

0040

Solid-Liquid Separation Process Development

Status: Accepted

Category: 2 Filter Testing

Mathias Stolarki

Dupont, Wilmington, Delaware, United States

In the majority of industrial production processes the target product is dispersed in a supernatant. The final product recovery therefore requires at least one solid-liquid separation step. The efficient particle separation has remained a repeated challenge in modern separation technology. Multiple slurry characteristics like particle size, particle shape, viscosity, compressibility, physico-chemistry, concentration – just to mention some – strongly influence the technology required for a separation problem. The possibilities to model the separation without intense experimental work are rather limited. So it is almost impossible to design a future separation process without sufficient lab work. As an additional factor of constraint in the separation process design time to market, capital and operation cost boundaries are getting need to be considered.

Several lab tools along with intense characterization are available for the determination of the separation technology best suitable within the given economic and process framework. For centrifugation processes bottle spin, LumiSizer, lab disc stack, bucket centrifuge and decanter centrifuge are established test methods with very frequent use. For filtration processes FiltraTest, R-Meter, CST, pressure leaf filter, Pilot filter press, cartridge filter, dynamic cross flow filter, Membrane Filter units etc are standard tools. In many cases the availability of samples limits and determines the scale of the test equipment.

The presentation will describe aspects of the separation process design complemented with exemplary data.

Bio

Since Dec. 2008 Research Engineer at DuPont Experimental Station
DuPont DuET-Particle Technology-Separations

Key Projects:

Cellulosic Ethanol – Solid-liquid separation

Decanter implementation in Bioseparation

Dynamic Cross-Flow Filtration

Upstream – Downstream Interaction

Jun. 2004 – Nov. 2008 Research Assistant at the Institute of Mechanical Process Engineering and
Mechanics, University of Karlsruhe

Process Engines Group

Key Projects:

Magnetic centrifugation

Magnetic filtration

Solid Liquid Separation