

E3k helps reshape Aust. water future



Innovative research and development specialist, e3k, has turned to tackling the urgent challenge of water storage.

Duncan Gilmore, president of e3k, said with the huge increase in demand for domestic water tanks brought on by the current drought conditions in parts of Australia, e3k is using its extensive engineering experience and understanding of water pressure within tanks to optimise tank designs to maximise their capacity-to-cost ratio.

"Traditionally, tank designs have been cylindrical because it is easy to manufacture and is a material-efficient shape for containing internal pressure," Mr Gilmore said. "Cylindrical shapes minimise wall thickness and help reduce material costs.

"However, with the expanding market need for slim-line shapes to fit into narrow spaces around homes and for underground tanks, the engineering design of tanks is becoming more challenging," Mr Gilmore said.

The principle behind the weird and wonderful shapes of many of the slimline tanks on the market is maximising strength and minimising wall thickness, saving material costs.

For example, during an engineering design and Australian Standards review of one proposed tank, e3k was able to reduce the required material thickness of a flat section of the tank to one-seventh – a significant reduction when it comes to designing for manufacture.

3D AND FEA ANALYSIS

Ray Hope, vice president of e3k Global, said as well as their general expertise in pressure vessel design, e3k engineers utilise 3D computer

modelling and analysis tools such as finite element analysis (FEA) to assess and optimise designs for strength, water capacity and volume of material required for production.

These computerised methods allow e3k to accurately simulate the effect of various loading conditions on tanks, as well as their performance under tests defined by Australian Standards, well before a single tank is manufactured or production tooling is produced.

However, Ben McGarry, principal engineer, for e3k Think, said it was not always necessary to use advanced computer analysis tools.

"We have had clients come to us wanting to utilise our experience with computational fluid dynamics (CFD), and we have been able to assist them using our understanding of fluid flow phenomena without having to go to the expense of performing a full CFD analysis for them."

Mr Gilmore said, "E3k's engineers have a 30 year history of enhancing the value of IP by creatively applying their understanding of engineering principles. In this case, their insightful approach to an age-old product is helping to reshape Australia's water future."

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Water tank shapes need to be adapted effectively to available space.

IN BRIEF >>>

QIMR TARGETS CHINA CANCERS

World-first clinical trials into a promising new immunotherapy treatment that targets cancer cells are about to get underway.

The ground-breaking research by scientists at the Australian Centre for Vaccine Development at the Queensland Institute of Medical Research (QIMR) discovered a way to treat a painful and often terminal cancer.

Nasopharyngeal Carcinoma (NPC), or Guangdong Cancer, is one of the top four causes of cancer death in the Guangdong Province of China, taking thousands of lives each year.



Queensland scientists have taken a giant leap forward and developed a new form of immunotherapy treatment that stimulates the immune system by 'training' a patient's blood to recognise and destroy the Epstein-Barr virus.

The treatment is about to go into clinical trials in the region, and it will be done on a not-for-profit basis, with QIMR receiving no commercial benefits for the treatment's transfer.

The phase one clinical trial would initially involve 30 patients, rising to 300 in phase two. QIMR will work closely with the University of Hong Kong and Queen Mary Hospital to conduct the clinical trials.

QIMR director Michael Good said under the phase one trial Professor William Wei, Dr Daniel Chua and Dr John Nicholls from the Departments of Clinical Oncology and Pathology at The University of Hong Kong Li Ka Shing Faculty of Medicine will test the efficiency of the immunotherapy method in 30 NPC patients.

"Our philosophy to this approach to treating cancer is to provide natural remedies and treatments and to make these available to patients including children," Prof. Good said.

www.qimr.edu.au ■