

Trimex Beach Sand Beneficiation Plant

Walchandnagar industries Ltd (WIL) received a contract from M/s Trimex Sands Pvt Ltd putting up the complete 2.1 MTPA Beach Sand Beneficiation Plant at Srikurmam, District Srikakulam in Andhra Pradesh in December 2007. This Plant is first of its kind in Asia, where 5 minerals are extracted. The WIL scope for the Project included Technology Supply; Basic Engineering; Detailed Engineering; Supply of all mechanical, electrical and control equipment; Construction including all Civil and Structural works; Erection, Testing & Commissioning of complete Beach Sand Separation Plant on EPC basis. WIL's technology partner for this project was Downer EDI Mining (earlier known as Roche Mining Mineral Technology Pty Ltd) Australia.



Pre-Concentration Plant Building

Downer EDI Mining did the complete testwork, developed flow sheets, basic engineering and selected their proprietary equipment, like spirals, magnetic and drum separators, electrostatic plate separators and shaking tables. Complete detailed engineering was done by WIL under Downer EDI Mining guidance. WIL procured Critical equipments under guidance of Roche.

Complete project management, procurement, inspection and construction activities were undertaken by WIL. A total of 50 engineers were deployed in Head Office and at Plant Site. Total work force at peak time was 350. All major civil foundations/ buildings were on piles; concrete thickener of 32 m diameter was built in PCP; the Ilmenite covered stockpile has dimensions of 26 M x 126 M.

Beach sand contains “Heavy Minerals” rich in Titanium, Zirconium and Rare earths. Being resistant to weathering by Physical and Chemical reactions and due to high specific gravity the heavy minerals settle along coast lines. The project was set up to recover heavy minerals such as Ilmenite, Silimanite, Industrial Garnet, Rutile and Zircon from beach sands at the sea-coast near Srikurmam in A.P. These products are used in Industry for manufacture of pigments, refractory material, sports equipments, pharmaceuticals, higher grades of ceramics and even aircraft application.

The plant was split into two locations namely Pre concentration plant (PCP) and Mineral separation plant (MSP). The Pre-Concentration Plant (Wet plant) comprised of Spirals, Classifiers, Screens and Cyclones, where the sand is handled in wet condition & differences in the specific gravity of various minerals is utilized to produce semi-finished products for further

treatment. Froth flotation process is employed for producing wet sillimanite. The ROM (Run of Mine) feed to the plant is 350 TPH.

The process water was brought from village Gara ~ 10 KM away from the Plant Sites, through ductile iron pipelines, separately for the two Plants from river Vamsadhara.



Spirals in Pre-Concentration Plant

PCP Plant feed	350 tph
Water in circulation in PCP	About 1500 m ³ /hr
Make up water required in PCP	About 200 m ³ /hr
Installed/Absorbed power KW	2963/1947
Wet sillimanite plant feed	45 tph

PCP produces valuable minerals like Coarse garnet, Ilmenite-Rutile-Zircon as a combined product & wet sillimanite in stockpiles.

In the Mineral Separation Plant (Dry plant) these semi-finished products from PCP are dried using fluidized bed driers, thereby, utilizing the differing electrical conductivities & magnetic properties of the constituents (with help of magnetic separation and electrostatic machines) for separation of the finished products. The finished products are stored either in bulk or bagged for sale. Wet Zircon plant –although a wet process is placed in MSP. Separation is effected by “hindered settling” (behavior of particles settling in isolation from each other) method in a battery of shaking tables. The circuit wise capacities are mentioned below.

Ilmenite-Rutile-Zircon feed	65 tph
Garnet feed	12 tph
Sillimanite feed	10 tph
Zircon feed	1.8 tph
Installed/Absorbed power KW	3065/1955



Product Stockpiles in Mineral Separation Plant

MSP produces valuable minerals like Ilmenite, Garnet, Silimanite, Rutile, and Zircon in dry form. They are stored in the bag house area.

WIL maintained quality of work at site by appointing quality assurance engineers & following proper fabrication, erection, inspection practices & maintaining proper project progress/commercial documentation in co-ordination with Trimex. In addition HSE engineers were stationed at Site to train the staff on health & safety measures and to monitor the HSE processes.



After all erection activities were completed, no load trials & load trials demonstrated under the guidance of Downer EDI Mining experts.

The Plant was formally inaugurated by Mr.K.Rosaiah, the Hon'ble Chief Minister of Andhra Pradesh, on 26 -June-2010.

WIL is more than 100 years old engineering house; listed on Bombay Stock Exchange; with 1500 employees and a turnover of Rs 673 crores; having main manufacturing facilities in Walchandnagar 130 KMs South East of Pune; a foundry in Satara District of Maharashtra; catering to nuclear, defense, sugar, cement, mining & bulk industries.