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BIOMASS and ALTERNATE FUEL SYSTEMS An Engineering and Economic Guide

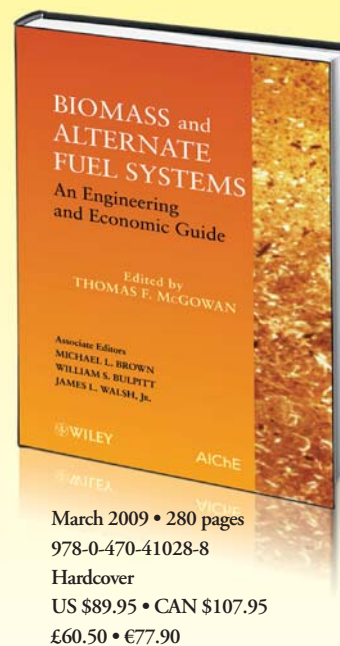
Edited by THOMAS F. MCGOWAN

Associate Editors: MICHAEL L. BROWN, WILLIAM S. BULPITT
and JAMES L. WALSH, JR.

Biomass and alternate fuels offer cleaner, renewable ways to produce energy, they can greatly reduce operating costs, and they are mostly carbon neutral. ***Biomass and Alternate Fuel Systems: An Engineering and Economic Guide*** provides readers with an understanding of these environmentally friendly fuels alongside step-by-step guidance for converting these fuels into energy. In addition to biomass, the book covers such alternate fuels as wood, biogas, reclaimed oil, used tires, cooking oil, solid wastes, and coke. Case studies help readers understand how they can install and operate energy systems to reap all the benefits of biomass and alternate fuels.

Everything readers need to know to take full advantage of biomass and alternate fuels is covered, including:

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- ▶ Evaluating the impact on capital, operating, and production costs
- ▶ Limiting emissions with pollution control equipment
- ▶ Using heat exchangers effectively
- ▶ Comparing the costs and carbon emissions of conventional and alternate fuels
- ▶ Complying with EPA and OSHA regulations



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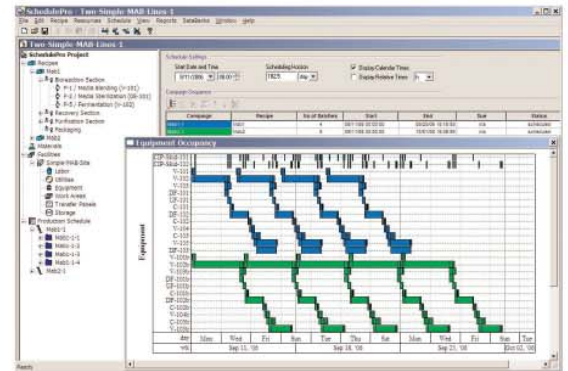
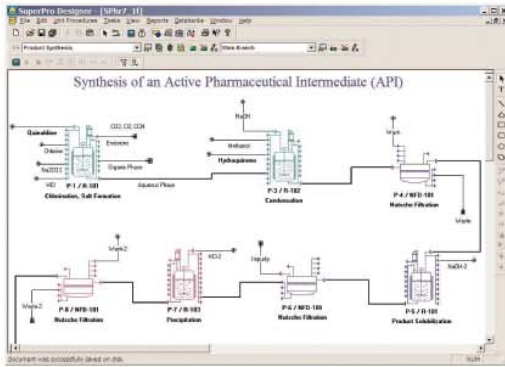
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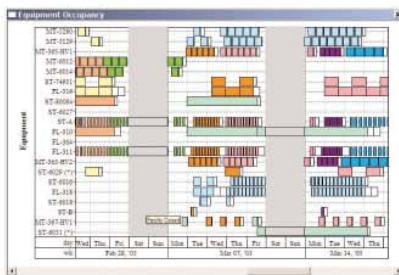
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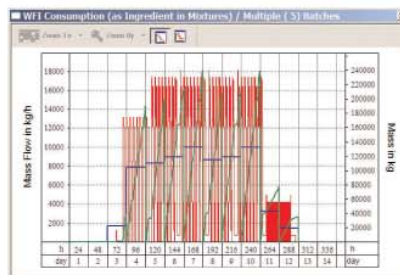


Use SuperPro Designer to model, evaluate, and debottleneck batch and continuous processes

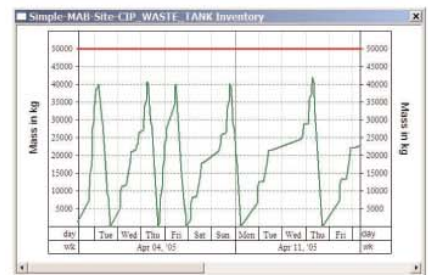
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Tracking of equipment occupancy in multi-product facilities



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Inventory tracking for raw materials, intermediates, products, and wastes

SuperPro Designer is a comprehensive process simulator that facilitates modeling, cost analysis, debottlenecking, cycle time reduction, and environmental impact assessment of biochemical, specialty chemical, pharmaceutical (bulk & fine), food, consumer product, mineral processing, water purification, wastewater treatment, and related processes. Its development was initiated at the Massachusetts Institute of Technology (MIT). SuperPro is already in use at more than 400 companies and 500 universities around the world (including 18 of the top 20 pharmaceutical companies and 9 of the top 10 biopharmaceutical companies).

SchedulePro is a versatile finite capacity scheduling tool that generates feasible production schedules for multi-product facilities that do not violate constraints related to the limited availability of facilities, equipment, resources and work areas. It can be used in conjunction with SuperPro (by importing its recipes) or independently (by creating recipes directly in SchedulePro). Any industry that manufactures multiple products by sharing production lines and resources can benefit from the use of SchedulePro. Engineering companies use it as a modeling tool to size utilities for batch plants, identify equipment requirements, reduce cycle times, and debottleneck facilities.

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