CHEMICAL ENGINEERING

UPCOMING FEATURES

OCTOBER 2012 | AD CLOSE: SEPTEMBER 7, 2012

THE BEST READ AND ONLY GLOBAL PUBLICATION IN THE CHEMICAL PROCESS INDUSTRIES

FEATURE REPORTS

From batch to continuous processing

Summary: Small chemical reactors offer a number of benefits compared to large reactors, such as a higher ratio of heat transfer area to working volume, and better mixing. While small batch vessels are impractical at the industrial scale, continuous flow reactors can provide the benefits of small physical size without the practical difficulties of multiple small vessels. This article considers the four basic needs of flow reactors (volumetric capacity, heat transfer, plug flow and mixing) and how these influence choice of equipment.

Related equipment and services: Reactor systems, such as tubular flow reactors, microreactors, oscillatory flow reactors, plug flow reactors and continuously stirred tank reactors (CSTRs); mixing systems; heat transfer systems.

Relevant industries: This article is relevant to processes that could benefit from continuous systems, which include many within the CPI, except for those that handle sticky or fouling materials.

Acid handling

Summary: Inorganic acids play a major role in the chemical process industries (CPI), as they are used as raw materials, catalysts or finishing and pH-control agents in the manufacture of a wide range of chemical products, from fertilizers to detergents, and even foods. Given their widespread use, it is needless to say that a major issue in the CPI is the proper and safe handling of the acids, as well as the materials selected for the equipment, piping and fittings used in the process. The correct storage and disposal of these materials is also important.

This article covers the most important inorganic acids: sulfuric acid (H_2SO_4), nitric acid (HNO_3), phosphoric acid (H_3PO_4), hydrogen chloride (HCl) and hydrochloric acid, and hydrogen fluoride (HF) and hydrofluoric acid; providing general guidelines on their physical properties, safety data, appropriate materials, storage, pumping and other common issues when handling such fluids in the CPI.

Related equipment and services: Storage tanks, piping and fittings, pumps, valves, special alloys and liners, analyzers and sensors, pH measurement, spill-control.

Relevant industries: All sectors of the CPI use acids, from mining and minerals to biotech and pharma.

NEWSFRONT

The effects of shale gas on feedstock decisions in the CPI

Summary: The increased availability of natural gas from shale deposits in North America and elsewhere is affecting the feedstock profile of those making commodity chemicals such as ethylene, propylene and others. This article will examine how the chemical process industries are being affected by shale-gas development.

Related equipment and services: All equipment used for thermal cracking of natural gas, including steam-cracking furnaces, burners, heat exchangers and associated equipment, as well as pumps, compressors, valves and other hydrocarbon refining equipment.

Relevant industries: This topic area has the potential to be relevant to a wide swath of the CPI, from natural gas producers all the way to consumers of commodity chemicals, such as plastics makers.

Steam handling

Summary: Steam is a utility widely used throughout the CPI. This month's Equipment Newsfront will present the latest products and services for the production, handling and monitoring of steam.

Related equipment and services: Steam generators, boilers, steam traps, heat-tracing systems, valves and piping.

Relevant industries: All sectors of the CPI use steam for heating, reacting and heat-recovery.

Send editorial materials to Joy LePree, contributing editor, at 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.

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

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FACTS AT YOUR FINGERTIPS

Fans and blowers

Summary: This one-page reference will touch on the major criteria for selecting and operating fans and blowers in the smartest and most efficient manner.

Related equipment and services: Centrifugal fans, pneumatic conveying lines, air ducting, positive-displacement blowers.

Relevant industries: Fans and blowers are used throughout the CPI for dilute-phase pneumatic conveying, ventilation, air-pollution control. and others

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ENVIRONMENTAL MANAGER

Safety considerations for vacuum systems

Summary: This article is the second part of a two-part series (part one appears in the September 2012 issue) that provides practical tips for choosing, implementing and maintaining vacuum systems to ensure maximum safety while producing vacuum conditions needed for carrying out certain process operations. This article reviews the potential hazards that can occur with process vacuum pumps and systems. These hazards include explosion risks, chemical sources of hazards, and physical sources of hazards. The article reviews proper design, operation and maintenance strategies to minimize these sources of risk.

Related equipment and services: All types of vacuum equipment (including steam-ejector systems, mechanical vacuum pumps, and integrated systems that use both), liquid-ring vacuum pumps, rotary-vane vacuum pumps, rotary-piston vacuum pumps, oil-sealed vacuum pumps, dry vacuum pumps, piping (for suction and discharge), spray nozzles, lubricating oils and oil-lubrication systems, vacuum-relief devices, foundations, nitrogen-gas inerting systems.

Relevant industries: Vacuum processing systems are used widely throughout the CPI, as an integral part of many unit operations (including distillation, evaporation, drying, crystallization and filtration), and are experiencing strong growth in industries that are expanding due to increased supplies of unconventional natural gas.

Signet Study Issue!

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SOLIDS PROCESSING

Blending, segregation and testing: Three sides of the same coin

Summary: This article will explore the relationship between blending, segregation and sampling and how the wide range of properties of solid particles influences the relationship between these three elements of solids blending.

Related equipment and services: Solids-handling equipment, especially bins and hoppers, inserts, diverters, blending units, feeders and conveyors and, of course, sampling systems.

Relevant industries: The manufacturing of many products in the chemical process industries (CPI), including such consumer products as dry-cell batteries, disposable diapers, water-filter cartridges, swimming-pool chemicals, cake mixes, and roofing shingles, is often affected by segregation. Some other industries in which segregation is a major concern include pharmaceuticals, chemicals, powdered metals and glass.

SHOW PREVIEW

ChemInnovations I

Summary: This piece will be the first part of a two-part preview for ChemInnovations 2012 in New Orleans, La. on November 14-15. The first installment of the preview will contain an overview of the event, and will highlight the technologies to be covered in the Chementator Lightning Rounds.

Related equipment and services: All CPI equipment could be fair game.

Relevant industries: All CPI sectors, with a focus on the U.S. Gulf Coast region.

BONUS DISTRIBUTION:

ChemInnovations, New Orleans, November 14-15

LOOK FOR THESE ARTICLES COMING IN THE NOVEMBER ISSUE:

Feature Reports

Dust Safety

Pumps

Equipment Newsfront

Pressure Measurement & Control

Equipment Focus

Analyzers

Facts at your Fingertips

Size Reduction