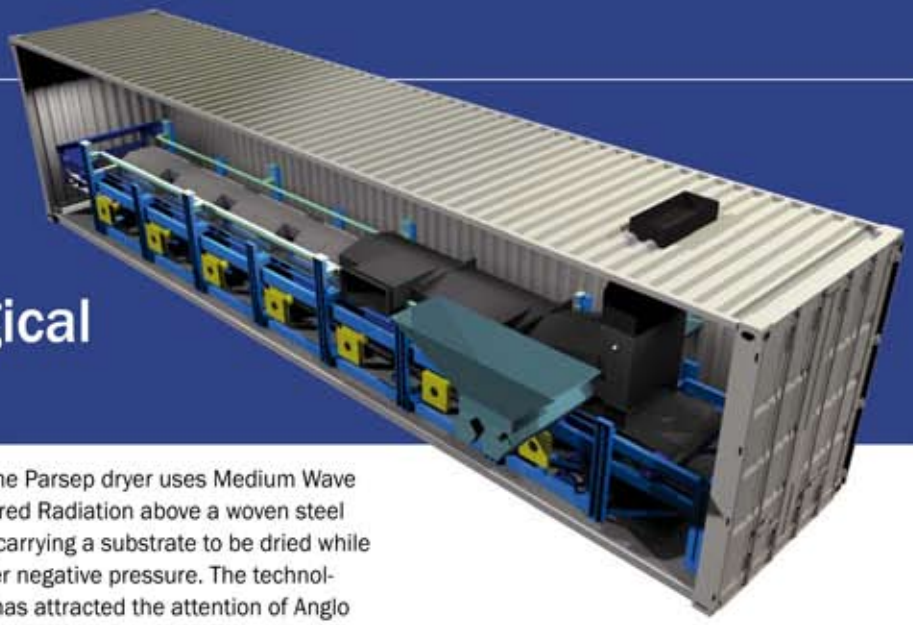
PSS drives development of improved metallurgical technologies



LaDePa fully assembled with feeder

Particle Separation Systems Technologies (PSS) is a company which specializes in the use of steel mesh technologies for screening and filtration.

The company, managed by Rein Buisman and Werner Altmann, has filed several patents and the primary drive of the company is the development of new or improved metallurgical technologies. Recent patents have been filed to recycle foundry sands, high intensity micronizing Commett Mill technology and the manufacture of high grade, dry, powdered ferric sulphate.

The PCT-patented Parsep drying technology has proven to be arguably the simplest and yet the most efficient drying technology available and capable of drying the most arduous and difficult minerals, chemicals and bio-solids.

Phase 1: Parsep dryer only

Phase 2: LaDePa showing the feed screws

The Parsep dryer uses Medium Wave Infrared Radiation above a woven steel belt carrying a substrate to be dried while under negative pressure. The technology has attracted the attention of Anglo American, Kumba, Exxaro and Vale (Brazil) in the mineral field and resulted in development agreements with Anglo American and Exxaro.

The technology initiated a bio-solids pit latrine processing development at the eThekwini Municipality (EM – the municipality that administers Durban and its surrounding entities) in 2010.

The main obstacle with pit latrines is the detritus accompanying the pit latrine sludge, being rags, plastic bags, wood, steel and carpets amongst other things.

A pilot project resulted in the development of a prototype LaDePa plant and the LaDePa process patent. The process technology separates the detritus and extrudes the bio-solids through a perforated section in the compaction screw extruder.

The LaDePa plant is containerized for mobility whereby the Genset is in a 20-ft container and the Parsep dryer in a 40-ft container. Loading is done with a bobcat into a feed bin outside the container. The detritus and bio-solids are then compacted while being transported to the other side of the container.

The design and compaction of the feed screw has taken two years to develop. The presence of detritus in a wide range of forms and shapes and the bio-solids consistency need to be taken into account to obtain a working solution.

The extruded solids then fall onto the woven steel belt under the screw extruder. The detritus is discharged separately at the end of the screw outside the container. The layer of extrusions in the 3 – 6 mm diameter range forms a permeable matrix and provides a high surface area which promotes evaporation when subjected to heat radiation from the MIR above and a negative (suction) pressure under the steel belt carrying the extrusions.

The overall solution was not only separation of detritus from bio-solids but also a very high evaporation rate between 3 – 5 ℓ per kWh.

The fast evaporation results in raising of the bio-solids (extrusions) substrate temperature to +180 – 200°C, effectively killing and eliminating the most lethal pathogens and ascarides. The EM is working closely with the University of Kwazulu Natal to research the benefits and effects of the LaDePa process.

Test work is on-going to establish the safety and hygienic conditions of the processed sludge at 80 – 90% solids which is suitable for bagging and resale as a fertiliser.

The EM is in the process of establishing a sustainable employment model which cleans the environment, provides for fertiliser and creates employment.

PSS and the EM are currently in negotiations with the Gates Foundation to develop the LaDePa 2, a sludge processing facility designed to be mass-produced for the developing world which has no access to sanitation. Part of the LaDePa 2 project is to investigate the stability of biogas-generated MIR, and, if successful, it will allow for genset-, mains- or biogas-operated plant.

PSS is entering the commercialization phase of the LaDePa 1 technology until the LaDePa 2 development is complete, which will take approximately two to three years. Enquiries from Brazil, Chile, Peru, Mexico, Kenya, Philippines, Bangladesh and Australia are being processed while locally the EM is acquiring a further three LaDePa plants which need to be operational for the next pit latrine emptying cycle in October/November 2012. The three LaDePa plants will be part of the new model and will be supplied on a rental basis.