GUIDE FOR STEEL STACK CONSTRUCTION

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

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SECOND EDITION - JANUARY 1996

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FOREWORD

At the request of the Industrial Ventilation and Power Industry Committee, Dr. Michael C. Soteriades, who did all the theoretical work for the previous edition, reviewed and updated the material for this new edition.

Although the vast majority of the original material has been reproduced here, some of the major differences with the previous edition are:

- The theoretical basis for the selection tables has been reviewed and expanded to make it more useful and easier to follow.

- The reinforcement criteria for the openings in the stack have been reviewed and clarified, including more detailed illustrations and drawings.

- Consistent with the original recommendation that when available the "undampened" designs have preference over the "dampened" designs, the new edition has eliminated "dampened" solutions when "undampened" designs are also available for the same geometry.

- A new chapter has been added providing conversion factors and guidance for working in the metric (SI) system. In this respect we have deviated from SMACNA's policy of reproducing all numerical data in both the English (I-P) and metric (SI) systems. This is because of the unique circumstance that the design of stacks involves consideration of wind-induced resonant vibration, which makes any deviation from the calculated metal thickness a potential risk. This is true even when going to a greater thickness, which in most other design situations is considered a safe and conservative procedure.

- The new edition has been reformatted per SMACNA's *Manual of Style*, which governs the presentation of all SMACNA publications to create a uniform look and feel.

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The SMACNA Industrial Ventilation and Power Industry Committee develops and maintains standards for the design and construction of industrial ventilation and air pollution control systems and duct systems used in nuclear and fossil fuel power plants.

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CHAPTER 1

INTRODUCTION

The industrial sheet metal contractor is often required to provide a steel stack as part of the system for process exhaust ventilation.

This handbook is devoted exclusively to free-standing stacks that are founded at ground elevation and of uniform diameter. The publication provides tables for stacks of fixed height ranging from 20 to 120 feet; specific wind velocities of 100, 125, and 150 miles per hour; and diameters ranging from 12 to 84 inches. The designer is cautioned that where unusual conditions are expected which may affect the structural integrity of the stack—i.e., excessive wind velocity, increased stack height, etc.—special consideration must be given to the design of the stack to compensate for these conditions.

The committee may consider stack design and construction for guyed and intermittently supported stacks in the future.

The Sheet Metal and Air Conditioning Contractors' National Association does not assume any responsibility or liability for the application of the principles and techniques contained in this guide.

The Industrial Ventilation and Power Industry Committee and its predecessor, the Industrial Duct Standards Committee, are indebted to Dr. Michael C. Soteriades of the Catholic University of America for his assistance in developing this guide.