Tailings Dewatering Webinar – 1 October 2020

Chat Log

Q: How dry is "dry" in terms of OMC?

A: Getting to OMC for compaction would represent the lowest moisture content achievable.

Q: Are there any applications of Solid Bowl Centrifuges in copper tailings?

A: Yes, although the scale of large copper operations is an issue.

Q: What is the maximum tolerable gap between the auger and the decanter housing in a SBC? Do I require specialist trades to rebuild? Do you recommend spares?

A: The gap depends on the PSD of the feed, but is typically 20 mm.

Q: Can existing cyclones be used for TerraFlowing?

A: Yes, as no special cyclones are required.

Q: Does TerraFlowing work for all tailings?

A: We have applied it to a range of tailings, with success, and are expending the work to test other tailings.

Q: What are the key parameters involved in TerraFlowing?

A: The PSD and specific gravity of the tailings, their clay mineral content, etc. There are also operating parameters depending on the particular tailings such as cyclone feed flow rate.

Q: Can cement and/or coarse-grained materials be added to dewatered tailings?

A: Yes, post centrifuging and post-TerraFlowing.

Q: Is there any special course to take to be a tailing engineer from Environmental and Geotechnical Engineering background?

A: Yes - AusIMM has recently offered a Tailings Management online, an interactive 6-week course at ~6 hours/week. The next offering will be in Feb 2021 – Go to:

https://ausimm.com/courses/tailingsmanagement-2/

Q: Does TerraFlowing remove the requirement for thickeners?

A: Possibly, as can centrifuges, at least in part.

Q: What is the typical floc dose for a centrifuge in g/t?

A: Up to about 300 to 400 g/t, similarly for TerraFlowing, possibly much higher than for thickening of tailings that are easy to thicken (coarse-grained and non-clay mineral-rich), the cost of which is offset by the reduced storage volume.

Q: What has changed in coal tailings centrifuges apart from better wear protection and probably higher torque compared to the Decanters used 20 to 40 years ago? Moistures seem similar to what was achieved at the time so do you run the same speeds?

A: The biggest change is reliability, and ease and speed of maintenance. The Alfa Laval P3 range has advanced wear protections to make centrifuges more reliable. Having tungsten carbide tiles on the edge of conveyor flights and solids discharge makes the centrifuges ready to handle tough mining applications.

Q: What is the largest centrifuge?

A: Alfa Laval's largest centrifuge for mining applications is the P3-10070 with 1000 mm bowl diameter, which could produce up to 70 t/h dry solids.

Q: What is the industry asking for in relation to dewatering?

A: There are certainly more questions being asked about tailings dewatering and alternative tailings disposal, particularly in the light of the new Global Tailings Standard. This is particularly the case in dry climates where water supplies are limited.

Q: How is the industry informing their choice between different dewatering methods?

A: The industry continues to like to see demonstrations of successful tailings dewatering before committing. The selection of the right dewatering method is a multi-criteria assessment process driven largely by cost and risk analysis.

Q: How well can dewatering be integrated into the plant?

A: It can be modularised and readily added, whether Centrifuges or cyclones.

Q: With the vibration sensors, when excess vibration is detected, is it generally easy to correct?

A: Yes, there are certain set points on the HMI for vibration levels.

Q: In case of tailings that are not dense and dust-free, is there a possibility to minimise acid and metalliferous drainage?

A: Possibly, if the reduced permeability f the cake maintains saturation.

Q: Surely the water balance of the site is also a driver. There is also a cost of managing too much water.

A: Yes, the site climate and water availability are key drivers of tailings dewatering.

Q: Regarding maintenance and after-sale support, what service is available?

A: Within Australia, Alfa Laval has a major service centre in Sydney, and some maintenance could be done onsite. Weir has a supply chain and service centre capability in all regions around the world.

Q: Can filters (such as filter presses) capture similar fines compared to decanters?

A: If there are ultra-fine particles in the feed, filter technology starts to struggle and gets blocked. Centrifuge technology could capture almost all particles regardless of their size, with an appropriate floc system.

Q: Has there been any geochemical analysis performed to enable dewatered tailings to be used safely for construction?

A: Dewatered tailings potentially have a range of uses in construction, with the sand fraction replacing traditional sources of sand (the second-largest resource utilised, after water), and the total dewatered product used with cement as shotcrete and in bricks, etc. Benign tailings can be used directly. Potentially contaminating tailings may need treatment. A big barrier to dewatering tailings and their re-use is the regulators, and also consultants and contractors.

Q: Has there been any dewatering of tailings from BIOX circuits in gold processing plants?

A: Nils' experience of BIOX circuit dewatering has been through the use of filter presses, but he sees no reason why centrifuges cannot be used.

Q: What is the maximum particle size to limit cloth punctures in Centrifuges?

A: There is no cloth in centrifuges. The cloth is used for filters.

Q: What is the typical kW requirement for the largest centrifuge?

A: Installed power: 250 kW for the main drive and 75 kW for the back drive. Power consumption when the centrifuge is running is around 200 kW.

Q: What is the design life Centrifuges, and how often is maintenance and major refurbishment required?

A: There has certainly been great strides in terms of the reliability of both Centrifuges and Cyclones in recent years, and in their reliability and ease of maintenance (being modularised).

Q: Cycloning is popular and successfully applied in Southern Africa and South America, in South America, but less so in other regions, why?

A: It may be a case of "What we've always done".

Q: How stable against erosion are the walls of "stacks" constructed using dewatered tailings?

A: Generally, some slope protection is required, during operations and certainly post-closure. The geotechnical stability of stacks constructed using dewatered tailings may also be questionable.