

Mineral sands solutions

Dealing with one technology partner saves both time and money in any investment project. Unique to the mineral sands market, Outotec is the only integrated technology supplier covering the entire process chain.

Outotec's technologies and expertise address every step of mineral sands production. From mineral sands concentration and processing through to upgraded products, such as synthetic rutile and high TiO₂ slag, Outotec offers a total solution.

Your total solutions provider

Outotec provides technology solutions for the sustainable use of the Earth's natural resources. As the global leader in minerals and metals processing technology, Outotec has developed several breakthrough technologies over decades. The company also offers innovative solutions for the chemical industry, industrial water treatment and the utilization of alternative energy sources. With a global network of sales and service centers, research facilities and more than 3,100 experts Outotec generated annual sales of EUR 878 million in 2009.

Outotec
More out of ore

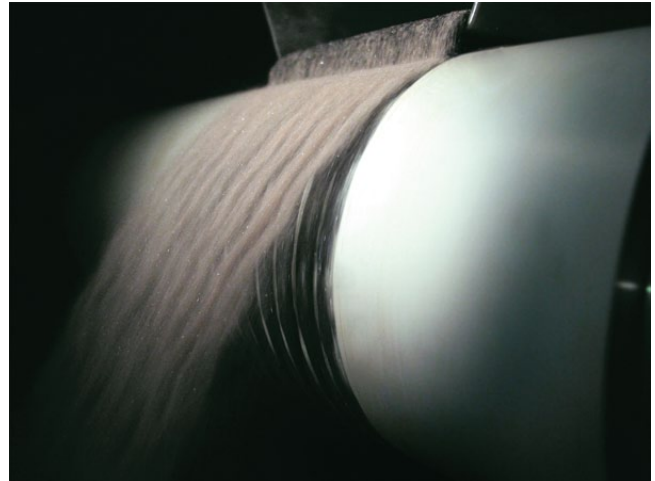
Upstream: Minerals processing and concentration

Mineral sands processing and concentration has been a focus of Outotec for over 60 years, and it reflects in their varied technology offerings, from physical separation techniques to automation and analyzing.

In addition to supplying a range of technologies, each technology is of state-of-the-art design. Advancing gravity circuits, Outotec has revamped the H9000 series spiral in both wash water and wash waterless varieties such that it is now applicable to both mineral sands concentrators and zircon sections of MSPs. Recent advancements in magnetic separation include the new high efficiency (HE) rare-earth roll separator designed specifically to overcome traditional obstacles of zircon processing. Outotec has also licensed the SLon® high gradient wet magnetic separator for fine ilmenite concentration and scavenging.

Outotec's grinding, flotation, thickening and intelligent instrument technologies round out the comminution, minerals processing, dewatering and control offerings for mineral sands and hard rock ilmenite beneficiation plants.

At the fully equipped laboratory in Jacksonville, Florida USA, Outotec conducts over 200 concentration and processing tests annually. Additionally, Outotec has testing partners strategically placed around the world. Clients' tap into these resources to receive comprehensive solutions for their mineral sands beneficiation needs.

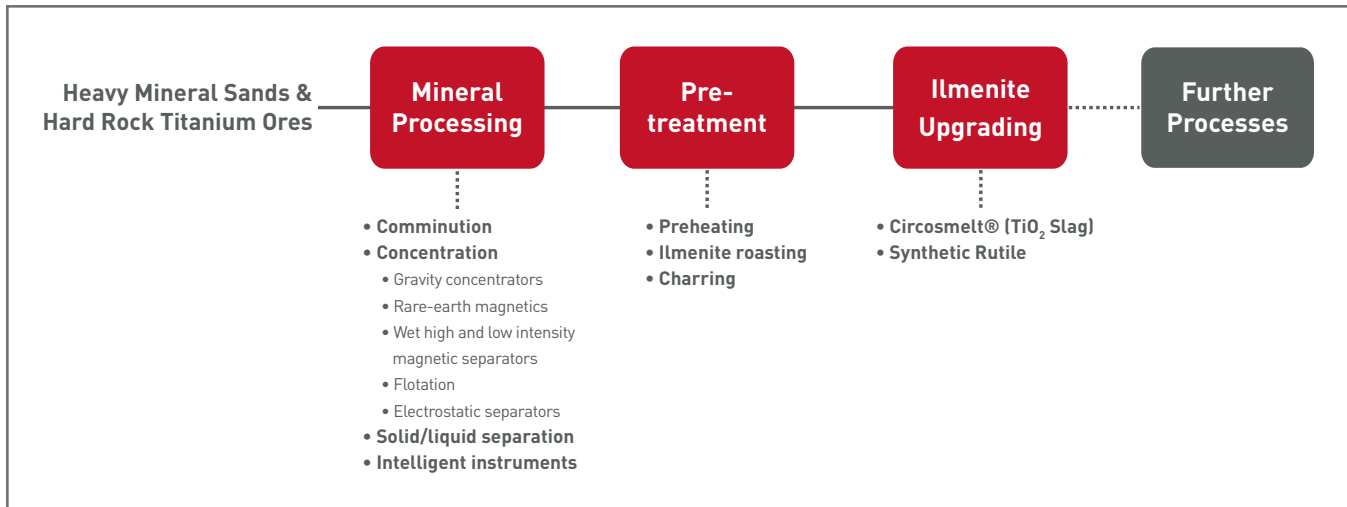


Downstream: Synthetic rutile and high TiO₂ slag

Outotec's Ferrous Technologies business sector picks up where the minerals processing sector finishes. They provide energy-efficient and cost-effective methods to generate various upgraded products with reduced detrimental impact on the environment.

Outotec bases all of their technology gains in comprehensive research and development from experience in their own production plants and pilot plants. Outotec houses research centers in Pori (Finland) and Frankfurt (Germany) where innovative technologies for metallurgical plants have been successfully developed for more than 80 years.





Pre-treatment

Outotec downstream technologies begin with preheating, roasting and charring. The combination of ilmenite preheating with charring of coal, and the subsequent feeding of the hot material into the reduction kiln offers a significant unit capacity increase for existing or new Becher SR plants.

Outotec has developed a technology for roasting of ilmenite under reducing or oxidizing conditions using Circulating Fluid Bed technology. Roasting alters the magnetic properties of the ilmenite and allows for the removal of chromite by magnetic separation.

Ilmenite upgrading

Following pre-treatment, Outotec offers ilmenite upgrading solutions for the production of both synthetic rutile and high TiO₂ slag.

Outotec's Becher process is, to date, the most advanced and cost effective technology to upgrade ilmenites to high grade synthetic rutile with + 92% TiO₂. The technology involves the reduction of ilmenite in a rotary kiln followed by aeration and leaching at atmospheric pressure.

In addition, for ilmenites that are not suitable for the Becher process, Outotec provides a gas-based technology for high grade Synthetic Rutile production.

This technology involves low temperature reduction of ilmenite in a 2-stage fluid bed system. It uses hydrogen as reductant with subsequent removal of iron and other impurities by pressure oxidation and leaching.

For titania slag production, Outotec offers the advanced Circosmelt technology, which is a combination of ilmenite pre-reduction with coal or gas and a highly energy efficient titania slag smelting process. Circosmelt has the advantage of significantly reduced electrical energy consumption due to the feeding of hot and partly metallized ilmenite to the smelter. Further advantages over other existing technologies are high specific furnace capacity, reduced risk of foaming slag and lower coke consumption, all at lower investment and operating costs.

In the case of coal based reduction, the separation of excess carbon at temperatures elevated to near Curie point, and the hot feeding of pre-reduced ilmenite into the smelting furnace is achieved by Outotec's newly developed PyroMag™ hot magnetic separator.

Utilizing decades of experience in their own mines, plants, and research facilities Outotec serves customers with integrated flowsheet design, technology supply, management and start-up services, and comprehensive training. For mineral sands processors this translates to total process solutions, and thus literally getting More out of ore!

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