Achieving a solids density is one thing; doing it in a managed way is another. Outotec 2nd Generation Paste Thickener provides ease of operation and reliability even in the most challenging applications. The thickener has a high sidewall and steep floor slope and with integrated automation it reacts to ever changing process conditions. The thickener utilizes control based on consistent solids inventory to achieve and maintain the required underflow density.

**BENEFITS**
- Maximized underflow density
- Increased beaching angle at tailings deposition
- Consistent performance in changing process conditions
- Rake load management by Smart Rake Lift
OUTOTEC 2ND GENERATION PASTE THICKENER TECHNOLOGY

The sedimentation process is used to achieve the maximum underflow density possible for a given unsheared yield stress. High yield stress material exceeding 200 Pa is produced, limited only by the rheology of the thickened bed and associated transport issues. While sedimentation is a proven industry practice due to low capital cost, the value of experienced process equipment specialists becomes more apparent as the boundaries of operation are pushed.

Applications
The Outotec Paste Thickener is best suited to applications requiring a high degree of dewatering, such as:

- Minerals tailings applications
- Mine backfill
- Pre-leach and CCD circuits

Outotec Paste Thickening Technology is designed to suit each project, because we understand that the drivers for each project will differ e.g.:

- Environmental
- Water recovery
- Regulatory requirements
- Tailings management
- Available land space, or other

Environmental Benefits
Choose the Outotec Paste Thickener for a higher beaching angle at the tailings deposition. Visit our website for a case study of tailings management at Yara Siilinjarvi in Finland. This is one example of how our technology has improved the tailings operations with benefits to the local environment.

Maximized Underflow Density
Using our process knowledge and tools all Outotec Paste Thickeners are designed to limit the build-up of rotating masses within the networked bed and reduce bogging or incidences of imbalanced rake loads in high yield stress solids beds. You will be able to maintain consistent solids inventory inside the thickener for a maximum continuous underflow density.

Outotec has a long history of development of Paste Thickeners. Our successful experiences with large scale paste thickening has developed a thorough understanding of the key aspects of high density thickeners;

- Effective flocculation
- Dewatering
- Raking
- Prevention of rotating mud beds
- Discharge of thickened solids

Vertical Load Monitoring
A key feature of the Outotec 2nd Generation Paste Thickener is Vertical Load Monitoring via Smart Rake Lift – one of the only systems in the world able to detect early formation of rotating beds. Tank mounted bed mass sensors can’t detect these loads.

By incorporating Vertical Load sensing with plant process data into the ACT Thickener Optimizer Control system the solids inventory within the tank can be maintained at a consistent loading. The Operator now has another view of what’s happening inside the tank. This leads to more consistent underflow density and reduced downtime.

Smart Rake Lift
With the Smart Rake Lift system, individual hydraulic cylinders are monitored and actively adjusted to maintain alignment of the rake mechanism.

Outotec delivered a Paste Plant to Yara’s phosphate mine in Finland.

As a result, a beach angle of four degrees was achieved.
**ACHIEVE MAXIMIZED UNDERFLOW DENSITY**

**Design tools**
Our application specific design of the thickener begins with the use of design methods such as Discrete Element Modelling (DEM) to examine solid particle movement within the thickener, and Finite Element Analysis (FEA) for structural steel design. Design for serviceability is a feature of our Paste Thickeners, with our skid mounted hydraulic power unit (HPU) for centralized connections of hydraulic hosing from the rakelift cylinders and drive unit.

**Unique Design Features**
Unique design features including smart rake system, low profile rakes with tie-cable load sharing, rake blades supported by thixoposts, steep tank floor slope and high sidewall, high installed drive torque, and feed systems with break tanks when required.

Our current development of rake drive units is up to 14.5MNm. Bearing life is >100,000 hours based on 99% at normal operating torque and 1% at maximum operating torque. Tank structures can be supplied as bolted or welded to suit project requirements.

**Static Pickets**
Static pickets [patented] extend vertically into the thickened bed. They are utilized with high yield stress and coarse particle beds to prevent build-up of rotating beds, which if undetected can lead to unscheduled equipment downtime.

Rotating beds can exhibit the negative incidence of high rake torque but with lower underflow density, which will certainly limit thickener performance. In the case of fine particle and non-free settling materials we utilize rotating pickets mounted on rake arms to enhance solids dewatering.

**Lifecycle solutions**
Outotec provides a complete solution for your thickening needs, with proven design features to achieve maximum UF density with process guarantee and operational reliability, coupled with life cycle service support. There are also options available for ongoing Operation & Maintenance services after commissioning.
Outotec develops leading technologies and services for the sustainable use of Earth’s natural resources. Our 4,000 top experts are driven by each customer’s unique challenges across the world. Outotec’s comprehensive offering creates the best value for our customers in the mining, metal, energy, and chemical industries. Outotec shares are listed on NASDAQ Helsinki. www.outotec.com