

Since its conception almost a century ago, the activated sludge system has emerged as the dominant waste water treatment technology, with tens of thousands of implementations worldwide. The pivotal role played by the activated sludge system was originally due to its high efficiency in COD- and suspended solids removal, while more recently new processes for the removal of the macro-nutrients nitrogen and phosphorus have easily been accommodated.

New aspects such as the application of high rate anaerobic reactors for pre-treatment and sludge stabilisation, the use of membranes for sludge separation, and the development of systems with granular sludge with a superior settling rate, have all increased the possibilities to produce a high-quality effluent, resulting in reduced investment and operational costs. However, in many cases traditional design criteria are still being used, which may lead to inflated investment and operational costs and sub-optimal performance.

In this book the authors seek to present state-of-the-art theory concerning the various aspects of the activated sludge system and to develop procedures for optimized cost based design- and operation. The design guidelines for biological nutrient removal are integrated with those of other main treatment units of the activated sludge system, such as the final settler, pre-treatment units, thickeners and digesters. Several detailed design cases are presented, which cover the main biological wastewater treatment configurations currently in use.

A significant part of the book has been dedicated to the recent advances in membrane bioreactor treatment (MBR) and to new nitrogen removal systems such as Sharon and Anammox.

More than two hundred detailed figures, one hundred tables and seventy worked examples have been used to present the theory to the reader. Furthermore www.wastewaterhandbook.com is available for the latest information, bonus chapters and free design tools.