



S2.3.3 - Real World Examples of Influences of Particles and Cake Formation on Solid-Liquid Separation Technology Operation

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The paper begins with a general discussion of the bench-top laboratory tests that are conducted for solid-liquid separation technology problem analysis, process development, technology selection, and scale-up. The tests include pressure, filter media, filter aids, and similar process parameters. Solid-liquid separation technologies are explained for continuous pressure filtration and batch pressure filtration. This provides an overview of the testing and troubleshooting. Three different case histories are presented illustrating different scenarios of the impact of particles, particle size distribution (PSD), and cake formation on the separation technology operations. The first is a specialty chemical application for a continuous rotary pressure filter where the particles changed from lab scale to production scale. The second case is a clarification application where the system was running successfully for over one-year but inexplicitly, the performance changed drastically and the filter media began plugging very quickly during the cycle. The final application looks at lab testing and pilot-scale testing where the cake

formation changed resulting is a unique operating technique. Sherlock Holmes and Dr. John Watson are fictional characters of Sir Arthur Conan Doyle. Process engineers who live in the real world can learn many things from the two of them for solving process filtration problems. One example that Holmes proves time and again is that there is no benefit to “jumping to conclusions.” As discussed in the illustrations, there are many choices of filtration technologies to achieve the necessary level of quality with a cost-effective and reliable process. Also, in terms of troubleshooting, there are many causes of filtration symptoms. With careful analysis and taking a creative and "non-conventional approach" by looking at what is behind the process data and the operating parameters, the optimum solution will be realized.

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Barry A. Perlmutter is currently President of Perlmutter Idea Development LLC. Barry is an experienced international practitioner with over 38 years of technical engineering and business marketing experience in the field of solid-liquid separation including filtration, centrifugation, and process drying. His strong professional skills focus on process solutions, innovation strategy, market expansion and business development. Barry has published and presented extensively worldwide on applications in the chemical, pharmaceutical, and energy/environmental industries and has been responsible for introducing many European companies and technologies into the Americas marketplace. He is an author of Elsevier’s “Solid Liquid Filtration Handbook”. He is currently editing a second book for Elsevier, Integration & Optimization of Unit Operations, to be published in 2022.

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