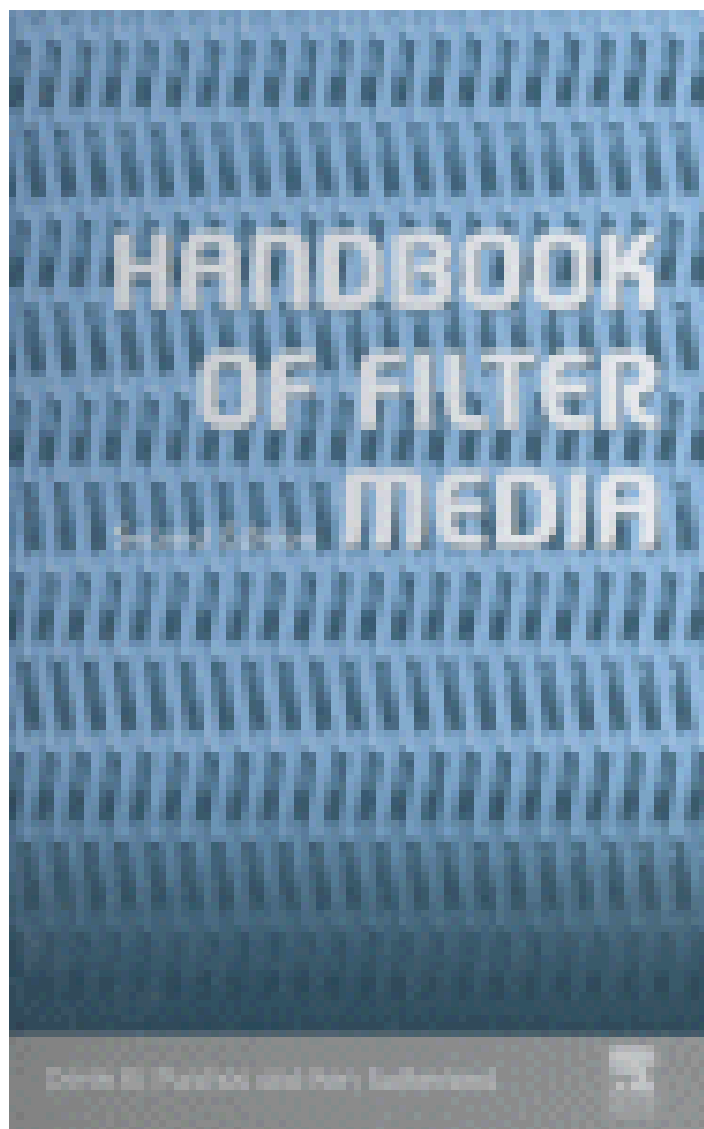


# Handbook of Filter Media

by [Derek B. Purchas](#), [K. Sutherland](#) (Editor)



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# Preface

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The appearance of a second edition of a technical handbook is a sign of the publisher's confidence in its value to its readers. This confidence is bred from the success of the first edition, but it must also involve the changes and additions to the second edition that make it an advancement upon the first. A purpose of this preface is to highlight some of those changes.

The first edition was written entirely by Derek Purchas, the doyen of consultants in the technology of filtration, certainly in the UK, and probably in the world. In its preparation Derek had the assistance of inputs from media manufacturers of all kinds, sizes and geographical bases. That assistance is no less a part of the second edition, and another purpose of this preface is to acknowledge that assistance.

The Handbook remains very much as Derek first wrote it, in terms of style, structure and content. Partly this is because the technology of filter media is very well established, so that a great deal of the material of the first edition embodied timeless features of the technology. The basic designs of filter have been in existence for over a century, and the six or so years since the first edition have not seen any major changes in filtration equipment.

However, there are significant changes in this second edition, of both structure and content, and, not surprisingly with a different main author, of style. The least of these is that the chance has been taken to make some textual corrections. Some additional emphasis is placed on air and gas filtration throughout the Handbook, especially in the more utility uses for such techniques.

The arrangement of the Handbook is similar to the first edition, although there are now two extra chapters, one formed by splitting one of the earlier chapters ('Textiles') into two, and the other being new ('Standards').

In terms of filter media technology, this second edition notes the following trends:

- the increased requirements for hot gas cleaning, involving advanced polymeric, metallic and ceramic media;
- the continuing development of membrane media, with an ever wider range of polymer compositions available;
- the rapid growth of cross-flow filtration as a process option;
- the increased use of composite media;

- the growth in availability of the various non-woven media made by spinning molten polymers; and
- the expansion of those media once thought of as restricted to reverse osmosis and ultrafiltration, i.e. those used for molecular separations, into the microfiltration range (and the parallel appearance of nanofiltration as a separate technology).

A technological change of a very different kind has been the appearance of the World Wide Web on the Internet, with many suppliers taking advantage of its existence to design and publish Web pages of their own. These sites vary enormously in quality, from little more than a company's name and address, to a complete inclusion of a product catalogue running to hundreds of pages and being a joy to read.

Although not a technological change, mention must also be made of the far-reaching changes in the corporate structure of the filter media marketplace. Many of the companies named in the first edition no longer exist as separate entities, if they exist at all. Of the 73 companies that advertised in the first edition over one-quarter no longer exist under those names (or have undergone major changes in their interest in filtration media).

Many of the specified media in the first edition are now available from a different supplier (or differently named at least). To some extent, this process is limiting the range of media available to the end user or filter OEM, although small companies are also appearing to make up the numbers.

A quick skim through the Handbook will show that it includes a considerable amount of proprietary information. This has been made available by the various manufacturers, in the interests of value to the reader, and the authors and publisher are exceedingly grateful to the manufacturers concerned. Acknowledgement is duly made in the text of the source of such material. Acknowledgement is also made to those members of staff of filter media manufacturers who have given their time in the identification of important new ideas in materials and media.

Some suppliers ignored requests to help, and some even expressly declined to contribute. To those companies, it is hoped that this edition will provoke regret that they did not take part in the exercise. Perhaps the appearance of a second edition may spur other suppliers to take an interest in the future.

There is no wish by authors or publisher to make this Handbook into a buyers' guide of filter media. Accordingly, no attempt is made to mention or even list all the suppliers of any particular type of medium. Those suppliers and their media referred to are deemed sufficiently representative of the type under discussion - but they are also among the limited range of suppliers who responded favourably to a request for help for this edition.

As to the authors: Derek Purchas, now effectively retired, was introduced earlier as the author of the first edition of this Handbook. He also wrote a classic textbook on solid/liquid separation processes, and co-edited a textbook on equipment scale-up. Ken Sutherland is a consultant, mainly in industrial marketing, specializing in the filtration equipment and materials sector. He is a co-author of Elsevier's Decanter Centrifuge Handbook (and of a textbook on

industrial market research). So that the reader will know where to place the blame for any errors in this edition, it is only fair that this Preface should be signed by

Ken Sutherland  
1 May 2002

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# Foreword to the First Edition

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'I worked hard at altering the arrangement of the first three chapters of the third volume. What labour it is to make a tolerable book, and how little readers know how much the ordering of the parts has cost the writer!'

These heart-felt words were written in his diary on 6 February 1854 by the eminent historian Lord Macaulay, at a time when he was struggling to make further progress with his monumental (and highly readable) multi-volume book *The History of England*.

Almost a century and a half later, that entry in Macaulay's diary struck a sympathetic chord as I sought relaxation at the end of another gruelling day's wrestling with the dry and unromantic desiderata of filter media. So apposite did it at once appear that I noted it for inclusion, in due course, in this brief foreword which was then no more than a one-word title, to be expanded when the pain and agony of the serious writing had been completed. In quoting it now I am emboldened to couple it with a few lines from *An Essay on Criticism* by that earlier bitingly witty author Alexander Pope:

The perfect Judge will read each word of Wit  
With the same spirit that its author writ:  
Survey the Whole, nor seek slight faults to find  
Where nature moves, and rapture warms the mind.

In reality, a technical book is inevitably and very properly likely to be subjected to critical assessment and comment at all levels, including both its breadth of concept and its minutiae – the more so where the book is offered as the first attempt to provide a comprehensive overview of the entire spectrum of industrial filter media. A corollary of this touch of realism is recognition that the resultant book must regrettably contain a variety of errors, oversights or deficiencies; notification of any of these would be welcomed, so that corrective action can be taken in future editions.

As will be evident from the very many acknowledgements throughout the book, compiling it has been made possible only by the generous cooperation of many companies and of the even more numerous individuals, some of whom have patiently responded to an almost endless flow of faxes, letters and telephone calls. In expressing my thanks to all of these, I would like to add an apology for any errors which, due to faults of misinterpretation, omission or commission on my part, may have crept into the printed text derived from the information they supplied.

Amidst the legion of those who have contributed to my endeavours since the first words were entered into my word computer on 8 February 1995, there is one person to whom special acknowledgement must be made. This is my wife Margaret, whose patient support has once again enabled us happily to survive the trials and tribulations which are the inescapable birth pangs associated with producing a book.

Derek B Purchas  
5 September 1996

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