

Fan and evaporation collaboration optimises energy efficiency

MechCaL has teamed up with I-CAT to develop a custom-designed evaporator using one of MechCaL's patented fan designs for a high-energy efficient unit with the first completed units destined for Douglas Colliery.

MechCaL and leading environmental solutions provider I-CAT have joined forces to develop an optimised evaporation canon using MechCaL's low pressure, high flow fans to evaporate mine water. The companies will work closely to leverage MechCaL's technical leadership in the use of composite materials with the I-VAP 500's ability to perform in harsh environments, while providing remarkable evaporation capability.

The aim of this cooperation is to further the efforts of both companies in bringing high performance energy efficient evaporation products to the mining industry. MechCaL's managing director, Jan du Plessis predicts that the joint venture will enable both companies to benefit from a simpler yet highly effective process for manufacturing products for the evaporation of excess mine water. "MechCaL is focused on providing the best mining ventilation and cooling solutions to help mines achieve high efficiency with lower energy usage. We expect that our



MechCaL and I-CAT will work together closely to leverage MechCaL's technical leadership in the use of composite materials for fans.

collaboration with I-CAT will streamline the process for our clients by providing them with a dual solution that is custom designed as opposed to having to secure these products separately."

He adds that MechCaL product's quality design and manufacturing also increase the product life as well as increasing the mean time before failure while reducing maintenance requirements.

The two companies have entered into a memorandum of understanding (MOA) with I-CAT being designated as the sole distributor. Six evaporator/fan units were produced at MechCaL's manufacturing facility in Pretoria last year and final assembly of the units with the intelligent weather control system was undertaken by I-CAT at its facilities.

The I-CAT I-VAP 500 was originally developed following the identification of a need for an effective and environmentally safe evaporation system that can be used to reduce excess wastewater in mines. After thorough research and development done in conjunction with the environmental department at I-CAT, a prototype of the I-VAP 500 was designed and built for trial use.

The I-VAP 500 is capable of handling 500 m³ of water per twelve-hour shift with evaporation rates measured at between 60% and 65%, depending on ambient weather conditions. In order to

ensure that the unit is light, durable and mobile, as well as being resistant to rust, it must be constructed from composite materials – the use of which is one of MechCaL's areas of expertise.

The high energy efficiency unit will have an inlet cone and nozzle configuration that is made from composite materials. The nozzle itself is designed using CFD coding to assist in an optimum flow pattern and droplet throw distance. The MechCaL manufactured I-VAP 500 will also incorporate MechCaL's patented nose and tail cones and state-of-the-art stator design, which improves air flow by reducing turbulence and promoting laminar flow.

The units are designed to be 'fit-for-purpose' with an emphasis on energy, evaporative efficiency and noise reduction. Working within harsh environments, the I-VAP 500 will ultimately manage excess water through evaporation but will also be adaptable for use in dust suppression as well as potential fire fighting applications by changing the water nozzle and pump configuration.

In commenting on the future relationship with I-CAT, Du Plessis says: "I-CAT is a prime example of an innovative company that seeks continuous improvement in environmental applications and thus the innovative nature of our two companies is a hand in glove fit." □

MechCaL and I-CAT

MechCaL was established in 2002 to design and manufacture industrial fans. The company has developed proprietary software that allows for high efficiency designs that reduce CO₂ emissions by using less energy. Out of manufacturing facilities in Pretoria, MechCaL focuses on developing specialised fans made from advanced composite materials.

I-CAT is a leading environmental management company with its primary focus on supplying products and services to assist companies in environmental compliance. The company delivers expert services and products through four main divisions: Dust Solutions, Fire Solutions, Water Solutions and Environmental Solutions. □