibility of such damages. IN NO EVENT SHALL SMACNA'S LIABILITY EXCEED THE AMOUNT PAID BY USER FOR ACCESS TO SMACNA'S PRODUCT OR $1,000.00, WHICHEVER IS GREATER, REGARDLESS OF LEGAL THEORY.

e) User by its use of SMACNA's product acknowledges and accepts the foregoing limitation of liability and disclaimer of warranty and agrees to indemnify and hold harmless SMACNA from and against all injuries, claims, loss or damage arising, directly or indirectly, out of user's access to or use of SMACNA's product or the Data contained therein.

2. ACCEPTANCE

This document or publication is prepared for voluntary acceptance and use within the limitations of application defined herein, and otherwise as those adopting it or applying it deem appropriate. It is not a safety standard. Its application for a specific project is contingent on a designer or other authority defining a specific use. SMACNA has no power or authority to police or enforce compliance with the contents of this document or publication and it has no role in any representations by other parties that specific components are, in fact, in compliance with it.

3. AMENDMENTS

The Association may, from time to time, issue formal interpretations or interim amendments, which can be of significance between successive editions.

4. PROPRIETARY PRODUCTS

SMACNA encourages technological development in the interest of improving the industry for the public benefit. SMACNA does not, however, endorse individual manufacturers or products.

5. FORMAL INTERPRETATION

a) A formal interpretation of the literal text herein or the intent of the technical committee or task force associated with the document or publication is obtainable only on the basis of written petition, addressed to the Technical Resources Department and sent to the Association's national office in Chantilly, Virginia. In the event that the petitioner has a substantive disagreement with the interpretation, an appeal may be filed with the Technical Resources Committee, which has technical oversight responsibility. The request must pertain to a specifically identified portion of the document that does not involve published text which provides the requested information. In considering such requests, the Association will not review or judge products or components as being in compliance with the document or publication. Oral and written interpretations otherwise obtained from anyone affiliated with the Association are unofficial. This procedure does not prevent any committee or task force chairman, member of the committee or task force, or staff liaison from expressing an opinion on a provision within the document, provided that such person clearly states that the opinion is personal and does not represent an official act of the Association in any way, and it should not be relied on as such. The Board of Directors of SMACNA shall have final authority for interpretation of this standard with such rules or procedures as they may adopt for processing same.

b) SMACNA disclaims any liability for any personal injury, property damage, or other damage of any nature whatsoever, whether special, indirect, consequential or compensatory, direct or indirectly resulting from the publication, use of, or reliance upon this document. SMACNA makes no guaranty or warranty as to the accuracy or completeness of any information published herein.

6. APPLICATION

a) Any standards contained in this publication were developed using reliable engineering principles and research plus consultation with, and information obtained from, manufacturers, users, testing laboratories, and others having specialized experience. They are subject to revision as further experience and investigation may show is necessary or desirable. Construction and products which comply with these Standards will not necessarily be acceptable if, when examined and tested, they are found to have other features which impair the result contemplated by these requirements. The Sheet Metal and Air Conditioning Contractors' National Association and other contributors assume no responsibility and accept no liability for the application of the principles or techniques contained in this publication. Authorities considering adoption of any standards contained herein should review all federal, state, local, and contract regulations applicable to specific installations.

b) In issuing and making this document available, SMACNA is not undertaking to render professional or other services for or on behalf of any person or entity. SMACNA is not undertaking to perform any duty owed to any person or entity to someone else. Any person or organization using this document should rely on his, her or its own judgement or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstance.

7. REPRINT PERMISSION

Non-exclusive, royalty-free permission is granted to government and private sector specifying authorities to reproduce *only* any construction details found herein in their specifications and contract drawings prepared for receipt of bids on new construction and renovation work within the United States and its territories, provided that the material copied is unaltered in substance and that the reproducer assumes all liability for the specific application, including errors in reproduction.

8. THE SMACNA LOGO

The SMACNA logo is registered as a membership identification mark. The Association prescribes acceptable use of the logo and expressly forbids the use of it to represent anything other than possession of membership. Possession of membership and use of the logo in no way constitutes or reflects SMACNA approval of any product, method, or component. Furthermore, compliance of any such item with standards published or recognized by SMACNA is not indicated by presence of the logo.

SECTION I

KITCHEN VENTILATION SYSTEMS

SECTION I

TABLE OF CONTENTS

TABLES

CHAPTER 1

INTRODUCTION

1.1 SCOPE

The information and drawings in this manual are presented primarily to illustrate the elements of construction and installation of commercial kitchen ventilation systems. The information is intended to encourage more standardization in installations and to call attention to the appropriate segregation of responsibilities of those concerned with installations.

The science of commercial kitchen ventilation includes both exhausting and replacing air within the cooking area. Managing and balancing airflow is a complex issue, whether a restaurant is a small free-standing site or a large institutional kitchen.

It is a challenge to properly ventilate commercial kitchens, as they require the movement of large amounts of air through ductwork and other equipment in very restricted spaces.

Overall design, construction and installation coordination, as well as maintenance, is required to get the optimum from the system, and achieve proper energy-efficient air balance.

This guide will assist the reader to understand the complexities of designing, installing, constructing and balancing both the exhaust and the make-up air systems required in commercial kitchen ventilation.

1.2 INTENT OF USE

Architect/Engineer/Design

This manual provides clear and definitive references of the codes and design requirements of both commercial kitchen exhaust and make-up air systems. The accompanying charts and tables will aid in analyzing and calculating the airflow rates and design criteria necessary to design and install a comprehensive and balanced system. This guide will help to design a system that offers efficient operating costs, climatic controls, and satisfies building and fire regulations.

Owners/Facility Managers

The principles and components of the kitchen ventilation system are explained so that owners and managers can understand the interdependence of each piece of the system. As well, they will be able to recognize the value of having a complete and properly integrated system that will provide a positive and comfortable work environment, at an effective cost.

Contractors

Contractors will be able to use the manual as a construction and installation guide and as a reference to confirm the model codes that administer these systems. We have tried to cover every facet of the construction and installation process from a practical point of view.

Code Officials

As a practical guide, code officials will find the information in this manual beneficial. It identifies the key areas of concern with regards to fire and health safety. Additionally, it identifies the “Standards of Practice” that quality contractors strive to achieve.

This manual will assist local authorities in judging adequacy and comparability in the installation of commercial kitchen ventilation systems, their components and assemblies.

A clear understanding and the ability to accurately analyze the complete system needs will aid in complying with fire and health standards and the need to create a comfortable work setting.

1.3 RESPONSIBILITIES

Architects

The architect is responsible for the design of commercial restaurants, which includes, fire-resistive walls, floor-ceiling assemblies, roof-ceiling assemblies, and the protection of openings therein as well as the horizontal and vertical smoke barriers. In their consideration for fire protection, architects must first determine the overall function of the structure, and the type of occupancy of its individual spaces.

They are also responsible to design appropriate spaces within the building that are required to be separated by fire-resistive assemblies with protected openings, as described in the local building code. Architects will communicate and cooperate with the authority having jurisdiction at the building site, and comply with any special conditions of fire protection design required by that authority.

Design plans should show:

- The necessary horizontal and vertical fire separations.
- The hourly requirements of the fire separation.