

Contained Liquid Dispensing

Releases of flammable, toxic or other liquids during chemical process operations are a worrying factor. Many a time such incidents turn into major accidents. In this article, Author discusses how new technologies can overcome the liquid handling challenges.



Incidents due to unexpected releases of flammable, toxic or other liquids during chemical process operations have unfortunately occurred many times in the past. Even today incidents continue to be reported when highly hazardous chemicals are improperly handled. In order to reduce the risk of such incidents which often result in a number of deaths and injuries, many industries face increasingly stringent safety regulations.

Important factors such as critical material selection of the facility components such as connections and piping have to be carefully considered to prevent problems that may jeopardise the safety of the operator, the facility, the project as well as the environment. Containment and thorough knowledge and understanding of the liquids are key issues.

The design of highly contained facilities and drum dispensing systems is therefore vital, allowing companies that work with harmful substances to provide the necessary health and safety measures for their staff, protection of the environment compliant with current legislation.

Many chemical and pharmaceutical manufacturers use extraction booths for the maneuvering of harmful liquids to control gases and vapors. These cabins offer working environment protection, however, generally they do not necessarily provide the minimal operator exposure, they are also large and inflexible.

Safe Handling of Toxic, Flammable and Corrosive Liquids

In an effort to combine safety, process efficiency and economic aspects, DEC has engineered a safe solution whether it is for charging or discharging drums for hazardous liquids. Manufacturing companies, which handle such products, require specialised facility design to achieve mandatory levels of containment. The DCS Liquid is a high containment system (< 1ppb) without requiring complimentary preventive measures such as constricting PPE or drum venting booths.

The compact system is fully mobile, which is a distinct advantage for flexible use. It protects both operator and environment without compromising product purity by atmospheric influences.

Feeding of Liquid to a Reactor

A current project with a major Swiss manufacturer of active pharmaceutical ingredients consists of the supply of several DCS Liquid systems for the emptying of drums of various sizes and the filling of standard 200 l barrels.

The ergonomically designed DCS Liquid system consists of a cylindrical stainless steel box with a transparent cover for optimal sight and two glove ports. Other materials are available eg, configurations in corrosion-resistant Hastelloy. The system comprises an integrated suction lance, which is housed in a special venting tube. The system handles different drum sizes and canisters which can be fitted

The design of highly contained facilities and drum dispensing systems is therefore vital, allowing companies that work with harmful substances to provide the necessary health and safety measures for their staff, protection of the environment compliant with current legislation.

into dummy drums. The drums are installed below the unit by either using a roller system or by a specially designed trolley for correct positioning of the drums. The drum is slightly inclined in order to guarantee full emptying.

Once the drum is connected to the system, the suction lance is introduced through the 'bunghole' into the drum and the liquid is then fully or partially charged or discharged. Strong odors are contained and evacuated by means of an extracting system, which is connected to the equipment.

Flexibility and Simplicity

With the positive experience gained on existing DCS Liquid systems specifically designed for drum emptying the customer now intends to standardise their global production with the new DCS Liquid containment system.

However due to the systems flexibility and simplicity it is now going to be implemented on both emptying and filling their liquid reactor systems. The product which is both corrosive and flammable is currently fed into the vessel by the customer's existing vacuum system. After the chemical reaction process, the liquid can be refilled back into drums either by gravity or by pump. The system is configured for submerged or surface filling for non-foaming products. It is fitted with a level detector to prevent from over filling and a roller top platform for highly accurate weighing operations.

The equipment is further protected with both under and over-pressure protection and can be fully inerted with nitrogen for highly flammable liquids/vapours or those which react to humidity. The system can be cleaned without disassembly. (CIP). Between each emptying and filling cycle, the lines are purged with nitrogen in order to remove remaining liquid and to allow accurate dosing.

This makes the DEC DCS perhaps the safest and most flexible system for handling flammable and toxic liquids.

In today's chemical process industries, companies are involved to various degrees with the handling of a wide range of hazardous chemicals. Technological breakthroughs are contributing to create a safer environment and more efficient and cost effective workplace making manufacturing more productive with reduced operator involvement. ■



Author Details
Gabriela Mikhael
Marketing, DEC Group
Email: g.mikhael@dec-group.ch

CHRONICLING PROCESS INDUSTRY INNOVATIONS SINCE 1986
CHEMICAL
ENGINEERING WORLD



A comprehensive knowledge-rich magazine
that disseminates information on all
segments of Chemical Process Industry



Chemical
Products Finder

Truly a Product Finder for innovative
and newly launched product information
in more than 100 sections of Chemical
Process Industry on single platter

CEW/CPF Spotlight

- Interviews with Industry Stalwarts
- Application Oriented Technical Articles by Practicing Professionals
- Latest Developments in Innovation and Technologies
- Future Trends of the Industry
- Current Indian & International Corporate News
- New Product Launches
- Latest Book Reviews
- Event Alerts and Many More.....

JASUBHAI MEDIA PVT. LTD.

Taj Bldg., 3rd Floor, 210, Dr. D. N. Road, Fort, Mumbai-400 001.

Tel.: 91-22-40373636, Fax: 91-22-40373635.

E-mail: industrialmags@jasubhai.com

Website: www.chemtech-online.com

