Biotech e3k breakthrough

E3k: new medical product development.

E3k Medical, part of the new product design and development arm of the Brisbane-based specialist research and development consultancy Gilmore Engineers, is taking on the unique engineering challenges inherent in the functional design of products for the medical industry.

Among the broad range of projects undertaken are the development of world-patented remedial drug inhaler technology, an emergency transfusion device, sharps-safe products, a portable sterilisation system, a sunscreen applicator, devices used during surgery, nursing home patient-assist equipment, and the design of a hyperbaric chamber.

Duncan Gilmore, president of e3k, said although the universal problems faced in any functional engineering design are present in the medical field, there are generally some larger challenges.

"Often products or devices need to combine multiple functionality and ease of use while preserving small component size," Dr Gilmore said.

Additionally, the industry is tightly regulated, presenting challenges found in few other business sectors. In Australia, medical devices must be entered on the Australian Register of Therapeutic Goods (ARTG), involving compliance with the *Therapeutic Goods Act 1989*.

"Factors which need to be considered in design of new medical items include ergonomics, materials and packaging," Dr Gilmore said. "Ergonomic considerations include usability, intuitive layout and comfort.

"Materials must be carefully selected, especially those for items which need to be sterilised or come into contact with skin, blood, tissue, medications or other fluids. Often the product will need to be able to be packaged in such a way as to facilitate sterilisation.

"Innovation is also required to get products to market as quickly as possible, and to create unique intellectual property."

E3k Medical is able to provide engineering assistance on a consultancy basis for the development of a broad range of products in the medical field including prostheses, patient-assist devices, surgical equipment, sharps-safe devices, and hospital equipment including beds, trolleys, chairs, lifts and monitors.

"Additionally e3k can work with diagnostic or pharmaceutical companies to develop engineering solutions which complement their own areas of speciality," Dr Gilmore said.

Steve McCallion, research and development engineer at e3k, said the engineers at e3k Medical use a number of tools to develop creative and robust design solutions. These tools include CAD (computer aided design), finite element analysis (FEA) and computational fluid analysis (CFD).

"Using 3D CAD software can greatly assist in the visualisation of tiny components and their interaction with each other," Mr McCallion said. "CAD also allows components to be scaled such that larger than life prototypes can be produced.

"The models created using CAD can then be imported into FEA software so that the 'virtual' components can be checked for mechanical strength."

FEA allows complex loading situations, such as those which may occur within the body, to be applied. CFD is used to analyse how fluids flow in or around components. ■

IN BRIEF > > >

INVENTIVE REWARDS

Inventors are being encouraged to apply for the Queensland Government's Innovation Start-Up Scheme (ISUS). ISUS round nine will assist up to 10 recipients, with individual companies eligible for grants of up to $85,000. ISUS helps reduce the struggle for innovators by supporting activities such as developing prototypes, refining designs, undertaking testing and other steps necessary to make a product market-ready. So far, 73 Queensland companies have shared $5.4million in ISUS grants since the competitive funding program started in 2000.

One of these is Mediasphere, a Daisy Hill-based multimedia and e-learning publisher, now expanded to Springfield, which received $85,000 in early 2006 to help commercialise its suite of six online education programs for home and schools. Mediasphere's flagship product BroadLearn is a web-based computer program with written lessons, speech tutorials, games and quizzes on literacy, mathematics and science to help kids improve their knowledge.

Mediasphere chief executive officer Anthony Carrucan said the funding helped the company undertake market research, secure intellectual property rights, and develop prototypes for BroadLearn. "We've since launched one of the BroadLearn programs, Early Learning, which went on the market late last year," Mr Carrucan said. "The program was introduced into ABC Learning Centres not long after, and the company is now on board as a partner. "Today, more than 1300 schools and kindergartens throughout the world have purchased the software. It is used for teaching and learning in all Australian states and territories, and overseas in the United States, the United Kingdom, New Zealand, Japan and China."

Earlier this month Mediasphere was named the winner of the inaugural Mincom Connect Award 2007 - Gateway to USA (see story in *Companies on the Move*), giving the young company the opportunity to be groomed and mentored by Mincom to expand even further in the lucrative American software market.

www.innovation.qld.gov.au ■