



SCREENING PROCEDURE TO DETERMINE SUITABILITY OF PROCESS TO CENTRIFUGATION

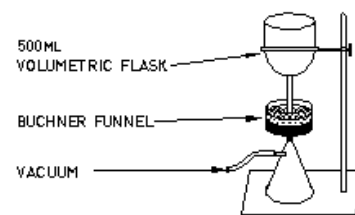
Before using a STM-1000 Pilot Plant Centrifuge to select a centrifuge for commercial processes, it is necessary to first determine whether the product in question is suitable for centrifugation and then whether a perforate or imperforate basket design is needed. The determination is divided into three steps that can be performed in the laboratory.

STEP 1: SETTLING TEST

1. Place a 750 ml sample into a beaker
2. Mix vigorously to ensure good particle distribution
3. Let stand at one gravity for approximately 30 minutes and observe and record the following information
 - a. Rate at which liquid clears as solids settle
 - b. Evaluate the liquid above the solids on a scale of “poor to excellent”
4. If the solids settle and the mother liquor clears to an acceptable level, centrifugation is possible. The next two steps determine whether a perforate or imperforate basket is required.
5. If no obvious settling is observed, centrifugation using an imperforate basket may be possible. Go to Step 3.

STEP 2: FILTERING TEST FOR A PERFORATE BASKET APPLICATION

A Buchner funnel is the best way to test the drain rate of the slurry under consideration. Set up a test stand as shown at right and perform the following test.



1. Use a four inch Buchner funnel fitted with a medium to fast drain rate filter disc.
2. Insert the funnel into a vacuum flask.
3. Place 1.5” to 2” cake of solids in the Buchner funnel .
4. Connect the vacuum flask to a standard laboratory vacuum system.
5. Take a known quantity of mother liquor and invert it over the surface of the cake in the Buchner funnel.
6. Record the time required for all of the mother liquor to drain into the vacuum flask.
7. Evaluate the drain rate of the mother liquor. Evaluation is based on the following observations.
 - a. Minimum drain rate of 0.5 gpm/ft² of filter area
 - b. Ideal drain rate is 1 to 3 gpm/ft² of filter area
 - c. No liquid should remain on the surface of the filter cake



WESTERN STATES

where *innovation* happens everyday™



625 Commerce Center Drive
Fairfield, OH 45011
P: 513.863.4758
F: 513.863.3846

innovation@westernstates.com
www.westernstates.com

8. If a drain rate of 0.5 gpm/ft² of filter area or higher is obtained additional testing with a STM-1000 Pilot Plant Centrifuge fitted with a perforate basket is recommended.
9. If a drain rate of less than 0.5 gpm/ft² of filter area is obtained the likelihood of a perforate bowl centrifuge being successful is low. Go to Step 3.

STEP 3: FILTERING TEST FOR AN IMPERFORATE BASKET APPLICATION

A laboratory bench-top centrifuge is used for this test.

1. Place two 15 ml samples of the slurry in a bench top centrifuge.
2. Spin for 90 seconds stopping every 30 seconds to observe the solids and liquid layers.
 - a. If after 30 seconds spinning, there is a definite solid phase and a definite liquid phase, additional testing with a STM-1000 Pilot Plant Centrifuge fitted with an imperforate basket is recommended.
 - b. If after 90 seconds spinning, there is no clear separation between the solid phase and the liquid phase, the process is likely not suited to basket type centrifuge processing.
3. The STM-1000 Pilot Plant Centrifuge is limited to 1300 gravities. If higher gravities are required to obtain an acceptable clarity of mother liquor, a horizontal bowl decanter centrifuge, which can produce up to 3500 gravities, may have to be required.

Note: The above tests can also be performed by using other funnels and vessels sizes