



## Shell Bitumen Handbook, sixth edition

*By Edited by Robert N Hunter*

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**Shell Bitumen Handbook, sixth edition** By Edited by Robert N Hunter

The Shell Bitumen Handbook has been regarded for many years as the authoritative source of information on bitumens used in road pavements. This new edition seeks to enhance that reputation. For over a hundred years Shell has been at the forefront of bitumen technology and continues to lead in research and development. The Shell Bitumen Handbook reflects this leading role. Compiled by authors from Shell offices around the world, The Shell Bitumen Handbook provides global best practice for civil engineers in pavement construction and maintenance to apply to projects of their own, as well as comprehensive theory for students and researchers. New to this edition, chapters covering: warm asphalt mixtures; sulphur extended asphalt; sustainable road pavements.

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## **Editorial Review**

### **Review**

Even in our internet age, there are some essential hard copy references that have a place on the diminishing bookshelves of most practising engineers and materials scientists. The distinctively yellow-bound Shell Bitumen Handbook, first published in 1949 and now issued in its sixth edition, is certainly one such valued book. It replaces the fifth edition of 2003 and is completely reorganised, thoroughly updated and expanded by around 50%. Three principal authors, led by civil engineer and expert asphalt consultant, Dr Robert Hunter, are supported by a panel of specialist authors, many of whom are with Shell Bitumen. Those familiar with the fifth edition will find the chapters rearranged somewhat, with a net increase in chapters from 20 to 24 and a doubling of appendices from 4 to 8. The new chapter sequence approximately follows the life of bitumen, from its origins and manufacture, through its properties and use in asphalts, then design, installation and performance of asphalt pavements, to durability and other applications for bitumen and asphalt. Two of the new appendices indicate an objective to make the handbook more international: Appendices 5 and 6, respectively, list bitumen and asphalt product standards across the world. In the former, different principles are used in various regions, with performance graded (PG) specification being used in North America and partly in China, whereas empirical testing is used elsewhere, such as penetration/softening in Europe, Africa and much of Asia, and viscosity in Australasia, the Indian subcontinent, Mexico and parts of South America (and for soft grades in Europe); unfortunately, there is some minor inconsistency between the text and the map in Appendix 5. A surprising omission from the previous edition was guidance on the design of asphalt mixtures. This gap is well and thoroughly addressed in the new edition, with a completely new, 50-page Chapter 12. In common with all the chapters in this book, Chapter 12 is clearly written and beautifully presented, being both easy and a pleasure to read, supported by full-colour diagrams of impressive clarity; there are no photographs in this particular chapter, but elsewhere there are plenty of good-quality images, as appropriate. This new chapter provides a grounding in the principles that underpin asphalt mix design, notably mixture volumetrics and aggregate grading, then explains the four most widely implemented design methods, all of which were developed in the USA: Hubbard Field, Hveem (or California), Marshall (or Corps of Engineers, perhaps the best known) and Superpave (the most recent, resulting from a research programme initiated in response to increasing premature pavement failures). As well as reorganisation and the new chapter on asphalt mix design, existing users will be pleased to know that this new edition sets out to update the whole opus, and two splendid examples are the completely new Chapter 7 on rheology of bitumens and the extended Chapter 8 (formerly Chapter 5) on polymer-modified bitumens and other modified binders. The former is a most valuable 30-page addition on a critical property, especially with the growth in the use of polymer-modified bitumens, authored jointly by specialists from Shell (Dr Richard Taylor) and the University of Nottingham (Professor Gordon Airey). A potentially complex account of the science of rheology is handled with skill and clarity, then the rheological behaviour of bitumen is considered first in terms of a low-temperature linear elastic region, then a high-temperature viscous region and finally an intermediate temperature visco-elastic region. --Proceedings of the Institution of Civil Engineers Construction Materials 169 February 2016 Issue CM1

Written by over 50 experts from Shell technical centres in Europe, Asia and America, the 6th edition of this popular handbook has 800 pages, double the size of the previous edition. It provides extensive information on bitumen and asphalt products, from resourcing, design and manufacturing to handling and construction, as well as global examples of pavement designs, regulations and specifications. Existing chapters have been substantially updated in line with current world practice and emerging standards, and revamped with colourful photographs, charts and tables, which vastly improve the reading experience. The inclusion of new

chapters on health, safety and environmental regulations; durability and performance-related test methods, specifications and best practices; recycling and low-temperature asphalts; and certification schemes all help to bring this book to the next level. The handbook secures its reputation as one of the most comprehensive reference books in bitumen and asphalt technology for new and experienced engineers as well as academics and researchers. --Civil Engineering Volume 168 Issue CE3 August 2015

#### From the Inside Flap

Shell has been at the forefront of bitumen technology for over a hundred years, and continues to lead in global research and development. The Shell Bitumen Handbook is the authoritative source of information on bitumen use in road pavements around the world. The Shell Bitumen Handbook explores the very latest technical trends within the industry. Compiled by an international team of Shell Experts from Europe, South East Asia and the Americas, the 6th edition contains global examples of regulations, specifications and practice, highlighting similarities and differences between the regions and reflecting the fact that growth economies are adapting and developing new practices, specifications and driving research in this area. An established and renowned source of vital information, The Shell Bitumen Handbook covers the manufacturing, handling and main engineering properties and specifications of both bitumen and asphalt technology, examining how they are designed, manufactured, tested and used. The book also covers the analytical design of flexible pavements a field in which Shell is particularly prominent as well as surface treatments and certification. The Shell Bitumen Handbook includes reference to new and revised European harmonised specifications as well as new guidance on recycling, warm asphalt mixtures, foam mixtures, bitumen additives and certification schemes for bitumen and asphalt. There are also expanded chapters on the constitution and structure of bitumen, bitumen rheology, polymer modified bitumens, bitumen health, bitumen adhesion and testing of asphalts and surface treatments. The Shell Bitumen Handbook provides new and experienced engineers with accessible and practical technical content such as: [[Global examples of bitumen regulation, specification and practice written by Shell experts across the world [[Coverage of the properties, testing methodology and performance related issues of different types of asphalt

#### About the Author

Robert Hunter, former foreign policy advisor to President Carter, is also on the staff of the Center for Strategic and International Studies at Georgetown University.

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