

# Technical approach to machining needed

By Guy Littlefair

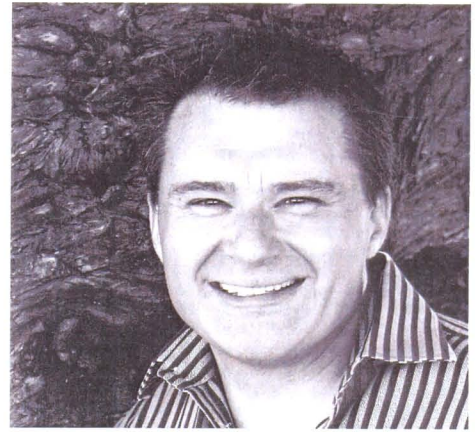
I've not lived in New Zealand for very long, having previously worked with the Europeans and North Americans, and so perhaps some would ask: "So what do you know about what we do here?" My answer would be simple: "Well, I can tell you what the rest of the world is doing and so let's compare notes."

Machining is a difficult industry to be in at the best of times. Customers continuously demand faster turn around times, at lower cost, with higher quality – as illustrated by the triangle below. Based on this, it's easy to look at the suppliers and demand the same from them – cheaper tooling; delivering more components per insert; providing better quality through enhanced surface integrity and dimensional accuracy. However, this is not the way we should be approaching things: far from it in fact. What the ma-

chining community needs to do is to move away from looking at the bottom line and look at the "technological approach", what I term "technoloach", of what they do. This does not necessarily mean buying the latest machine tools or investing in new generation CAM software but instead focussing on what really makes a difference to productivity and thinking outside the square. What should be considered is: "What are the small changes that can be made to the established norms which will result in a significant impact on profitability and allow thinking 'outside the triangle?'" (see fig. 1).

Typically, the cost of production for machined components is along the lines of that shown in the Pi chart below. You will notice that only around 3% of the total is attributable to tooling and only 18% attributable to workpiece material. These are relatively small percentages and this has been reflected in surveys which report that it takes a 30% reduction in the cost of tooling to deliver only a 1% reduction in the total cost per component. Similarly, it takes a 50% increase in tool life to have the same 1% reduction in the total cost per component. In contrast, by adopting a new technoloach and increasing the cutting speed by 20% and modifying the machining process to suit, we can expect a 15% or greater reduction in the total cost per component. The interesting juxtaposition is of course that we may actually have to pay slightly more for our tooling technology to cope with the higher feeds and

speeds but this would significantly be outweighed by the net cost benefits (see fig. 2). Technology driven machining practices are not the only thing we in New Zealand should be focussing on however. My advice would be the establishment of a Trade Organisation to support the machining based manufacturers, similar to the "British Turned Part Manufacturers Association" ([www.btma.org](http://www.btma.org)). Such an organisation would serve as a shop window for the world to see the evidence and possibilities of what the New Zealand machining community is able to produce. Some of the machining I have seen here, since I arrived in 2005, rivals that of the best in Europe and whilst many describe it as "Niche manufacturing" I would rather argue that we consciously take the position in the world we do, rather than being forced to take it and so prefer the term "Boutique manufacturing". A specialist trade organisa-



tion could manage the global interests of the boutiques leaving them to perfect what they do best. A trade organisation could be useful for other reasons as well, and whilst it's safer to leave the politics to the politicians a stronger voice for lobbying has to be a positive. New Zealand is able to be dominant on the world stage in many areas. This can also be true of its machining industry and by adopting and implementing suitable technoloaches together with taking a team effort approach to global business, the path taken may well be more direct and ultimately less problematic.

Dr Guy Littlefair heads the Machining and Machinability Research Group at AUT University – the only such group in Australasia. He has acted as a machining consultant to some of the world's largest engineering companies including those in the Automotive, Aerospace and Petroleum sectors as well as working with numerous SMEs. He is currently working towards establishing a national centre for machining research to help support industry in New Zealand by revolutionising perceptions and approaches to machining technology.

Fig. 1

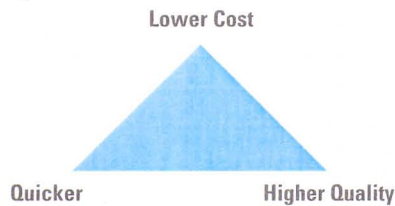
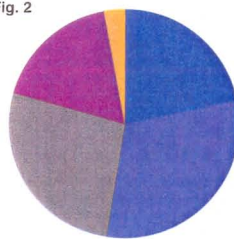


Fig. 2



Typical machining cost distribution

- Cutting Tools (3%)
- Workpiece cost (18%)
- Machine cost (26%)
- Labour (30%)
- Buildings/administration (22%)