



### FEATURE REPORTS

#### Achieve Mixing Revolutions Through Testing

**Summary:** There are many reasons to examine a mixing operation at a testing facility, the most simple of which is to verify equipment capabilities before purchase. But testing can also reveal — for each particular application and production environment — the unexpected benefits of changing machine speed ranges, controls, horsepower, valve configuration, ports for the addition of ingredients, materials of construction, and many more subtle changes such as machine elevation, discharge techniques, when and how to apply vacuum, or when to alter the viscosity of materials to increase shear before letting it down. This article will help illuminate why and what to test.

**Related equipment and services:** Mixers and mixing accessories; testing services

#### Internal Corrosion Sampling

**Summary:** Internal corrosion is much less understood than external corrosion, and understanding of the phenomenon is still evolving. Sampling methods are critical for forming a complete and accurate picture of the internal corrosion situation in a particular system, and for effectively mitigating and controlling internal corrosion. This article describes the most widely used sampling methods for evaluating internal corrosion, and how they can be used in combination, as well as independently.

**Related equipment and services:** Corrosion inhibitors; corrosion monitoring instruments; anticorrosion materials and devices

### NEWSFRONT

#### Biogas

**Summary:** Countries without large reserves of natural and unconventional gas are looking for ways to meet their domestic energy needs. One option is the production of biogas. In Germany, for example, there are now around 7,100 biogas plants, and the methane from these facilities produced 11% of the electricity generated from renewables. This month's Newsfront will present the latest technology and R&D for biogas production.

**Related equipment and services:** Equipment and plants for biogas generation, gas separation and cleanup; biotechnology; fermentation

Send editorial material for consideration to Gerald Ondrey, Senior Editor (gondrey@che.com)

### Catalysts

**Summary:** This Newsfront will present the latest in catalyst technology, including the most recently commercialized biocatalysts, and catalysts for petroleum refining, petrochemicals and fine-chemicals production.

**Related equipment and services:** Catalysts; regeneration and disposal services; enzymes; and so on

Send editorial material for consideration to Joy LePree, Contributing Editor (jlepree@che.com)

### FRACTIONATION COLUMN

**Summary:** 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

### FACTS AT YOUR FINGERTIPS

#### Weighing Systems

**Summary:** This one-page reference sheet looks at the components of accuracy in a weighing device, as well as the need for calibration. It also outlines the strengths and limitations of both loss-of-weight and gain-in-weight weigh-batching systems.

**Related equipment and services:** Batch-weighing systems; scales; analytical balances; any instrument used to weigh materials for processing

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### FOCUS

#### High-purity processing

**Summary:** Short descriptions of a range of recently released products related to high-purity processing.

**Related equipment and services:** Any piece of processing equipment used in pharmaceutical, biopharmaceutical, food and beverage or other industries where purity in manufacturing is of the utmost importance

### ENVIRONMENTAL MANAGER

#### Recommended Practices and Guidelines for Safe Process Vacuum Systems

**Summary:** Several unit operations — including distillation, evaporation, drying, crystallization and filtration — are often operated under vacuum, for a variety of reasons. This article discusses the hazards of steam ejector systems and mechanical vacuum pumps (which are both widely used to achieve the desired vacuum conditions), and provides improved design and operations practices that can be made to mitigate them.

**Related equipment and services:** Steam ejector systems; mechanical vacuum pumps; integrated vacuum systems (which combine steam ejectors and mechanical vacuum pumps); instrumentation to monitor and control vacuum systems; pressure gauges; vacuum gauges; flowmeters; temperature indicators

#### Overpressure Protection: Low-Temperature Effects

**Summary:** In designing and sizing relief-device and effluent-handling systems, one commonly overlooked aspect of the performance is examining the potential for low-flowing temperatures that can cause the components of the system to reach temperatures below their respective, minimum design metal temperatures (MDMT), which may result in brittle fracture with subsequent loss of containment. This article equips the overpressure-protection designer with knowledge on limitations of the typical overpressure-protection analysis philosophy, common sources of low temperatures for further investigation, and possible design remedies for MDMT concerns.

**Related equipment and services:** Pressure relief devices; materials of construction, particularly for low-temperature service; engineering and construction firms who design overpressure systems

### ENGINEERING PRACTICE

#### Modeling Green Projects to Evaluate Economic Impact

**Summary:** Modeling a process or proposed process to see if it meets project requirements is an economically viable way to enhance the conceptual demand. In terms of assessing the potential environmental impact of a process, modeling efforts provide engineers with a convenient means of identifying the most promising green processes, in terms of capital investment and return. This article provides a detailed example of such a modeling exercise, which provides an assessment of the potential impact of switching to a synthetic fuel produced from municipal waste.

**Related equipment and services:** Modeling software; consulting services related to modeling; process control systems; combustion systems; furnaces

### YOU AND YOUR JOB

#### Working with the Chemical Safety Board After an Accident

**Summary:** After a serious accident at a facility in the chemical process industries (CPI), the U.S. Chemical Safety Board (CSB) may immediately initiate an investigation, often while the emergency is still unfolding. The CSB team will consist of skilled accident investigators who are often accompanied by independent experts noted for their specialized knowledge of whatever systems or processes are to be investigated. They also arrive with legal authority, sometimes in the embodiment of accompanying federal marshals. This article aims to provide a sense of that process as well as some suggestions for dealing with it.

**Related equipment and services:** All equipment, materials and services related to safety and emergency response

### LOOK FOR THESE ARTICLES COMING IN THE AUGUST ISSUE:

#### Feature Reports

Temperature Measurement & Control

Valves

#### Equipment Focus

Pipes and Fittings

#### Equipment Newsfront

Seals and Gaskets

#### Facts at your Fingertips

Heat Transfer Fluids