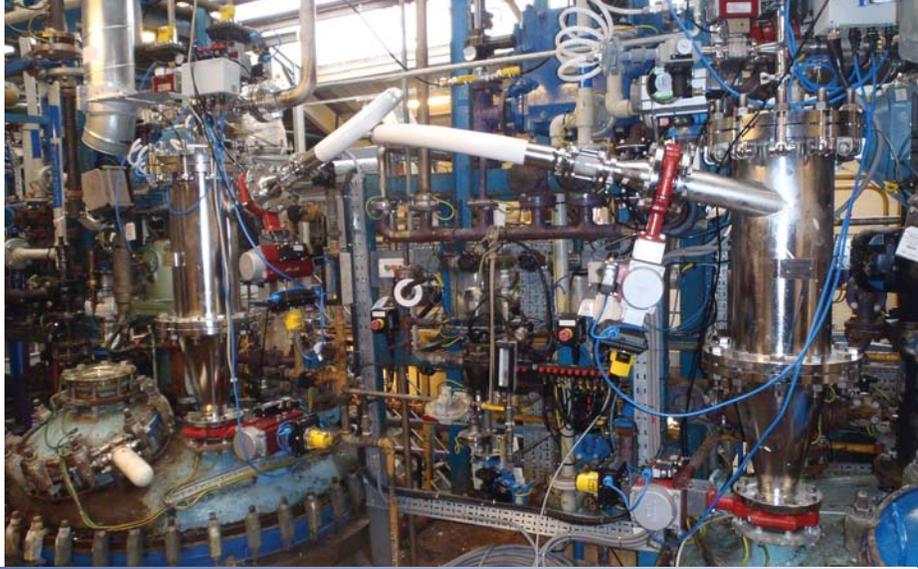


# Improving Employee Health and Safety through Contained Transfer:

## Material Transfer Solutions for Applications Involving Multiple Powders



### Overview

Manually transferring powder is a common but unsafe method for introducing material into a process, especially when the powder is hazardous and poses a risk to operating personnel. This was the challenge faced by a chemical contract manufacturer who was looking to improve the way they charged various powders into reactors. The Powder Pump was tested to ensure it could successfully accomplish the material conveying it was tasked with. After meeting quality assurance approval, the Powder Pump units were installed with control systems to create an automated solution that provides a closed system and dust-free environment.

### About

The customer referenced in this case study is a leading UK chemical manufacturer of intermediates for numerous industries, the most noted being pharmaceutical, agrochemical and specialty chemical. Their range of expertise includes custom synthesis, contract manufacture, and process optimization.

### Challenges

Contract manufacturing typically involves the use of multiple powders with varying characteristics, which makes a transfer solution difficult to put in place

because the technology that works for one type of powder might not work for another.

Prior to contacting DDPS, the customer's method of transferring miscellaneous powders was performed manually. This created high labor usage and also made employees susceptible to back injury from the constant lifting of heavy bags.

The powders were charged to multiple reactors through open manways which increased the health and safety risks of employees by creating a dusty environment. To further add to this challenging scenario, the powders involved in this process were hazardous and the reactors in which they were charged into contained highly flammable solvent.

The objectives of the customer were to find a solution that would:

- successfully transfer multiple powders with varying characteristics.
- contain the products to maintain a dust-free atmosphere, reduce operator exposure and explosion risks.
- eliminate the need to manually dump bags of material.
- provide automation to help reduce labor.

## Solution

After gaining a full understanding of the customer's challenges and goals, our approach was to first demonstrate the Powder Pump technology at the DDPS UK facility. The Powder Pump is uniquely suited for this type of processing problem because it is designed specifically to be able to accommodate a wide variety of powders and is ideal for batch and metered charging.

The demonstration was conducted with a powder that featured similar characteristics of one of the many products that was being used in the customer's application. After a promising demonstration, a test unit was installed at the customer's site for a "real life" trial to assess its transfer performance with a variety of the powders used in the actual production operation. The onsite trials revealed the potential impact that the Powder Pump would have not only on the overall efficiency of the transfer process, but the cleanliness of the facility due to the closed system that was created from this arrangement. During these tests, conveying distance and transfer capacity were also assessed to determine what size Powder Pump would be required.

The end solution included a permanent installation of DN250 Powder Pumps on two reactors, both controlled by a single PLC control system with HMI. The Powder Pumps and HMI panel were rated for installation in an ATEX Zone 1 area and the PLC was installed in a safe area.

## Results

Many additional advantages were observed after the customized solution was put in place aside from improvements in efficiency and housekeeping noted in the onsite trials. The streamlined automation helped free up hours of labor each week that were previously consumed by manually moving and dumping bags, allowing employees to have more time to perform other important work tasks.

Since solids charging via the Powder Pump offers more precise dosing than manual transfer, product quality was enhanced, which is especially important in the case of high-value products like pharmaceuticals. Product yield was also improved as a direct result of the increase in general productivity, allowing the customer to meet their client's manufacturing orders in less time.



*Powder Pump installation on reactors.*



*PLC control system with HMI graphic displays.*

## De Dietrich Process Systems, Inc.

244 Sheffield Street  
Mountainside, NJ 07092

P 908.317.2585  
F 908.889.4960

www.ddpsinc.com  
sales@ddpsinc.com

**De Dietrich**  
PROCESS SYSTEMS 