



*"Autodesk Inventor Professional has enabled us to extend our product range, increasing our business opportunities, while the efficiencies achieved in assembly have been phenomenal. The past year's 60% turnover increase and 85% rise in net profit are largely attributable to our use of the software."*

André Eksteen  
Managing director  
Agricon Pelleting Machines  
Oudtshoorn, Eastern Cape

## Autodesk Inventor Professional – helping to develop alternative energy sources

Patented equipment designed by eastern Cape manufacturer, **Agricon Pelleting Machines**, using **Autodesk Inventor Professional**, compacts waste material to create viable alternative energy sources that are cheaper – and burn cleaner – than coal.

When Agricon was established by managing director, André Eksteen, five years ago, its activities focused on the design and assembly of animal feed pelletising equipment, aimed at replacing costly imported machinery.

In 2005, when the company moved to Autodesk Inventor Professional software, on the advice of eastern Cape Autodesk reseller, Micrographics, Eksteen re-designed and improved the company's original Agri 150 Pellet mill, producing a much more robust and less expensive product.

The ease of modelling with Autodesk Inventor Professional, combined with its cabling and harnessing capability, simplified and accelerated design work. In addition, the FEA capability of the software enabled Eksteen to analyse the stresses on the shafts, which he discovered were badly underdesigned. The resulting robust shafts, plus the automatically controlled feeding system, ensure smoother operation and reduced user maintenance.

Autodesk Inventor Professional also helped overcome the hitches the company had been experiencing during assembly. By providing the companies that waterjet and laser cut the machine parts with electronic files of designs, Agricon could be certain that parts would be 100% correct. This eliminated delays and costly reworks that had been hampering assembly.

The software has also created extensive business opportunities for the company. The company has been able to extend its product line; adding seven more pellet mills, with capacities ranging from 200 kg to five tons/hour, to the Agri pellet mill range.

The bigger machines compact virtually any waste biomass material, converting it into alternative energy sources for use by industry. Material that can be pelletised includes sawdust, coal dust (or duff) and grape husks. Animal manure can also be pelletised to produce fertilizer.



About 500-million tons of coal dust that can't be used in high temperature burning facilities have accumulated in mine dumps in Gauteng, creating serious ground and air pollution. Coal dust is also dumped into dams, giving off methane gas during its natural fermentation process.

With Agricon's Agri mill, the coal dust can be compacted into pellets with a diameter of 11mm and a length of 10 – 15 mm. Produced at 65% of the cost of mining fresh coal, it can be used to fuel industrial burners. Another advantage of pelletised coal dust is that it burns more cleanly, giving off less carbon monoxide than coal.

"The mills are a very practical solution," says Eksteen. "The compact and robust design of the machines make them ideal mobile pellet factories. They can be transported to a waste dump, eliminating the need to transport the waste to a factory.

"At a time when fuel is at a premium in this country, with an over-extended electricity grid and soaring oil costs, we believe this is a viable, eco-friendly supplement or alternative for industry," says Eksteen.

Pelletising equipment has been installed in all the country's provinces. A pilot pelleting plant at Sasol Secunda has been installed to test the viability of coal dust pelletising for gasification, while Cape Lime uses pelletised coal dust to fuel its burners at its mine in Vredendal. There has also been significant international interest in the system and negotiations are under way with companies in Holland (wood pelleting), USA (charcoal pelleting) and France (Bentonite pelleting).

Agricon's equipment was placed fourth in the 2004 National Innovation Competition.

