



# Celsius

ISSUE 4

DECEMBER 2004



Heat Treatments Limited  
Quarterly Newsletter  
Summer Issue

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## The Benefit of Expertise



According to the dictionary, 'expertise' is defined as a 'special skill, knowledge or judgement' and we believe that it is our expertise within the field of heat treatment that sets us apart as a company.

Having been in the industry for such a long period of time we have had the opportunity of building up a solid foundation of expertise within the company. Over the last 48 years we've been challenged to come up with solutions to problems, to adapt our services and techniques and most importantly learn from our mistakes. Most years the company has sent people overseas to attend conferences and seminars; we've formed alliances with international organisations and license providers and we've invested in training. Why? Because maintaining and developing a level of expertise requires work and a commitment to learning.

As you might have already guessed, this issue of Celsius focuses on the benefits of knowledge and expertise. We have spoken with one of our clients – Supreme Steel Products - who are experts in their field of operation – Investment or Lost Wax Casting. We raise awareness of our apprentice programme, which has been a mainstay in our ability to grow our skills and experience and also provide you some information on automotive heat treatment applications from the real experts – Adam and Ivan from the Lab team.

You will see that we have inserted a short survey into this issue of Celsius. This being the fourth issue of our newsletter we would like to get some feedback from you. And as a thank you for making the effort to respond, we are putting all returned surveys into a draw to win a special Heat Treatments Christmas hamper.

On behalf of the team at Heat Treatments I would like to wish you a Happy Christmas, and we look forward to working with you in the New Year.

Fergus Thomson  
General Manager



**Heat Treatments**

QUALITY • SERVICE • EXPERTISE



# Supreme Steel Products



## An interview with Robert Peter, General Manager

Supreme Steel Products is one of the leading investment casters in Australasia and has been producing precision investment castings since 1984. Servicing customers in Europe, America, Australia, Asia, England, and of course New Zealand, the staff at Supreme are highly experienced in the areas of investment casting, engineering, metallurgy, casting techniques and tool making.

Celsius spoke with the company's General Manager, Robert Peter about the business, their relationship with Heat Treatments and the benefit of using the right expertise.

### What service does Supreme focus on?

"At Supreme we specialise in producing complex and near net shape components using the Investment or Lost Wax Casting process. The process is capable of producing highly complex components, which dramatically reduce the need for expensive machining and further fabrication processes."

### What is Investment Casting?

"Investment Casting involves a number of steps including; the production of detailed expendable patterns [usually in wax], the building of a refractory mould around the pattern using a ceramic slurry, removal of the pattern through the application of heat, firing of the mould to develop a maximum ceramic bond, casting of molten metal into the mould and the removal of the refractory and finishing of the cast product."

### What are the benefits?

"Key advantages of the process include the ability to create complex intricate shapes often involving curves or internal passageways. High melting point metals such as carbon steels, stainless steels, tool steels, cobalt and nickel based alloys can be used and the process allows for greater freedom of design as there is no requirement to part the mould for pattern removal. Thin walled configurations can be made and a high degree of surface finish and dimensional accuracy can be obtained. Most importantly there are the cost benefits associated with the reduction of machining, reproducibility and assembly."

### What makes Supreme different?

"By specialising in Investment Casting we've built up a wealth of knowledge and expertise in this area. We are continually pushing the boundaries and developing techniques that will achieve the results our customers want. It's always a challenge to do something that hasn't been done before!"

### What is your involvement with Heat Treatments?

"The relationship with Heat Treatments goes back as early as 1975 when Julian Bogalo, one of Supreme's business partners, used their services at another

company. We currently use Heat Treatments for more complex or technical heat treating processes as we have the capacity to do some of our own heat treatment."

### What do you see as the key benefit of using Heat Treatments?

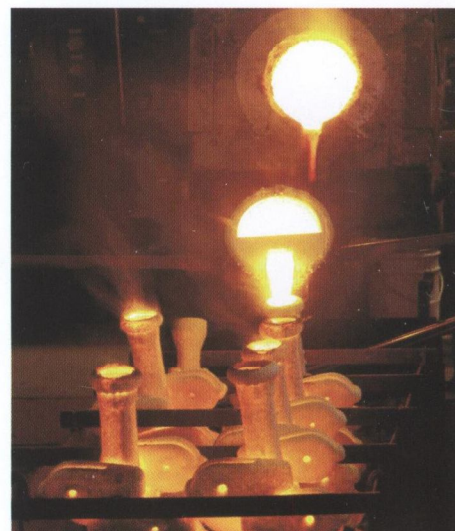
"It is our belief that in order to maintain our position as a leading supplier of Investment Casting in Australasia we need to stay focused on our core business and that means aligning ourselves with suppliers who we believe are experts in their fields."

"Heat Treatments have the capacity to help us with some of the more technical jobs we get and we see them as 'experts' in the field of heat treating.

Having an alliance with them has meant we can look at jobs that require their type of expertise. For example we are currently working on a project that will require the use of a cryogenic chamber and having discussed this need with Heat Treatments they made the call to build one. Obviously it will benefit them long term as they will be able to offer this service to other customers; however what is important is our ability to work strategically together in order to benefit both companies and ultimately our customers."

*Heat Treatments would like to take this opportunity of thanking Julian Bogalo, Robert Peter and the team at Supreme for their support.*

**Supreme**  
**STEEL**  
**PRODUCTS LTD**  
PRECISION CASTING SPECIALISTS



**Celsius**  
CUSTOMER  
PROFILE





# A Recipe for Success: Automotive Components



One of the key things that sets Heat Treatments apart is the level of expertise and experience within the lab team.

As trained metallurgists, with over 45 years combined experience in the trade, Adam Walmsley, Ivan Mitchell and Gopal Reddy are tasked primarily with providing metallurgical quality assurance of Heat Treatment's processes and services. The team also provide crucial advice and support during the specification phase of a products life cycle.

In previous issues of Celsius we have looked at what is required in terms of cold and hot work tooling. In this issue we look

specifically at what is required for components used in the automotive industry. As these components are usually safety critical or are an integral part of an expensive assembly, the material they are made out of and the heat treatment process used needs to be considered carefully.

The following table provides a guide to material and heat treatment processes for common automotive components. Please note that it is a generalised guide only and for motor sport applications and / or problematic components, it's a good idea to call the technical team at Heat Treatments. Contact (09) 621 0020

AUTOMOTIVE COMPONENTS		
Application	Main Properties Required	Suggested Material & Heat Treatment
Crankshafts	Fatigue resistance, high strength	4340 sometimes also nitrided
Camshafts	Wear resistance	4140 nitrided or EN39b carburised (allow for distortion)
Con-rods	Fatigue resistance, high strength	4340 H&T 35HRC
Flywheels	Strength, moderate wear resistance	1045 or 4140, sometimes nitrided for extra durability
Drive Axles	Torsional strength	2767 H&T to 45HRC
Gearbox Internals	Wear resistance, Fatigue resistance, low distortion during hardening	EN39b carburised
King Pins	Wear resistance & strength	EN39b carburised or 4340 induction hardened

\* H&T = harden and temper

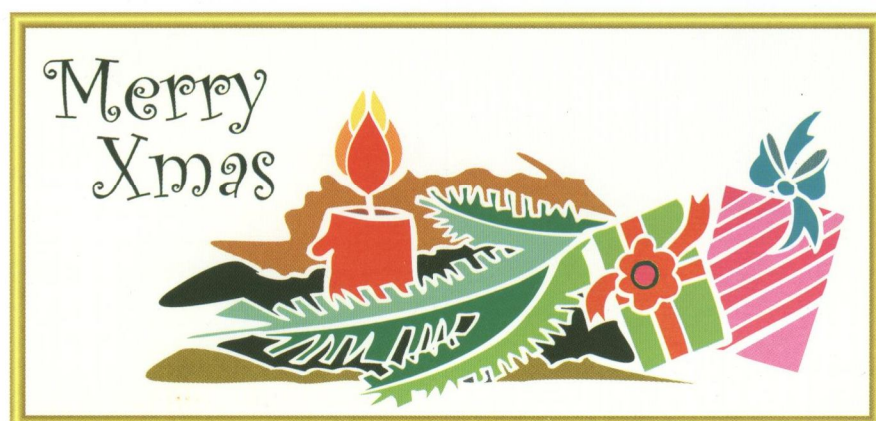
## Mark Your Diaries Now!

The turkey is in the furnace and the beers are in the cryogenic chamber ... so take note of the following dates!



Monday 20 December	Final day for work accepted for heat treatment HTL Pick-up Service finishes
Tuesday 21 December	HTL Delivery Service finishes
Wednesday 22 December	HTL Closes at 2.00pm
Wednesday 5 January	Heat Treatments opens with skeleton crew
Monday 10 January	Machine Shop operational with skeleton crew HTL Pick-up / Delivery Service commences
Monday 17 January	HTL fully operational

Genuinely urgent heat treatment enquiries during the shut down period are to be directed to (09) 626 6090.



## Did you know...

- **The cruise liner Queen Elizabeth 2 moves only 50 feet for each gallon of fuel it consumes.**
- **When steel is heated above a certain temperature it loses its magnetic properties and a magnet will not stick to it, this temperature is called the 'curie point'.**
- **Heat Treatment's gaseous Nitreg nitriding technology provides the ability to surface harden components with minimal distortion, thus avoiding expensive corrective hard-finishing operations. In addition it also is significantly more environmentally friendly than toxic salt-bath and other processes used by many heat treaters.**



# Knowledge Brings Change



The whole field of heat treatments is continually evolving and along with it come changes in the kinds of processes we use. As our knowledge and expertise increases we are able to refine what we do and find better and safer ways of doing things.

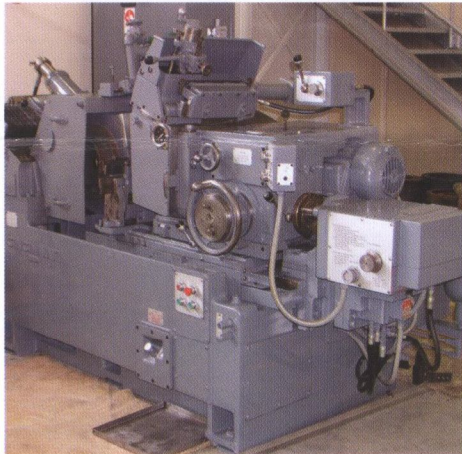
A good example of this is our move away from Cyanide Salt Baths. Back in the 1970's and early '80's these baths were very common. In fact Heat Treatments had no less than ten molten salt baths in operation.

Although Salt Baths can be used to carburise (case harden) components quickly, there are significant issues with using this process. Top of the list is the fact that cyanide is a deadly poison if used or stored incorrectly – ask any possum! In addition cyanide salts will explode if water or moisture is inadvertently introduced into the molten salt and, under certain conditions, highly toxic hydrogen cyanide gas can be released into the atmosphere.

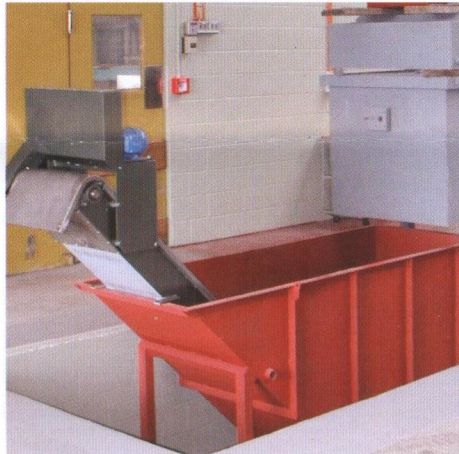
Today, thanks to our awareness of the

dangers of this process and our increased knowledge and expertise in the area of Sealed Quench Furnaces, we have been able to virtually remove the need for Salt Baths.

Our Sealed Quench Furnaces are computer controlled and well suited to batch work. Most importantly we are able to produce the same quality results as a salt bath, without the environmental impact!



□ Centreless Grinder



□ New Shaker Hearth Quench Tank Installation



□ Sealed Quench Furnace being loaded

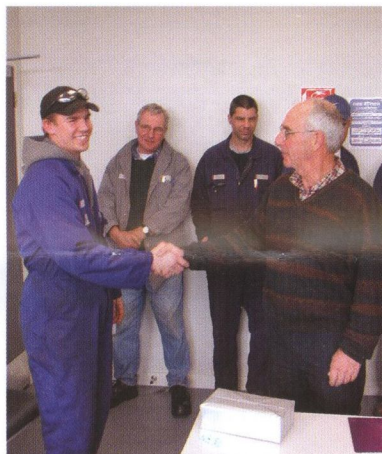
## Your Hired!



If our Machine Shop were to run it's own version of Donald Trump's 'The Apprentice' the catch phrase wouldn't be 'You're Fired' it would be - 'You're Hired'.

Out of the 15 people working in the Machine Shop, a total of 8 have worked through their apprenticeships with Heat Treatments. Currently the team has one Apprentice who is just finishing his Machining and Tool Making qualification and another about to start.

According to Machine Shop Operations manager, John Baird, the foundation of the skills and experience that exists within the team is due in no small part to the running of the apprentice programme over the last 38 years.



□ Matthew Thompson receiving his certificate from Keith McGregor - Managing Director



□ Qualified HTL tradesmen who served their apprenticeships at Heat Treatments Ltd



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### The Heat Treatments Service Team:

□ Heat Treatments:	Len Allen Murray McLeod	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