

## ► ACCURATE TO THE LAST MICRON

The new Co-ordinate Measuring Machine in the machine shop has certainly exceeded our expectations since it was commissioned in March 2004. When the call was first made to invest in the machine the goal was to avoid having to consider other expensive special purpose inspection equipment that might only be used a few times a year. However the benefits of the machine have far exceeded our expectations and we've been able to deliver a greater level of service and product quality to customers as a result.

As the full CMM model the WENZEL LH54 can inspect multiples quickly, it enables a more thorough inspection and establishes process capability. This helps avoid quality issues at a later date by providing a more accurate analysis. As a consequence, customers are supplied a more accurate product with a lot less delay in the quality assurance process because of measurement difficulties. Thanks to the machine we have identified a variety of quality and compliance issues and, as a result, have been challenged to become better engineers and producers.

The WENZEL LH54 has a working envelope of 1000 x 500 x 400 (y,x,z axis) with a fully indexable probe and will accept up to 250 kg on the granite table.

The machine is available for customers to have components measured and if a CNC program has been generated for



these components, then reports highlighting issues can be produced. Programs can be retained for future use if required by the customer. As the machine is in use constantly we will need a week's notice. If the demand for this service is high we will look at adding additional resource to accommodate the demand.

To book the machine or to find out more contact John Baird on 09 621 0020.

## ► AND THEY'RE OFF ...

Following on from the awesome record set last year by the Heat Treatment Skyline team (see Nov 2006 issue) the car has now been run at the import All-Stars meeting at Taupo. It netted two 7.7 sec passes with a reduced power level from when the car was run in Willowbank Australia, resulting in a first equal result after the eliminations.

The Heat Treatments Camaro is also gearing up for the season with a new engine program. The next meet is the AC Delco Nationals – so watch this space for results.



# Celsius

HEAT TREATMENTS LIMITED

## Looking at the bigger picture

Autumn Issue (March, 2007)

No-one could doubt that heat treating is in the McGregor blood. Founded by W.D. McGregor in 1946, Heat Treatments has always had a succession of McGregors' working either at the helm or within the business itself. On board currently are Keith and his two son's, Kevin and Reece, and whether they are tweaking the Heat Treatment racing cars or working on a customer's product, they each derive immense satisfaction from being part of an organisation their father / grandfather started.

To get a 'big picture' perspective on the business, Celsius spoke with Keith McGregor:-

### What do you see as the key factors influencing the business over the last few years?

"The increase in operating costs has been a significant factor impacting the business over the last decade. Energy charges have increased dramatically, as have labour costs. Compliance costs have risen and, although adherence to legislation has had a positive impact on the quality aspects of our business, it comes at a price."

"Simply passing on such large cost increases is not possible in a market the size of New Zealand and consequently we've had to look at ways of making the business more cost efficient."

### What would you say were the major changes that have occurred in the business?

"Investment in new plant has been a hallmark of Heat Treatments throughout the years and it's been one way we've countered the rise in operational costs. By installing newer, faster machines, and looking at automating as many processes as possible, we are working towards making the business more efficient."

"Examples of this include a new fully automated shaker hearth which operates unmanned throughout the night and a new induction hardening machine [not yet commissioned] that is capable of working on two pins at a time rather than the current machine which can only do one."

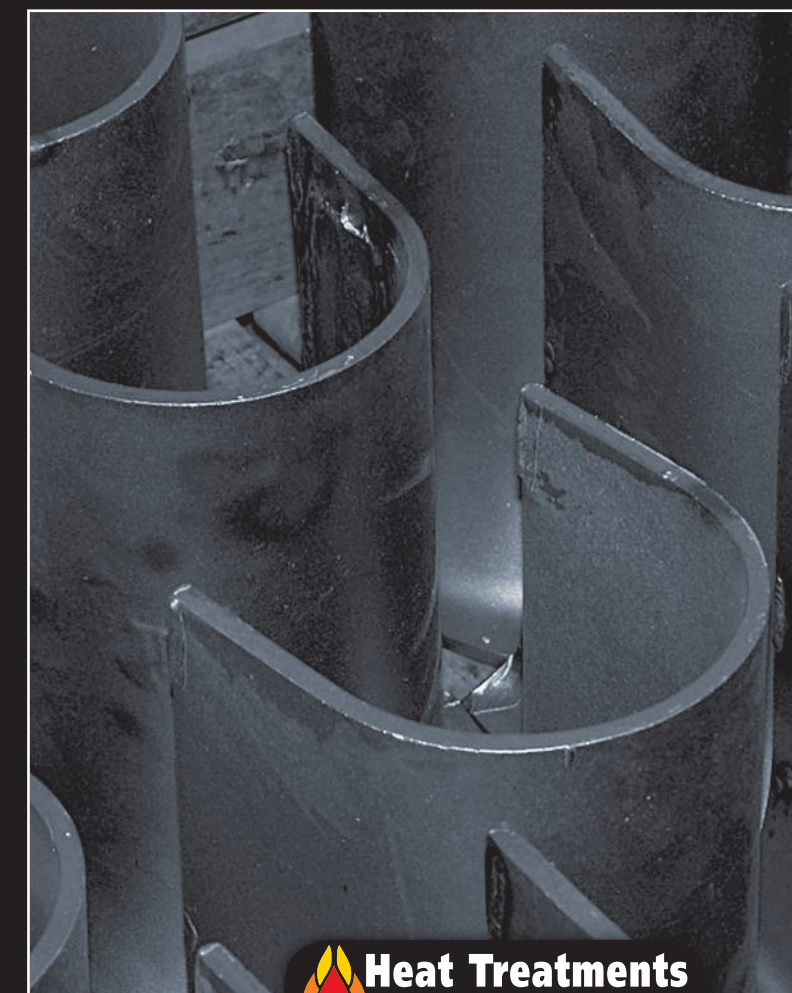
### How is the market changing?

"Customers are looking for a higher degree of accuracy, hence our decision to invest in a co-ordinate measuring machine that can measure down to just a few microns. They want to avoid any reworking as it costs both time and money."

"We've seen a lot of work head off-shore only for it to end up back at Heat Treatments as the quality of the work has been so poor. For example we recently had to re-work some screws that had been made overseas and which were breaking due to incorrect heat treatment."

### Where to from here?

"There is always a way of improving what you do and when you pull together a group of like-minded people there is always a new idea brewing somewhere. Many concepts have been born on the back of a lunch wrapper and many more come from our involvement with heat treating organisations overseas. Wherever the ideas come from our goal is to make good on those that will see us continue to lead the heat treatment industry in New Zealand."



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#### THE HEAT TREATMENTS SERVICE TEAM:

<b>Heat Treatments:</b>	Len Allen Reece McGregor Adam Walmsley	Customer Service Production Quotations
<b>Technical / Metallurgical:</b>	Adam Walmsley & Ivan Mitchell	
<b>Machine Shop:</b>	Dennis Scotting Brian Thompson John Baird	Estimates & Quotations Production Operations
<b>General:</b>	Steve Askew Kathy Williams Elaine Folau	Quality Co-ordinator Receptionist Accounts Receivable



## ► AT THE CUTTING EDGE



Brent Sandow became involved in the knife industry 20 years ago when he and his father began making custom knives as a hobby. Their knowledge and experience grew with the help of the South African Knife Guild and it wasn't long before the hobby turned into a business.

According to Brent, the industry in New Zealand is relatively small with only 40 to 50 custom knife makers, most of whom are hobbyists. The offshore market on the other hand, where Brent sells the majority of his knives, is huge. Buyers are either individuals or organisations that have a specific need or people who are collectors.

"To a collector a custom knife is a piece of art and buyers often get quite involved with design and material selection.

It's important to understand that although a custom knife is expensive in comparison to a factory made knife, it does appreciate in value over time and, of course, it will always perform better," says Brent.

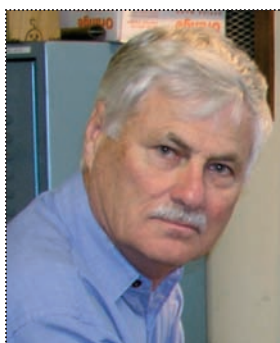
What makes a good versus bad knife comes down to the design, the ergonomics (i.e. only the cutting edge is sharp), the fit of the various components (i.e. no gaps, scratches), the edge geometry in relation to the knife's intended use and of course proper heat treatment.

*"Although the market is small in New Zealand there is a growing interest in custom knives and we've even started running courses from our workshop for those people who want to know more."*

Brent Sandow can be contacted on [knifebug@maxnet.co.nz](mailto:knifebug@maxnet.co.nz) / [www.brentsandowknives.com](http://www.brentsandowknives.com) or 0274 427046



## ► THE HEAT TREATMENTS NOTICE BOARD



John Dykes

John Dykes our Calibration & Services Engineer retired after 16 years of service with Heat Treatments. John was instrumental in the design and build of ovens and furnaces for Heat Treatments and also some customers – many of whom he continued to support in terms of repairs and spares. His skills will be sorely missed and his departure means we will be closing our furnace building and field support operations.

Warren Gates also made the move to retirement having given 29 years of service to Heat Treatments in the machine shop. Like John, his skills and experience in machining will be sorely missed, as will his sense of humour.



Warren Gates

At the end of last year we recognised a number of people who had reached long service milestones. Those over the 20 year mark included; Ken Woolmore (23 years), Ivan Mitchell (20 years), and Jackie Boxsell (20 years). Numerous others reached the 15 year mark and we would like to thank all of these people for the contribution they have made to the on-going success of Heat Treatments.

If you happen to speak to Kevin McGregor and Tuane Rima in the near future don't be surprised if they sound a little tired! There's a good chance they'll have been up through the night with their newborn sons!

Congratulations also go to Reece and Gazala McGregor who married recently.

## ► NITRIDING

By Adam Walmsley

Nitriding is a surface hardening treatment that introduces nitrogen into the surface of steel at relatively low temperatures of about 520°C. The nitrogen reacts with the alloying elements in the steel and forms a hard compound known as 'Nitride'. Nitriding is a very low distortion process in comparison to conventional heat treatments thanks to the low processing temperatures and the absence of a quenching requirement.

Nitrogen can be introduced as a liquid (in a salt bath), a gas or a plasma. The Nitrex nitriding system that HTL use is a highly refined variation of gaseous nitriding with computer controlled nitriding potential (concentration). Controlling of the nitriding potential allows the nitrided properties to be improved significantly over the more conventional nitriding techniques.

The principal reasons for nitriding are:

- Obtain high surface hardness
- Increase wear resistance and anti-galling properties
- Improve fatigue life
- Improve corrosion properties
- Retain surface hardness at high temperatures
- Low distortion

Here are some precautions to be aware of to insure a successful nitriding job:

### Residual Stresses:

Nitriding is performed at temperatures that will relieve any residual stresses in the material and may result in distortion. This effect can be reduced to a minimum or even eliminated by incorporating a stress relieving operation during manufacture. As a general rule, the part should be rough machined, leaving 0.2mm – 0.5mm on dimensionally critical areas, stress relieved, finish machined, then finally nitrided.

### Material Condition:

Steels to be nitrided should preferably be in a hardened and tempered condition prior to nitriding. High tensile steels such as 4140/4340/P20 are supplied by the steel company already in the hardened and tempered condition. However, many tool steels are supplied annealed. Grades such as H13, D2, A2, and O1 will respond much better if hardened and tempered first.

### Threads:

Nitriding increases 'notch sensitivity', which means notched components can become brittle. This is especially relevant to high strength fine threads. If you have any highly stressed threads please make us aware of them so they can be masked.

### Growth:

A small amount of growth occurs on all surfaces during nitriding. Dimensionally critical parts should have an allowance for growth. Generally with our process, depending on the depth of nitriding we expect 2 – 10micron of growth on all surfaces of growth on all surfaces.

### Cleanliness:

Cleanliness is very important with nitriding, as any contamination can affect the atmosphere control and may result in discolouration and/or reduced properties of the nitrided layer. Not only is your job effected, but everyone else's work in the load may suffer. Used plastic moulds in particular must be thoroughly cleaned, as dirty water jackets and plastic left in sprue areas can be a real issue.



If you have any questions or would like to dial one of the Metallurgy Lab's team members contact 09 621 0020, follow the prompts and press 3 for 'Heat Treatment Services' and then 4 for 'Technical Enquiries'.

## ► BRING THE CUP HOME

As a 'contributor' to the Emirates Team NZ campaign, Heat Treatments have provided a range of heat treating services to the Team, as well as a small furnace for their heat treatment needs in Valencia. Being associated with such a focused and innovative group of people has been a great experience for us and we have enjoyed getting regular updates sent via ETNZ.

We would like to take this opportunity to wish Emirates Team NZ a successful campaign and have every confidence they will be bringing home the Cup!

If you would like us to forward news updates from ETNZ please email us on [info@heat-treat.co.nz](mailto:info@heat-treat.co.nz) and we will forward you the newsletters when they are sent through to us.

