

Your industry needs your voice

Succeeding David Wilkins, the new CHTA Chairman is **Terry Littlewood** (Expert Heat Treatments). His first Hotline message is also addressed to non-CHTA subcontract heat treaters who receive a copy of this issue along with a membership application form.



"We have an opportunity to be heard at Westminster"

Terry Littlewood

Firstly, let me say to my industry colleagues that I am both honoured and humbled to have been elected Chairman of our trade association. Secondly, on your behalf, I wish to thank David Wilkins for his seventeen years' service to CHTA's Management Committee and, in particular, for his two terms as Chairman. I only hope I can live up to the high standards he has set.

In the past few years the CHTA has tried, with limited resources, to get itself heard at the DTI and at Westminster. In order to do so, we have had to join forces with related industry associations. By affiliating with the Surface Engineering Association, this has been achieved whilst, crucially,

retaining CHTA's independence. We still manage and administer our Association yet, through the SEA, we are now being heard and, hopefully, listened to.

In July this year, we have an opportunity to visit the Palace of Westminster and present our industry concerns and grievances to ten MP's from the Parliamentary Committee for Industry. Each of our individual businesses has many common concerns, and we can now focus these officially and press for action.

We know that, at Westminster, there is little or no willingness to see recent legislation amended, but we now have an opportunity to explain the burdens that it has imposed. We will also be able to object constructively to any future proposals that we believe will adversely impact our businesses, our particular industry, and the general engineering industry of which we are an essential sector.

Therefore, over the coming months, two factors are most important: what do we say to Government and with what strength of conviction do we state our case?

On this, I issue two invitations:

- Firstly, CHTA members should contact CHTA Management Committee members (listed in the previous *Hotline*), our Secretariat or myself* and let us know what messages they wish to be sent to Government.
- Secondly, to contract heat treatment companies that are not CHTA members, please, please apply to join the Association now.

At present, CHTA membership represents

some 70% of our industry capacity. Membership only costs £500 per annum and, if nothing else, you receive 24/7 effective advertising on the CHTA website (www.chta.co.uk) irrespective of all the other benefits outlined there.

More importantly, you have a voice that needs to be heard. The only way to make an impact is to join forces with your industry colleagues in CHTA and those of our fellow associations in the SEA.

Remember, there is strength in numbers. Don't delay – join today, be heard tomorrow.

We look forward to hearing from you and representing your views, with the complete conviction of people who believe in the future of our industry and the wider engineering sector that we are both dependent upon and yet vital to.

*Terry Littlewood can be contacted by telephone (020 8337 7744), fax (020 8330 2699) or e-mail (terrylittlewood@hoyt.co.uk).

CHTA Secretariat

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

Contract Heat Treatment Association

c/o WHTC, Aston University,
Aston Triangle, Birmingham B4 7ET.

Tel: 0121 359 3611, ext.5212

Fax: 0121 359 8910.

E-mail: mail@chta.co.uk

Website: www.chta.co.uk

CHTA Secretary: Alan J. Hick

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



Guido Plicht
Senior Research Engineer

AIR PRODUCTS

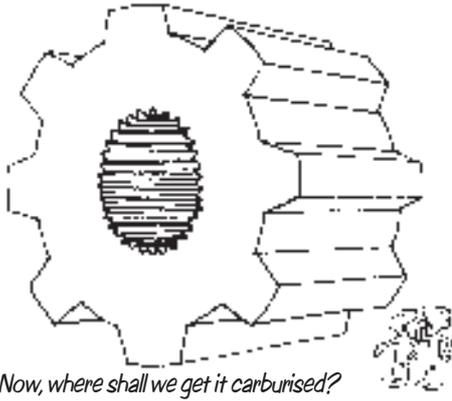
Ask the expert

Q. I have measured the oxygen in my continuous furnace, and it's low, but my parts still come out oxidised. Why?

A. That is a question that comes up frequently. When troubleshooting for oxidation in a continuous furnace atmosphere, it's important to measure both oxygen level and dew point. To find out more, visit our website.

tell me more

www.airproducts.co.uk/ate1



Now, where shall we get it carburised?

FAST response

As reported in the previous edition of *Hotline*, traffic is increasing rapidly on CHTA's website (www.chta.co.uk) where one of the most popular features is "Click here to find a heat treater". This gives the visitor access to the up-to-date electronic version of CHTA's *Buyers Guide* with automated search facility.

Like the hard-copy *Buyers Guide*, now in its 9th edition since first publication in 1977, the electronic version directs the user to appropriate CHTA members, in the North, Midlands or South, offering specific

treatments of specific materials in specific processing media.

What about the enquirer seeking specific furnace/equipment capacity? He normally contacts CHTA's Secretariat, aka Wolfson Heat Treatment Centre, to avail himself of the free service provided using the Centre's FAST computerised database which incorporates information from many CHTA members.

Complementing the *Buyers Guide* coverage, the FAST (Facilities Available for Subcontract Treatment) system has been operated by Wolfson Heat Treatment Centre since 1973 and has enabled rapid response to thousands of such enquiries over the last thirty years.

The success of the system is down to its highly detailed nature, based on questionnaires completed by participating companies on the understanding that the information supplied is handled in strict confidence by Wolfson staff, with the sole purpose of advising enquirers where jobs can be undertaken. For the Centre's eyes only, the system is not directly accessible to enquirers.

For each piece of equipment operated by the heat treater, the database includes the following information:

- Plant type
- Number of units of the same type and size

- Processes conducted therein
- Batch or continuous
- Operating temperature range
- Maximum charge dimensions
- Maximum charge weight
- Heating method
- Processing medium
- Quenching/cooling medium
- Power rating and frequency (induction)
- Notes on special features
- Back-up facilities
- Quality approvals
- Areas served
- Shut-down periods
- Full company contact details.

These indexed fields are quickly searched so that speedy contact is established between firms requiring specific facilities and those able to provide them.

Many CHTA members are also members of Wolfson Heat Treatment Centre and are thus able to participate in FAST free of charge. Further details are available from Alan J Hick at Wolfson Heat Treatment Centre, Aston University, Aston Triangle, Birmingham B4 7ET (tel: 0121 359 3611, ext. 5212; fax: 0121 359 8910; e-mail: hickaj@aston.ac.uk).

Finally, a message for those contract heat treaters already in the system. Be sure to notify the Wolfson Centre regularly of any changes in your facilities so that FAST retains its high-level credibility.

MEMBER PROFILE

J.J. Castings

The latest recruit to CHTA membership is Caerphilly-based J.J. Castings Investments (Heat Treatment) Ltd. Commonly known as "J.J.Castings", the company is a family-owned and -run business, established fifty years ago and now specialising in subcontract heat treatment operations from freehold premises in South Wales.

Over the years there has been heavy investment in capital equipment because the business specialises in the treatment of large components. For example, the induction hardening shop, set up in 1960, boasts vertical processing of lengths up to 7 metres. The maximum diameter induction hardened to date is a 1205mm OD/ 1116mm ID 2200mm-long tube. The smallest diameter would be 6-8mm.

JJ's induction hardening operations handle a huge variety of components, catering for one-off as well as mass-production orders for the automotive industry. Generators range from 25kW/450kHz to 1000kW/3kHz.

Furnace work (stress relieving, annealing,

normalising, solution treatment and tempering) commenced in 1971. With maximum temperatures up to 1000°C, the numerous electrically-heated computer-controlled batch furnaces, some with quenching facilities, encompass large (9900mm-long x 3900mm-wide x 2500mm-high (40tonne load) and 3300mm-high x 3300mm-wide x 5100mm-long (20tonne load)) and small (500 x 500 x 500mm approx.).

In 1976, J.J.Castings was the first company in the UK to install a plasma nitriding facility. In the tallest plasma nitriding furnace (5900mm-high x 1100mm-diameter), long items can be processed vertically, whilst another (2000mm-diameter x 2000mm-high) caters for larger diameters. JJ's smallest plasma nitriders measure 500mm diameter x 750mm high.

The company also offers PVD coating, a service established in 1983 for all sorts of tools and knives, decorative applications, motor-sport components, surgical parts and food-processing equipment. Titanium nitride, titanium aluminium nitride and chromium nitride coatings are available for items measuring up to 1m in length or



diameter. The lowest coating temperature employed is about 250°C.

Works Manager Theresa Rees notes that the company meets extremely high standards of quality and customer care. Originally registered in 1987, J.J.Castings currently holds BS EN ISO 9002:1994 approval; transition to ISO 9001:2000 will be completed in June this year.

High-purity Nitrogen at Lower Flow Rates

Nitrogen for furnace applications was once only available through the cryogenic mode of supply. The advent of on-site nitrogen generators permitted an alternative supply route but at the expense of purity levels. Now, new advances in technology have overcome the purity problem while enabling flow rates amenable to the heat treatment industry. **Rob Edwards, Guido Plicht and Beth Jennings**, of CHTA sponsor Air Products PLC, explain.

In the metals processing industry, some companies traditionally use exothermic, endothermic or ammonia-based generators to create the necessary process atmospheres. Compared with atmospheres composed of technical gases such as nitrogen, these generated gases have serious disadvantages. For this reason, many heat treatment companies use high-quality atmospheres based on nitrogen.

It is becoming increasingly important to produce parts at competitive prices. In a number of heat treatment processes, it is possible to use nitrogen with lower purities, which means higher oxygen levels compared with liquid-nitrogen supply sources.

In general, protective atmospheres provide an environment neutral to the metal, to prevent oxidation and provide a bright surface finish. Therefore, air has to be removed from the furnace, making it important to provide sufficient flow of the atmosphere to prevent air ingress.

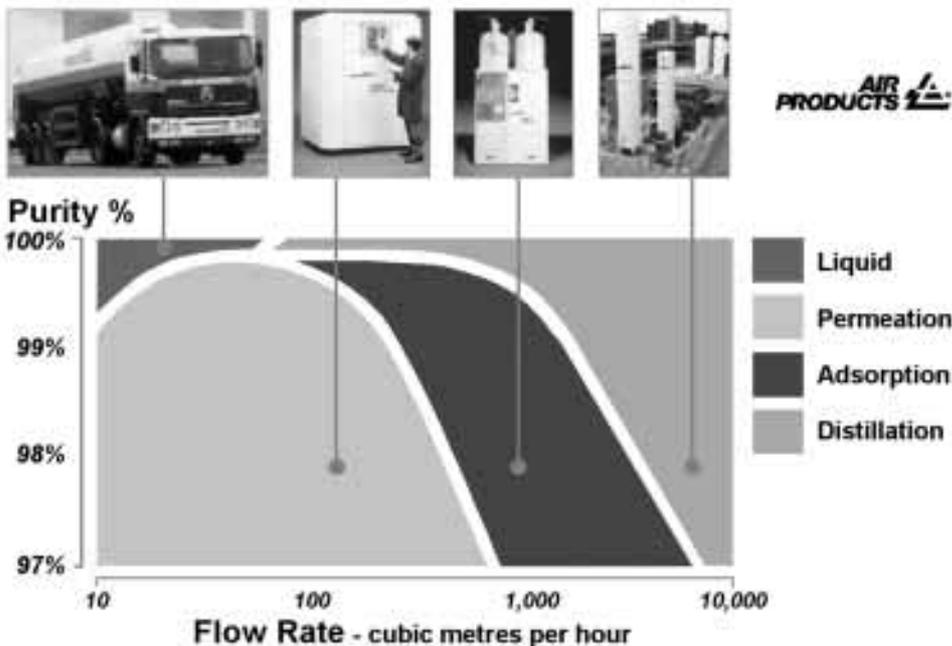
Nitrogen can be supplied in different ways and with different purities. For the quantities employed normally by heat treatment companies, bulk or on-site supply can be used. Bulk, or liquid stored nitrogen, has traditionally the highest quality associated with it because of its of 99.9995% purity.

On-site nitrogen can be produced in different ways with different purities, using well-known technologies such as: membrane systems, pressure swing adsorption (PSA) systems; and, for higher flow rates, the high-purity nitrogen (HPN) generator system.

Most carburising furnaces processing with nitrogen/methanol atmospheres are now operating on membrane or PSA-based nitrogen supply systems because the lower-purity option is acceptable to the process and codes of practice. However the advantages of this mode of nitrogen supply could not be realised for a high-purity requirement.

Since nitrogen flow rates, operational

On-site generation: the choices for nitrogen



procedures and process requirements are different in every plant; there can be no general recommendation for mode of supply. However there was a gap in the range, particularly with regard to heat treatment applications at the lower flow rates, but with a high-purity requirement. Oxidation of base metal surfaces is the most common atmosphere-related problem. With the addition of reducing gases, this problem could often be avoided with lower-purity nitrogen supply systems. This need not be the case now.

Air Products has focused on developing high-purity generation equipment, which has delivered several low-cost innovations. One that is proving most attractive to the heat treatment industry is the high-purity pressure swing adsorption (HP PSA) system.

Air Products is the only industrial gases company that can achieve 5ppm oxygen (equivalent to cryogenic product) through a low-cost commercially-available non-cryogenic technology. The real differentiator between standard and high-purity PSA generation is the proprietary process cycle and selective carbon molecular sieve (CMS) used within the PSA technology.

The range and capabilities of the high-purity PSA enable the benefits of on-site nitrogen generation without the issue of

purity of gas, or the addition of reducing gases. The benefit of such systems is that they can be offered at a cost competitive to exothermically- and endothermically-generated atmospheres, but with greater security of product supply.

These extremely cost-effective nitrogen systems feature a proprietary adsorption process developed by Air Products and unrivalled in the industry. In this unique process cycle, oxygen, moisture and carbon dioxide are removed from air, through the use of a molecular sieve, to produce a gas with maximum efficiency.

The advantages of on-site generation are cost savings, consistency of product quality and security of supply, in a flow range that is amenable to the heat treatment industry. Additional benefits found within the delivery of gas through an on-site generation device include power savings, versus traditional modes of supply, and lower environmental impact through a reduced number of product deliveries.

Rob Edwards, Guido Plicht and Beth Jennings help to create and deliver Air Products' expertise in heat treatment atmospheres. For further information contact Shawn Lainchbury (telephone 01932 249398 or e-mail lainchs@apci.com) or visit www.airproducts.co.uk/ghta1.

TERRY ATTERBURY RETIRES

Aged 63, Eur Ing Terry Atterbury, ACT(Birm), CEng, FIM, SenMweldl, MIQA, retires from TTI Group at the end of March after many years in the subcontract heat treatment sector. He does so after a career that has seen him become one of the UK's best-known and well-respected heat treatment metallurgists.



"I shall find it difficult to walk away from a profession that became so much a part of my life..."

Terry Atterbury

Terry studied metallurgy at Aston, doing the part-time ACT(Birm) and graduating in 1964. He subsequently gained Fellowship of the Institution of Metallurgists in 1977. He's proud of his status as a Chartered Engineer and European Engineer, is a Senior Member of the Welding Institute and a Member of the Institute of Quality Assurance, and holds the Diploma in Nondestructive Testing.

Starting work, at the age of 16, at ICI Laboratories (Smethwick & Witton), Terry subsequently moved to BSA and GKN Labs where he was always involved with ferrous metallurgy and heat treatment.

Whilst at GKN, Terry installed the first-ever integral oil-quench vacuum furnace in the UK and spent much of his subsequent time with vacuum heat treatment. He moved to Aldridge Heat Treatment as General Manager in 1980. Aldridge was bought by what is now TTI in 1986 and Terry was made a Director at that time. He was promoted to Group Technical Director about five years later.

Terry has delivered and/or had published many papers ("lost count") on the metallurgy and heat treatment (especially vacuum heat treatment) of special steels, and is part author of a book. He has been a loyal supporter of the activities of Wolfson Heat Treatment Centre since its inception in 1973.

Married to Margaret, with two children (son Paul was MD of Walsall Heat Treatment until 2002) and three grandchildren, Terry's life-long hobbies have been motorcycling and photography (although his family will say that work has always been his hobby). Sadly, last year he decided the time had come to hang up his leathers and he sold his cherished BMW (and bought a new camera).

Terry hopes to be doing some heat treatment training and consultancy after retirement. Extra free time will give him the chance to spend more with his family and to take his photography more seriously.

Reflecting on his career, Terry observes: "I can say with total sincerity that I have no regrets about taking metallurgy and heat treatment as my profession. I shall find it difficult to walk away from a profession that became so much a part of my life and from so many friends and colleagues who I shall always remember".

We're sure that all those friends in our industry will join CHTA in wishing Terry a long and happy retirement.

WALLWORK INVESTS IN NEW CAPACITY AND GAINS AEROSPACE APPROVAL

Wallwork Heat Treatment has invested over £750,000 during the last twelve months in new plant at its Small Heath, Birmingham division. This includes a new recently-commissioned Seco/Warwick 10.0 VPT vacuum furnace that will take tools and components up to a total weight of 1200kg.

The new plant is designed for vacuum hardening of alloy steels and annealing of stainless steels. Its unique isothermal cooling system makes it highly suitable for heat treatment of hot-die steels, for aluminium or magnesium die casting, with minimal distortion, and for hardening high-alloy engineering steels for critical automotive and turbine-engine component applications.

A unique feature of the new furnace is the custom-built control system, designed and put together by the Wallwork engineering team. This allows very precisely controlled heating and quenching cycles, with excellent temperature uniformity throughout the furnace envelope. The isothermal characteristics make it ideal for heat treatment of large components, up to

1000mm square and 1500mm in length.

The furnace is well suited to hardening of high-speed steel components, including the new sintered materials. The very rapid quench rates possible also allow very efficient processing of large tools, particularly using H13, and also enable effective hardening of En24-type steels.

"This new capacity," says Mike Allen, Director of Wallwork Heat Treatment (Birmingham) Ltd, "will allow us to radically reduce our turnaround times, especially on stainless steel annealing and vacuum treatments for larger tools and dies."

The Wallwork Group, which also includes the Bury facilities and Tecvac in Cambridge, additionally reports that it has been awarded SCI Part 1 Approval by BAe Systems. This covers flying parts, and includes heat treatment, case-hardening and other related processes for parts made from ferrous and non-ferrous metals, including titanium and nickel products. Wallwork has long maintained Part 5 Approval, which covers non-flying parts such as jigs and production tooling.

Wallwork Heat Treatment Managing Director Ian Brown said: "Wallwork has provided heat treatment and coating services for many years to the aerospace industry, especially for toolmaking and jigs. Now that our customer base extends far deeper into control and hydraulics components and highly-stressed engine parts, this accreditation allows us to offer comprehensive support for heat treatment and coatings services throughout the aerospace sector."

NEW BODYCOTE GILLINGHAM PLANT OPENS

Established under a long-term agreement between Delphi Corporation and Bodycote Heat Treatments Limited, the new Gillingham Service Centre has been commissioned, validated and opened for business on March 1st.



The new vacuum furnace at Wallwork Heat Treatment, Birmingham.

The new Service Centre will provide vacuum and sealed-quench heat treatment, gas nitriding, thermal deburring, metallurgical coatings and associated treatments. The Centre is also equipped with computerised process controls, environmentally-friendly cleaning systems and environmental protection systems. Colin Grey is Works Manager.

Utilisation of the facility will be increased by making the services available to third parties, extending Bodycote's UK network to serve the South-East of England and the Home Counties. The availability of a Bodycote service centre in this area will provide efficiency, logistical, quality and economic benefits to local engineering manufacturing companies.

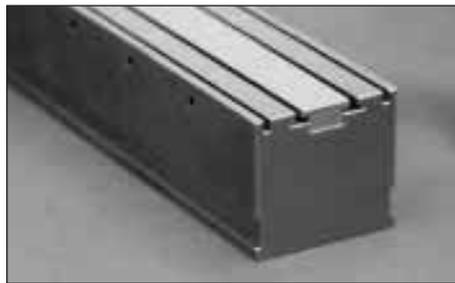
Mike Hallas, Managing Director of Bodycote Heat Treatments comments; "This is another major milestone in the trend to outsourcing of metallurgical services and brings this, already-successful Bodycote business model, into the South-East of England"

Delphi Corporation is one of the world's largest technology companies. The Gillingham plant, part of Delphi Diesel Systems, manufactures components for diesel-injection systems, including Delphi's advanced second-generation common rail system, which is supplied to Ford, Renault, Hyundai and PSA Peugeot Citroën for their highly-regarded diesel passenger cars.

Bodycote Heat Treatments Ltd is a subsidiary of Bodycote International plc, the world's largest supplier of metallurgical services. With over 240 plants in 20 countries, Bodycote provides global access to a wide range of metallurgical solutions, including heat treatment, metal joining, metallurgical coatings, materials testing and the densification and manufacture of components by powder metallurgy and hot isostatic pressing.

NEW ULTRAHARD DUPLEX PVD COATING

Cali-Coat, a new PVD duplex coating now available from Tecvac Ltd, a Wallwork company, gives brass, copper, aluminium and steel tools and components a surface



Cali-coat, silvery grey in colour, is shown applied to an extrusion tool. The central strip in the image is uncoated brass.

hardness of 2000HV (twice the hardness of high-quality chrome plate) to extend the working life of extrusion dies, tools and components by up to six times.

The *Cali-Coat* process increases surface hardness and reduces surface friction. Applied under vacuum by a new type of electron-beam physical vapour deposition (PVD) process, the coating closely matches the surface geometry. This allows it to replicate mirror surfaces and other 'polished' finishes.

Cali-Coat has a silver colour. It adheres strongly to metal surfaces, with applied layers up to 20 microns thick to eliminate flaking. It has a very high erosion resistance to harsh fillers, such as glass fibres in plastics during the moulding process. This is especially valuable when using dies or moulds with vacuum slots that are primarily intended for specialist extrusion processes to produce structural items such as window or door frames.

Cali-Coat's ability to coat brass and copper is also likely to benefit all users of complex mould tools that employ copper or brass inserts to enable rapid heat flow during the injection moulding process.

A unique feature of the Tecvac *Cali-Coat* hard coating process is that working tools and inserts can be stripped and recoated at Tecvac's specialist facility in Cambridge to restore original performance.

The radical reductions in die and tool wear achieved using a *Cali-Coat* PVD hard coating decrease downtime and give better dimensional stability for moulded or extruded products. For more information about the process, call Richard Burslem on 0161 797 9111.

ANOTHER "UNDERSTANDING HEAT TREATMENT" COURSE

Wolfson Heat Treatment Centre's well-established "Understanding Heat Treatment" course will next be staged on 14-16 October this year at the usual venue, Aston Business School at Aston University in Birmingham.

The course is designed to impart a general insight into the metallurgical/technological background to industrial heat treatment, with the emphasis on steel processing. It's open to both residential and non-residential participants.

For full details and registration forms, contact the Course Administrator, Wolfson Heat Treatment Centre, Aston University, Aston Triangle, Birmingham B4 7ET (tel: 0121 359 3611, ext. 5212; fax: 0121 359 8910; e-mail whct@aston.ac.uk; web: www.aston.ac.uk/whct).

GUIDANCE TO HELP EMPLOYERS INVESTIGATE ACCIDENTS AT WORK

The Health and Safety Executive (HSE) will issue new guidance later this year to help employers investigate incidents that cause injuries and ill health in the workplace.

The decision to issue the guidance, rather than to recommend legislation to require employers to investigate incidents, was taken by the Health and Safety Commission (HSC) after taking views in response to a wide-ranging consultation exercise.

HSE received 684 responses to the 1998 discussion document, *A new duty to investigate accidents*, and 460 to the 2001 consultative document, *Proposals for a new duty to investigate accidents, dangerous occurrences and diseases*. This set out proposals to introduce specific legal requirements on employers and others to investigate incidents reportable under the *Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR)*.

There was overwhelming support for the principle of using incident investigations to learn lessons and prevent workplace injury and ill health, and a range of views over how that could best be achieved. Research commissioned by HSE into current practice, published in *Accident investigation – The drivers, methods and outcomes*, revealed widespread lack of confidence in carrying out such investigations, and many felt that guidance to address this knowledge gap would be more helpful than a legal duty.

HSC Chair Bill Callaghan said: "We want people to learn the lessons from work-related incidents with the potential to cause injury and ill health so that they can prevent similar occurrences in the future."

For the best in contract heat treatment,

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www.chta.co.uk

We recognise that some employers need help to tackle this issue, so we are preparing a range of guidance material. We will monitor the effectiveness of this guidance closely – and, if there is no improvement in incident investigation, then we may consider the possibility of recommending new legislation.”

In 2001/2 249 people died and 27,477 more suffered major injury through work activity, while 40.2million days off work were caused by work-related injury and illness. Lessons can be learned by investigating these incidents, and also ‘near misses’ – serious health and safety failures where no one is injured.

The guidance will come in a range of formats and the first of these will be published later this year. They will include paper and software investigation tools, and basic and more detailed information leaflets.

ONLINE GREEN GUIDANCE LAUNCHED FOR SMEs IN THE METALS SECTORS

New guidelines have been launched on the NetRegs website to help small businesses in the metals production and processing sectors understand their environmental obligations.

The guidelines – which can be viewed at www.environment-agency.gov.uk/netregs – are designed to help those working in the production and processing of metals industries to comply with the environmental legislation governing their activities.

NetRegs offers advice on good environmental practice and easy-to-understand guidelines on regulations governing the manufacture of both ferrous and non-ferrous metals, metal forming, wire drawing and metal casting.

The site – a joint initiative between the Environment Agency, the Scottish Environment Protection Agency and the Environment and Heritage Service (NI) in conjunction with the Small Business Service – is free to use and anonymous.

Environmental impacts associated with metals production and processing range from air emissions – such as dust and

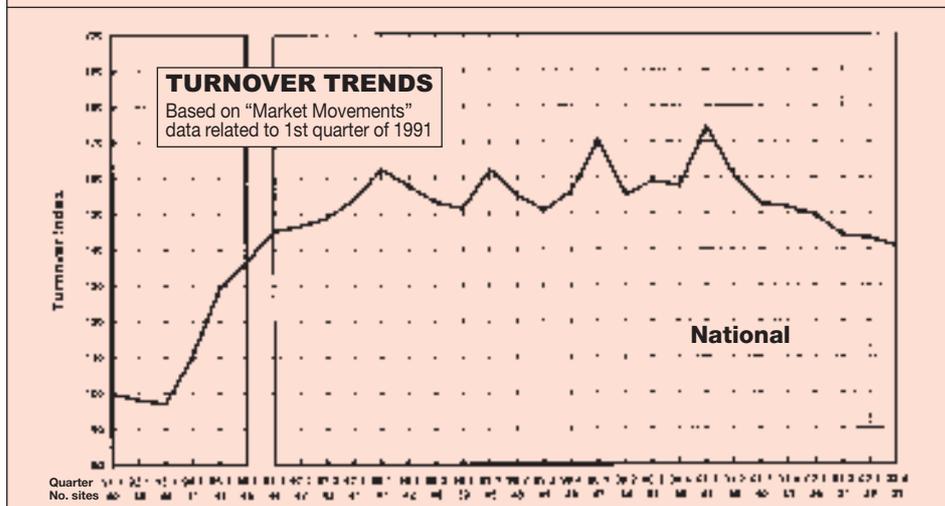
Market Movements

ANALYSIS OF QUESTIONNAIRE REPLIES RELATING TO 31 CHTA MEMBER SITES

“THIS QUARTER” =
1 OCTOBER – 31 DECEMBER 2002
 = **TURNOVER INDEX 100**

National

OVERALL ANALYSIS (31 SITES)	Mean index
This quarter last year	98.7
Last quarter	101.6
Predicted next quarter	107.2



carbon dioxide from scrap preparation, furnace fumes and finishing processes – to contaminated water discharges from material decontamination, cooling and wet scrubbing processes. Other impacts include land contamination, energy use and waste generation.

Last year, the sector was responsible for at least four major and ten serious pollution incidents in England and Wales affecting water, air and the land.

The launch of the guidelines follows research commissioned for NetRegs that revealed that awareness of environmental regulations among small businesses in the UK remains low. It found that 86% of small businesses questioned did not think their activities harmed the environment. But when prompted with a list of potentially damaging practices, nearly 60% said they conducted at least one of them. Only 18% could name any environmental legislation affecting them.

Environment Agency Chairman Sir John Harman said: “Many SMEs in the metals production and processing sectors already

provide a valuable recycling function, re-using scrap materials and waste. The NetRegs guidelines have been designed to help them understand their statutory obligations and further improve their environmental performance, whether it be reducing their emissions to air and water or tackling noise problems and reducing energy use.”

MTI

NORTH AMERICAN HEAT TREATER PERFORMANCE

According to returns from participating members of the Metal Treating Institute, North American commercial heat treatment sales increased for the second straight month in December. At \$62.3million, they were up by 2.2% compared with the \$60.9million of December 2001. For the year, the industry posted a decline in billings. Heat treaters reported 2002 sales of \$875.7million, a drop of 4% from 2001's total of \$912.4million.

Advertising in *Hotline* – a bargain!

Readers are reminded that advertising in *Hotline* is open to both CHTA members and suppliers to the trade. A quarter-page ad, for example, is a bargain at a cost of only £100. For booking space or further details, contact CHTA's Secretariat.