

ADVANTAGE

Gilmore Engineers Finds Niche Opportunity in US Market

The ability of Gilmore Engineers to provide a diverse range of product development services and expertise created considerable interest among "start-up" companies during the recent Pacific Design Engineering Show at Anaheim in the United States.

Gilmore Engineers was one of around 1500 exhibitors at the show which was held in conjunction with the Medical Design and Manufacturing West 2000 (MD&M) exposition. About 15,000 delegates attended the combined events over a three-day period.

The design show targets original equipment manufacturers on the West Coast of the USA that generate almost \$50 billion in business annually. The MD&M exposition which is now in its 17th year, targets the world's leading manufacturers of medical devices - a \$69 billion a year industry in the USA.

Gilmore Engineers' President Dr Duncan Gilmore said the range and type of expertise provided by his company placed it in a unique position at the show.

"There are many start-up companies and growth industries - particularly in the

biotechnology field - which have an increasing need for product development," he said.

"Gilmore Engineers' ability to provide research and development services including intellectual property development(ThinkTank), product refinement and problem solving expertise was of particular

interest to those companies," he said.

"They included manufacturers of surgical equipment, developers of innovative cardio-vascular devices, and bio-technology equipment."

continued page 2

...at the Olympics too!

When Australia's kayakers line up at the Sydney Olympics they will have a better understanding of their capabilities, thanks to some innovative research and design work by Gilmore Engineers.

The Queensland Academy of Sport recently asked Gilmore Engineers to devise a way of obtaining a reliable measurement of the forces applied by athletes to the foot bars in their kayaks. It was necessary to measure the timing between the upper body paddle action and the subsequent application of leg force through each stroke in order to develop advanced biomechanical training programs for the kayakers.

The QAS had been unsuccessful in its attempts to find commercially-produced devices that met the primary functional requirements of low-cost, easy installation, ability to withstand high impact loads in one direction of force, together with durability in a salty environment.



continued page 2

FROM PAGE ONE

Gilmore Engineers in US Market

He said manufacturers of building products, companies interested in rapid prototyping of large objects, software developers, automotive component suppliers, entertainment theme parks operators, and those requiring advanced engineering analysis and refinement of their existing products had also expressed interest in the expertise offered by the company.

Dr Gilmore said one of his company's major strengths was that it had strong links with many other research and development organisations and was able to co-opt specialists in many fields including medicine and biotechnology.



Visitors discuss projects at the Pacific Design Show in Anaheim, California.

"This factor, together with the company's strong record of achievement in diverse fields, and the professional, enthusiastic and competitive approach of staff, was commented on by many of the visitors to the exhibition," Dr Gilmore said.

"I believe these are the factors that will help us to develop productive business relationships in the United States, and have already resulted in active involvement with a number of American groups," he said.

New Member of the GE Team



A new staff member has added to the already extensive range of engineering expertise at Gilmore Engineers.

Daniel Byrnes B.E. (Manufacturing and Materials), MEngSc joined Gilmore Engineers as a Research and Development Engineer in the New Products Division in January 2000. For the previous seven years, Daniel was a Research Engineer at the CSIRO Division of Manufacturing Science and Technology at the Queensland Centre for Advanced

Technology, Pinjarra Hills near Brisbane, Queensland. During this time he was involved in improving metal casting processes ranging from aluminium and magnesium to ferrous metals.

Professionally, he has a wide range of skills in product design, testing and analysis, and also in the use of numerical modeling to develop solutions to industry problems.

Privately, Daniel is a keen glider pilot and participates in a wide range of other sports including squash, tennis and running.

FROM PAGE ONE

At the Olympics!

After many hours of brainstorming by Gilmore Engineers, a solution was developed. The housing and main components were constructed of nylon and stainless steel, with critical parts being subjected to a stress analysis.

A 3D CAD model was generated along with a full set of production drawings, before the device was manufactured and successfully put to use by the QAS.

(The commercialisation rights on this device are retained by Gilmore Engineers. Inquiries should be directed to the Brisbane office.)

Systematic Approach to Product Development Yields Best Results

Whether developing a new product or improving an existing one, a swift and successful outcome is more likely to be achieved through a systematic and staged approach to the project.

Gilmore Engineers have developed a staged approach to new product development that has proved itself to be efficient and practical in its application to a wide range of complete products, as well as to constituent components. It also allows for the review and evaluation of progress at specified stages.

Stage 1: Background Research

Before embarking on the development of any new product it is necessary to gain a thorough understanding of factors such as how the product will be used, the environment in which it will be operated, user requirements and any rules and regulations governing its use. If it is planned to commercialise the product, market research should also be undertaken to establish consumer needs and potential demand. This information enables guidelines and parameters to be established against which the project can be evaluated at later stages.

Stage 2: Ideas and Solutions

Gilmore Engineers have proved the value of a ThinkTank approach to generating new ideas and achieving practical solutions to a wide range of design, manufacturing, commercialisation and problem-solving challenges.

The ThinkTank involves free-thought brainstorming sessions that encourage lateral thinking and often generate hundreds of creative ideas - some of which

are discarded while others form the basis of the final solution.

This is an important stage because it allows many options and possibilities to be explored before there is a more substantial commitment to design and development. It is also an opportunity for both client and designers to decide if it is practical to proceed.

In addition to the extensive range of engineering expertise that Gilmore Engineers' staff can contribute to the process, the company can co-opt experts in many other fields including medicine, biotechnology, physiology or food technology, to help develop solutions to a particular project.

Stage 3: Concept Refinement

The most promising concepts generated by the ThinkTank are qualitatively assessed against the selection criteria developed in Stage 1. This is also an opportunity to identify weaknesses and to evaluate the strengths of particular concepts and investigate if they can be integrated in the final design.

Some basic modeling, prototyping or "prontotyping" (rapid prototyping) may also be undertaken to prove concepts or differentiate between ideas.

By the end of this stage the design team should be able to finalise one or more fully developed concepts.

Stage 4: Development

This is the stage when the overall concept is refined, detailed engineering designs are completed, and the project becomes a physical reality with working prototypes.

Stage 5: Testing

Prototypes or pre-production models undergo final testing, wholly or in part. Testing may involve the physical operation of the product or computer analysis of its performance.

The objective is to ensure that the final product meets the parameters established in Stage 1 and performs to the required standard.

Stage 6: Commercialisation

This is the "make-or-break" stage that decides whether the product will be a commercial success.

Gilmore Engineers can also provide important support to other professionals such as market researchers, patent attorneys and financiers who may be involved in this stage. The company can offer expertise in the areas of project management, marketing, protection of intellectual property, and help with obtaining development capital.

WEBSITES OF INTEREST

www.dogpile.com

A search engine which enlists several other search engines on your task.

www.statedevelopment.qld.gov.au

Financial assistance for innovative projects.

www.cat.csiro.au

Queensland Centre for Advanced Technology.

NEW CONTACT DETAILS FOR GILMORE ENGINEERS

Website

www.gilmore-engineers.com

Email

info@gilmore-engineers.com

MURDER - and Other Investigations

Providing forensic evidence in a murder inquiry, investigating the cause of cracks in the chassis of a heavy vehicle, or assessing factors that may have caused a customer to fall in a shopping centre, are all within the scope of expertise offered by Gilmore Engineers.

The company's Failure Analysis Division has also provided expert witness reports on issues as diverse as loss of life through suffocation or arson, work injuries, product failure, motor vehicle accident analysis, and cases involving patent and copyright infringement.

In a number of alleged-murder investigations, Gilmore Engineers was required to undertake scientifically-based tests and engineering research, and to re-create scenarios in order to assess the validity of existing circumstantial and physical evidence.

In investigating the vehicle chassis' cracks it was necessary to establish if they were the result of overloading, recent repairs,

poor initial engineering design, or poor quality material. The investigation involved the use of engineering methodology and computerised finite element stress analysis to examine the detailed behavior of the chassis under load. Metallurgical analysis was also undertaken.

The Gilmore Engineers' Failure Analysis Division currently consists of five professional engineers, and during the past 14 years has investigated and reported on more than 700 cases. Company President Dr Duncan Gilmore has personally been preparing expert witness reports for more than 21 years.

As well as providing detailed written reports, the engineers involved in the investigations are available to provide oral presentations in any forum required.

Where necessary, Gilmore Engineers' consultants work in conjunction with other specialists such as physiotherapists (to assess the safety and design of an office furniture product),

physiologists, medical specialists and patent attorneys (in relation to the design of drug delivery devices), and human movement specialists (regarding sports training instrumentation).

In addition to having highly qualified and professional staff available to undertake failure analysis investigations, Gilmore Engineers' consultants have the skill and experience to lead the investigations on behalf of other organisations, where necessary.

The company's failure analysis services are offered worldwide, with particular attention being paid to countries in the Pacific Rim.

Towards Cleaner, More Efficient Engines

Research and development engineer Philip Teakle has developed two major computer models to assess and analyse new design concepts of internal combustion engines.

The first program, ODIE, is a lumped parameter model based on data relating to engine geometry, inlet and exhaust specifications, engine speed, fuel injection specifications, and engine and fuel pump timing. This can provide predictions on brake output power, fuel consumption, thermal efficiency, in-cylinder pressures and temperatures, fuel and air delivery ratio, and scavenging efficiency.

The second program, TAILPIPE, is a more complex multi-zone emissions model that can be applied to two or four-stroke direct fuel-injected engines using diesel or other fuels. It is designed to undertake detailed analysis of gas movement in the cylinder, fuel spray dispersal, temperatures in different parts of the cylinder and combustion.

Both programs are invaluable tools, enabling preliminary analytical assessment of novel engine concepts without the need to produce expensive physical prototypes.

Gilmore Engineers Pty Ltd
ACN 060559480

Queensland Clunies Ross Centre
Brisbane Technology Park
Cnr Miles Platting and Logan Roads
P O Box 4037
EIGHT MILE PLAINS 4113
Brisbane, Queensland, AUSTRALIA

Phone: 61 7 3853 5250
Fax: 61 7 3853 5258
Email: info@gilmore-engineers.com
Website: www.gilmore-engineers.com

ENGINEERING STAFF

Duncan Gilmore PhD
Nicholas Agnew PhD
Philip Teakle M.Eng.Sc.
Ray Hope PhD
Daniel Byrnes M.Eng.Sc.

SERVICES

Research and Development
Engineering Failure Analysis
Technical Project Management
and Product Commercialisation

DISCLAIMER

This publication is for general information only, and does not intend to give specific advice.