

JUNE | AD CLOSE: MAY 5 | MATERIAL DUE: MAY 10



## UPCOMING FEATURES

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The June e-newsletter will cover FLOW CONTROL and deploy June 16.

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### TOPIC: IMPROVE ENERGY EFFICIENCY USING HEAT PUMPS

#### FEATURE REPORTS

**Summary:** Whereas a heater can only convert less than 100% of the energy put into the device into useful heat, a heat pump can provide many multiples of the device energy input by combining the heat rejected from said device with heat available from a typically free source. This translates into a much lower energy cost over the heat pump lifecycle, which pays for its typically higher initial cost when compared with a heater. Heat pump technology applications have been growing, from typical refrigeration, space heating/cooling, to industrial or hybrid uses. This article discusses heat pumps, their types, working principle, components, and does an overview into the process for defining, specifying and evaluating a heat pump project.

**Related equipment and services:** Process heaters, heat pumps and associated equipment, such as temperature transmitters and process control systems.

**Relevant industries:** All sectors of the chemical process industries (CPI) could use heat pumps in buildings. Other sectors, such as the food-and-beverage industry may consider using heat pumps for the production of warm water used for cleaning and processing.

### TOPIC: AN OUNCE OF PREVENTION: CYBERSECURITY AND THE CHEMICALS SECTOR

#### FEATURE REPORTS

**Summary:** Though all industries face some degree of cybersecurity risk, the chemicals sector carries unique vulnerabilities. Computer-based automated Industrial Control Systems (ICS) are widely used by chemical owners and operators to manage and run their facilities. Malicious actors, be they nation states, business rivals, or cybercriminals

intent on blackmail, are deploying a range of tools to exploit vulnerabilities resulting from increased interconnectedness between operational technology (OT) and information technology (IT) systems. This article describes the specific cyber-risk profiles of the CPI, and also provides guidance on government and industry cybersecurity standards from a legal standpoint.

**Related equipment and services:** Cybersecurity systems and other digital tools

**Relevant industries:** Cybersecurity is a critical topic in any plant that uses connected industrial control systems.

## TOPIC: MEMBRANES

### NEWSFRONT

**Summary:** Membranes are widely used for many different types of separation applications, from wastewater treatment and desalination to gas purification. Because membrane separation can often be more energy efficient than alternative methods, such as distillation, researchers and companies alike are working to develop new and improved membranes in all areas. This month's Equipment Newsfront will discuss some of these developments.

**Related equipment and services:** All types of membranes and membrane modules and systems

**Relevant industries:** Wastewater treatment, desalination (reverse osmosis), air separation, natural-gas sweetening and more.

Editorial information for consideration should be sent to contributing editor Joy LePree ([jlepree@chemengonline.com](mailto:jlepree@chemengonline.com))

## TOPIC: BIOPROCESSING

### FACTS AT YOUR FINGERTIPS

**Summary:** Bioprocesses require hygienic processing, and clean-in-place (CIP) systems are among the critical aspects that help avoid contamination and ensure highly sanitary operations. This one-page reference provides information on design considerations and equipment for CIP systems.

**Related equipment and services:** Cleaning systems, spray nozzles, heat exchangers, tanks and vessels

**Relevant industries:** Food and beverage, pharmaceuticals, biofuels, bio-based chemicals, dairy, brewing

## TOPIC: WEIGHING & DOSING

### FOCUS

**Summary:** Both batch and continuous processes often require regular, precise addition of reactants, additives and other materials. Such dosing is performed with special pumps for liquids, but also weighing systems that are used for both liquids and solids. Weighing systems are also used prior to packaging lines and other applications to make sure the correct amount of product is being used. This month's Focus department presents the latest products and services for these and other applications.

**Related equipment and services:** Load cells and other types of weighing devices, dosing pumps and systems

**Relevant industries:** Most CPI sectors use weighing and dosing systems

Editorial material for consideration should be sent to senior editor Gerald Ondrey ([gondrey@chemengonline.com](mailto:gondrey@chemengonline.com))

## TOPIC: VALVE ACTUATORS

### ENGINEERING PRACTICE

**Summary:** Because of their role in controlling valve position, valve actuators are critical pieces of process equipment, and their selection should be given careful attention. There are several factors that can influence the type of actuator that is suitable for a given process. This article is intended as a guide to valve-actuator selection. It will describe the essential function of actuators, outline the main types of actuators, and lay out the factors that should be considered when selecting them.

**Related equipment and services:** Valves, transmitters, electric, pneumatic and hydraulic valve actuators, piping, flanges and others

**Relevant industries:** Valves and valve actuators are common throughout the CPI sectors

## TOPIC: IMPROVING INNOVATION STRATEGIES IN THE CPI

### YOU & YOUR JOB

**Summary:** Responsible chemical innovation has done wonders for agriculture, home goods and many other industrial categories. Yet for all of the good work being done, too many chemical companies are missing out when it comes to the critical innovation operations practices for future success. From bioplastics to alternative fuels, the chemicals industry is moving steadily into uncharted waters. Without the proper innovation strategies and infrastructures in place, traditional chemical companies will increasingly struggle to keep pace. This article provides some tips to help chemical

companies revamp their innovation operations, outpace competitors and reach new boundaries.

**Related equipment and services:** Software and tools used for: cost engineering; project scheduling, planning and management; process and product design and modeling

**Relevant industries:** All sectors of the CPI are concerned improving their innovation engines.

## TOPIC: ONE-STAGE FILTRATION FOR SILICONE PRODUCTION

### APPLIED TECHNOLOGIES

**Summary:** Reliable silicone-manufacturing operations depend on a complex network of process technologies, including, among other things, the removal of solids, as well as traces of water and gels from the intermediate silicone product. Traditionally, this activity has been a two-stage operation. However, there is a single-stage filtration technique that combines the removal of solids, water and gels that can enable a manufacturer of silicone products to streamline its production activities and enhance operational efficiency.

**Related equipment and services:** Filtration systems, filter media and associated equipment.

**Relevant industries:** Silicone manufacturing

## THE TOWER DOCTOR

**Summary:** This new column presents lessons learned from actual troubleshooting experiences by a distillation expert. This issue examines responsibilities for clean-up during startup of an olefins plant.

**Related equipment and services:** Project management, construction and engineering services

**Relevant industries:** All sectors of the CPI that use distillation

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