



SAMPLING CASE STUDY IN-LINE AND VESSEL SAMPLING FOR MAJOR AGROCHEMICAL EXPANSION PROJECT

Sampling

A sample taken from a process pipeline or reactor should represent the exact constituents of the process without any contamination. Contamination of a sample can create incorrect test results and cause further process problems. DDPS' range of samplers has several design features built in to overcome contamination problems and provide a true representative sample. Our range of sample dispensing options and secondary containment solutions are designed to suit the process needs of the pharmaceutical, chemical, biotechnology, food and beverage and petrochemical industries. Sampling solutions of all levels of sophistication are available from simple manual sampling to remote automated sampling and analysis systems. Toxic, flammable and corrosive media are safely sampled using systems with all wetted parts in a variety of materials of construction. Types of samplers available include:

Inline Samplers: designed to take representative samples from process pipeline. Inline Samplers are commonly used where chemicals are being introduced into the process or between process steps where it is difficult to obtain a sample from a vessel without creating hazards or additional contamination

Surface Mounted Samplers: a new type of sampling valve which can be bolted on to the side or bottom of a vessel or large pipeline. Surface mount samplers are commonly used for taking samples from large pipelines or from the side-wall of vessels.

Vessel Mounted Samplers: allows samples to be taken from a dip pipe mounted at the top of a vessel. The vessel sampling systems are ideal for the sampling of batch processing within reactors or storage vessels holding intermediate product or bulk chemicals.

The following case study demonstrates our ability to create a customized solution that meets the specific needs of the customer. For further information please visit the sampling section of our website: www.ddpsinc.com/sampling

The Customer

A major agrochemical manufacturing company was carrying out a major expansion and upgrade to its facilities and had employed an international EPC contractor to construct the plant.

The Problem

The process at hand is multi stage and the final product quality is dependant on each stage of the process operating within the design conditions. Any variation in feedstock or operating conditions can result in off specification product, and/or loss of yield.

Product sampling between stages and in one case periodically from a reaction vessel was required so that actual product composition from stage to stage could be monitored through chemical analysis. Although inter stage sampling had been performed within their existing plant, the company had experienced problems with existing installed equipment. Additionally, the client wished to improve safety on the new plant.



The Solution

To fulfil the complex sampling requirements the process needed 15 in-line sampling systems and one vessel sampling system.

The in-line systems were all based on the SD-IL-400 PFA-lined or the SD-IL-300 316L stainless steel wafer pattern in-line sampling valves, depending on the operating temperatures and characteristics of the chemicals being handled.

In-line sampling systems from 1" to 6" nominal bore with fully PFA-lined wetted parts, Chemraz seals, and 316L stainless bodies were supplied; unlined 316L stainless steel units were provided from 2" to 4" nominal bore.

All in-line units were fitted with PTFE bottle adapters with screw threads cut to match the customers standard sample bottles. The adapters were fitted with vents designed to enable any vapors to be piped away from the operators. Where the level of hazard was higher, the units were fitted with stainless steel cabinets with door latches capable of being operated with one gloved hand. To contain any spills the cabinets had 250ml capacity bunds with drain connections to safely deal with any spills. Cabinets also had vent connections to enable any fumes emitted from the sampling operation to be safely taken to a scrubbing system to ensure plant safety. Some units were designed for horizontal installation while others were for vertical line installation. In either case safety cabinets were fitted as needed. All valves were fitted with a double spring return/dead mans handle system and locking mechanism.

A vessel sampling package based on a liquid recirculation system and complete with all interconnecting pipe work, PTFE tubular pump, isolating valves, tubular sight glass, and SD-IL-400 PFA lined 1" sampling valve was supplied, pre-assembled and tested. Recirculation lines were all 1" NB and all wetted parts were PTFE, PFA, glass and Chemraz ensuring a system highly resistant to corrosion. The recirculation system was chosen as this gives excellent representative sampling even when solids are present in the fluid to be sampled. As a result of this innovative solution, the client was able to achieve his goal of having fully representative sampling throughout the process while providing the highest practical levels of personnel safety and security.

