

Application Spotlight

# Digital Gas Flow Control for Spray Dryers

# Repeatability & Process Optimization

## Digital Gas Flow Control for Spray Dryers

Spray drying is a method to produce a dry, fine (free flowing) powder from liquids, suspensions or emulsions. The process is widely used in pharmaceutical, food and chemical industries. Pharmaceutical spray dryer plants, for instance, convert liquid into powder medicine.

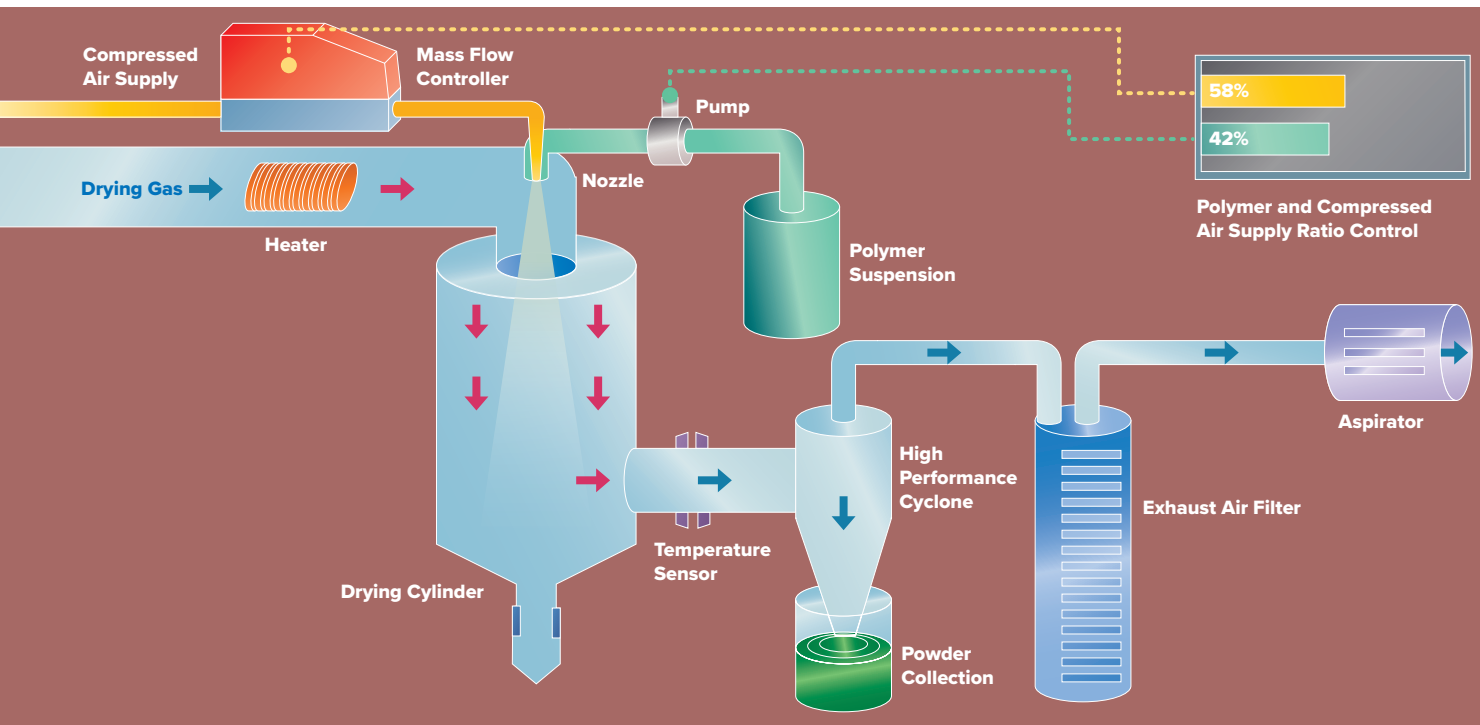


Fig. 1 Functional scheme of a spray dryer process



Fig. 2 Thanks to its high accuracy and repeatability, its long term stability and perfect temperature compensation, the digital mass flow controller **red-y smart series** from Vögtlin is especially suited for spray drying processes. High turndown ratio, easy and reliable operation and a wide range of options make this device an economical way to get better results within your spray dryer application.

### Application

Spray drying is a technological method of producing a dry powder from a liquid or slurry by rapidly drying with a hot gas. This is the preferred method of drying of many thermally-sensitive materials such as foods and pharmaceuticals.

A consistent particle size distribution is a reason for spray drying some industrial products such as catalysts. Air is the heated drying medium; however, if the liquid is a flammable solvent such as ethanol or the product is oxygen-sensitive then nitrogen is used.

In most cases the air is blown in the same direction as the sprayed liquid (co-current) and a fine powder is produced. Various technologies are used in the spray drying process: Pressure nozzle atomization, two-fluid nozzle atomization and centrifugal atomization.

### Challenge

For most spray drying systems, variable area flowmeters (VA-meters) with manual control valves are used. If inlet pressure prior to the manual valve changes, the gas flow becomes unstable. This creates non-repeatability and non-conformity in particle size of the process.

### Solution

MEMS technology of the mass flow controllers (MFCs) provides for a 500ms rapid response. Plug-and-play functionality and no warm-up periods improve user productivity.

Vögtlin MFCs have a unique way of compensating for changes in ambient and gas temperature, which strongly improves the repeatability. The MEMS technology ensures a long-term stability without any drift. The digital MFCs also allow to automate the process with the use of a digital control system.

Gas flow readings are taken 3 times per second and can be stored using data logger software. Traceability of production can be guaranteed.



Fig. 4 Mini Spray Dryer B-290 from Büchi with a built-in Vögtlin variable area flowmeter  
 Courtesy of BÜCHI Labortechnik AG, Switzerland



Fig. 3 Vögtlin offers modular MFC systems based on your demands and requirements.

### Key Features

- ★ High repeatability & reliability
- ★ High turndown ratio
- ★ Long-term stability
- ★ Short response time
- ★ Safe and fast control
- ★ Compact unit with high-quality components

### Interfaces

- ★ Analog
- ★ Modbus RTU
- ★ Profibus DP-V0/DP-V1
- ★ Profinet
- ★ EtherCAT

### About Vögtlin Instruments GmbH

Established in 1986, Vögtlin Instruments GmbH is a Swiss designer of precision flow instrumentation. Vögtlin became a member of the TASI group in 2011. The division TASI Flow delivers flow meter, flow control and dispensing solutions.

TASI Flow products are developed, customized and serviced through technical centers in the US (Wisconsin), in Europe (Germany, Switzerland and UK) and China (Beijing and Shanghai).

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