
FLUID FILTRATION:

Gas

Volume I

Robert R. Raber

editor

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FLUID FILTRATION: GAS

Volume I

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Foreword

The symposium on Gas and Liquid Filtration was presented at Philadelphia, Pennsylvania, 20–22 October 1986. The symposium was sponsored by ASTM Committee F-21 on Filtration and The American Program Committee of The Filtration Society. Robert R. Raber, Farr Co., served as chairman of the Gas Filtration sessions, and Peter R. Johnston, Ametek, Inc., and Hans G. Schroeder, International Consultants Association, served as chairmen of the Liquid Filtration sessions. Mr. Raber is also the editor of this publication (Volume I—Gas), while Mr. Johnston and Mr. Schroeder are co-editors of Volume II—Liquid.

Related ASTM Publications

Fluid Filtration: Liquid (Volume II), STP 975 (1986) 04-975002-39.

A Note of Appreciation to Reviewers

The quality of the papers that appear in this publication reflects not only the obvious efforts of the authors but also the unheralded, though essential, work of the reviewers. On behalf of ASTM we acknowledge with appreciation their dedication to high professional standards and their sacrifice of time and effort.

ASTM Committee on Publications

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Overview

1986 marks the tenth anniversary of ASTM Committee F-21 on Filtration. Organized on 10-11 March 1976 in Philadelphia, Committee F-21 has worked within the following scope: "The development of test methods, performance specifications, practices, definitions, and classifications, and the stimulation of research to support performance standards for filtration systems, media, and equipment."

In the decade since the committee's founding, significant advances have been made in particle measurement technology and in the overall state of the art in filtration. These facts led the Executive Subcommittee of F-21 to conclude that a symposium on Gas and Liquid Filtration would be most timely. This Special Technical Publication (STP 975) contains 45 refereed technical papers that were reviewed and revised prior to their presentation at the 20-22 October 1986 symposium. STP 975 is organized into Volume I on Gas Filtration with 29 papers and Volume II on Liquid Filtration with 16 papers.

Volume I was sponsored by Subcommittee F21.20 on Gas Filtration. From its beginnings in 1976, F21.20 has had strong research interests and brought together many, diverse technical experts twice each year to develop full consensus methods. The first six years of research and development resulted in the publication in 1982 of ASTM F 778, Standard Methods for Gas Flow Resistance Testing of Filtration Media. The next principal effort of the subcommittee was directed toward developing a standard for measuring filtration media efficiency versus size using polystyrene latex spheres. This standard is now in its final draft stages. In 1982, F 21.20 also undertook the task of converting Federal Standards FF-300 and FF-310 on air conditioning filters into consensus standards. The ASTM version of FF-300 was published as ASTM F 872 Standard Specification for Filter Units, Air Conditioning: Viscous-Impingement Type, Cleanable in 1984; the FF-310 equivalent is now in committee ballot.

The papers in this volume are divided into two sections: Section I, Analysis of Fundamental Filtration Mechanisms; and Section II, Applications and Testing. Section I has been organized by Dr. Kenneth Rubow of the University of Minnesota. It consists of six papers: three on fibrous filtration, two on granular bed filtration, and one on membrane filtration. The topics covered include clean filter efficiency, pressure drop,

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electrostatic enhancement, and effects of particle loading.

Section II consists of 23 papers. It is divided into six subsections on flat media testing, respirators, filtration for occupied spaces, protection of equipment, protection of the environment, and protection of processes. These topical subsections have been organized by Mr. James C. Wilson of Hollingsworth & Vose Co. (Flat Media Testing); Mr. Daniel A. Japuntich of 3M Corp. (Respirators); Dr. James E. Woods of Honeywell, Inc. and Mr. Richard D. Rivers of EQS, Inc. (Filtration for Occupied Spaces); Mr. Robert M. Nicholson of Donaldson, Inc. (Protection of Equipment); Dr. Wayne T. Davis of the University of Tennessee (Protection of the Environment); and Dr. Alvin Lieberman of Hiac-Royco, Inc. (Protection of Processes). Dr. Vern Bergman of Lawrence Livermore Laboratory, University of California also assisted in the early organizational phases.

One of the goals of this publication has been to cast theory in a clear and concise format; another goal is to provide a forum for future directions in filter testing. I hope it will provoke an ongoing interest in improving not only test methods but also the means by which filtration equipment is specified.

Robert R. Raber
Farr Company
El Segundo, CA
Symposium chairman and
editor

