Chemical Industry Overview - Malvern in-line analyzers

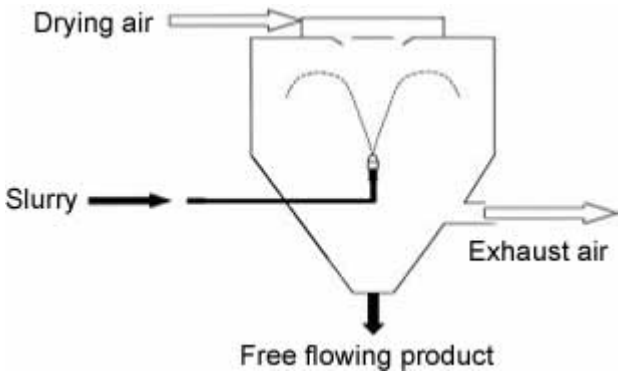
Chemical industry processes are almost as diverse as the products they spawn. Products that are derived from these chemical reactions cover a myriad of applications that enrich our lives.

The production of graphite for brake linings and lubricants, chemical catalysts for plastics, elastomers and pharmaceuticals are just a few of the product types that chemical manufacturer s produce to supplement and enhance our every day lives.

Most of the chemical applications require either spray drying or milling of these compounds, where particle size becomes a critical parameter.

Most milling processes are comprised of a grinder, classifier, cyclone and blower. The grinder mills the material to a finer size and the classifier is used to control the particle size. The two work in conjunction, as the ground material leaves the grinder the classifier allows the smaller material to escape and returns the larger material to be reground. The blower provides gas or air for transporting the newly ground material to the cyclone. The cyclone separates the suspended material from the gas and then serves as an airlock to atmospheric pressure. This allows the newly ground product to free fall out of the cyclone to be collected, bagged or conveyed.

Spray driers convert slurries into free flowing powders. This is accomplished by spraying a slurry through an atomizer positioned in the center of a cyclone, and spraying the material upwards. Drying air is added, to aid in solidifying the material as it dries and forms on its way down into a free flowing powder.



In either of these cases, it is essential to measure the newly ground or formed material. There are three basic approaches to measuring particle size, off-line, at-line and in-line (in situ). The off-line approach requires human interaction to extract the material from the process line and then deliver the newly obtained sample to the lab for analysis. At-line applications also require personnel to remove the sample from the process and then measure the material near the point of extraction using a lab instrument. Both of these approaches expose possibly harmful material to personnel and the extraction and measurement of the material is venerable to human error. These two approaches take time and are inadequate for controlling dynamic chemical processes.

When using a rugged Malvern, Insitec in-line instrument the material is continuously sampled and measured in real time with no human interaction. Knowing the particle size of the powder in real time allows chemical manufacturers to increase throughput and improve the quality of the resultant products. Particle size is also one of the key variables in controlling process equipment in the chemical industry such as grinding devices and classifiers.

Ultimately, reliable particle size information can help any chemical process run more smoothly. Malvern has years of experience, on in-line particle sizing and installations on hundreds of chemical process lines.

Raise Productivity and Minimize Energy Use

Process improvements for the chemical industry are influenced by many factors. These factors can include feed rates, classifier settings, etc. In spray dried processes, they can include air flows and resonance times.

Regarding these factors, Malvern in-line analyzers have a role throughout the chemical manufacturing processes:

- Real-time particle size analysis can be used to adjust mill parameters, reducing the out of spec material generated at the start-up of each production run or during product change over.
- Locating the sampling points at strategic positions in the process contributes to the detection of process problems that may give early rise to out of spec product.
- Real-time size data allows an increase in the overall yield of the chemical process. By having an eye in the process and always knowing immediately what is being produced, process optimization may be achieved.
- Monitoring the product using Malvern analyzers, results in the less likely production of material that has to be recycled through the process or blended with other material. Producing the correct particle size the first time contributes to a tremendous savings in energy and makes any chemical process more efficient.

Customize your Products

The chemical industry is being called upon to tailor their products to suit their customer's individual needs. It's not adequate anymore to produce a good consistent product, and is not as profitable as it has been in the past either. Chemical manufacturers are being relied upon more and more to produce products specific to individual clients' needs. Competition has tightened and product customization is important to gain even a small edge. This type of customization could include providing a tighter particle size distribution or a reducing the amount of fines or oversized particles in specific deliveries.

Reference:

http://www.malvern.co.uk/ProcessEng/industries/chemical/overview.htm