

FEATURE REPORTS

Advanced Combustion Control

Cost savings, increased efficiency and lower emissions are key motivators for optimizing combustion operations. One means of improving the performance of combustion systems is the application of advanced control techniques. This article discusses several methods of advanced combustion control, including sensors, software, adaptive control, control-loop decoupling, artificial neural networks and others.

Related products and services: Control-loop sensors and actuators, low-emissions burners and associated equipment, flame-temperature sensors, light-absorption sensors, model predictive control (MPC) systems

Relevant industries: Combustion systems are widespread in the chemical process industries for generating process heat, steam and so on.

Distillation

Distillation columns present one of the most challenging design and operational challenges in most chemical and refining processes. Part 1 of this two-part feature report on distillation technology covers the details of divided-wall columns and provides some example applications for such technology as either a new design component or in a retrofit scenario. Part 2 relates to innovations in the design, rating and troubleshooting of distillation columns, with focus on hydraulics and phase behavior. This article will discuss some of the key innovations going on in the software-modeling world that will improve the ability of design and plant engineers to improve and predict column performance and design. This article will also go through a number of different strategies related to column design and troubleshooting, and which ones are most likely to be successful. Some of the areas that will be covered will include; column modeling in traditional process simulators; dynamic modeling of columns; more detailed look at column hydraulics; energy use in columns and how to evaluate alternative strategies; and safety and risk.

Related equipment and services: Distillation columns and internals, computer software and simulation software.

Relevant industries: Distillation is widely used throughout the CPI, from petroleum refining, through petrochemicals and fine chemicals to pharmaceuticals.

FRACTIONATION COLUMN

This monthly column in *CE* is written by the technical director at Fractionation Research Inc., a consortium of end-users, engineering companies and distillation equipment providers that pool budgets on distillation research.

Related equipment and services: Distillation towers; trays and packings; tower-scanning equipment and services

Relevant industries: This column addresses segments across the entire CPI, and is relevant in the currently booming markets of downstream oil-and-gas processing.

NEWSFRONT

Spotlight on Lithium

The main focus of this Newsfront will be on some of the latest developments in the processing of lithium ores, for any application, but mainly for batteries. Lithium carbonate is one of many compounds used in processing for energy storage applications, but battery makers are increasingly moving to lithium compounds, especially for use in motor vehicles. It is expected that the demand for lithium-ion batteries will increase in the near future.

Related equipment and services: Batteries; Equipment used in processing lithium ores, such as crushing, grinding and separation equipment

Relevant industries: Lithium is used in a variety of applications from pharmaceuticals to energy storage. An expected growth area is in battery manufacture.

Editorial material for consideration should be sent to contributing editor, Paul Grad (pgrad@che.com)

Software

This month's equipment newsfront will present the latest software and applications (apps) that are available for CPI applications using cell phones, tablets and other portable devices. Such apps range from product selection and specification, through maintenance on the plant floor.

Related equipment and services: Software and apps, portable devices and hand-held equipment.

Relevant industries: All CPI sectors use software products

Editorial material for consideration should be sent to contributing editor, Joy LePree (jlepre@che.com)

FACTS AT YOUR FINGERTIPS

Adsorbents

Adsorption is widely used industrially for the purification of liquids and gases. This one-page reference will explore the properties of major industrial adsorbents, such as activated carbon, alumina, silica, zeolites and others.

Related products: Industrial adsorbents, pressure-swing adsorption (PSA) equipment, water purification systems, emissions control equipment

Relevant industries: Since purification and separation are ubiquitous in the CPI, industrial adsorbents are common in many industry sectors, including power generation, petrochemicals, specialty chemicals, hydro-carbon processing and others.

FOCUS

Maintenance Equipment

This month's Focus will present the latest new products and services in maintenance equipment and technology.

Related products and services: Maintenance equipment, instrumentation, analysis and control equipment, software and much more

Relevant industries: All sectors of the CPI use maintenance equipment

Send editorial material for consideration to assistant editor Mary Page Bailey, (mbailey@che.com)

ENVIRONMENTAL MANAGER

Strategies for Optimizing Cooling Tower Operation

Many chemical process facilities and power plants can no longer rely on once-through cooling as the preferred choice for steam condensation from boilers and auxiliary equipment, thanks to stricter environmental

regulations. As a result, many facilities have turned to cooling towers with air-cooled condensers. This article provides guidance for managing cooling-tower design, operation and maintenance, with focus on managing blowdown so that it meets strict discharge thresholds.

Related equipment and services: Cooling towers; air-cooled condensers and other condensation systems; wastewater-monitoring devices; wastewater-management services, including filtration, reverse osmosis, membrane-based separation systems, precipitation units and related unit operations; water-treatment chemicals

Relevant industries: All industries of the CPI, as well as the power-generation industry

Laboratory Safety: Best Practices to Manage Change

Laboratories are found throughout the chemical process industries (CPI), most prominently in research and development facilities, but also in production plants typically as quality-control laboratories. Even for the most experienced chemists, engineers and laboratory workers, safety must remain at the forefront. This is especially true when new chemicals, employees or equipment are introduced. This article will present best practices for managing change wisely in CPI laboratories. By elaborating on a number of clear-cut action items, the article will offer readers a highly useful tool for ensuring their workplace is as safe as possible.

Related equipment and services: Laboratory safety equipment, such as fume hoods, eyewash fountains, showers and safety storage cabinets; Personal protective equipment, such as protective clothing for safe handling of chemicals, gloves, eyeglasses and face shields; Software that aids in management of change

Relevant industries: Laboratories are typically found in R&D facilities and as quality control laboratories in production plants throughout the CPI

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SOLIDS PROCESSING

Dry Separation Methods

The chemical process industries (CPI) have many applications that require classifying or separation of dry, solid materials. This article will define the main categories of dry separation methods (air classification, screening and specific-gravity separation), with brief explanations of the various types of equipment used for these processes.

Related products: Solids handling and separation equipment, including gravity separators, air classifiers, screeners, sieves, fans, blowers, vibrators and any other equipment used for the separation or classification of solid materials

Relevant industries: Any CPI sector that deals with dry solids, especially mixtures of different solids or particles
