



# Pharmaceutical Water: System Design, Operation, and Validation, Second Edition

*William V. Collentro*

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# Pharmaceutical Water: System Design, Operation, and Validation, Second Edition

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**Pharmaceutical Water: System Design, Operation, and Validation, Second Edition** William V. Collentro

A major new work on all aspects of water, the most used raw material ingredient in the pharmaceutical and biotechnology industries—used as an excipient in pharmaceutical formulations, as a cleaning agent, and as a separately packaged product diluent.

Drawing on the author's extensive field experience with more than 400 pharmaceutical and related water purification systems, the text's numerous case studies illuminate the best and worst of water system design and operation.

The expanded *Second Edition* also includes new chapters that discuss:

- passivation and electropolishing
- rouging
- ozone systems and accessories
- USP purified water and water for injection
- individual component process and instrumentation diagram (P&IDs) with control interface
- documentation and specification requirements
- systems installation, start-up, and commissioning

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