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Mike Evans
Research and Development Director
Genesis Fitness, Johannesburg

Genesis Fitness fights above its weight

An 85% reduction in prototypes, combined with accelerated manufacturing time and reduced manufacturing costs, have enabled a 100-person South African business – **Genesis Fitness** – to compete with large, well-resourced international companies.

With 60% of the local market, Genesis Fitness is South Africa's largest manufacturer and distributor of cardio vascular and weight training equipment. In addition to the design and manufacture of three ranges of weight training equipment, the company also provides gym design services and wellness programme management services.

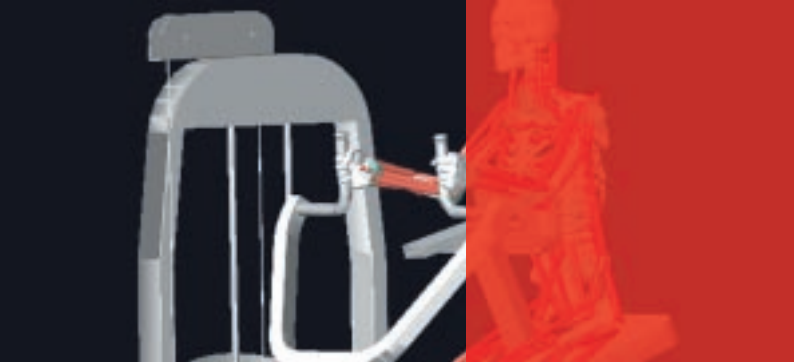
The 24-year-old company recently introduced Autodesk Inventor to its design office, accelerating its manufacturing process, cutting costs and getting its products to market faster.

The increased manufacturing capability at Genesis coincides with strong growth in the wellness market. Not only are individuals seeking improved health, but business has also identified the need for greater wellness among staff.

According to reports in *Business Day*, absenteeism costs South Africa about R12-bn a year, while 50% of corporate healthcare expenses can be ascribed to potentially modifiable risk factors, such as lack of exercise, smoking and poor nutrition.

Genesis Fitness clients include major gyms, such as Planet Fitness, Family Fitness and Super Sport Health and Fitness, while it also counts companies such as Barloworld, Eskom and Nedbank among its top corporate clients.

"Today, the provision of facilities such as wellness centres not only improves the productivity of staff, but is also a strategy aimed at helping to retain critical skills," says research and development director, Mike Evans.



An overall 35% timesaving in the design and manufacture of Genesis equipment is enabling the company to implement a critical research and development strategy of halving the development cycle of new ranges.

“With Inventor, we’ll be launching new ranges of our weight training equipment every five years, rather than on a 10-year cycle,” says Evans.

Collaboration with biomechanics specialists, combined with use of Inventor’s finite element analysis (FEA) capability, has enabled Genesis to boost the performance and quality of its equipment.

“We’re one of only two gym equipment manufacturers in the world that work with biokineticists who use specialised biomechanical modelling software to simulate body movement and forces placed on the body,” says Evans. “With the use of Inventor’s STEP or IGES files, the biokineticist can quickly and easily simulate use of our equipment and suggest design improvements.”

Design changes ensure that an exercise will target the correct muscle group(s), without undue joint or ligaments stress. In the seated row machine, for example, moving the seat back two degrees reduced force on the lumbar region and strain on the joints between the lumbar vertebrae.

“We quickly make the suggested changes to an Inventor model after which we use the FEA capability of the software to test that the frame is sturdy enough to cope with repeated forces that will be exerted on it. While we can be confident about the quality of the equipment, we’re also not wasting materials by over engineering it,” say designers Mark Trafankowski and Jaques Coetsee.

Significant time savings have been achieved in the design phase with digital prototyping reducing the number of physical prototypes by 85%. “Previously, we built an average of six physical prototypes for each our machines. Now, we build just one,” says Evans.

Collaboration with sub-contractors has been accelerated with parts being returned to Genesis in a week. “Previously, this would have taken three to four weeks,” says Evans. In addition, because they use specifications direct from a DWG or DXF file, there aren’t any errors.”

Time and material savings have also been achieved in the manufacturing process. Cutting and welding times have both been halved, with overall assembly time being reduced by 35%. The cost of consumables has also been halved.

“We’ve been able to reduce the thickness of the steel by 0.5 mm and, together with more efficient welds made possible by modelling them on Inventor, have also made significant weight savings.”

Lead times for delivery of Genesis machines are now 30 days.

“Not only is this significantly faster than any competitors, but gyms that opt for Genesis equipment also receive rapid maintenance service, giving us a big advantage over international companies,” says Evans.

Genesis is supported by the Autodesk Premier Solutions Provider, Modena Design Centres.

