WOOD focus

ISSUE NO. 16 Spring 2007

WHO'S WHO AT HEAD QUARTERS

The Institute of Wood Science is now established in the London office and the staff has settled in to their premises well. You will be aware of Tony Willenbruch from the previous issue of Wood focus, who as our director we are confident will help to develop the Institute.

In addition there are Sally Abbot and Tom Newman who will always be there to help you should you have any queries regarding any aspects of the Institute and the office. So who are these people?

Sally Abbot
Executive Assistant
Institute of Carpenters
& Institute of Wood Science

Sally spent her formative working years in politics and survived three general elections. 14 years ago she moved to Suffolk where she brought up her two daughters, gained much experience in various jobs and ended up with her own life coaching practice.

Sally joined the Institute of Carpenters in October 2006 and also now enjoys working with the Institute of Wood Science; although interested in the many aspects of wood industry, her only previous experience of the material is owning some wooden artefacts and extracting splinters from various (catastrophic) DIY projects. Her interests include theatre, literature, and writing.

Thomas Newman
Administration Assistant
Institute of Carpenters
& Institute of Wood Science

Thomas is an Economics graduate from Plymouth University who has worked in various countries in Europe and South America. He has experience within the construction industry from a hands-on level to direct marketing and selling of foreign property. He recently helped a friend to convert an old barn into a habitable residence and has always had a keen interest in carpentry. He recently finished an internship with the Spanish Chamber of Commerce in London.

CHANGES OF EDITOR

OUTGOING

David Woodbridge FIWSc

Having edited ***Wood Focus*** since its launch eight years ago (and prior to that the Journal of the Institute from 1992 to 2000) David is of the opinion, especially with the Institute's collaboration with the Institute of Carpenters, that a new approach for Wood Focus would not go amiss and that the time has come when he should retire from the post as editor. His intentions were made known to and accepted by the Council of Management in December 2006.

The 15 issues that he has produced have all had their challenges and it has been an enjoyable activity planning the content of each issue and trying to maintain a balance between newsletter type items and articles that have a technical or topical content. Concerning the latter, at the back of his mind has frequently been the value, as supplementary material, that they may have for students working on the IWSc courses. He has often referred his own students to them.

Finally, his thanks go to all those who have, over the years, contributed articles and provided support in the publication process.

The magazine of the IWSc INSTITUTE of WOOD SCIENCE

INCOMING

Barry Matthews FIWSc

Barry left school with the intention of pursuing a career in Engineering, first as a draughtsman and then as a designer of mechanical equipment. During a time of employment with The Timber Research and Development Association (TRADA) he registered at the Buckinghamshire College of Higher Education to study for the Certificate of the Institute of Wood Science (IWSc).

An opportunity arose which enabled Barry to accept a post as a Senior Lecturer at the College, later to become the Buckinghamshire Chilterns University College (BCUC). He worked with a team of lecturers involved in both the Certificate and the Associate Courses for the IWSc, and was also involved in the development of courses for degree and Post-graduate degree qualifications in timber.

As a member of the IWSc Barry became a council member and contributed to the Education Committee, he was conferred with Fellow of the Institute. In 2001 he became the Editor of the Journal of the Institute, with the departure of David Woodbridge as Wood focus editor he recently took on that role.

FIRE DOORS - Ask the experts

Colour Concentration in headings not Consistant - See/Compare Page 9

Andrew Forecast and Peter Barker of Chiltern International Fire respond to Frequently Asked Questions about timber-based fire door sets with up to 60 minutes integrity performance.

Q: How can existing fire door sets be upgraded?
A: There are numerous methods for upgrading existing door sets to enhance their inherent fire resistance, although every upgrade is specific to each door set and consequently may not necessarily be appropriate for another design. The only way to ensure that the most appropriate method is chosen - and to have the enhanced integrity performance underwritten - is by commissioning a site survey by a qualified fire engineer. The relatively large numbers of components that make up a fire-rated door set are integral to its performance and a comprehensive knowledge of these components is needed, e.g.:
a) Whether the door can be upgraded to the required integrity.
b) What the most appropriate upgrading measures are.
c) If there are other issues that may negate the performance of the door, such as sidelights or over panels.
d) How to address glazing, panelling, ironmongery, intumescents, core type etc.

Q: Is a 10 mm x 4 mm intumescent seal for 30 minutes integrity and a 20 mm x 4 mm intumescent seal for 60 minutes integrity adequate?
A: Whilst it is generally true that larger intumescent strips are used for higher integrity periods, the intumescent specification for the door must be as tested or assessed for that particular door set. This is the case for:

- the size of the intumescent seal,
- the location of the seal and
- the type of seal.

NB: The type of seal is also particular to the manufacturer, as different manufacturers' seals do not perform comparably, even if they are of the same generic type, e.g. graphite. It is for this reason that interchanging between different seal types and/or manufacturers is not permitted, unless there is test evidence available to demonstrate otherwise.

Q: Can a test laboratory provide copies of test/assessment reports?
A: No, not without the written permission of the test sponsor, as all door manufacturers' test and assessment data is held in confidence by the relevant test laboratory.

Q Traditionally a FD20 door set comprised a 25 mm doorstop, no intumescent and a 30-minute blank. Is this still acceptable?
A: Prior to 1972 the British Standards prescriptively defined how to construct a fire door set and this included using 25mm doorstops. Since then the standards have been changed and the method of proving performance is by independent testing. For economic reasons, manufacturers generally test to achieve 30 minutes and sell the same product for 20 minute applications as well. Purchasers should satisfy themselves that acceptable evidence exists, rather than working to out of date prescriptive solutions.

Q: Can rising butt hinges be used as a closer for the fire door?
A: Approved Document B cites rising butt hinges as acceptable for use on fire resisting door sets, providing there is suitable test evidence available. To the best of our knowledge, there is no supporting fire test data for the use of rising butt hinges and this, coupled with their known limitations, lead us to recommend that such hinges are not used with fire resisting door sets.
In order for rising butt hinges to operate effectively, either the leaf head or frame head has to be chamfered, which means there will be the correct leaf to frame gap on one side of the door, but too large a gap on the other. If the gap is too large, the intumescent seal will not react as intended and it may therefore negate the performance of the leaf.
In some instances both the leaf and frame head may be simultaneously chamfered, giving rise to a different but potentially serious problem whereby the reacting intumescent seals in the head force the leaf open due to the direction of flow and pressure from the reacting material.
Another problem with rising butt hinges is that they rely on gravity to close the door over the latch and it is quite common for pressure differentials within a building to prevent the hinges from doing so. This can then lead to the door 'bouncing' on its latch and not fully closing within its frame reveal, thus failing to function as an effective fire resisting door set.

Q: Do any timbers have an inherent spread of flame classification? And how do I treat timbers for class 1/class 0?
A: Spread of flame and fire resistance are two quite separate performance characteristics. Fire doors must prove their fire resistance rather than spread of flame performance.
In Approved Document B, the typical performance rating for untreated timber or plywood with a density of more than 400 kg/m^3 is class 3 and therefore any untreated timber will need test evidence to prove that it has a higher rating.
In general, timber will need treatments to achieve the higher ratings. It is recommended that a timber treatment specialist is consulted to ensure that the most appropriate method is chosen.

Caption?

Q: Can intumescent strips be over-painted?
A: Most manufacturers of intumescent seals recommend that ideally intumescent strips should not be painted over. For further clarification contact the seal manufacturer for supporting evidence and advice.

Q: Can fire doors be glazed?
A: Not all fire rated door sets can tolerate glazing and it is therefore essential to check the test evidence/assessment data for that door. If the door can accept glazing then it is of paramount importance that the exact guidelines are followed, as apertures may need to be internally framed/lined with timber.
The following is an excerpt from '*A Guide to Best Practice in the Specification and Use of Fire-Resistant Glazed Systems*' written by the Glass and Glazing Federation (GGF).
'The fundamental Golden Rule
Fire-resistant glass must only be used as part of a fire-resistant glazed system – which includes the glass, the glazing seal, beads, fixings and frame. All the essential components of such a system must be compatible under fire conditions, and the performance must be referenced to appropriate and relevant test evidence.'

Q: If the door does not fit, can it be resized?
A: Resizing a door set is not something that should be done without first contacting the manufacturer. Most door designs rely on components being of a minimum size in order to perform in a fire. Lippings are particularly important on typical flush door leaves – removing 3 mm or 4 mm can in some instances halve the depth of a lipping which could have a detrimental effect on the fire performance.

Q: What is the recommended gap between leaf edge and frame for a fire rated door?
A: The recommended leaf edge to frame gap specified in BS 8214: 1990 is 4mm on all edges. Intumescent seals are engineered to react within this size of gap to give optimum sealing and clamping performance.
It is through extensive testing of fire rated door sets, together with knowledge of the pressure regime within a fire test that a larger gap is permitted at the threshold of the door. There is negative pressure at the threshold during test conditions and so cool air is drawn in underneath the door. It is for this reason that there is unlikely to be a failure at the threshold and also why there is no need to fit a perimeter intumescent strip at this location (door sets below FD60 performance). A larger gap at the threshold is also useful from a practical end use application for accommodating floor coverings. We recommend a gap of 10mm from the bottom of the leaf to the structural surround.

Q: Can a FD60 door set be hung in a softwood frame?
A: In practice it is very difficult to pass a 60 minute fire test using a softwood frame, simply because it chars more quickly than most hardwoods. For this reason dense hardwoods are usually used, but softwood would be permissible if it were supported by appropriate test evidence.
Q: Can a letter plate or eye viewer be fitted to a fire-rated door?

A: Fitting a letter plate or eye viewer will breach a fire rated door set and has the potential to allow a direct passage for hot gases and flames. It is therefore important that:
a) There is test/assessment data for the fire rated door set to tolerate the ironmongery.
b) The ironmongery being fitted has been previously tested in a door set of comparable construction.
c) The maximum height at which the letter plate can be fitted is adhered to (see below).
The test conditions of BS476: Part 22: 1987 are such that the neutral pressure axis is at 1000 mm from the threshold of the door (500 mm in BSEN 1634 – 1 2000); below the axis the pressure is negative and above the axis the pressure is positive. This means that above the neutral pressure axis hot gases will be forced against the door set and without supporting test data, a letter plate fitted at this location may compromise the integrity of the door set. The tested height of a letter plate relative to the neutral pressure axis is therefore an important constraint in limiting its location.

Q: Can kick/push plates be fitted to the face of the fire door?
A: It is usually permitted to face fix kick plates and push plates to a fire-resisting door. We permit facing the door with metal to a maximum of 30% of the timber area of the leaf, provided that the metal face is surface fixed and does not wrap around any leaf edge or interfere with any essential intumescent seal. Above the 30% limit of timber surface area, or for any other condition, further test evidence must be generated. The reason for limiting the area of metal on a door is because when heated in the fire the metal will expand, while the wood will shrink, causing distortion. It can also act as a heat sink, thus accelerating char and erosion at localised areas.

For further information on fire doors visit www.chilternfire.co.uk,
Telephone 01494 569800
Email cif@chilternfire.co.uk

Caption ?

How do the pictures relate to the article ?

Sculpture sur Bois

By David Woodbridge FIWSc

In a remote mountain hamlet, at 1530 m above sea level (Ben Nevis is a mere 1344 m above sea level) in the French Alps it was something of a surprise to alight upon a small but impressive studio of wood carvings, turnery and numerous functional and decorative hand-crafted wooden articles. The enterprise is run by Hélène Milliat and her husband, Patrick. Their studio is set out in a vaulted ground floor space within a building which must be at least 400 years old. In an adjoining building three floors have been converted into a wood machining workshop and timber store. Access to this hamlet is limited to service vehicles only and for many of the winter months it is subject to deep snow.

Picture 1. *Friburge, Champagny le Haut, Vanoise*

Hélène Milliat is the wood carver and sculpture and Patrick (a photographer and atelier) prepares the timber and produces his own turned items ranging from bowls to a wide variety of lamp bases.

In this remote valley, which in itself is a National Park, they have been in business for fourteen years relying on hikers, cross country skiers and summer tourists for their trade along with sales generated from an eye catching website (http://atelier-bois.lescreatifs.com).

With the wide range of articles produced there is an equally wide range of woods used, each chosen for its particular properties and characteristics.

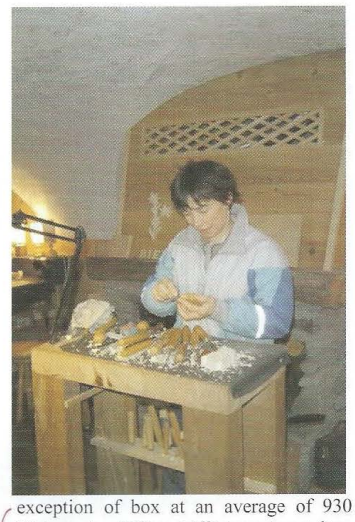
Picture 2. *Part of the exhibition, displaying a wide range of children's puzzles, toys, wall mounted plaques and bas-reliefs.*

For intricately carved pieces lime (*Tilia* spp.) is the favourite. But spruce (*Picea* spp.) is also used provided the wood is really slowly grown and fine grained, a feature typical of the spruce grown at the higher alpine altitudes. For children's toys and jigsaws beech and maple provide robust, cleanly worked, easily decorated and splinter free material.

Picture 3. A *selection of chisels and carving tools.*

Sycamore (*Acer pseudoplatanus*) and acacia (Probably false acacia (*Robinia pseudoacacia*)) are favoured for many of the turned items on account of their striking figure, especially the latter, their workability, fine texture and contrasting colours. Beech (*Fagus sylvatica*) is used for a range of items associated with cooking and household ware. For a richer colour and natural figure, wild cherry (*Prunus* spp.) and walnut (*Juglans regia*) are favourites. Other timbers used by both artisans are maple (*Acer* spp.), ash (*Fraxinus excelsior*) and box (*Buxus sempervirens*). Of the fruit-woods commonly chosen by wood turners pear (*Pyrus* spp.) features in their product range.

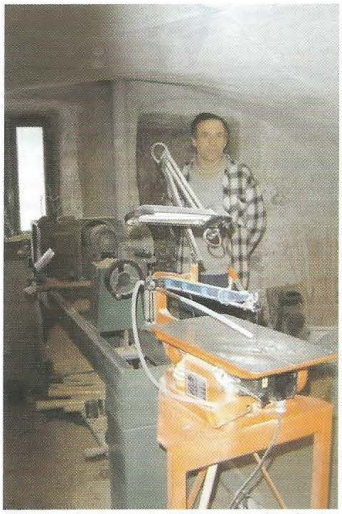
And for some really special items, clock pendulums for example, hornbeam (*Carpinus betulus*). At an average density of 770 kg/m^3 this wood (with the exception of box at an average of 930 kg/m^3) is the heaviest wood used by the Milliats. It is reasonable to assume that this is the reason why hornbeam has been found to be suitable for pendulums. For similar reasons lime, averaging only 560 kg/m^3 (apart from spruce at around 470 kg/m^3), is the lightest and least dense of the woods used, hence one of the reasons why it has such a unique reputation for wood carving and bas-reliefs. Lime has a cell structure that, in addition to having very small diameter vessels, is truly diffuse porous with the elements evenly distributed and no great variation in cell wall thickness regardless as to whether the wood is grown early or late in the growing season (Jane, F. W. 1956. *The Structure of Wood.* London. Adam and Charles Black).



Picture 4—*Hélène Milliat waxing a lime carving of the Alpine gentian flower.*

Picture 5. *Turned bowls and lamp bases.*

Production machinery is limited to a circular saw bench, a jig saw, a narrow band saw, an overhand planer and a wood turning lathe. All the products are finished, polished or painted by hand.



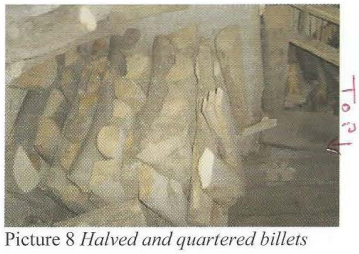
Picture 6. *Patrick Milliat in the lower workshop which houses the lathe and jig saw.*

The uniform structure allows this wood to be cut and worked, whatever the direction of the cut, without chipping or tearing. Pear has similar homogenous properties but is harder.

The woods used in the enterprise are obtained from nearby sawmills and specialist suppliers and, with some exceptions, are normally the product of the woodlands in the alpine foothills.

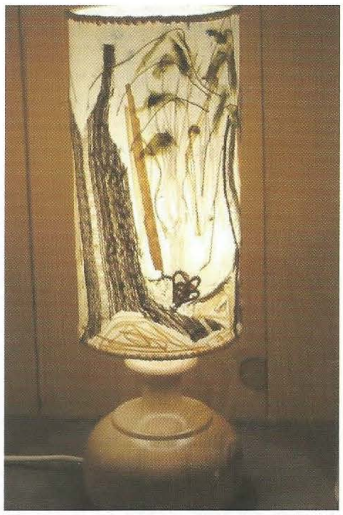
All the timber is stored within the premises and comes in all shapes and sizes, much of it being seasoned for many years before use, very much in the tradition of the wood working crafts from the medieval times.

Picture 7. *Timber storage in waney edged boards.*



Picture 8 *Halved and quartered billets*

The aspect of the enterprise that was outstandingly impressive was the depth of understanding and appreciation of the potential for each type of wood used and the care with which each item was crafted to best enhance the wood's natural features–a refreshing scenario in today's world of mass production and making real sense of the much used (but not always achieved) term FIT FOR PURPOSE!



Picture 9. *Ash lamp base and hand-painted shade. (0947)*

All photographs courtesy of the author.

CAPRICORN TIMBER

Capricorn Timber opened their doors for trading in 1993, in the firm belief that the marketplace for speciality timbers had an exciting future. After Fourteen years, and the recent purchase of a new £3.25 million pound sixteen acre site have confirmed those early ideas as being well founded.

In the early days of trading the company relied heavily on the knowledge of it's small trading team, all of whom are still with the company, and have the satisfaction of seeing their efforts having produced a respected supplier to the UK and European trade.

The original stocks of durable, untreated sustainable softwoods, still forms the main basis of the companies stockholding, along with joinery quality Hardwoods. All supplies are from legal and sustainable sources. Certified material currently accounts for approximately 38% of the total stock, and it is expected that this figure will increase substantially in the short term.

Exterior cladding is a particular strength of the company. Produced in Western Red, and Yellow Cedar, Douglas Fir, Thermowood, Siberian Larch,, and more latterly Southern Cypress. These highly durable timbers require no potentially toxic treatments, and compliment the growing demand for building products of a low carbon footprint.

Constructional timbers such as Merchantable Douglas Fir, Pitch Pine, and Oak, with lengths up to 60 feet available, form an important part of the stockholding. To compliment this side of the business, the company has two qualified visual strength graders.

Over the last two years the company have seen increasing support for its stocks of Fijian Mahogany, which is anticipated to be fully certified, later into the year.

Other ancillary services available are kilning, preservative treatment, fireproofing, priming, and clear lacquer.

In the last six months the website (www.capricorntimber.co.uk) of the company has been totally updated, and is now a valuable source of daily enquiries.

The importance of machined products continues to increase, to the extent that the new site will house a 25,000 square foot modern mill. The installation of new moulders and re-saws will effectively quadruple the current capacity, and provide much reduced lead times.

Nationwide delivery is available through the company's fleet of 8 wagons.

Contrary to most timber companies practice, Capricorn believes in holding a comprehensive range of quality stock to attract them to a wide customer base.

Customer site visits are very much encouraged, and most buyers find the experience both positive and thought provoking, admitting they had little comprehension that stocks and opportunities existed.

If you would like to arrange a visit, or simply learn more about the company, contact the sales team on (Tel) 01283 821110, (Fax) 01283 821112. (Email) sales@capricorntimber.co.uk.

WHITEWOOD PRICES IN 2006 - A SNAPSHOT.

Andrew J. True AJWSc

The UK softwood trade has witnessed an unusual event during 2006. Rising whitewood prices against a falling domestic market demand!

This runs contrary to one of basic laws of economics, where falling demand is generally followed by falling prices. In fact the past few years in the UK whitewood softwood trade has been a very strong buyer's market, and therefore the buyer has had a strong influence on pricing.

But, another key economic theory is that inflation (rising prices) can be influenced by supply.

This is what has occurred in the UK softwood trade, much to the consternation of buyer's faced with a depressed demand. According to the Timber Trade Federation, the price of whitewood rose by almost 30% in the nine months to end September 2006, (and redwood by over 10% for the same period). Whereas the overall UK demand was down by some 10%.

Though, to put matters into perspective, today's prices in financial terms have only really recovered to actual prices of 10 years ago!

What, in a snapshot, is the background to this development?

From a market viewpoint:

- The world is now a global market resulting in many more options for sawmills.
- Ten years ago Japan and USA markets were not such realistic options for European suppliers, and as a result there was much more dependence on the UK market place. Now European sawmills have well established business in Japan and America.
- Prices during the last half of 2006 slumped in the US, resulting in lower volumes shipped from Europe. Additionally, there is ever increasing capacity in European sawmills. These points should lead to over supply in Europe and hence falling prices. However, the opposite has occurred.
- Demand for whitewood was strong in Central Europe and Scandinavia, and coupled with strong Russian demand, (which in turn reduced availability of Russian items), maintained the strong growth in prices. The new European states, especially Poland and the Czech Republic, enjoyed a very strong domestic demand.
- European sawmills are opening up markets in the Middle East and China, and now even India is being targeted.

From a supply viewpoint:

- The supply of logs has generally tightened.
- There are export restrictions on Russian logs, which primarily negatively impacts production in the Baltic States - this area is also a key supply source to the UK.
- The Swedish storm of 2005 has, in turn, lead to a reduced medium term supply of whitewood logs (after the short term glut).
- New tax regulations in Finland have meant that there is less of an incentive for private forest owners to fell logs.
- Germany, which has now overtaken Sweden in softwood production, had a particularly harsh and late 2006 winter. Therefore logs, which would normally have been felled during January/April 2006, were not. Hence a tightening of supply, coupled with mega production German sawmills consuming large quantities of logs, lead to continued hefty price hikes.
- So, in summary, prices have risen due to log supply issues, and an overall strong demand. Strictly in line with economic theories.

What of the future?

- Definitely China will consume much more wood as it grows into a middle class country - China could soon become a net importer of lumber.
- But there is always the threat of a US lead world economic recession. Probably, more realistically is the fact that the US economy, and hence housing starts will up-tick prior to the Presidential Elections, hence domestic US lumber prices will rise, and the European mills will move increasing volumes to the US market, later in 2007.
- Also, at the time of writing, the unseasonably warm weather in Scandinavia and Russia has slowed considerably the felling of logs.
- The UK, especially with the 2012 Olympics on the horizon and a long recognised need for increased building work, will move out of its current lumber market recession.

In conclusion, a snapshot for the future is 'continued firm to rising whitewood prices, against a backdrop of continued tightening log supply.'

TheWoodAwards

2007 CALL FOR ENTRIES

Entries are now open for The Wood Awards 2007 – the premier award for wood in buildings and furniture. Now in its fifth year, these awards can bring true recognition to professionals working successfully with wood. With permission from the owner of qualifying projects, anyone associated with a qualifying building or furniture project - from the timber supplier to the designer - can enter a project. With categories and special awards covering nearly every type and size of project in construction, joinery and furniture, the compact and bijou are as likely to win as the grand design.

The categories, as last year, are **Commercial & Public Access**, **Private**, **Structural**, **Conservation/Restoration** and **Furniture**. Additional awards may also be made at the discretion of the judges for a **Small Project**, any **Innovation**, or the **Best Use of British Timber** – all of which are irrespective of category – as well as an **Offsite Manufactured Project**. See www.woodawards.com for Conditions of Entry by 25th May 2007.

Glenn Howells Architects, Gold Award winner in 2006 with The Savill Building, said *"We were absolutely thrilled to receive the three awards for Commercial Category Winner and Gold Award Winner, Structural Category Winner and Best Use of British Timber Winner 2006. This is the first time a project at this event has won three awards in one night. In view of all the hard work that the whole team and client put into the project over 6 years, we always hoped that it would be well received, however this result has surpassed our expectations".*

The Wood Awards recognise excellence in the design, production, installation or commissioning of outstanding examples of joinery, wood structures and furniture, completed between May 2006 and May 2007. The shortlist will be announced and exhibited for the fourth year running at Earls Court in September, and the award winners will be announced at The Wood Awards Party at Carpenters' Hall in London in October.

Over twenty generic sponsors of the awards continue to be led by the American Hardwood Export Council, the Carpenters' Company, the Forestry Commission, and Wood. for Good.

Visit www.woodawards.com for more information, full conditions of entry and entry forms.

TIMCON SERVICE OFFERING ACCELERATES DURING 2006

The Timber Packaging and Pallet Confederation (TIMCON), represents over 120 pallet manufacturers, case makers, export packers and pallet repairers in the UK, turning over an estimated £350m. TIMCON has a full time secretariat responsible for working with various legislative committees, and thanks to its close working relationships with appropriate government departments offers a complete interpretation and advisory service regarding relevant legislation. The Confederation also handles a wide range of additional services on behalf of the industry, such as marketing, technical matters, seminars, public relations, education, training and publications.

President, John Dye, comments: "Trading conditions for our members in the wood pallet and packaging industry have been extremely difficult in the past year. Nevertheless, year-on-year, the scope and sophistication of our various services have grown apace and despite the adverse circumstances, 2006 has seen probably the most significant acceleration of these services since TIMCON was founded. There are many positive aspects to the market in the longer term and our ongoing programme of activity certainly reflects this".

The unrivalled advantages of wood products in the fight against global warming have been highlighted in the recently published Stern Report on climate change. Wooden pallets and packaging products can be repaired, recycled and used for energy generation, making timber pallets and packaging the most responsible choice on environmental grounds. The production and processing of wood is highly energy-efficient, giving it an ultra-low carbon footprint, whereas other materials such as steel, aluminium, or plastics require large amounts of energy to produce.

A major success has been the continuing development of the International Standards for Phytosanitary Measures (ISPM 15) and ISPM 15 continues to be increasingly accepted around the world. For some time the UK has implemented its own compliance scheme involving the Forestry Commission and the Northern Ireland Forest Services – all of which has been administered by TIMCON. In November, it gained legal status in Great Britain and under this new law any company or individual found operating without a valid UKWPMMP / ISPM15 certificate, will be liable to prosecution by the Forestry Commission.

TIMCON is working closely with wood for good on a marketing initiative to raise awareness of the importance of timber as a global packaging and transport material. A joint advertising campaign was developed in support of this and to underpin the message a film (in memory stick format) was released to promote the unique benefits of wooden packaging. The main thrust of the message being to explain that the use of wooden packaging material from reputable, sustainable sources, companies can help reduce their carbon emissions and help protect the environment against accelerating climate change.

Early in the year, TIMCON negotiated special licensing rights from the NWPCA for the sale of Pallet Design System (PDS) software in the UK. Until then, it had been necessary to join the NWPCA to be eligible to purchase PDS, but that is no longer the case and members can now purchase direct from TIMCON. This market leading software is a computer-aided design tool that helps design the best pallet for any job at the lowest cost. By inputting all of the customer's pallet design alternatives and the materials needed to build the pallet, the program produces low cost and accurate performance forecasts; identifies potential problem areas and redirects the pallet supplier and user to more practical design alternatives, without costly trial and error or expensive prototyping and testing.

Health and safety issues are of course an industry wide problem and in the wood packaging and pallet sectors, TIMCON is playing an important role in helping the Health & Safety Executive communicate vital and potentially life saving information. Many of its members are already investing in improved health and safety measures, realising that while investment may be relatively expensive – so are accidents. Not just because of the possible life-changing effect on the victims themselves, but the likely compensation payments and increased insurance premiums involved. At the AGM, Alan Scobbie, a senior manufacturing sector inspector from the HSE commented: "TIMCON is playing a fundamental role in helping the Health & Safety Executive communicate vital and potentially life saving information to the industry".

A carefully planned publicity programme has been very much in evidence in supporting and communicating these topics and issues to members and other interested groups throughout the year. In addition to the advertising activity, there have been three newsletters, over thirty press releases and editorials and a series of briefing meetings with editors from key titles.

John Dye again: "While this remains a difficult time for the industry, TIMCON remains focused on making a positive contribution. With a solid infrastructure in place and further new initiatives planned for the coming year, when the market circumstances change fir the better, the industry will be in a stronger and more challenging position than ever before".

For further information please contact
Claire Forrest, RED Communications Ltd,
Tel: 01480 465953, email:
claire@redcomm.co.uk

THE MECHANICAL DETERIORATION OF WOOD AND FURNITURE OBJECTS DUE TO THE IMPACT OF THE ENVIRONMENT

Nigel Bamforth, Senior Conservator, Furniture & Wood, Victoria & Albert Museum, London

The environment can have a profound effect upon the preservation of timber. Throughout the centuries timber has been subjected to a broad spectrum of problems, many of which can be seen manifesting within the furniture object itself. Environmental problems such as temperature and humidity change within the built environment create problems such as timber movement, condensation, mould and bacteria as well as insect infestation. Of recent years the effects of central heating can be problematic and it is important to be aware of the nature of all these changes. Monitoring the environment is an essential part of the control required to maintain the long term stability of a timber object. Seasonal drifts that allow slow equilibrium are less harmful than abrupt change; the amount of mechanical damage is directly related to the material, restraint, and relative humidity change. Small differences affect small changes, large differences produce major catastrophes. To understand this it is important to establish the relationship between the environment's temperature and the humidity.

Temperature can be measured as the outward manifestation of the amount of energy contained within an object. At higher temperatures atoms and molecules move at a faster rate, and due to this movement the chemical reaction occurs more quickly. Thermal shock such as a temperature rise of 10^0 C can increase the

rate of chemical degradation by as much as 100%. The increase and decrease in temperature causes both the expansion and contraction of the timber, and central heating systems produce excessively dry air.

Image 1. bench end.

This can be a major contributing factor when splits and shakes occur in furniture and wood objects, especially if the construction restricts movement or expansion.

Image 2. Venetian frame.

Timbers as in many organic materials are dependent on their moisture content to maintain their living structure: it is the hydroscopic and anisotropic nature of the timber that changes when it is no longer a living organism. Different timber species can also incur variable hydroscopic behaviour mainly due to the variations in the cell structure of the timber species.

Fluctuating relative humidity and temperature will stress the timber, whereby the specific factors of the interaction between R.H and the timber will affect the deterioration of furniture and wood objects, namely: the set point for relative humidity or the high levels of moisture within the air; fluctuations in R.H, excessive dryness; and the rate of R.H. change. Generally it is the fluctuation of R.H. that may cause the splitting, warping, delaminating and other dimensional changes and can be measured as the amount of moisture in the air relative to the amount of moisture the air can hold at a given temperature. This will regulate the performance of the timber as it governs the amount of moisture contained in materials at equilibrium with the environment. As the relative humidity changes, the timber water content adjusts to the new relative humidity level creating a new equilibrium, and can be variable from the exterior surface to the core due to the moisture absorption time factor. As the relative humidity within the air fluctuates, so does the moisture absorption cause dimensional change and mechanical break down.

Initially the timber's greatest dimension change was from green, exhibiting different properties averaging 4% shrinkage on the radial, 8% tangential and 0.1% to 0.2% on the longitudinal planes.

'In the initial drying of the timber, there is no dimensional response to the loss of free water, it is only when a portion of wood tissue has reached the fibre saturation point and begins to lose bound water does shrinkage begin' (Rivers, S. and Umney, N. (2003) *Conservation of Furniture,* Butterworth and Heinemann Oxford p.79).

Due to the diversity of timber-related objects and the manner that they react to changes in relative humidity it is impossible to establish a specific for each species. What is accepted is a mid-point of 50% + or -5% between the upper limit of 65% to 70% R.H. the point where timber swells, mould precipitates and timber infestation is acknowledged, and a lower limit of 40% to 45% R.H., a point when mechanical deterioration such as splitting and shrinkage is incurred.

The effects of R.H. change are not felt in the short term it is the time that the timber spends at a different R.H. that the consequences of the stresses will be noted. When the environment is unstable the effects of higher R.H. can be seen in the biological factors such as living organisms. The chemical reaction rates increase with higher temperatures, increased concentration of reactants and increased pressure. The effects of this RH change will provoke an increase in the concentration of water which in turn will possibly affect the mechanical deterioration of the timber.

Environmental fluctuations are common causes that affect the relative humidity in the air; this can be due to weather patterns or more locally within the built environment such as moisture retention in brickwork and plaster, or moisture rising from the ground. The furniture's construction should be able to compensate for minor fluctuations in domestic environmental conditions; the failure of furniture to withstand these dimensional changes is generally due to poor construction techniques and design faults.

There are certain considerations that need addressing when employing timber: directional grain stresses; movement effected by moisture fluctuation; and the tension and constraint within the timber itself that might lead to permanent deformity and induce splits and fractures.

General problems affected by R.H. can be due to construction restraints that prevent natural dimensional change: uneven moisture penetration due to both wet and dry tension within the object's environment; and where timber is employed with applied facings onto a substrate, such as a laminate or veneer

Image 3. French commode.

Image 4. shield.

In these instances the longitudinal dimension will remain virtually unaffected by fluctuations in relative humidity, but across the grain moisture-related movement between the substrate and the veneer might undergo mechanical change.

There are also other factors detrimental to the degradation of timber: mechanical damage due to vibration; and the movement of the timber object and vibration due to particular frequencies. The duration of the stress in conjunction with the frequency of the vibration can cause internal as well as surface damage to the timber.

Monitoring the environment will ensure that one is in control of the timber's movement. Maintaining a figure of 50% to 55% R.H. will allow a measure of stability to be maintained, generally incurring the moisture content of the timber to be approximately 11%. By achieving this consistency and maintaining a temperature in the region of 16^0 to 20^0 C. a stable environment will be achieved for the well being of timber objects.

Image 1 - 2 etc - is this for identification purposes?
And what are the pictures meant to illustrate?

Strength Grading: Plus Ça Change...

Jim Coulson

A look at the recent history of Strength Grading regulations in the UK and Europe and how the imminent introduction of the new European Standard, BS EN 14081, will affect the grading and marking of Strength Graded timber destined for the UK market - by Jim Coulson, FIWSc FFB, Technology For Timber Limited.

A New Standard in Strength Grading?

For well over 30 years, the United Kingdom has led the way in ensuring the safety and reliability of timber graded for structural use. At first this was achieved with only partial success, using a voluntary system of Quality Assurance attached to the process (which at that stage was known as "stress grading") but since 1988, a mandatory system of 3rd-party Certification on both machine and visual grading procedures has been in force in the UK, with full, legally-enforceable status conferred by our Building Regulations. And our present system has ensured, for almost two decades, that *all* structural timber placed on the market in the UK has been essentially problem-free and has been kept within acceptable limits of accuracy, in respect of its load-bearing capabilities. (True, there have been a small number of well-publicised instances where timber has been delivered to site at too high a moisture content: but the situation is a whole lot better than it used to be 15 or 20 years ago - largely thanks to the efforts of the UK Timber Grading Committee, who "police" such matters on behalf of the Timber Trade and the users and specifiers of wood.)

Up until September 2006, we in the UK were therefore able to prohibit the supply of incorrectly-graded structural timber onto our market, by insisting that *all* Strength Graded wood was graded and stamp-marked under the control of a recognised Certification Body; and that any such CB must be authorised to operate by the UKTGC. In the Code of Practice for the Structural Use of Timber - BS 5268: Part 2 – it is specifically stated that *only* timber marked under the auspices of one of the UKTGC-listed CB's may be used for construction in this country. But since last September, we are on notice that we cannot keep to our tried and trusted procedures for very much longer, thanks to the recent EU-wide adoption of the *harmonised* European Standard covering the Strength Grading of Timber: EN 14081:2005.

Even though it is dated "2005" on its cover, that only refers to its year of publication, when the final draft was adopted in its various Committee stages as a fully-approved European Standard: it actually passed into full "active" EN status in September 2006 – and at that time, it was given a 12-month period, within which it has to be implemented by *all* EU Member States. In other words, any European timber producer *could* be using EN 14081 now: but in the very near future we must *all* be using it - by September 2007 at the very latest!

So what will EN 14081 replace? For a start, it has already made the two previous European Standards concerned with Strength Grading – EN 518 and EN519 - obsolete (these dealt with visual and machine grading respectively). The net result of this is that all of the machine settings, which producers currently use in order to select timber to C16 and C24 for use in the UK, are also effectively obsolete; and so these settings must now be replaced with new ones (incidentally, it is not generally known that there are – and have been for over 10 years – a good many other "C" classes available within Europe: but these two are the ones that particularly affect us, since the Span Tables given in Building Regulations Advisory Documents use C16 and C24 rather than any other of the 12 available options).

What this all means is that at some stage very soon, all UK softwood mills (as well as any overseas softwood producers who export machine-graded timber to us) will have to re-calibrate their machines using the new EN 14081-derived settings; and first indications are that the *yield* of timber -even from the same source - will be affected, probably slightly downwards.

And EN 14081 will also make a significant change to the *marking* of Machine Strength Graded timber: not only will the reference number on the stamp mark change from EN 519 to EN 14081, but the timber Species reference code will change too. For example, a mixed parcel of European redwood and European whitewood will change from the well-known "ER/EW" to the slightly curious term "WPPA". Also, the Certification Body – now officially called a "Notified Body within Europe" – will have to be identified on the timber stamp solely by a reference number: with its well-known logo being relegated merely to an *optional* extra.

There is some comfort, though: about the only two things that will *not* be replaced directly are the British Standards which give our graders their rules for the *visual* grading of timber: these are BS 4978 and BS 5756, and they cover the visual grading of softwoods and hardwoods respectively. Their number(s) may possibly still appear on the new-look timber grade stamp, along with the timber's visual grade and its Strength Class: although the requirement for this is somewhat ambiguously worded and is subject to some different interpretations. For example, I have already heard that some European-based Notified Bodies are telling their client mills that the Grading Standard number, plus the timber's grade, need *not* appear directly on the stamp; but it can be indicated purely by a reference number that points to some "associated documentation" held on file by the producer. I consider this to be a retrograde step in the recognisability and ultimately the acceptability of Strength Graded timber.

But whatever the situation with regard to the appearance of their actual numbers on the timber stamp marks and any remaining authority they may still have in respect of timber graded for use here in the UK, even these "reprieved" British Standards on visual grading will have to make some alteration to their rules, in order to comply with "new requirements" given for *all* European timber Strength Grading rules. So – as of now - we are duty-bound to change the rules contained in both BS 4978 and BS 5756, in respect of fissures and distortion, and certain types of rot or insect damage. Happily, the Knot Area Ratio method of visual grading in softwoods is unaffected: so graders won't have to learn a whole new method of working!

How will EN 14081 be implemented across Europe?

All Notified Bodies with an interest in the checking of structural timber are now included in a so-called "Sector Group": and the one concerned with EN 14081 and Strength Grading is called Sector Group 18 (known to us who have dealings with it, simply as "SG18").

Over the past few years, whilst EN 14081 was progressing through its various stages towards final approval, SG 18 has been working on a "Position Paper" (apologies for all the Euro-type gobbledegook!) which was supposed to be a "harmonised" - and thus definitive - document for *all* Notified Bodies to follow, when implementing EN 14081 at any premises where timber is being graded for structural use, anywhere within the EU. And the situation has also, I'm afraid, been rather complicated by the introduction of CE-Marking for structural timber; which was one of the main aims

behind the synchronised timing for the Europe-wide introduction of EN 14081.

Unfortunately perhaps, the UK Government has decided to "opt out" of the *mandatory* introduction of CE-Marking in respect of graded structural timber: whereas almost every other EU Member State has made CE-Marking of structural timber a *compulsory* requirement, in line with working to EN 14081. The upshot of this added twist in the implementation of such a key piece of EU documentation has led directly to a situation in which most Notified Bodies within Europe will be busy approving their members' systems, processes and paperwork, with a view to enabling them to affix the CE-Mark on their graded timber; whereas the UK's focus has been (and needs to be) on ensuring that the *grading process* is being carried out properly. Thus, the members of SG18 set about creating a Position Paper (remember what that is?) which was initially written with the express purpose of controlling only the *paperwork systems*, rather than checking the accuracy of the graders' day-to-day work in sorting out safe structural timber…and so that is where I decided to put my oar in.

It looked for a while last year as though we in the UK were going to have to accept the fact that CE-Marking of graded timber would be no more than a paper exercise: indeed, the "Final Draft" of the SG18 Position Paper that came before the UKTGC in the middle of 2006 stated quite categorically that the Notified Body *should not check the grader, but only a sample of graded timber, which was to be kept back from every production shift!* It didn't take much thought to realise that such a proposed (or should I say "imposed") procedure would be both prohibitously expensive and virtually unworkable, as well as failing to achieve the desired objective of preventing bad graders from operating in the industry. And so I got the UKTGC's permission to try and get myself authorised to attend the next SG18 meeting in September 2006 (this was no easy task: since they don't let just any Tom, Dick or Harry join in their fun!) and once there, I then proceeded to make a fuss about this state of affairs, until the Chairman of SG18 invited me to form a sub-committee to produce an Amendment to their Position Paper (possibly in an attempt to shut me up!).

So in November 2006 I undertook the task of making more sense out of the bureaucrats' Position Paper: along with two like-minded members of SG18 - a very co-operative Swedish official from SP (one of that country's main Notified Bodies) and an influential Finnish gentleman from VTT (also a Notified Body: a sort of Finnish equivalent of BM TRADA in respect of grading matters). Between the three of us, we managed to remove virtually all of the unworkable parts of the "paper processes" as required in the Final Draft of the SG18 Position Paper and instead, we put in the most important part of all: an insistence that the graders should be subject to *annual assessment* to prove that they were still competent to grade. In addition, we changed the day-to-day control of the grading operation from a requirement to keep a huge number samples (a minimum 20 pieces of timber per shift, for each and every shift where grading was done throughout the year!), to a much more logical one, in which the grader(s) must be selected from an "approved" list that is held as a part of the company's "Factory Process Control" documentation.

This FPC is – thankfully - a full part of the EN 14081 procedure: and so the newly-required grader-checking process will be independent of whether or not any CE-Marking is to be done on the finished product. In other words, *every* producer of graded timber *must* have their grading procedures overseen and fully approved by their Notified Body, and that approval *must* include the checking of the graders by a "competent authority". In reality, it is expected that this will generally be the Notified Body, which will carry out the grader assessment at the same time as the surveillance visit is done to check on the other procedures: since few senior personnel in the company will have the necessary competence to do this for themselves.

<u>What will happen to your graded timber in 2007?</u>

The answer to that question depends upon the next meeting of the full Sector Group 18 membership, which is to be held in Ljubljana (in Slovenia) on 18th April 2007. On that date, our proposed Amendment to the Final Draft of the Position Paper will be debated and then voted upon: and the signs are that it has not met with any strong objections; though we will not be able to say for certain, until after that crucial meeting. But assuming our major changes stand: it is very likely that *all* Notified Bodies – whether preparing their clients for CE-Marking or not – will have to ensure that all of the visual graders in any establishment are fully assessed for their competence in grading, at least once per year (as we in the UK currently insist on via the UKTGC, with BS 4978 and BS 5756).

The marking of graded timber will undergo a fairly major change: and unless and until SG18 create a definitive way of doing it, there will be some variation in how the marking may appear – largely depending upon which Notified Body is responsible for approving the grading operation in the particular company. But at least one major UK Certifier – BM TRADA – has nailed its colours to the mast and declared that the grade – GS or SS in the case of softwoods – and the Grading Standard, as well as the Strength Class, must appear on each piece of timber graded under its control: and we should expect to see the BM TRADA logo on the stamp as well, as an instantly-recognisable reassurance that all is as it should be. Other graded timber from European sources will most likely bear the CE-Mark as well, since there is little point in their altering their marking procedures and factory set-up, just for UK stocks.

But at the end of the day, whatever combination of letters and logos may prevail on any timber stamp, the two things that will absolutely show compliance with the new European Standard are its number – EN 14081 – and the Strength Class, whichever may be appropriate for the country where that timber is to be used. And for us, that is still (mainly) C16 or C24.

And so, even though it seems to have been a very long-winded way of getting back to where we started, that all-important mark on the timber, from September 2007 (or perhaps even earlier) will actually hide a lot of blood, sweat and toil that was expended in Finland at the 11th hour, in order to retain that all-important reassurance: namely, that the timber we use has been graded by graders who have been individually tested and proven to be competent. And that must be a victory worth celebrating!

Legend for example opposite

1) Producer identification (Company Name – or Reference No.)

2) Letter "M" – if Machine Graded

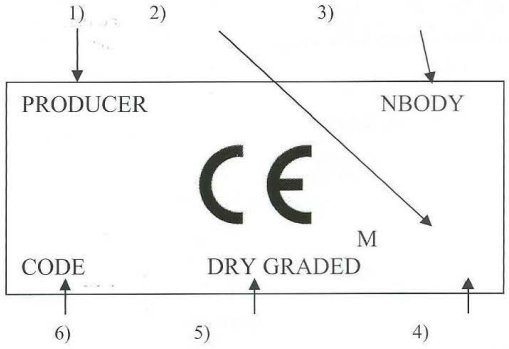
3) Identification number of Notified Body (or logo if preferred)

4) Strength Class or grade and grading rules

5) Reference to Moisture Content if graded at 20% or below

6) Code number to identify documentation, which refers to all necessary information required to accompany the parcel of graded timber – as stated in the Producers FPC

EXAMPLE OF POSSIBLE MARK THAT CAN APPEAR ON TIMBER PRODUCED IN ACCORDANCE WITH BS EN 14081: 2005



A New Source of Energy from an Old Friend.

Andrew J. True BSc

In the light of the recent upward price trends for our main sources of power, oil and gas, trees and timber will also play an ever increasing role in the world's power markets.

Technological advances are continually being made in the processing of timber, and resultant by-products, and one key area in sawmill activity has always been to find markets for mill residues (bark/chips/sawdust/etc). This, until recently, was not always easy, apart from providing raw material input for pulp and paper mills.

However, now there is a growing market for wood pellets for fuel, research is underway to extract oil from timber, and also technology is now in place for the generation of electricity from bark and other basic sawmill residue.

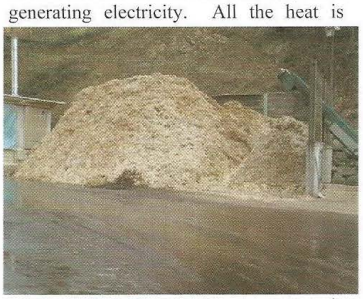
The latter is an opportunity for small to medium output sawmills with kilns and some added value manufacturing facilities.

One such company in Germany has built a power plant to generate electricity and heat from on-site bio-mass (mainly bark from the log de-barker).

As background, the sawmill needed extra heat for its kilns, and the solution offered by the German company Seeger Engineering, was to construct a heating system combined with an electricity generating plant. Construction of the well insulated plant took under one year - from a "greenfield site" to electricity generation.

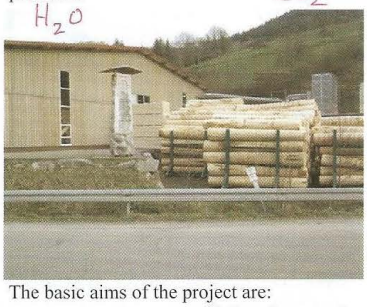
The result is a small power plant that yields 19,000 megawatt hours of heat per year - this is used within the company and also piped to a nearby convalescent centre to provide for their total heating needs - and approximately 19,000 megawatt hours of electricity per year. This, when not being used in the sawmill, will be sold to the network/grid.

Simplistically, the bark is burnt, heating oil contained within a sealed system, which in-turn drives the turbines, thus generating electricity. All the heat is



captured. The entire process is automatically controlled and monitored by computer.

The exhaust gases are emitted through heat exchangers and an electro-filter to eliminate fine particles. The gases (CO2 and H2O) are neutral for the environment. Ash, on the other hand, will be reconstituted locally into building products.



The basic aims of the project are:

- to generate sufficient heat and electricity for the on-site production, and additionally for the re-habilitation centre, 1.5 kilometers away.
- to use bark waste and sawmill waste in an ecologically friendly manner, with a minimum loss of energy.
- 100% usage of natural resources
- to observe and adhere to current requirements for the environment.

Finally, the economical use of bark provides savings for the sawmill company, and additionally provides an income from sales of heat and electricity, from a product that previous had to be almost given away.

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The Council of Management wishes to record its thanks to those listed below for their support as Corporate members:

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AHEC MEETS NEED FOR KNOWLEDGE WITH GRADING SEMINAR AT BCC

Over 50 personnel from leading importers and merchants attended a special training seminar on the American National Hardwood Lumber Association (NHLA) grading rules, at the Building Crafts College in Stratford, East London, at the end of February 2007.

Grading guru, Bob Sabistina, former Chief Inspector at the National Hardwood Lumber Association HQ in Memphis, led the event, which was organised and coordinated by the American Hardwood Export Council.

The seminar included an overview of how timber meets the key NHLA grades; FAS, number one and number two common. It illustrated how dimension and various defects affect grading and explained how the system works with different species and in association with colour grading. The session concluded with a hands-on grading test in the College's workshop.

The feedback from the delegates was positive and with attendance at 100%, it clearly met a need for knowledge and information. AHEC is considering running similar courses elsewhere in the UK, and NHLA training can be arranged for individual companies.

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