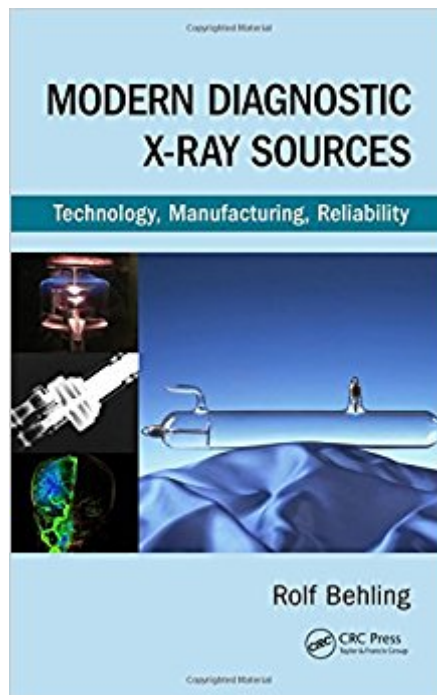


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# Modern Diagnostic X-Ray Sources: Technology, Manufacturing, Reliability



## Synopsis

Modern Diagnostic X-ray Sources: Technology, Manufacturing, Reliability gives an up-to-date summary of X-ray source design for applications in modern diagnostic medical imaging. It lays a sound groundwork for education and advanced training in the physics of X-ray production and X-ray interactions with matter. The book begins with a historical overview of X-ray tube and generator development, including key achievements leading up to the current technological and economic state of the field. The book covers the physics of X-ray generation, including the process of constructing X-ray source devices. The stand-alone chapters can be read continuously or in selections. They take you inside diagnostic X-ray tubes, illustrating their design, functions, metrics for validation, and interfaces. The detailed descriptions enable objective comparison and benchmarking. This detailed presentation of X-ray tube creation and functions enables you to understand how to optimize tube efficiency, particularly with consideration for economics and the environment. It also simplifies fault finding. Along with covering the past and current state of the field, the book assesses the future regarding developing new X-ray sources that can enhance performance and yield greater benefits to the scientific community and to the public.

## Book Information

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## Customer Reviews

"The author has produced a unique reference about medical X-ray imaging technologies. Designers and technologists who are actively involved in designing the forthcoming generations of medical X-ray systems could benefit from this book." — Axel Mainzer Koenig, CEO, 21st Century Data

Analysis, in *The Optical Society* "This unique book provides fascinating and useful tours of some of the many worlds supporting a single high-value technology product. Stakeholders in the use of x-rays in medicine will find complete chapters on topics, including history, basic x-ray physics, imaging, tube design, manufacturing, alternative technologies, and economics. The chapters covering basics contain comprehensive reviews provided in a readable style. The chapters on industrial x-ray chapters provide equally readable access behind the curtains describing much of what it takes to deliver an x-ray tube to a hospital. Much of this information is impossible to find elsewhere. A comprehensive demonstration of the interlocking of fundamental science, engineering, and industrial processes is recommended to all those interested in how things work."

Stephen Balter, Ph.D., Professor of Clinical Radiology, Columbia University Medical Center "Rolf Behling, based on his long and deep technical and industrial experience in this field, is a true heir of Wilhelm Conrad Röntgen and C.H.F. Müller and is a perfect author for writing this exciting story. I can recommend this book not only to specialists but also to the interested general reading public. I am sure this book will be a success!"

Georg Gärtner, Southeast University Nanjing "Very valuable for engineers and physicists."

Professor Dr. Peter Schreiber "Very comprehensive. The author provides insight into state-of-the-art and future medical applications."

Dr. Jens-Peter Schlomka, Morpho Detection Germany GmbH "This book is a state-of-the-art, comprehensive journey into the world of medical X-ray. It handsomely bridges the history, the technical generation, and the use, as well as gives a technical outlook from the perspective of a very accomplished developer of X-ray components and systems."

Dr. Stephan E.L. Haferl, Industrial X-ray Technologies (IXT) "An accurate and comprehensive overview of the technology and physics behind today's X-ray sources. If you work in the field of medical X-ray imaging, I highly recommend you read this book, and you will likely keep it on your desk for reference."

Mats Danielsson, Professor, KTH Royal Institute of Technology "This book fills a significant gap. There has been a great need for a single work that thoroughly covers the physics and engineering of medical X-ray sources."

Norbert J. Pelc, Professor of Radiology, Stanford University School of Medicine "I am pleased to endorse Rolf's detailed description of X-ray technological innovations that have driven X-ray source design, performance, and reliability for more than 125 years."

Clarence O. Clark "A definitive book covering all relevant aspects of X-ray sources for medical imaging. It contains a comprehensive discussion of the history, developments, and trends in relation to the requirements of medical imaging systems, and goes deep into the physics and technology."

Roland Proksa, Philips Research

Rolf Behling holds a diploma in physics from the University of Hamburg, Germany. During more than 30 years in the medical industry he has held many positions, including department head of tube technology development, global project coordination manager, global innovation manager, head of marketing and field support for X-ray tubes, department head for X-ray tube development, project manager, and process physicist. The first spiral-groove-bearing X-ray tube was developed under his leadership. He currently heads the Philips Group for Advanced Development of X-ray Tubes and X-ray Generators at Philips HealthTech in Hamburg. He is a part-time lecturer at the University of Hamburg and has written numerous patents and publications in vacuum technology and medical imaging.

I have never seen a book dedicated to x-ray sources. It definitely fills a huge gap in scientific literature. This book is very comprehensive. It covers everything from the history to the deep technical details (Stuff you didn't know but were afraid to ask). The authors insight into future trends seems to be very insightful. I believe this book will be an industry standard for many years to come. If I was a rich man I would buy copies for all my nerdy friends.

I agree with the editorial reviews and confess that this has become my go-to book for x-ray sources, both for teaching and professional application. Once you step beyond the nicely presented and interesting historical introduction, much of the first half of the book can be found scattered through various basic and advanced medical imaging and radiation physics texts, but only if you have a good collection! I have seen nothing to equal the second half of the book. All the things you want to know about x-ray sources but were too afraid to ask. I love the multitude of illustrations and photos; quite a few are sourced from Philips (which is not surprising given the author's employment), but there is a balance of other manufacturers represented and this does not change the quality of the text. I had one advanced question that I couldn't find the answer to in the book, but the author was very approachable and answered it very knowledgeably. I recommend this book to anyone involved in advanced x-ray imaging, including radiology medical physicists. However, the introductory material could also be used for many starting out in x-ray imaging physics and technology, and this duality of basic and advanced is why it sits nicely on our bookshelf. (PS. I am not a verified purchaser because the book was bought by our hospital)

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