

# DemcoTECH Engineering: designing fit-for-purpose conveying systems



*NPC fly ash silo:  
20tph tandem  
screw conveyors.*

With well-designed conveying systems comprising the heart of an efficient materials handling operation, the numerous factors to consider in technology selection include the material characteristics, the overall system with respect to capacity, distance and ground elevation and terrain, as well as future operational requirements.

As a respected supplier in conveyor design and engineering, DemcoTECH Engineering provides a comprehensive range of advanced conveying technologies, for a broad range of materials from coal, gold, iron and manganese ore, bauxite, diamondiferous material and tailings, through to industrial products such as cement, limestone and sulphur. The conveyor systems supplied range from troughed, air-supported 'Aero conveyor' and pipe conveyors through to stacking, shuttle, mobile and grasshopper conveyors, and feeders. DemcoTECH's extensive track record in the supply of belt conveyors includes downhill, extendable and inclined systems, while, in line with its total solutions approach, a full range of

supporting and auxiliary equipment is provided. This includes trippers, stackers and load-out equipment. Turnkey multi stream sampling plants are also designed and supplied by DemcoTECH, with references including Khumani Iron Ore and a sampling facility at the Saldanha iron ore terminal in South Africa.

Underpinning its services are advanced testing and modelling/simulation tools to design fit-for-purpose systems.

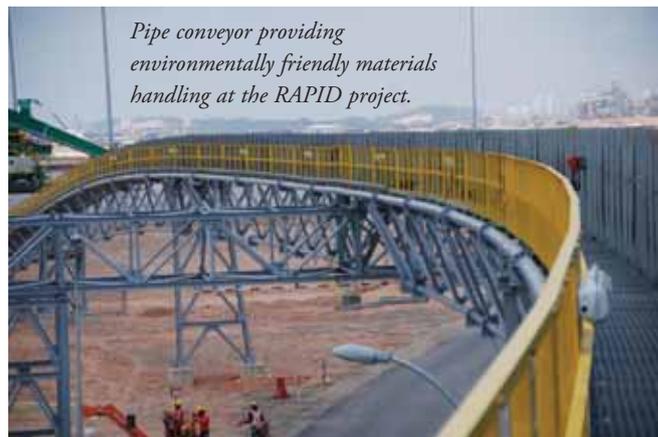
"Critical elements include determining the chute geometry to give the desired capacity, providing a flow pattern with acceptable characteristics, and thorough

design and detailing of the conveyor plant," says DemcoTECH Engineering GM, Paul van de Vyver.

Offering services from conceptual design through to project completion, DemcoTECH's project services are tailored to the needs of small to mega contracts.

"Our projects demonstrate the flexibility of our services, ranging from providing a shuttle conveyor and installing it during a plant shut of seven days working 24 hour days for a miner in South Africa through to a massive four-year contract for Vale's multimillion-dollar iron-ore import/export facility in Malaysia. We have also just completed a turnkey project in Malaysia for the prestigious Petronas RAPID project, with the main feature of our system being a 2.2km pipe conveyor. Here we actually tested the belt on our in house pipe conveyor test rig to determine and select the specific belt for the specific application," adds van de Vyver.

The multi-million dollar RAPID contract included the materials handling for offloading



*Pipe conveyor providing  
environmentally friendly materials  
handling at the RAPID project.*

and stockpiling sulphur for storage and then loading onto ships for export purposes, with materials handling system comprising, mainly, the multi-curved pipe conveyor feeding a jetty belt conveyor, which in turn feeds the rail-mounted ship loader.

“The pipe conveyor provides an environmentally friendly solution, being fully enclosed on both the carrying and return sides, also eliminating transfer points thus reducing the potential for any spillages and dust generation,” adds van de Vyver.

DemcoTECH’s conveyor expertise has also been applied widely on diamond mines, as demonstrated for Liqhobong and Lëtseng mines in Lesotho.

At Lëtseng, DemcoTECH was contracted for the tailings disposal system, providing a conveyor with fixed tripper and multiple discharge points, a 1.6km overland conveyor and a 1km-long tail-driven regenerative downhill extendable conveyor with a rail-mounted tripper and spreader, and also incorporating an emergency dump system.

“The overland conveyors had to accommodate Lesotho’s high altitude mountainous terrain, requiring engineering solutions, such as inclusion of a regenerative braking system on the tail pulley of the extendable conveyor to prevent the conveyor from running away,” says van de Vyver.

DemcoTECH’s work included the mine’s expansion initiatives covering the upgrading of the run-of-mine (ROM) stacker and the conveyor design and expansion layout to increase the tailings dam.

At Liqhobong, DemcoTECH designed and constructed a system to dispose of between 3mtpa (million tonnes per annum) to 4mtpa of dry tailings.

“As with Lëtseng, the system had to be flexible enough to be re-routed, extendable and capable of withstanding the extreme weather and conditions associated with the mountainous terrain,” says van de Vyver.

The existing system discharged material onto the tail end of the new 320m-long extendable downhill conveyor. The layout of the conveyor system ensured that tailings can be routed to two discharge points, that is to a shiftable conveyor depositing tailings along the dump wall or onto a standby slewing conveyor.

DemcoTECH was also responsible for



*Grindrod Maydon Wharf: mobile ship-offloading and warehouse distribution system.*

the materials handling systems of the expansion to Grindrod’s multi product terminal at Richards Bay in South Africa. DemcoTECH utilized both belt and pipe conveyors to convey various materials, but mainly rock phosphate and coal, from the three Richards Bay terminal sites.

At Grindrod’s Maydon Wharf terminal in Durban, South Africa, DemcoTECH applied mobile conveyor technology in the form of ‘grasshopper’ conveyors for the mobile ship offloading and a warehouse distribution system for a fertilizer storage facility. The system replaced a trucking system in order to improve productivity. Four 800tph (tonnes per hour) grasshopper conveyors are positioned on the jetty to satisfy the ship’s docking arrangements and, in addition, the existing warehouses were modified to incorporate five reversible, multi-point discharge shuttle conveyors that feed individual bays. Fully sequenced automatic starting and stopping ensures a seamless operation, with no blockages or hang-ups, with the ability to handle different types and grades of fertilizer.

The expansion of a manganese export facility for Assmang at its Cato Ridge Alloys plant in South Africa included rail tripper upgrades, troughed conveyors with transfer houses, and an elevated travelling tripper discharging onto a stockpile. The ore is then reclaimed for the stockpile and feeds a highly automated road load-out facility. The turnkey project was done with DemcoTECH being responsible for the materials handling and Kantey & Templer

providing the civil works and structural steelwork.

An import terminal project at the Port of Ploce in Croatia also drew on DemcoTECH’s advanced conveyor and load-out station design skills. “The multi-product terminal handles coal and iron ore, with the very different material properties introducing design implications for the system, particularly for the chutes and train rapid rail load-out system,” notes van de Vyver.

Screw conveyors were used for handling the fly ash discharge from the silo. The contract was for the leading South African based cement producer, NPC-Inter cement at its Simuma Plant. DemcoTECH provided the detailed design and layout, as well as the structural, mechanical, electrical, control and instrumentation engineering and supply.

## ABOUT DEMCOTECH

DemcoTECH Engineering is a specialist bulk materials handling and niche process plant company, offering services to the power generation, cement, mining, metallurgical, manufacturing and port handling industries. Services include conceptual design, feasibility studies, design, engineering, procurement, expediting, construction and commissioning. After-sales services include spares, maintenance, refurbishments and operational readiness packages covering procedures, systems and workplace tools required to successfully operate and maintain a new or upgraded plant.