



WorkNC helps compress the development time for the T.25 City Car



Gordon Murray

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Jon Ingleby, Gordon Murray Design
Prototyping Applications Manager.

Highlights

- The company can leave WorkNC to cut overnight, or while its engineers get on with other tasks, with absolute confidence in the results.
- As the CAD interface is so reliable and WorkNC is tolerant of small imperfections in the model, the company saves the considerable amount of time it can take to repair these.
- Other CAM software packages used in the past have been very complicated, so have fallen into disuse because the company’s requirements are intermittent. WorkNC is so simple to operate engineers can jump back into programming immediately.

■ A new vehicle concept

Sescoi’s WorkNC CAM/CAD software is playing an important role in the design and development of a new vehicle concept, which addresses traffic congestion and the overall CO₂ impact produced during the lifecycle of a car. Designed and developed by Gordon Murray Design based in Shalford, Surrey, UK, the T.25 City Car and the iStream manufacturing process started from an idea first conceived by Gordon Murray in 1993.

■ The man himself

Company founder, Gordon Murray, is very well known in the motor racing world. He designed a series of Brabham F1 racing cars which enabled Nelson Piquet to win the world championship in 1981 and 1983. Within two years of moving to McLaren as Technical Director, his Honda powered McLaren had won 15 out of the 16 grand prix races and gave Ayrton Senna his first driver’s championship. Subsequently, as head of McLaren Cars, he designed road-going supercars – the McLaren F1 and the Mercedes-

Benz SLR McLaren, before forming Gordon Murray Design in 2007.

■ iStream manufacturing process

The key design elements for the T.25 and iStream are for a very small vehicle, which protects personal mobility, is economical and safe to own, fun and stylish to drive, yet which has a low lifecycle carbon footprint. To achieve these aims, and to make the car as spacious as possible inside, required considerable effort on vehicle packaging, with many design iterations. This was further complicated by the principles of iStream, which demanded flat packing of the vehicle for transportation, ready for final assembly in end user markets.

■ Benefits of easy to use CAM

Jon Ingleby, the company’s Prototyping Applications Manager, uses WorkNC to produce the body panels for the styling studio model as well as for the seating buck, which is used to evaluate the space inside the vehicle. Machining of the models and molds,



which can be full size, is carried out on the company's ITP overhead gantry CNC mill.

He explains, *"I used WorkNC at McLaren, so it was the natural choice when I joined Gordon Murray Design. We have a wide range of responsibilities in the design studio so the software's ease of use is very important to us. WorkNC is sometimes not used for a few weeks, but because it is so simple to operate we can jump onto it again and start programming immediately. Software packages I have used in the past have been very complicated, so have fallen into disuse because our requirements are intermittent and we have forgotten how to use them."*

■ Enabling multi-tasking

A range of rapid prototyping methods is used in the styling studio, including conventional pattern making, fused deposition modeling, CNC milling and composite panel production. To compress development times, engineers need to be skilled in all these areas and have the means of working on several tasks simultaneously.

Jon Ingleby explains, *"There are three cycles of body design during the vehicle development program, from wind tunnel models to a full size model, which we can machine on the ITP gantry mill using 3+2 machining*

techniques. In WorkNC it takes about 1-2 hours to program the roughing toolpaths and, while cutting is underway, we program the finishing paths. We have never had a problem with WorkNC so we can leave it to cut overnight, and while we get on with other tasks, with absolute confidence in the results."

■ Time compression

Gordon Murray Design uses Catia V5 to model the T.25. 'A' class surfaces are imported into WorkNC ready for machining. Jon Ingleby says, *"The CAD interface is very reliable, and WorkNC is tolerant of small imperfections in the model, saving the considerable amount of time it can take to repair these. Once machining has been completed we inspect the part with a touch probe and compare it with the original model. In every case it is well within tolerance."*

Having these facilities in-house enables Gordon Murray Design to ensure the confidentiality of the project and produce new prototypes within one or two days. Jon Ingleby adds, *"The ease with which we can pick up WorkNC, after not using it for a few weeks, is crucial to our way of working. We would not have been able to complete the car within our two year target without WorkNC and the ITP machine. It has enabled us to compress two months work into one week."*

