



# SGT NEWS



*Compiled and published by FMJ International Publications Ltd on behalf of the Society of Glass Technology*

## CLEAR BENEFITS FOR INSTITUTE OF MATERIALS MEMBERS

### IN PRINT

The December 1994 issue of *Glass Technology* has further papers from the Spring meeting, including modelling process plants with Vissim software, considerations in modern cold end line control, decorating processes for tableware and palletisation and pallet handling.

Papers featured cover

properties of CaO-TiO<sub>2</sub>-SiO<sub>2</sub> glasses, static fatigue transition in optical glass fibres, static fatigue and tensile fracture of glass fibres containing bubbles and a two-dimensional analysis of the viscoelastic problem of a glass preform during optical fibre drawing.

*Physics and Chemistry of Glasses* has a selection of papers on the spreading kinetics of calcium magnesium aluminosilicates, fragility of liquids in the system Li<sub>2</sub>O-TeO<sub>2</sub>, the effects of viscosity on the behaviour of bubbles, spectroscopic properties of Tm<sup>3+</sup> in ZBLAN fluoride glass, structural characterisation of magnesium phosphates, electrical relaxation in vitrified and supercooled single and mixed nitrate hydrates and a structural approach of (1-x)NaPO<sub>3</sub>.xNa<sub>2</sub>B<sub>4</sub>O<sub>7</sub>.

Both journals feature a wide range of abstracts from the latest scientific and technical publications.

Professional membership of an organisation such as the Institute of Materials provides the individual with the opportunity to achieve a standing within the workplace. Following the decision of the Society of Glass Technology to assume a closer association with the Institute, the way is now open for Members to achieve Chartered Engineer status through dual membership. Graham Price, the Institute's regional development manager with responsibility for applications and professional development explained why this makes good sense to a joint meeting of the North West Section and the IoM North West Ceramics Section.

The Institute of Materials covers three main roles: A professional body providing qualifications, accreditation and continuing professional development; a learned society providing information and directing policy; and a membership organisation. Its objects are laid out by a Royal Charter which directs it to advance and develop all aspects of science, technology, use, practice and study of materials of any and every kind.

The Institute has a total of 18,000 members with 25% of these overseas. It is the largest materials society in Europe, but there are no real equivalents for true comparison. Annual turnover is

£5 million, the main source of income coming from the sale of books, journals, conferences and information services. A staff of 80 run the entire operation, with 10 working on professional membership. It is a nominated body of the Engineering Council and has just passed its five yearly review.

An elected council of 60 members directs policy and over 60 specialist and professional committees provide initiatives and discussion in most subject areas - virtually all the members have a committee active in their own special interest.

Following the most recent merger with the Plastics and Rubber Institute and the Institute of Ceramics, the combined body has taken up a policy of devolution to the regions. Support is provided for locally organised events by an area co-ordinator.

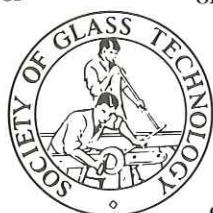
The reasons for registering as a professional member can be separated into the personal and the professional. Personal development can be promoted by having direct access to information at the Institute, through contacts with other members, a careers advice service is readily available and being recognised as a professional provides a sense of belonging and pride.

Being a member of such a large organisation provides a collective voice which influences:

*President: Mr R Nickels, BSc, MInstE, CEng, FSGT.*

*Honorary Secretary: Mr W Simpson, FSGT, FICeram, FIIM, FBIM.*

*Honorary Treasurer: Mr R T Montgomery, CA.*



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Government, by initiatives such as the Materials Strategies Commission; university courses by the accreditation system; and influence of the Engineering Council which is currently looking at a unification of the engineering profession and a review of how we teach and train the engineers of the future. The larger the professional body, the greater its influence on the Engineering Council.

There are many routes to professional membership. The straightforward way is by degree, followed by two years of structured training and then three years' responsible experience. Many individuals do not follow this pattern of development, however. Those not holding an accredited degree or without one at all have to follow the alternate individual case route to CEng.

Engineering Council examination papers is one way but these are very difficult and cover a very wide syllabus. A two year full-time taught masters degree is another pathway but this is a hard standard, since not many degrees comply and it is two complete years with no compromise for employees.

The mature candidate route requires a 10,000 word paper demonstrating both a depth and breadth of knowledge of materials. It is the equivalent of a final year degree project, with provisions for added maturity such as economic considerations.

Working for a small organisation is no obstacle. When a company cannot afford to spare the time to place their graduate engineer in accounts, there may be a local company that can provide the relevant experience for a few weeks secondment - although it is an advantage to work for a large organisation like British Steel. On reaching the required standard, the candidates receive their MIM, CEng.

The standards set should not be seen as daunting. Professional membership can be attained by most people working in industry.

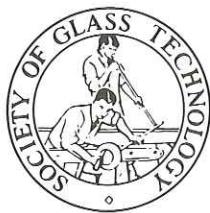
Maintaining one's knowledge base is essential for anyone in a career which must support an entire lifespan. Continuing professional development provides members with the means of keeping up-to-date with the latest trends and developments. The employer supports this by sending



the employees on courses or to seminars and conferences. Employees can further themselves through private study, learned society meetings, low cost conferences and the Institute's network of mentors.

It always pays to invest in your career. The case against is that it costs £1.50 per week to maintain professional status.

A joint scale of fees has been arranged for Society of Glass Technology members, which allows them to enter at the appropriate grade and opens the route to chartered engineer status for those with suitable backgrounds. This in no way affects the status of Society members; the journals and meetings programme continue as normal. Anyone wishing to obtain further details should contact Jill Costello. ■



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## NEW EDITOR

**Professor Alan Owen, Physics and Chemistry of Glasses Editor for the last 20 years, has taken sabbatical leave from the University of Edinburgh and is currently at the University of Arizona. This has led to a change in the editorial structure of the journal to reflect the global nature of the papers submitted for publication.**

Dr John Parker of the Department of Engineering Materials, University of Sheffield has taken up the overall editorship, with particular responsibility for submissions from Europe, Middle and Near East, China, Africa and Australasia.

Professor Owen will establish the position of American Editor, with a catchment area which takes in the Americas, Japan and other Asia/Pacific countries. On completion of his sabbatical, a new Editor will be appointed in association with the American Section.

The collection areas for authors are not completely binding and they will be reviewed regularly.

## HEALTH AND SAFETY AT FURNACE REPAIRS

Dr Parker is a senior member of the Glass Research Group. He has many published papers to his name, was joint author with Dr C Clark-Monks of 'Stones and Cord in Glass' and has been Abstracts Editor for both Society journals since 1978, a position he will continue.

Professor Owen began his association with P&C in 1963, as assistant editor to Professor R W Douglas. His time with the journal has seen it advance from a publication concerned mainly with developments in the UK to its present highly regarded international position with a good track record in publishing submitted papers within a year of acceptance.

The Furnaces and Refractories Committees have jointly organised a one day clinic meeting to discuss the problems and pitfalls of disposing of waste refractories in a climate of ever-tightening health and safety regulations. The clinic will be held on Tuesday 15 November at Keresforth Hall, Barnsley. Mr J Hartley of Pilkington will chair the meeting.

Further details can be obtained from Jill Costello at the Society.

## 'UK GO' MEETING

The UK Special Interest Group, Glasses for Optoelectronics (UK GO) has organised a meeting on chalcogenide and halide glasses for optoelectronic applications. The day long clinic meeting will be held on Friday 20 January 1995 at BT Laboratories, Martlesham Heath.

Further details can be obtained from Dr Angela Seddon FSGT, Glass Research Group, University of Sheffield or Jill Costello at the Society.

# SGT NEWS



## GLASSES FOR OPTO-ELECTRONICS

Many other glass types are being researched together with high silica glasses for opto-electronic applications such as amplifiers, switches, filters and lasers. Dr Angela Seddon of the University of Sheffield's Glass Research Group presented a survey of the most recent advances to a joint meeting of the North West Section and the Institute of Measurement and Control.

The rapidly developing optical fibre network is based on silica glass. Fibres made from silica have low loss or highly transparent windows at wavelengths of 1.3mm and 1.55mm. Losses are due to Rayleigh scattering and the scatter caused by the presence of hydroxides in the glass.

These reach minima at about the same wavelength range. Low loss optical fibres still suffer losses; to transmit over very long distance requires amplifiers at regular intervals. Old-style amplifiers

turned the weak light into an electrical pulse which was then amplified and transformed back into a strong light signal and shone down the next length of fibre. Electrons from the rare earth element erbium were found to emit a photon of light at the 1.55mm wavelength and this discovery was used to make the first all optical fibre amplifier.

Work exploring the 1.3mm wavelength has not found a suitable rare earth ion candidate for silica glass. Praseodymium ions in a fluoride glass could be a possible alternative but the melting problems of this glass type have to be overcome. Fluoride glasses need to be prepared in controlled atmospheres in order to overcome their volatility, avoid contaminants, reduced species and dissolved gases. Careful melting is also required to maintain homogeneity. ZBLAN glasses have a very tight temperature versus viscosity which

requires control.

Because fluoride glasses readily absorb gases, they can be used as passive remote sensors in areas such as an oil refinery, where an electric spark would be a potential problem. The dissolved gas, such as methane, absorbs light in the same spectra area, cutting down the signal and tripping an alarm.

Chalcogenide glasses contain a substantial amount of sulphur, selenium or tellurium and are finding applications in infrared sensing devices. Chalcogenides have volatilisation problems and have to be melted in sealed ampoules inside a rocking furnace. Their viscosity is tuneable by adding halide dopants.

A travelling acoustic wave causes compression inside a glass body. Two focused waves will interact together to produce peaks and troughs within a glass. This acousto-optic effect can be used to construct very small diffraction gratings within a waveguide.

Optical switching is essential for the progress of opto-electronic devices. The fast response times needed require a highly non-linear refractive index coefficient. This can be attained by incorporating organic molecules within sol-gel derived glass.

The correct choice of organic molecule will ensure matching transparency, while the glass will be compatible with the existing components. Sol-gel processing brings the processing temperatures to below the thermal degradation points of the organic component.

The incorporation of laser dyes into a sol-gel glass host provides a solid, stable environment which is being exploited by both

communications and defence-oriented companies as high energy lasers. ■

### PRESENTATION TO MAURICE E WALLAGE, HON FSGT



Past President, Maurice Wallage, who is convalescing at his home after heart surgery, has been presented with two pieces of glass that together recognise his outstanding contribution to the Midlands Section over a period of some 40 years and the esteem in which he is held by its members.

The first item, an engraved

glass medallion Award for Service, was presented by Ron Pritchard, FSGT, on behalf of the President. The second (shown above) was a piece of crystal glass from the bottom of a pot, mounted on a wooden base. This was presented by George Mattocks, FSGT on behalf of the Midlands Section.

**LOCAL SECTION CONTACTS**  
For details of forthcoming local section events in your area, contact the following.  
All SGT members and non-members welcome.

**London**  
— Mr T Ensor,  
United Glass Ltd,  
Porters Wood,  
St Albans,  
Herts AL3 6NY.  
Tel 0727 59261.

**Midlands**  
— Mr R W Fisher,  
Sismey and  
Linforth, Unit 94,  
Heming Rd,  
Redditch, Worcester  
B98 0AE.  
Tel 0527 529810.

**North East**  
— Mr J Henderson,  
44 Woodside Ave,  
Throckley,  
Newcastle upon  
Tyne NE15 9BE.  
Tel 091 264 4775.

**North West**  
— Dr D Martlew,  
Pilkington  
Technology Centre,  
Hall Lane, Lathom,  
Ormskirk, Lancs.  
Tel 0695 54210.

**Scottish**  
— Mr D A Rennie,  
United Glass Ltd,  
Glasshouse Loan,  
Alloa FK20 1PD.  
Tel 0259 218822.

**Yorkshire**  
— Miss R M Sales,  
20 Blackbrook  
Drive, Sheffield  
S10 4LS.  
Tel 0742 306179.



# ELECTRIC FURNACES AND CONTROLS

AFT has become a new force in the electric furnace world over a very short period. From modest beginnings as a consultancy, the company is now recognised as a leading designer, supplier and contractor of electric technology. Charles Lucas described the latest innovations to the North East section at a meeting hosted by Corning.

Associated Forehearth Technologies was set up in 1985, with the principal aims of supplying molybdenum electrodes and electrode holders to the glass industry. This work has been of great success and continued ever since with an updated and expanded range of holder designs available to customer specifications.

A contract to design and build a 1.5 tonne tank furnace for a Syrian client led to the 'furnace in a box' idea. The entire structure was prefabricated at AFT's base in Worksop, with the refractories in place before despatch. All that was needed at the customer's site was a prepared base for the furnace to stand and a power supply to plug into.

Designed to melt all sorts of glasses but not lead, the furnace has a wide melting area - keep-

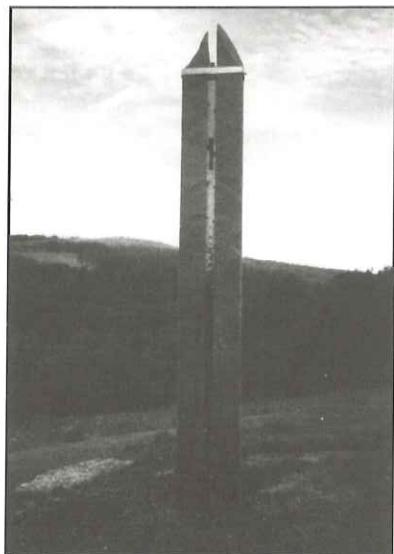
ing the electrodes well separated - and two gathering bays. The melting end has 1711 type AZS refractories with an expected life of three years or more assuming 365 days of production each year. It is designed to take stirrers through the roof.

The 'furnace in a box' concept involves one transport cost, no overseas labour costs, provides complete control over all the components going into it, is built in a worker-friendly environment and incorporates the AFT busbar system. Options for a fossil fuel-fired furnace are on the drawing board awaiting a customer.

AFT has also designed and built the Speedgob hand-held gob length measurement system for Rondot in France. Three sensors provide six timings of the gob as it passes from the feeder to the IS machine mould measuring the length, speed and interval between gobs. Optimising the gob length helps speed up the recovery of production after a job change. An internal memory can remember the timings for up to 256 gobs. These measurements can be recalled to the LCD display or sent to an IBM-compatible computer via a serial port. The information can then be used to locate and correct delivery system problems.



## GRIZEDALE GLASS SCULPTURE



Artist and glassmaker Charles Bray has installed a new piece in the Grizedale Forest Park. The sculpture, called simply 'Light Column', is approximately 3m high. It is made up from local slate and float glass, in the form of a rock pillar split down the centre with the glass.

The central glass core of 25mm Pilkington float has a layer of 10mm float on either side. There is also one small slab of 25mm copper blue glass from Hartley Wood & Co which transmits some of its colour down through the green of the float glass.

Grizedale Park is located midway between Lake Windermere and Lake Coniston in the English Lake District and can be approached from the north by way of Ambleside and Hawkshead and from the south from Newby Bridge through Rusland and Satterthwaite.

## INFORMED OPINION

Society members are invited to contribute both technical and general interest news items for publication in SGT News. If there is a topic on which you would like to voice an opinion, contact David Moore on Sheffield (0114) 2663168.



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## SPRING MEETING PLANS FOR 1995

The Annual Meeting of the Society of Glass Technology will be held on 30-31 March 1995 at the Prince of Wales Hotel, Southport. The first morning incorporates a works visit to Pilkington plc with registration. The conference session begins with a keynote lecture on marketing opportunities by Dr J Nolan of Rockware. The theme followed by the speakers will be glass opportunities and the

management of research and development, productivity and quality for a profitable glass industry. Papers will cover all glass types and products, with particular representation from glass industries in the North West.

The Annual Dinner and Dance will be held on the Friday evening in conjunction with the local hosts, the North West Section. Further details are available from Jill Costello.