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## Hot off the presses!

The 10th Edition of CHTA's *Buyers Guide to Contract Heat Treatment* has now been published.

10th Edition



The  
Contract  
Heat  
Treatment  
Association  
[www.chta.co.uk](http://www.chta.co.uk)

## Buyers Guide to Contract Heat Treatment

Your definitive guide to sourcing from  
70 UK-wide subcontract heat treatment specialists

Representing the majority of UK subcontractors, CHTA has compiled the guide, and its complementary website at [www.chta.co.uk](http://www.chta.co.uk), to assist engineering industry in making the most of the many benefits of contract heat treatment.

The guide also features on [www.chta.co.uk](http://www.chta.co.uk) in database format, updated in line with the latest information in the hard copy.

Copies of the new *Buyers Guide to Contract Heat Treatment* accompany this issue of *Hotline*.

For additional copies, contact Diana Blair:  
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# Solvent degreasing: how to be compliant

*With deadlines fast-approaching, Virotec's Ian Lucas examines the impact of complex new legislation on solvent degreasing and looks at the options facing heat treaters.*

My sympathy goes out to all those heat treaters confronting the unpopular but necessary task of improving their cleaning and degreasing plant. Not only have we been hit by complex new solvent legislation, we have been swamped by confusing information from competing solvent and equipment suppliers.

The most contentious issue is whether trichloroethylene can continue to be used safely following its reclassification to risk phase R45 and the introduction of the SED Regulations. There is also a great deal of confusion concerning the use of all chlorinated solvents and their alternatives as a result of the new legislation.

Everyone is in search of the "dream clean", the Holy Grail of solvent degreasing. To find it, we need to address the confusion, understand the legislation and consider the solvent and other degreasing options in turn.

## **Virotec and SED-compliant degreasing**

*Virotec Ltd was formed in August 2000 to provide SED-compliant surface degreasing and treatment technology for the UK and Eire industrial manufacturing markets.*

*The Virotec team includes recognised experts from the surface treatment industry with over 24 year's individual experience in equipment manufacture.*

*Virotec's management team includes the two degreasing equipment industry representatives invited by the UK Environmental Agency to sit on the Technical Working Party responsible for the official guidance notes for the SED Regulations 2004.*

*The company has an unrivalled portfolio of equipment and technical services including both "fully-enclosed closed-loop" and "multiple-door" solvent degreasing systems, plus an extensive range of aqueous equipment and process options.*

*Virotec is a subsidiary of the highly-respected and successful engineering company Gravatom Engineering Systems Ltd ([www.gravatom.com](http://www.gravatom.com)). As a design, manufacturing and technical-support function, Virotec enjoys the benefit of sharing the specialist skills and technical competences of Gravatom.*

*Clients include: Spirax Sarco Ltd, BNFL plc. Normalair Garrett, Marston Aerospace, INEOS Chlor, Cobham plc / FR-HiTEMP, Xtrac Motor Sport Transmissions, G&J Hall Ltd.*

*For more information, contact Virotec on 01489 897300/309, e-mail [sales@virotec.co.uk](mailto:sales@virotec.co.uk) or visit: [www.virotec.co.uk](http://www.virotec.co.uk).*

## **Traditional solvent process**

One of the reasons solvent degreasing has become so contentious is that it is widely regarded as the best cleaning option. Put simply, solvent degreasing produces brilliant results! It has been the favoured degreasing process for over 80 years and is recognised as a simple, fast, flexible and reliable degreasing process.

Solvent degreasing shifts most oils and greases from almost any metal with safety. Solvent equipment is typically more compact and energy-efficient. The self-cleaning recirculatory process provides clean, dry and stain-free components consistently. The oil-rich waste is conveniently concentrated to provide usable recovered solvent. This is a truly cost-effective degreasing medium which sets the benchmark for today's cleaning standards.

## **Perception, problems and confusion**

However, current perception of the traditional solvent process paints a very different picture. Traditional degreasing is perceived as a serious risk to health and the environment, especially the use of trichloroethylene. It is perceived to be heavily restricted in terms of use and difficult and expensive to employ safely. There is even a perception that solvent will be banned.

These perceptions, largely incorrect, have created confusion in the market. This confusion has been compounded by the following:

- complex legislation such as the EU Solvents Emissions Directive (SED);
- delay in UK adoption of EU SED;
- reclassification of trichloroethylene and n-propyl bromide (nPB);
- competitive marketing – supplier ambitions cloud the real issues;
- expectation of technological developments;
- previous legislation not implemented;
- ambitious time scales resulting in slow progress.

Heat treaters face the difficult task of trying to make sense of legislation which is plagued by difficult definitions. The new legislation has created negative expectations and there appears to be delayed commitment by regulators. There is a common belief that there is lots of time to make a decision, but the timescales are ambitious and heat treaters need to act now to comply with the legislation.

## **Solvent Emissions Directive**

To evaluate how the legislation effects

solvent degreasing, we need to look at the requirements of the EU Solvent Emissions Directive (first noted in *Hotline* 83 five years ago) and its UK counterpart, the UK Solvent Emissions Regulations 2004. The main features of this directive are as follows:

- controls emissions of volatile organic compound (VOC) to atmosphere;
- includes all industries and all VOCs;
- specifies control limits of emission to atmosphere;
- differentiates between high- and low-risk substances (consumption threshold one tonne per year for VOCs with risk phases of R40 and above (including trichloroethylene), two tonne per annum for any other VOC);
- enforced by Environmental Agency and local authorities.

The timing of this legislation is all-important. While it was adopted as law in the UK in 2004, it is effective back to April 2001. The critical deadline is Oct 31st 2007. This is when all installations must be compliant and licensed. However, given the time it will take to consider the options and implement improvements, coupled with the time it will take for regulators to process license applications, **heat treaters must act now to ensure compliance.**

The regulators intend to avoid issuing conditional licences wherever possible; hence they are expecting applications to be based on compliant operations being in place and proven at the time of application – **31st October 2006 at the latest.** This means operators of VOC systems need to act now to ensure they have licensed compliant systems in time.

Anyone not operating a Solvent Emissions Regulations (SER) 2004 compliant system on the 1st November 2007 will be in breach of the regulations and can be subject to penalty and restrictions on operations.

## **The way forward**

So what are the options facing heat treaters? To make an informed decision, you need to consider your solvent choice, your equipment and alternative cleaning solutions.

### **1. Traditional chlorinated solvents**

Despite current perceptions mentioned earlier, chlorinated solvents are not banned, nor are they expected to be. They can continue to be used while also complying with the new legislation and they continue to offer significant benefits. As well as offering proven performance,

**chlorinated solvents can be used safely with SED-compliant technology.** Indeed, SED-compliant systems are proven over a long period and represent a cost-effective option. These systems can appear complex, compared with the traditional solvent process, but in practice they are easy to use and provide simpler operation methods. Overall, SED-compliant systems using chlorinated solvents provide an opportunity to achieve the benchmark set by tradition.

When it comes to the use of trichloroethylene, the SED states that substitution of trichloroethylene with a safer substance must be considered where technically possible. Trichloroethylene is not banned. Unlike many alternatives, there is extensive knowledge of its safety/risk profile based on 80 years of experience. There is even reason to challenge its reclassification.

In terms of substitution, it is important to remember that the reclassification of trichloroethylene does not include other chlorinated solvents; so there are other such options available. One of the most suitable alternatives is perchloroethylene (risk phase R40), especially in terms of emission control.

## 2. Solvent equipment

Solvent equipment options are available in two basic types:

- fully-enclosed hermetically-sealed closed-loop systems;
- hermetically-sealing multiple-door systems (MDS).

Both of these alternatives are suitable for complying with the SER 2004, based on specific practical and technical requirements of individual applications.

### *Fully-enclosed hermetically-sealed closed-loop degreasing systems*

These machines are designed to provide maximum containment of solvent. Operational features include multi-tank/multi-process closed-circuit cleaning programmes with continuous distillation and integral drying.

The drying process is either recirculated-air drying or vacuum drying, both with refrigerated solvent recovery and regenerative carbon deodorisation. The cleaning and drying operations take place within a single process chamber with an hermetically-sealing process door.

Components, arranged in baskets or jigs, are placed within the process chamber where they are optionally fully or partially immersed or sprayed with solvent as an initial cleaning action. Solvent from the initial cleaning is transferred to the still for internal recovery and the work is subjected to a second cleaning process, optionally of

immersion, partial immersion or spray. Solvent from the second process is normally transferred to a holding tank for further use in a subsequent process.

The work components may be exposed to additional process activities that can include further immersion, spray or vapour to achieve the required cleaning performance. Cleaning processes can also include ultrasonic agitation in conjunction with vacuum conditions.

These machines can be equipped with work-handling facilities to provide fixed or variable speed. They can also be fitted with two-directional rotation or variable-angle oscillation to the work baskets to assist and enhance cleaning and drying performance.



*A Smart MDS solvent degreasing facility.*

The machines are fully hermetically-sealed and include the most up-to-date process and containment features. They have virtually **zero solvent emissions**, typically reduce **solvent consumption by 99%** (compared with equivalent open-top systems) and, in most cases, operate within the 1000kg/year derogation limit. With closed-loop solvent management systems fitted, operator contact with the solvent can be avoided.

This technology is particularly suitable for degreasing multiple components where there is a complex nature, either due to product design or work packing arrangement, that can involve retention of solvent. It also provides enhanced cleaning within dense and close-packed components. The rotation aids the access and egress of solvent within the enclosed parts. Vacuum, if used, aids drying from

enclosed areas within the work.

*Hermetically-sealing multiple-door systems*  
The Smart MDS solvent degreasing facility, developed by Virotec, is based on the proven traditional immersion process which has been commonplace within the UK for many years.

The lower process chamber of the plant is principally a solvent degreasing system which is fitted with an hermetically-sealing door. The upper section of the system is an enclosure encompassing the area over the degreasing chamber. There is a vertical door, on the front or end of the upper enclosure, to close off and isolate the area above the solvent chamber when degreasing is taking place.

A vertical hoist, within the degreasing enclosure, lowers and raises the work through the degreasing process. The hermetically-sealing door is fitted to the top of the solvent chamber at the base of the upper enclosure. The upper enclosure is ventilated by an extraction fan and motor.

The Smart MDS system is designed to **reduce the idling losses of traditional solvent immersion processes by up to 98%\***. As a result, replacing a typical open-top system with a Smart MDS system achieves an overall reduction in solvent consumption of approximately 80%\*\*<sup>\*\*\*</sup>, providing the strong potential of achieving exclusion from the SED regulations.

Even greater reductions in solvent emissions can be achieved by fitting a carbon abatement unit. These units can be factory fitted or retrofitted at a later date when performance of the system has been evaluated. Retrofitting avoids unnecessary expenditure, helps capital finance planning and ensures compliance with environmental legislation.

The Smart MDS range includes fluid management facilities that can be interconnected with proprietary fresh and waste 'closed-loop' solvent container systems. The controls and fluid connection points are a standard component of the Smart MDS system.

This technology is suitable for larger free-draining components where solvent retention is not a concern.

## 3. Alternative solvents and aqueous options

There are many and varied alternatives to traditional chlorinated solvents used in SED-compliant systems. Each has very specific characteristics and while they

\* Compared with equivalent-sized open-top systems.

\*\* Solvent consumption varies according to nature of components being degreased.

can be very effective in certain applications, there can also be limitations. When considering alternatives, there are a number of factors to take into account:

- it is important to understand and define the cleaning requirement;
- consider the specific characteristics of each option;
- there are multiple systems for different applications;
- there are both cost and risk factors to consider;
- trials and analysis are very important.

Since alternative options are more specific than chlorinated solvents, you need to have an in-depth understanding of what you need to achieve. For example, is the main requirement oil removal, particulate removal or surface treatment, and what types of oils, and how much, require removal?

It is also important to compare the chemical potential with your requirement. You may require, or be able to use, multiple systems. However, you may find alternatives are less flexible, requiring compromise and additional cost.

#### Alternative solvents

The following are the main solvent alternatives to trichloroethylene and other traditional chlorinated solvents:

- Methylene Chloride
  - good chlorinated solvent for liquid immersion;
  - more difficult to achieve effective control of emissions.
- Brominated solvents
  - proposed as direct replacement for trichloroethylene;
  - reclassified as high-risk substance R60; hence not a “safer substitute”.
- Hydrocarbons
  - effective in very specific applications;
  - high surface tension – limited capillary action;
  - flammable and explosive limit considerations;
  - slow drying;
  - variable component make-up – residue deposition considerations;
  - proven process and equipment available; typically complex and expensive.
- Modified alcohols
  - similar considerations to hydrocarbons;
  - improved constituent quality;
  - less residue deposition;
  - faster drying.

#### Aqueous options

There is a large range of aqueous options to choose from and they can be used for specific contaminants and metals. They also offer good potential for surface

treatment and they are good for low-specification inter-stage cleaning.

However, aqueous options usually require multi-stage systems with wash, rinse and drying cycles. They have higher energy requirements, increased waste and maintenance.

#### The future

To comply with the new legislation, the decision really comes down to whether to invest in compliant surface cleaning using traditional or alternative chlorinated solvents, or whether to opt for a non-solvent alternative.

To help you make that decision, the following is a brief summary of each option:

#### Compliant surface cleaning using chlorinated solvent

- ✓ Modern compliant machinery available.
- ✓ High levels of operator and environmental safety.
- ✓ Long-term solvent availability.
- ✓ Continued simple effective performance.
- ✓ Reduction in fluid consumption.
- ✓ Overall efficient and effective operations.
- ! Technical management of solvent quality important (stability).
- ! Requires a higher level of operator technical competence.

#### Non-solvent alternatives

- ✓ Increasing importance to the metal cleaning industry.
- ✓ Developing equipment technology and chemistry.
- ✓ Greater range of chemical and process options.
- ✓ Need greater understanding of requirements.
- ✓ Technically-focussed applications.
- ✓ Safe and effective machinery required.
- ! Waste and energy issues.
- ! New product health and safety awareness.

Which option you go for will depend on your requirements and whether you are prepared to compromise in terms of budget, risk and performance.

Is solvent degreasing a future-proof option that can still outweigh the alternatives? It is certainly true that solvent degreasing is the benchmark in degreasing standards. It is also clear that solvent degreasing is here to stay for the foreseeable future. The use of solvents for degreasing is not banned, but controlled.

Appropriate control can be achieved at reasonable cost and compliant equipment and related solvent-management systems are readily available. Furthermore,

trichloroethylene may have been reclassified but it can still be used in appropriate situations.

However, if you do decide on an alternative, there are good options available offering different treatment opportunities. Whatever you decide, time for compliance is very limited. You need to act as soon as possible and avoid leaving it until nearer the October 2007 deadline.

#### FIND OUT MORE

*Virotec has produced a comprehensive guide to the Solvent Emissions Regulations 2004 including solvent emission limit values. Copies can be obtained via the Virotec website at [www.virotec.co.uk](http://www.virotec.co.uk).*

*Virotec can also visit solvent users to discuss specific applications in detail. For an appointment or to find out more, contact Virotec on 01489 897304/309, e-mail [sales@virotec.co.uk](mailto:sales@virotec.co.uk) or visit [www.virotec.co.uk](http://www.virotec.co.uk).*

## New Noise-at-Work Regulations

The *Control of Noise at Work Regulations 2005* came into force for all industry sectors in Great Britain on 6 April this year, introducing new requirements for action to be taken by employers.

The aim of the Noise Regulations is to ensure that workers' hearing is protected from excessive noise at their place of work, which could cause them to lose their hearing and/or to suffer from tinnitus (permanent ringing in the ears).

The *Control of Noise at Work Regulations 2005* replace the *Noise at Work Regulations 1989*. The level at which employers must provide hearing protection and hearing protection zones is now 85 decibels (daily or weekly average exposure) and the level at which employers must assess the risk to workers' health and provide them with information and training is now 80 decibels. There is also an exposure limit value of 87 decibels, taking account of any reduction in exposure provided by hearing protection, above which workers must not be exposed.

The full text of the *Control of Noise at Work Regulations 2005* can be viewed online from [www.hse.gov.uk/noise/regulations.htm](http://www.hse.gov.uk/noise/regulations.htm). Guidance can be found in the free HSE leaflet *Noise at Work* (INDG362 (rev 1)) and in HSE's book *Controlling Noise at Work (L108)* (ISBN 0-7176-6164-4) available from HSE Books or from bookshops, price £13.95.

# Knowledge Transfer Partnerships

**Richard Burslem** (*Wallwork Heat Treatment Ltd*) enthuses about the scheme aimed at mutual-benefit industry/academia co-operation.

Knowledge Transfer Partnership (KTP) is a scheme designed to help businesses access academic and research expertise with a view to developing new products, processes or services. The scheme generally runs for between one and three years and is part-funded by a group of Government and national bodies such as DTI and DEFRA.

Normally a suitably-qualified graduate, a KTP Associate is employed by an academic body and placed on site within the business to undertake the project. The Associate has access to facilities at the academic body and receives help and guidance from it to achieve the project goals.

There are many advantages for a business in this kind of partnership:

- The Associate is employed by the academic partner on a fixed-term contract; thus the business avoids the problems of having to employ somebody directly. If the project should not develop as expected, the business can ask for the Associate to be replaced.
- The academic partner provides project management, as well as making available its own research and testing facilities if required.
- The Associate has a broad base of expert support to turn to in the academic partner and, so, is not isolated as if solely employed by the business.
- The project gives the Associate the opportunity to experience and understand a business environment and can be used as a “try-before-you-buy” exercise for both parties. Historically, around 70% of Associates are offered permanent employment with the host business after completion of the project.
- The bonus is that the total project cost is heavily subsidised and should be much less than undertaking the project in-house or even engaging consultants. Typical costs to the business are around £16,000 each year.

This all sounds very good and I guess most readers will be at least aware of the scheme, if not some of the detail; so why not take it up?

**“So is it all worth it? I would answer a resounding yes to that question.”**

## Instigation

We avoided investigating the scheme for some time as we thought there would be impossible criteria for us to comply with, endless administration and, unless it was something like “on-site direct nuclear case-hardening”, the project would not be advanced enough to be accepted. How wrong we were!

The normal point of contact for a business to investigate a KTP is via the local business link, who will then try to find a suitable academic partner, depending on what is in mind for the project. In our case, the academic partner, which happened to be Sheffield University, found us as part of their business outreach programme. Over an informal chat, we discussed several projects that might be suitable for a KTP.



*Wallwork's KTP Associate Yao Lu has an MSc in Environmental and Energy Engineering (with Distinction) from The University of Sheffield.*

Initially we considered materials- and process-based projects, where the emphasis was on innovation, but the possibility of success was far from certain. However, when we were asked what our major business concern was and we replied “energy costs”, it seemed obvious to develop a project that would look at our energy consumption and find ways to reduce it.

This really was a breakthrough because here was a practical project from which we should get tangible results, with the benefit of a known cost and time scale. For us, this was the key. KTP need not be about “blue sky thinking”; it could be used to tackle everyday business problems that require extra resources to resolve.

The project is drawn up between the academic partner and the business, with a work schedule and series of targets, and

then submitted for approval to the funding body. The academic partner's advice is invaluable at this stage as to what elements can be allowed for funding and so getting the project approved quickly. For instance, I was surprised that some of the cost of measuring equipment could be included.

We were given a lot of help with the application itself and the administrative effort for us was minimal. The job specification and interviewing for the KTP Associate was undertaken jointly but the University took care of all the other recruitment issues.

Another benefit, particularly for a small business, is that the KTP project is well managed by the academic partner. After the initial project approval meeting, further regular but not onerous meetings take place, between all partners, to ensure the project is on track and to make amendments or suggestions for improvements following the experience gained. As our KTP has progressed, we requested the inclusion of a “mini project” to tackle a waste-disposal problem we had identified. This was accepted into the scope of the KTP, albeit with strictly-defined time and cost boundaries.

Joining us in December 2005, our KTP partner quickly became “one of the family” but, because she is not our employee, she has not been pulled off the project to get involved with production matters. As a consequence, the project is on target and on time.

There is a good website with further details at [www.ktponline.org.uk](http://www.ktponline.org.uk) which carries details of all current and past projects as well as contact information and all the necessary forms.

## Instant benefit

So is it all worth it? I would answer a resounding yes to that question.

On her induction tour of the factory, our KTP Associate queried our process gas burn-off from the sealed-quench furnaces; within a short period, this led us to change a practice we had been following for over 20 years. The saving in gas usage from this small step alone will be over £6,000 a year and will also help us to meet our Climate Change Agreement target.

Achieving tangible results so soon in the project was a real bonus. We are looking forward to the rest of the project with confidence.

*Do other CHTA members have KTP experience they would care to share in Hotline? – Ed.*

# CHTA/SEA CCA Workshop for heat treaters

As the Surface Engineering Association's scheme administrator, Neil Kimpton hosted a seminar at SEA headquarters on May 11 to take a group of twelve CHTA members, yet to register, through the process of making an application for a Climate Change Agreement (CCA). This involved discussing some of the fundamentals of the scheme, and going through each document of the application paperwork in turn.

The process of making an application is now even easier than it was for the first wave of heat treatment applications. This is because the SEA and DEFRA have, between them, created a complete example application for a company to follow.

This encompasses not only completed examples of the PP3.02, PP4 and SEA 05/06 base-year form, but also all the supporting evidence required for the PP4, including a manufacturing process description, schematic site map, site map with process flows and 90/10 information. Says Neil, SEA's Technical Services Administrator: "I have found that applications which follow the examples closely tend to be processed by DEFRA very quickly, and certainly much quicker than the current expected six-week processing rate for applications under IPPC eligibility".

All of the example paperwork, along with blank copies of application forms, can be downloaded from [www.sea.org.uk/cc.aspx](http://www.sea.org.uk/cc.aspx). This section of the SEA website is also undergoing a revamp to make navigating through it easier and quicker.

Companies are reminded that if they operate any of the processes listed in the accompanying table, they are eligible to



SEA's Neil Kimpton (left) with Richard Burslem.

make a CCA application and so receive up to an 80% reduction on the tax levy they currently pay on electricity and gas use.

If you wish to check the eligibility of your company, or discuss a potential application further, please contact Neil Kimpton at Surface Engineering Association, Federation House, 10 Vyse Street, Birmingham, B18 6LT (telephone: 0121 237 1143; fax: 0121 237 1124; e-mail: [neil.kimpton@sea.org.uk](mailto:neil.kimpton@sea.org.uk); website: [www.sea.org.uk](http://www.sea.org.uk)).

Commented Richard Burslem, who introduced the workshop as leader of CHTA's CCA Steering Group: "The scheme operated by SEA is one of the best-value schemes available when compared with other trade sectors. CHTA has had several useful energy-efficient measures, for heat treaters to use, accepted by DEFRA. The administration is not particularly onerous and SEA is there to help you. I would urge all CHTA members who have not yet applied for the CCL rebate to consider applying as a matter of urgency."

## HIGH STANDARDS AT BODYCOTE

The provision of high-quality heat treatment services and the ability to satisfy the most stringent standards have always been key to Bodycote Heat Treatments' expansion. On-going development in management systems has resulted in further quality accreditations being gained.

Since the last issue of *Hotline*, the company has achieved AS/EN 9100 approval of its Stillington facility, bringing the number of their UK plants with this accreditation to 13.

In addition, ISO 9001:2000 approval has been awarded to the Gillingham facility which, in its previous existence, was the heat treatment department of Delphi Diesel Systems and part of their quality system. Thus, all of the UK Bodycote Heat Treatments plants now carry this accreditation in their own right.

Bodycote continuously improves its management systems and procedures and regularly secures additional customer-specific approvals as their range of services expands and in response to the outsourcing trend, which is now involving even more critical components.

Bodycote, the thermal processing and testing services group, operates 298 facilities in 30 countries. The Group provides heat treatment, testing, hot isostatic pressing, and metallurgical coatings to a wide range of industries including automotive, aerospace, power generation, oil and gas, military, petrochemical, agricultural, consumer product, pharmaceutical and construction.

## WALLWORK EXPANDS IN THE SOUTH-EAST

Following the retirement of Graeme Wallace, Chairman and Managing Director of Essex Heat Treatments Ltd, the customer base of the business was acquired by Wallwork Heat Treatment Group in March.

The Essex Heat Treatments business is being incorporated into the Wallwork nationwide operation, and customers are now supported through Wallwork's national network, which includes a major heat treatment facility at Swavesey, Cambridge, operated by Tecvac Ltd, a Wallwork subsidiary.

Based at Cambridge, Essex Heat Treatments' senior manager Richard Candler is working with the Tecvac team, to ensure a smooth integration of the EHT service.

"Over the last three decades, Essex Heat Treatments has gained an excellent reputation for high-quality heat treatment services," commented Wallwork director Richard Burslem. "Our sales and technical team will maintain the Essex standards of

<ul style="list-style-type: none"> <li>• Ageing</li> <li>• Annealing</li> <li>• Austempering</li> <li>• Austenitic nitrocarburising</li> <li>• Boronising</li> <li>• Carbon restoration</li> <li>• Carbonitriding</li> <li>• Carburising</li> <li>• Chemical vapour deposition(CVD)</li> <li>• Electron beam treatment</li> <li>• Ferritic nitrocarburising</li> </ul>	<ul style="list-style-type: none"> <li>• Flame annealing</li> <li>• Flame hardening</li> <li>• Furnace brazing</li> <li>• Hard facing</li> <li>• Hardening</li> <li>• Homogenising</li> <li>• Hot isostatic pressing</li> <li>• Hydrogen de-embrittlement</li> <li>• Induction annealing</li> <li>• Induction / torch brazing</li> <li>• Induction hardening</li> </ul>	<ul style="list-style-type: none"> <li>• Ion implantation</li> <li>• Laser treatment</li> <li>• Malleablising</li> <li>• Martempering</li> <li>• Nitriding</li> <li>• Normalising</li> <li>• Physical vapour deposition (PVD)</li> <li>• Precipitation hardening</li> <li>• Press quenching (/tempering)</li> </ul>	<ul style="list-style-type: none"> <li>• Sintering</li> <li>• Solution treatment</li> <li>• Steam treatment</li> <li>• Straightening</li> <li>• Stress relieving</li> <li>• Sub-zero treatment</li> <li>• Sulf BT</li> <li>• Tempering</li> <li>• Toyota diffusion process (TD)</li> </ul> <p style="text-align: center;"><b>Process list for CCA</b></p>
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quality and service. They will provide EHT customers with a much wider range of heat treatments, including plasma nitriding and vacuum carburising, and access to a wide variety of advanced hard coatings from our facility at Swavesey, coupled with a full range of conventional salt-bath, sealed-quench and vacuum treatments. We welcome existing customers and invite prospective customers to try the new service."

All Essex Heat Treatments customers in the South East now have access to the Wallwork supply chain, which enables overnight services on a 24/7 basis, with collection and delivery to fit JIT production schedules.

### INCREASED NITROTEC CAPACITY FOR TTI

As part of Aalberts Industries Metal Treatments, TTI Group are market leaders in the provision of low-temperature thermochemical treatments to counter corrosion and wear. They are currently increasing capacity in this field.

From its nine sites in the UK, the group provide heat treatments to a large number of British engineering companies. It is in the area of low-temperature treatments that TTI has the widest range of processes, including salt-bath nitrocarburising at Letchworth, gas and plasma nitriding at Telford, and PVD and plasma nitriding in Birmingham. TTI also operates the world-renowned *Nitrotec* treatments.

*Nitrotec* is a surface engineering process for steels and cast irons using a gaseous nitrogen-bearing atmosphere at temperatures below 723°C. The treatments develop iron-nitride surface compound layers between 5 and 50 microns thick, supported by a nitrogen-rich diffusion zone in the substrate. By choice of treatment temperature, time and nitrogen potential of the atmosphere, the structure, composition and hardness of the compound layer and the sub-surface diffusion zone, are controlled.

An innovative oxidation technique, combined with specially-formulated aqueous quenchant and organic sealant, is incorporated depending on the engineering requirements of a specific application. *Nitrotec* engineered surfaces have corrosion resistance superior to that of zinc plating and wear resistance equal to that exhibited by hard chromium plating. In applying *Nitrotec*, two traditional processes can be replaced. Duplex treatments, such as case-hardening and plating or painting, can be substituted by one single *Nitrotec* treatment.

As the leading nitrocarburising-plus-oxidation process, *Nitrotec* is now a mature technology that is increasingly

specified as an alternative to conventional heat treatment and surface finishing techniques. Developments in thermal treatments and sealant finishes ensure that there are always new applications for a process that provides a combination of properties, including enhanced wear and corrosion resistance.

Accordingly, a new furnace for *Nitrotec* processing, featuring an innovative atmosphere control system and a load capability of 1000kg, has been installed by TTI Group at its *Nitrotec* Services plant in Birmingham. This extra capacity adds to what is already the largest *Nitrotec* treatment facility in Europe.



TTI Group's new *Nitrotec* furnace.

### TAMWORTH HEAT TREATMENT WINS TOP SAFETY AWARD

Tamworth Heat Treatment has scooped a prestigious safety award from one of the world's leading training and advisory bodies.

Following gruelling tests by a strict independent adjudicating panel, Tamworth Heat Treatment, an independent company specialising in heat treatment for the engineering industry, was given the esteemed International Safety Award by the British Safety Council.

Only companies with below-average accident rates are eligible to apply and winners must also have good safety policies, plans and commitment to health and safety at the highest board level. They must detail their health and safety officer's qualifications and provide information about significant advances they have made in health and safety for the year.

Mr Davis Ballard, Chief Executive of the British Safety Council, says: "For nearly fifty years, we have led the way in promoting health, safety and the environmental best practice in society. In the 21st century, many organisations worldwide are now making health and safety a top priority. Through achieving an International Safety Award, Tamworth Heat Treatment is helping to make our vision of a safe working environment a reality."

## CHTA Secretariat

Items for inclusion in *Hotline* and enquiries about CHTA activities should be addressed to:

### Contract Heat Treatment Association

c/o SEA, BJGF Federation,  
Federation House, 10 Vyse Street,  
Birmingham B18 6LT  
Tel: **0121 329 2970** (or 0121 237 1123)  
Fax: 0121 237 1124  
E-mail: [mail@chta.co.uk](mailto:mail@chta.co.uk)  
Website: [www.chta.co.uk](http://www.chta.co.uk)

CHTA Secretary and *Hotline* Editor:  
Alan J. Hick B.Sc., C. Eng., FIMMM

The Contract Heat Treatment Association is not responsible for the statements made or opinions expressed by contributors to *Hotline*.

CHTA is affiliated to:



Surface Engineering Association

Prime Minister Tony Blair added his support: "I send my congratulations to all of those organisations being presented with an award by the British Safety Council. These awards recognise the success that these organisations and their employees have achieved in their pursuit of excellence in the management of health, safety and environmental matters. The Government would like to place on record its appreciation of the support given by the council in raising awareness of the benefits that effective health, safety and environmental management brings to business, employees and the environment."

**Don't forget to register  
for Wolfson's  
"Understanding Heat  
Treatment" course  
October 17-19**

**Contact details in diary on  
page 10**

**Please send your news  
items for Hotline 105  
by e-mail to:**

**[mail@chta.co.uk](mailto:mail@chta.co.uk)**

**Deadline: August 31st**

# Middleton Heat Treatments Ltd

New CHTA member Middleton Heat Treatments Ltd was formed in 1988 when the assets and business of British Heat Treatments, East Anglia Division, were purchased by its then Divisional General Manager, Roger Middleton, and his sister Jean Brumby.

Roger, an Honours Metallurgist and Chartered Engineer, was aware from the outset of the downturn in the region's manufacturing base for agricultural machinery (upon which the company had relied for many years) and, even at that time, the decrease in manufacturing in general. He therefore decided that the business should concentrate on giving fast turnarounds on small high-value components, used in the local oilfield exploration and production industry and manufactured by the many associated precision-engineering businesses. Having been implemented, this policy means Middleton Heat Treatments can't boast thousands of tonnes per month of output or a line of sealed-quench furnaces. However, the company can process parts machined early in the morning, destined to

be flown out by helicopter soon after lunch to be fitted to a gas production platform before teatime!

Processes operated are wide and varied, including induction and flame hardening, nitrocarburising and QPQ, case-hardening, harden and temper, solution treatment of aluminium alloys, normalising, annealing and, importantly, stress relieving. The latter is also closely associated with the oilfield industry, and the company has one of the largest stress-



A vessel for stress relieving at Middleton Heat Treatments.

relieving furnaces in the area: a 375kW bogie-hearth furnace with a bogie size almost 6m long and 2m wide.

When Jean retired some six years ago, Roger's son Simon joined the company, having helped out for many years during school vacations and with knowledge of heat treatment that many much older folk would envy.

Being situated within sight of the most easterly point in the British Isles, it had been thought that the company's Lowestoft location would be somewhat restricting. However, as well as the local customer base, work is now received from as far away as Dorset, Scotland, Northern Ireland and, even further east than Lowestoft, Norway and Sweden.

Prior to the takeover, the Division had lacked somewhat on the quality front, perhaps because of its agricultural background. Improvements were soon made and now the company is, of course, ISO 9001:2000 registered.

Further information and photographs can be seen on the website at [www.middleton-heat.co.uk](http://www.middleton-heat.co.uk).

## CODERE SA

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F: ++41 32 465 10 11  
info@codere.ch - www.codere.ch

### Products

The main product range consists of batch furnace lines in modular construction, pre-vacuum continuous batch furnaces, mesh belt-conveyor furnaces, pit furnaces, precious metal treatment furnaces and auxiliary equipment. We also supply oxygen probes and supervision software

### BATCH TYPE FURNACE LINE

under controlled atmosphere, in modular construction  
No mechanical locking of the charge



Half or fully automated operation (automates + monitoring system)  
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Several temperature ranges (1100°C – 1000°C – 850°C – 650°C)  
Cylindrical tight heat-treatment chamber (very long working life)  
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All modules with double jacket  
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### SYSTEM 250

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We pride ourselves on the relationship we have built up over the years.  
We aim to customise our offer to meet your current needs and future requirements.

### Fields of activity

Consulting, development, research and manufacture of industrial furnaces

### Our clients are active in the following manufacturing industries:

- Tooling & machining
- Automotive
- Aeronautics
- Medical & optical
- Fastener & spring
- Precious metal
- International heat treatment shops.



Codere prides itself on a very active sales and service network throughout Europe and Asia.

Codere has recently joined the Wolfson Heat Treatment Centre and is currently looking for local representatives in the UK and Irish market.

# Super Systems

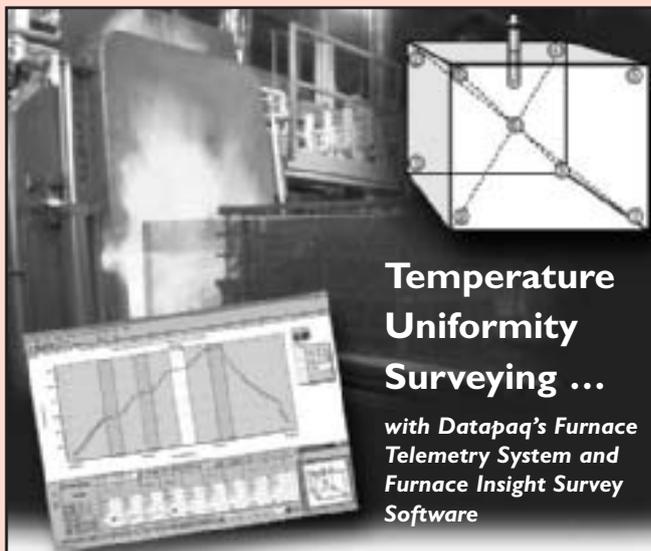
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## ATMOSPHERE EXPERTISE

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# Diary

July 4-6 2006

**THERMOPROCESS KOREA 2006**  
Seoul, Korea

"The 4th International Heat Treatment Technology, Refractory, Furnace & Surface Finishing Industry Equipment Exhibition":  
[www.thermotec.co.kr](http://www.thermotec.co.kr)

July 12-14 2006

**TRIBOLOGY 2006**  
London, England

"Surface Engineering and Tribology for Future Engines and Drivelines":  
[www.imeche.org.uk/events/trib50](http://www.imeche.org.uk/events/trib50)

July 17-23 2006

**FARNBOROUGH INTERNATIONAL AIRSHOW**

Farnborough, England  
[www.farnborough.com](http://www.farnborough.com)

July 21 2006

**SEA HOUSE OF LORDS RECEPTION**  
London, England

[www.sea.org.uk](http://www.sea.org.uk)

July 27 2006

**CHTA PUBLICITY SUBCOMMITTEE\***  
Birmingham, England

August 3 2006

**CHTA MANAGEMENT COMMITTEE\***  
Birmingham, England

September 20-21 2006

**EAST MIDLANDS MANUFACTURING EXHIBITION**

Donington Park, Derbyshire, England  
[www.industry.co.uk](http://www.industry.co.uk)

September 20-22 2006

**ALUMINIUM 2006**  
Essen, Germany

6th world trade fair and conference:  
[www.aluminium2006.com](http://www.aluminium2006.com)

September 26-29 2006

**15TH IFHTSE CONGRESS**  
Vienna, Austria

Organised by the Austrian Society for Metallurgy and Materials in conjunction with the International Federation for Heat Treatment and Surface Engineering: [www.asmet.at/ifhtse2006](http://www.asmet.at/ifhtse2006)

September 27 2006

**INDUCTION HEATING & MELTING**  
Birmingham, England

[www.bifca.org.uk](http://www.bifca.org.uk)

September 27-28 2006

**FURNACES NORTH AMERICA 2006**  
Reno, Nevada, USA

The Metal Treating Institute's conference and exposition: [www.metaltreat.com](http://www.metaltreat.com)

October 4-6 2006

**A3TS 2006**  
Bordeaux, France

This 34th Congress on Heat Treatment and Surface Engineering combines a conference and an exhibition: [www.atftt.org](http://www.atftt.org)



CHTA's new hard-copy "Buyers Guide to Contract Heat Treatment" made its exhibition debut on the Surface Engineering Association's stand at "Subcon 2006" (16-18 May, NEC Birmingham). There CHTA Secretary Alan J. Hick, proud compiler and designer, admired his handiwork. The new publication was also on display at the "Foundry, Furnaces & Castings Expo" (5-7 June, Harrogate), the event of which CHTA was a supporting association.

October 10-12 2006

**MATERIALICA 2006**  
Munich, Germany

[www.materialica.com](http://www.materialica.com)

October 11-12 2006

**NORTHERN MANUFACTURING EXHIBITION**  
Sheffield, England

[www.industry.co.uk](http://www.industry.co.uk)

October 11-13 2006

**62ND HÄRTEREI-KOLLOQUIUM**  
Wiesbaden, Germany

German-language heat treatment conference and exhibition: [www.awt-online.org](http://www.awt-online.org)

October 12 2006

**FURNACE CONTROL SYSTEMS**  
Birmingham, England

[www.bifca.org.uk](http://www.bifca.org.uk)

October 17-19 2006

**UNDERSTANDING HEAT TREATMENT**  
Birmingham, England

71st repeat of Wolfson's well-established course. Details from Derek Close, Wolfson

Heat Treatment Centre, Federation House, 10 Vyse Street, Birmingham B18 6LT (tel: 0121 237 1122; fax: 0121 237 1124; e-mail: [derek.close@sea.org.uk](mailto:derek.close@sea.org.uk); [www.sea.org.uk/whct](http://www.sea.org.uk/whct))

October 20 2006

**SEA AWARDS DINNER**  
Coventry, England

[www.sea.org.uk](http://www.sea.org.uk)

October 26 2006

**CHTA PUBLICITY SUBCOMMITTEE\***  
Birmingham, England

November 8-9 2006

**MANUFACTURING TECHNOLOGY, IRELAND**  
Dublin, Eire

[www.industry.co.uk](http://www.industry.co.uk)

November 14-15 2006

**INDUSTRIAL FURNACE TECHNOLOGY COURSE**

West Bromwich, England  
[www.bifca.org.uk](http://www.bifca.org.uk)

November 16 2006

**CHTA MANAGEMENT COMMITTEE\***  
Birmingham, England

November 28-30 2006

**21ST NATIONAL CONFERENCE ON HEAT TREATMENT WITH INTERNATIONAL PARTICIPATION**

Jihlava, Czech Republic  
[www.ecosond.cz](http://www.ecosond.cz) / [www.asociacetz.cz](http://www.asociacetz.cz)

December 14 2006

**CHTA AGM\***  
Birmingham, England

February 7-8 2007

**SOUTHERN MANUFACTURING & ELECTRONICS EXHIBITION**

Thorpe Park, Surrey, England  
[www.industry.co.uk](http://www.industry.co.uk)

March 28 2007

**BIFCA ANNUAL SAFETY & STANDARDS SEMINAR**

West Bromwich, England  
[www.bifca.org.uk](http://www.bifca.org.uk)

April 18-19 2007

**MIDLANDS MANUFACTURING EXHIBITION**

Coventry, England  
[www.industry.co.uk](http://www.industry.co.uk)

25-27 April 2007

**5TH INTERNATIONAL CONFERENCE ON QUENCHING AND CONTROL OF DISTORTION**

Berlin, Germany  
[www.quenching-and-control-of-distortion.com](http://www.quenching-and-control-of-distortion.com)

June 12-16 2007

**THERMPROCESS 2007**  
Düsseldorf, Germany

[www.thermprocess.de](http://www.thermprocess.de)

For the best in subcontract heat treatment services, go to . . .  
**www.chta.co.uk**  
. . . your guide to sourcing from 70 UK-wide heat treatment specialists



The Contract Heat Treatment Association

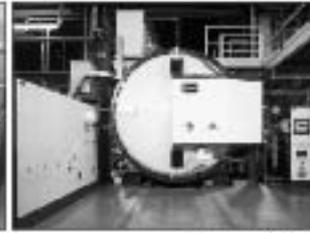
\*Members wishing issues to be raised at CHTA meetings should notify CHTA's Secretary at [mail@chta.co.uk](mailto:mail@chta.co.uk).



Atmosphere Furnaces



Installation Technology



Vacuum Furnaces



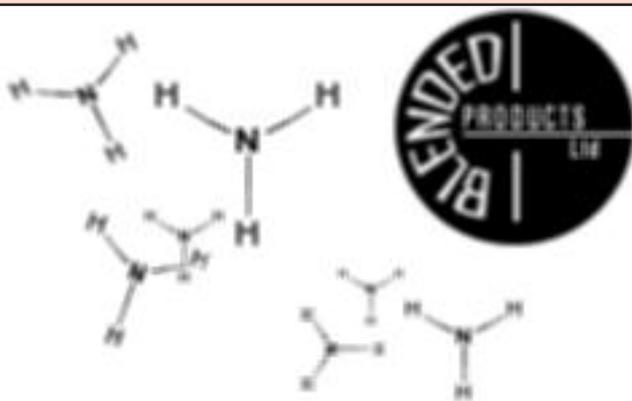
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- automation and control technology
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- repair and refurbishment



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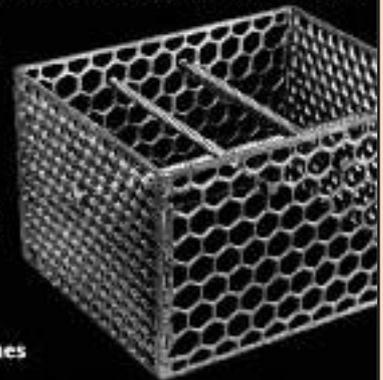
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# CHTA Benchmarking Club

Participating members will have recently completed and returned the May questionnaire for CHTA's Benchmarking Club, a six-monthly exercise launched in 2002 with the aim of sharing and comparing performance data anonymously. Completed responses are collated by CHTA's Secretary (only) and reported, without identification of responding companies, to participating members only. Presently the Benchmarking Club is restricted to recording just four measures, as listed below. In order to enhance the usefulness of the exercise, it has been proposed that the range of measures reported might be extended:

#### Current measures:

- Annual turnover/ employee
- Average debtor days
- Energy as % turnover
- Maintenance cost (excluding labour) as % turnover

#### Other possible measures:

- Wages (including pension and NI) as % turnover
- Consumables (excluding energy) as % turnover
- Maintenance cost (including labour) as % turnover
- Insurance costs as % turnover
- Health and safety costs as % turnover
- Environmental costs as % turnover
- Education and training costs as % turnover
- Quality assurance costs (excluding labour) as % turnover
- Quality assurance costs (including labour) as % turnover
- Gross profit as % turnover
- Annual turnover / number of active customers
- Annual turnover / number of orders completed
- Annual number of customer complaints / number of active customers
- Electricity use (kWh) as % total energy use
- Turnover growth, % annually
- Number of active customers growth, % annually
- Number of orders growth, % annually
- Number of staff growth, % annually

Shortly members will receive an e-mail questionnaire from CHTA's Secretariat requesting their opinion on keeping current measures and adopting those proposed, with an opportunity to suggest any other measures.

# Market Movements

ANALYSIS OF QUESTIONNAIRE REPLIES RELATING TO 37 CHTA MEMBER SITES

"THIS QUARTER" =

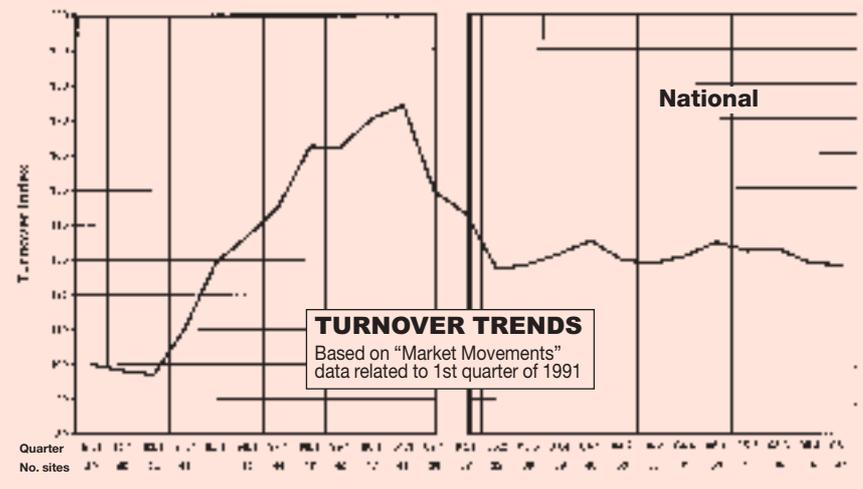
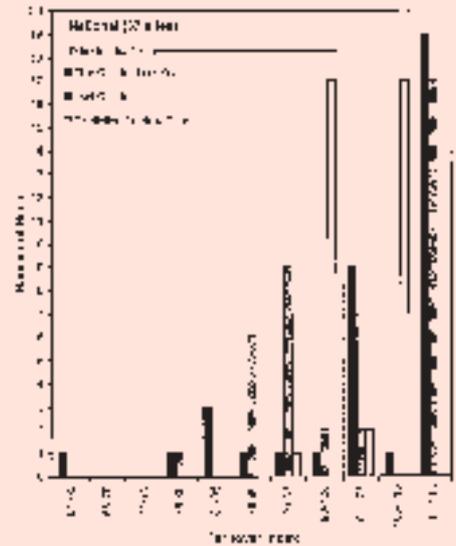
**1 JANUARY –  
31 MARCH  
2006**

= **TURNOVER INDEX 100**

## National

**OVERALL ANALYSIS  
(37 SITES)**

	Mean index
This quarter last year	<b>105.2</b>
Last quarter	<b>100.5</b>
Predicted next quarter	<b>104.2</b>



## ADVERTISING

### Advertising in *Hotline*

Regular readers will have noted growing advertising content in *Hotline* as this newsletter becomes an important UK outlet for the promotion of heat-treatment-related equipment and services.

More and more companies are highlighting themselves in a quarterly publication read, in hard-copy form and on CHTA's website, by both heat treaters and those who influence the choice of heat treatment services.

*Hotline* is not just a vehicle for advertising from suppliers to the trade; advertisements from CHTA members are also welcome.

The 2006 single-insertion charges for black-and-white ads are:

- Quarter page (121mm high x 86mm wide): £150+VAT;
- Half page (121mm high x 178mm wide or 254mm high x 86mm wide): £265+VAT;

- Full page (254mm high x 178mm wide): £475+VAT.

*Hotline* can now also feature full-colour ads for an extra £200+VAT on top of each of these charges.

Advertisers in four consecutive quarterly editions of *Hotline* are entitled to a series rate where all of the above prices are discounted by 20% per insertion.

The deadline for booking ads in September's *Hotline* 105 is August 18th. For further details, contact *Hotline* Editor Alan J. Hick (tel: 0121 329 2970; e-mail: [mail@chta.co.uk](mailto:mail@chta.co.uk)).

## STATESIDE STATS

### NORTH AMERICAN SALES UP 9.4% FOR YEAR

Through April 2006, sales recorded by participating MTI members reached \$296.2million, an increase of 9.4% over 2005 year-to-date sales of \$270.1million. April 2006 billings totalled \$70.7million, a rise of 2.9% over April 2005 when the figure amounted to \$68.7million.