

► MAKING THEORY A REALITY - TAKE TWO



Zealand and Electropar, was run in conjunction with S.A.F.E. Engineering (South Auckland Forging) in Drury.

Ivan kicked the seminar off in the morning with a lecture

Ivan Mitchell was yet again seen waving the Heat Treatments flag at a seminar series run by the Manukau Institute of Technology (MIT) in September. Entitled 'Materials Awareness', the seminar was part of an ongoing 'Maintenance and Reliability' seminar series.

The seminar, which was attended by "students" from Holcim, Global Hydraulics, ACI New

and video aimed at giving the participants an understanding of the metallurgy behind heat treatment, as well as demonstrating the technical reasoning behind material selection.

Following a lunch hosted by Heat Treatment's staff, the entire group moved on to S.A.F.E. for the 2nd part of the seminar.

"As always our goal in doing these seminars is to build people's understanding and knowledge around the issue of material selection. One of the biggest hurdles we face is getting people to understand the importance of this. It's often the old story of trying to make a silk purse out of a sow's ear," says Ivan.

"If there is sufficient interest from customers we would be keen to extend these types of educational forums to more of our customers."

To register your interest in attending a seminar please let Ivan know or email your contact details to: info@heat-treat.co.nz

► FESTIVE SEASON SHUT DOWN

Tuesday 19th December

- Final day work accepted for heat treatment
- HTL Pick-up service finishes

Wednesday 20th December

- Last day of HT processing
- HTL delivery service finishes

Thursday 21st December

- HTL (Heat Treating & Machine Shop) closes at noon



From Monday 8th January 2007

- HTL maintenance crew active
- Some HT services will be available

From Wednesday 10th January 2007

- More HT services available
- HTL Pick-up / Delivery service commences
- Machine Shop operational with skeleton crew

From Monday 15th January 2007

- HTL fully operational (subject to some significant maintenance work being completed)

In the case of an emergency during the shut-down period please call 021 473388 or 021 2515688.

Merry Christmas from the Team at Heat Treatments Limited.

Celsius

HEAT TREATMENTS LIMITED

Another Year On...

Summer Issue (Nov, 2006)

Having to draft the end of year shut-down programme always brings home to me the fact that yet another year has sped by. In looking back over the past year I would have to say that whilst business has been steady there has been a general flattening out across the industry.

Key milestones for Heat Treatments Limited this year have included the commissioning of our new automated shaker hearth furnace and the much heralded Nitrex nitriding furnace. In addition we've installed the first of the bulk washing plants and a large, new CNC lathe. Good progress has been made on the large sealed quench furnace and a replacement high temperature stainless annealing furnace. The Project & Maintenance team have also carried out some large refurbishment projects, the most significant being vacuum furnace hot-zone modules.

Without a crystal ball it's hard to say what 2007 will hold so our plan is to move forward on a positive note by seeking new work, offering better services and continuing to improve our processes.

In this final issue of Celsius for the year don't miss out on Ivan and Adam's discussion on distortion – an on-going issue in heat treating. The Heat Treatment GTR Skyline hits the big time with a world record and, staying with the car theme, we put the spotlight on David Douds and his obsession with the Vauxhall. The quality team give us a year in review and of course there is the shut-down programme dates for your diaries.

In closing I would like to thank all our customers and suppliers for their valuable support throughout the year. From everyone at Heat Treatments, Merry Christmas and Happy New Year.

Fergus Thomson
General Manager



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THE HEAT TREATMENTS SERVICE TEAM:

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



QUALITY • SERVICE • EXPERTISE

► WORLD RECORD SMASHED IN AUSTRALIA

Reece McGregor and the Heat Treatment Skyline team smashed the AWD world record at Willowbank, Australia in September. The team put their success down to hard work and an awesome track.

"The biggest thing for us is running on a good track – that's a big help. We've also made some small changes here and there to make the whole package work together. Sometimes you have the power but you don't have traction, then other times it might be the other way 'round," says Reece.

In the two week lead-up to the official race at Willowbank, Reece and the team made waves with a 184mph pass in licensing, then 7.69 secs at the Nationals, then 7.59 secs during testing. In the first pass at Willowbank, Reece did a stunning 7.577 secs at 305.98 km/h (190 mph) and had everyone in the grandstand on their feet cheering.

"Our next goal would be to be to get to 7.4 seconds and break the 200 mph barrier."



The world record was previously held by HKS in Japan and there is talk of a 'Heads-up' race in New Zealand at some point in the future. No doubt Reece and the team will be doing a little more tinkering before that to ensure they can hold onto their world record.

► PETROL IN HIS VEINS

With a passion for driving, David Douds is more than happy out on the road delivering and picking up products in the Heat Treatment van – even in the chaos of Auckland traffic. In fact his enthusiasm with vehicles extends well beyond his day job – David is hooked on Vauxhall's.

His most recent purchase is a Vauxhall Velox 1965 P.B model 3.3 litre overhead valves (OHV) in-line six cylinder motor. With 97,000 miles on the clock, the car was in near mint original condition with only some work on the upholstery, body spraying and changes to spring ratings having been done over its 41 years. In fact, a good indication of the vehicles work history is that the new shocks installed by David were the first in the vehicles history!

David got hooked on Vauxhall's in 1965 when, at the age of 15, he saw a brand new one in Ranfurly Road, Epsom. He bought his first Vauxhall, a 1966 model and the last of the PB series with front disc brakes, back in 1973 for \$1595. His second was a 1963 PB model with a 2.6 litre motor bored out to a 3.6 litre which he got in 1984.



As a member of the Vauxhall owners club of NZ, David plans to continue to maintain and upgrade the car with the emphasis being on keeping it original.

► ADVANCEMENTS IN THE OFFICE

Keeping a close eye on costs is vital to any business and that's why Heat Treatments completed the first stage of implementing new ERP (Enterprise Resource Planning) software - Syteline.

One important aspect of the Syteline system is its ability to accurately track and monitor all purchases, enabling the company to have greater control over expenditure and

develop enhanced relationships with suppliers.

The advantages of the new system are many but of course a prime one is that by better managing our own suppliers we in turn can ensure we are offering the best service we can to our customers.

More about Syteline in later issues.

► DISTORTION DURING HEAT TREATMENTS OF STEELS

By Ivan Mitchell and Adam Walmsley

When heat treating steels often the greatest enemy is distortion. There are 4 main causes of distortion during heat treatment, most of which can be reduced by careful consideration of design, manufacturing methods and material selection.

Quenching Uniformity:

Parts with differing section thicknesses, especially asymmetrical components will suffer most from this form of distortion. When a part has both thin and thick areas they will cool at different rates and the resulting thermal expansion or contraction will create bending or shape change. These effects can be reduced by improving design to incorporate more uniform sections and by using steels which require slower quench rates. The general rule of thumb is higher alloy steel = slower quench required.

Residual Stresses:

Stresses remaining in the steel from previous work such as machining, welding, fabrication or even the original steel manufacture will relax during heating and cause size and shape change. The best way to reduce this type of distortion is to stress relieve the metal after rough machining, welding or heavy working but prior to finish machining and heat treatment. Stresses can also be reduced by precautions such as machining equal amounts of material off both sides when machining flat sections.

Distortion at Temperature:

This type of distortion is caused by the steel becoming weak at high temperature and sagging or bending due to insufficient support in its weak state. Jigging and orientation during heat treatment have an influence here so we use our experience to minimise this effect and produce the best result possible. Sometimes distortion in a certain direction or area maybe more important to you than other areas, so inform us if there are any special considerations to make.

Design also has quite an influence with high temperature distortion and we often find it beneficial to imagine the part is being made from plasticine and think of what could be done to help support it. One last factor to bear in mind is furnace and quenching size limitations; i.e. we probably won't be able to hang your 2m long shaft during heat treatment due to the size of available furnaces and quench systems meaning such a configuration may be prone to some distortion.

Transformation Distortion:

When steels are heat treated they go through a series of complex volume changes as the steel transforms through it's different phases. These volume changes are generally predictable but different for every steel grade. With uncomplicated parts this volume change will only result in a general all-over size change, however with complex parts of differing sections the volume change can result in shape distortion or bending.

This type of distortion can again be reduced by good design i.e. attention to uniform section thicknesses. Steels with lower austenitising (hardening) temperatures will also usually exhibit a smaller volume change.



"A load of gears for carburising – correct orientation and jigging play an important role in minimising distortion"

► QUALITY YEAR IN REVIEW

- In March Heat Treatments had their annual assessment from the Civil Aviation Authority which they again passed with flying colours.
- The Machine Shop undertook an ISO9000: 2000 surveillance audit in July.

- Having had a formal H&S system / policy in place for numerous years, we are celebrating surpassing our own record of days worked without a Lost time Injury (LTI) which represents in excess of 13,000 worked man days – Well Done All!!!!.

