



Computational Modeling of Pulverized Coal Fired Boilers

Vivek V. Ranade, Devkumar F. Gupta

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Harness State-of-the-Art Computational Modeling Tools

Computational Modeling of Pulverized Coal Fired Boilers successfully establishes the use of computational modeling as an effective means to simulate and enhance boiler performance. This text factors in how computational flow models can provide a framework for developing a greater understanding of the underlying processes in PC boilers. It also provides a detailed account of the methodology of computational modeling of pulverized coal boilers, as well as an apt approach to modeling complex processes occurring in PC boilers in a manageable way.

Connects Modeling with Real-Life Applications

Restricted to the combustion side of the boiler (the authors assume some prior background of reaction engineering and numerical techniques), the book describes the individual aspects of combustion and heat recovery sections of PC boilers that can be used to further improve the design methodologies, optimize boiler performance, and solve practical boiler-related problems. The book provides guidelines on implementing the material in commercial CFD solvers, summarizes key points, and presents relevant case studies. It can also be used to model larger boilers based on conventional, super-critical, or ultra-super critical technologies as well as based on oxy-fuel technologies.

Consisting of six chapters, this functional text:

- Provides a general introduction
- Explains the overall approach and methodology
- Explores kinetics of coal pyrolysis (devolatilization) and combustion and methods of its evaluation
- Presents computational flow modeling approach to simulate pulverized coal fired boiler Covers modeling aspects from formulation of model equations to simulation methodology
- Determines typical results obtained with computational flow models
- Discusses the phenomenological models or reactor network models
- Includes practical applications of computational modeling

Computational Modeling of Pulverized Coal Fired Boilers explores the potential of computational models for better engineering of pulverized coal boilers, providing an ideal resource for practicing engineers working in utility industries. It also benefits boiler design companies, industrial consultants, R & D laboratories, and engineering scientists/research students.

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