

Centrifuges In The Potato Industry

Applications –

Centrifuges are installed in the premises of crisp producers, chip producers and potato processing factories.



Applications essentially fall into four groups :

1. Starch dewatering
2. Effluent treatment
3. Potato meal
4. Wash water cleaning (mud dewatering)



Group 1 - Starch dewatering

Units installed to recover starch from the wash water used in the cutting or slicing process at crisp manufacturers.

We find that for each 100 tonnes of potatoes processed, approximately 2 - 3 tonnes of starch was produced at 60% dry solids. This typically has a value of around £100.

This application is also relevant to chip manufacturers.

The starch yield is less in the case of straight cut chips and we believe that approx. 0.3 - 0.5% of the potato tonnage being processed can be recovered as starch at 60% dry solids.

Process Problems

Peel and gelatinised starch produced by the blanching process and by steam peeling, caused us concern. Lab. trials indicated that two products were being discharged from the centrifuge solids outlet:-

- (a) Starch 57 - 60% dry solids
- (b) Gelatinised (slimy) starch 25% dry solids approximately

We found that by a slight modification to the device intended for screening Potato fibre, we could succeed in the removal of gelatinised starch, the problem was thus eliminated.



Conclusion

The decanter centrifuge is well suited to cold starch dewatering. There are several incentives to remove the starch from the effluent.

1. To sell the dewatered starch
2. To reduce effluent costs
3. Recycle centrate to the pre-wash area
4. Reduction of fresh water requirement

Group 2 - Effluent Treatment

Typically, after grit removal the underflow from a clarifier is typically thickened to 2- 10 % ds prior to land disposal by tanker.

A centrifuge was installed and cakes of up to 40% were easily achieved without flocculant addition. The product was saleable to farmers as an animal feed additive. In this case abrasive peelers were used in the process.

When steam peeling is used one cannot expect such a high dry solids content of the cake, nevertheless the resultant cake of 25% is still truckable and a saleable product.

Some factories do nothing more than screen to 7 mm and pump the whole flow of factory effluent through the decanter centrifuge which has the result of removing 98 - 99% of suspended solids and a reduction of 50 - 60% in COD.

Conclusion

The centrifuge is ideally suited for effluent derived from potato processing. Clients who have used belt presses have complained of high maintenance costs in comparison to centrifuges. It is to be noted that centrifuges have also replaced rotary vacuum filters for similar reasons.





Group 3 - Potato Meal

Peelings, reject potatoes and substandard products can be pulverised to form a slurry. At this point water is added and the slurry can be centrifuged to produce a cake of 40 - 55% dry solids.

This commands a higher price than the waste in its original form.

The dryness of the cake is largely influenced by the proportion of cooked potato in the feed and can be sold as an animal feed



Group 4 - Potato Wash Water Cleaning

Use of the decanter centrifuge on a closed loop to the potato pre-washer or potato flume/transport water leads to the continuous removal of earth, mud, soil, potato debris etc. from the washing water.

The solids are discharged as a stackable cake between 50 and 60 % ds.

The cleaned liquid discharge is returned to the washer for reuse thus reducing the amount of water used at plant and allowing the washer to be run for extended periods before emptying.

The addition of polyelectrolyte is not normally required but may be used to improve the superfines capture. Liquid discharges or concentrates of <90 ppm suspended solids can be obtained.



