



SGT NEWS



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PLAQUES ON WALLS

To remain competitive in the modern industrial environment a company has to meet the demands of its customers and better its opponents. A quality management system, mission statement and investors in people accreditation can all help in this respect. Another measure is a public commitment on environmental issues. At a joint meeting of the North West Section, Institute of Measurement and Control and Institute of Materials NW Ceramics Group, Mike Henty of Brunner Mond detailed the implementation of his company's environmental management system.

Where does a company turn to following the successful implementation of a total quality management system? The climate of change, the improved lines of communication and empowerment of the workforce has already permeated through the company's culture. The momentum for change can be harnessed to meeting obligations towards the environment on a local, regional and global scale.

The pressures to set up an environmental management system come from legislation, the local community and customers. If the company is found guilty of breaking pollution regulations then the director responsible would have to meet personal fines and even imprisonment. The local community has to cope with dust, smell, traffic and noise around any company's site so being seen to be a considerate neighbour helps. On the customer side, many companies operate an environmental audit system for suppliers for which it pays to be compatible.

The most positive reason to implement an environmental management system is that it makes good business sense: waste released into the environment is a cost and reducing it will impact positively on the bottom line.

Commitment is the key to a successful environmental management system, this needs to be informed commitment and needs the involvement of the board down to the shop floor. It is not an

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

FURNACE AND REFRACTORIES COMMITTEES MERGE

After a number of years of holding joint committee meetings, the Furnace Committee and the Refractories Committee have merged to form the Glass Batch, Furnace and Refractories Committee. Permission was obtained at the most recent council meeting.

The chairman of the new committee is John Osbourne of Beatson Clark, the last chairman of the Refractories Committee.

Meetings will continue to be held around the country, with the host providing a factory tour after the end of discussions.

Contact Jill Costello at the Society for more details on committee membership and the date and venue of the next meeting.



GLASS OPPORTUNITIES - THE CHALLENGE OF WASTE MANAGEMENT

The Society of Glass Technology's 1998 Spring Meeting will be held at the Dunkenhalgh Hotel near Blackburn, Lancashire on Wednesday 13 to Friday 15 May. The theme of the conference will be the challenges of waste management with a range of speakers covering subjects: including waste vitrification, refractory waste, packaging waste and waste disposal.

The meeting will start on Wednesday with a works visit in the afternoon and evening reception. Conference papers will be presented all day Thursday, with the President's Address in the afternoon, followed by the Society AGM. Instead of a dinner dance there will be a conference banquet with entertainment on Thursday evening. Papers will continue on Friday, finishing in the early afternoon.

overnight achievement and requires long term dedication. It must also be closely linked with awareness training.

FIRST STEPS

An initial review has to be made to identify the scope of interaction between the process and the environment; assess causes and effects; establish the balance between measuring, reporting and action; identify trouble spots; and set up appropriate departmental links.

The review is then followed by the drawing up of a policy. This must be committed to obeying the law and to being continuously reviewed. The policy should be dynamic, open to review and flexible.

Resources can then be allocated. These should never be underestimated as the people at the sharp end are essential in a successful EMS. Ownership empowers the workforce to come up with their own solutions to potential failures and bottlenecks.

Aspects of the total process have then to be broken down by process mapping from mine or quarry, to the plant and on to the customer. This should cover local, regional and global concerns. Significant effects should be identified and regulated, an incidence history should be maintained and the potential to cause serious harm should be recorded. At Brunner Mond there were 40 alarms on the process before this review, afterwards there were 240.

Objectives should be set to make the business link, for example waste minimisation. These need quantified, time-based targets such as reducing bio waste by 50 tonnes by December 1997. The targets should be achievable

not wish lists in order to maintain morale and avoid disillusionment.

A plan should be set out linking objectives and targets, this should be resourced, achievable and agreed.

A manual, mirroring the quality management system is useful but not easy to achieve as it has to balance being as simple as possible while covering the breadth of the work environment.

Control is vital, instruments and alarms installed to monitor releases also help in controlling the system and optimising the process.

Records are linked in with control providing a comparative resource to measure progress and track trends. The records should be simple and understandable and their structure cannot be taken for granted. A quick fix IT solution may sound good but there could be too much time taken up sorting out the system rather than recording data.

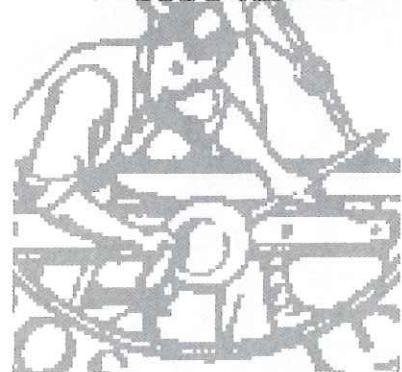
AUDITING AND COMPLIANCE

Brunner Mond has trained some of its workforce to act as environmental auditors. These members of staff are capable of providing solutions as well as assessing progress. The audits follow topics, such as water, rather than a broad brush approach. An independent auditing firm is also employed for certification to ISO14001 standards.

A review of the policy, its objectives and targets is performed after auditing. Compliances, incident rates and complaints are all assessed before a revised policy is set for the next cycle of assigning resources, determining effects and objectives, planning, etc.

On-going costs for Brunner Mond's environmental management system have been around 8500 man hours with a further £20,000 spent on consultants, external auditors and the manual. Around 50 man days per year have been allocated to run the system. Training is fun for those involved with light-hearted guesses of how much a fine for non-compliance would be or how long the managing director would be in prison. The workload for the operators is more or less the same but just more effective.

On the plus side, the company has another plaque for the wall, has gone some way to maintaining good relationships with its neighbouring communities, customers and regulators while also achieving bottom line savings. ■



IN PRINT

The October 1997 issues of Glass Technology contains three papers from the Society of Glass Technology's Spring Meeting on the Challenge of the Environment including Derek Norman's paper on Environmental management systems. The peer reviewed papers include: A report of the ICG Technical Committee 2 - Chemical Durability and Analysis on the indirect determination of sulphide-sulphur in glass by flame atomic absorption spectrometry; the effect of repeated leaching on the release of lead and other cations from lead crystal glass (24% PbO) by acid solutions and water; and vitrification of fly ash from thermal power stations.

The October issue of Physics & Chemistry of Glasses contains papers on calorimetric and differential thermal analysis studies of glasses in the ternary systems $ZrF_4\text{-}BaF_2\text{-}AF$ ($A=Na, Li$); ion exchange on glass substrates - influence of the mixed cation effect on concentration profiles; microhardness and elastic properties of bulk glasses and thin films of the $Ge_xSb_{40-x}S_{60}$ family; helium permeation, diffusion and solubility in sodium galliosilicate glasses; formation and properties of sodium scandium silicate glasses; dependence between Faraday effect of $AlF_3\text{-}BaF_2\text{-}CaF_2$ glasses and species of rare-earth ion; a neutron scattering study of As_2Se_3 glass fibres; observation of green upconversion fluorescence in Er^{3+} doped Nb_2O_5 prepared by the sol-gel method; bulk and surface crystallisation of potassium heptagermanate glass; polaronic hopping conduction in $Fe_2O_3\text{-}PbO\text{-}B_2O_3$ glasses; extended X-ray absorption fine structure study on the structure of multicomponent ZnX_2 and CdX_2 based glasses ($X=Cl, Br$ and I); thermodynamics of some transition metal ions in a borosilicate glass melt; and a comment on the paper 'Do hydrogen ions really cross a glass membrane to enable pH measurement?' by ABE & MAEDA.



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CLINIC MEETING

The Glass Batch, Furnace and Refractories Committee is holding a clinic discussion on Tuesday 7 October at Keresforth Hall, Barnsley. The meeting will debate the question of whether furnace operations are actually safe or if glassmakers just manage emergencies efficiently.

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

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CRYSTAL GLASS POLISHING OPTIONS

The Society of Glass Technology's Spring Meeting included two presentations which looked at ways of solving the problems of acid polishing. One based on the recovery of waste products from etching sludge to yield a valuable batch material and a second which looked at using an alternative process to cut down emissions.

Acid polishing is a well established process in the crystal glass industry and achieves a brilliant finish on glass items. The process uses sulphuric and hydrofluoric acids at elevated temperatures which produces waste gases, such as HF and SiF₄, which need to be treated before they can be released into the atmosphere. Etching sludge, a highly corrosive and toxic material, is a by-product of acid polishing and requires special treatment.

ETCHING SLUDGE

The main constituents of etching sludge are lead sulphate, potassium and sodium hexafluorosilicate with adherent polishing acid (H₂SO₄ and HF). Wolfgang Porcham of Swarovski described how his company has developed a recycling process, yielding a lead carbonate concentrate, which can be used to replace red lead in the fine crystal glass batch.

Firstly, the insoluble salts that are dispersed in the polishing acid are settled and removed. Clarified acids are then removed and re-used in the polishing plant. The etching sludge is washed with water to remove any adherent acid which is then filtered off. The filter cake now consists of lead sulphate and alkali hexafluorosilicates. Digestion with a sodium carbonate solution gives basic lead carbonate and

this is also filtered off. Contaminants such as silica gel and alkali fluorides are removed in a final wash before the lead carbonate is dried and ground for the glass batch.

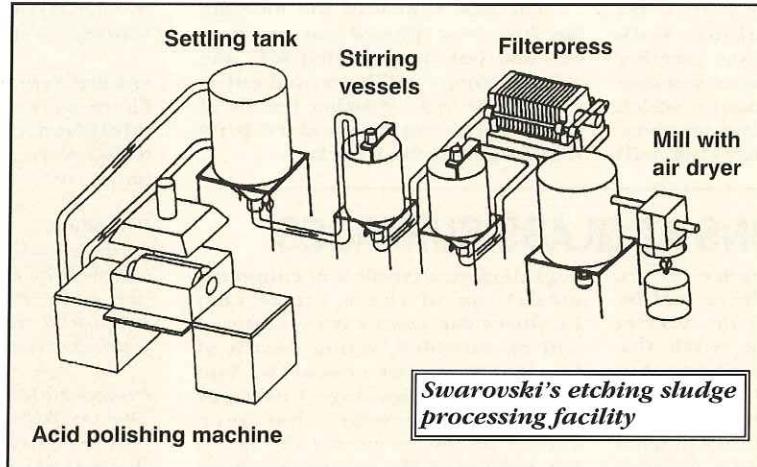
One tonne of etching sludge yields about 400kg of dried, ground lead carbonate. The process does not result in any solid waste. The effluent does not differ in principle from the rinsing water which comes from the acid polishing plant and the two can be treated together.

Usually 10%, but up to 35% of red lead can be replaced and still yield fine crystal. Sludge does not have to be disposed of as a special waste to landfill and 66% of the operating costs of the recovery plant can be met by savings in red lead purchases.

ACID FREE POLISHING

Acid polishing was adopted as an alternative to the traditional methods of mechanical polishing which is slow, laborious and does not lend itself to large scale mass production. Following the introduction of regulations on the emission of HF and SiF₄, however, crystal factories are now faced with the problem of fitting wet scrubbers to their plants. Fitting the scrubbers to comply with guidelines can cost up to £300,000 for a large scale production facility.

Initial investigations carried out by Nick Kirk and taken over by Adam



Kelsall at British Glass have shown that lead crystal can be polished at a viable rate using a ceria embedded wheel and ceria slurry. In his presentation Dr Kelsall revealed how further work into the polishing mechanism has revealed a chemomechanical effect; the ceria particles react with the glass surface as well as abrading it.

Chemomechanical glass polishing with ceria can be used on a wide range of applications and glass compositions, ranging from precision optics for lasers to finishing TV screens and domestic mirrors. A range of polishing grades are readily available. In the presence of water, cerium is thought to enhance the rate of surface hydrolysis, softening the surface layer allowing more glass to be swept away by the polishing particles.

Cerium oxide is generally considered to be a low hazard material particularly when handled as a sludge or slurry. It does not give off any gaseous emissions. Waste polish is easily handled by allowing the solids to separate in tanks. Chemomechanical polishing targets specific areas, unlike acid polishing which attacks the entire glass surface reducing the levels of lead in the polishing wastes. However, mechanical polishing has its own, mainly economic, disadvantages. It is more labour intensive; automation would be needed for larger companies and there are problems with intricate shapes. As the capital cost of abatement equipment rises and the penalties for failure to comply grow so

these disadvantages may be outweighed by the many advantages the method offers. ■

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 P West, United Glass Ltd, Porters Wood, St Albans, Herts AL3 6NY.
Tel 01727 59261.

Midlands
— Mr C Baldwin, Stein Atkinson Stordy Ltd, Midland House, Ounsdale Road, Wombourne, Near Wolverhampton WV5 8BY.
Tel 01902 324000.

North East
— Mr J Henderson, 44 Woodside Ave, Throckley, Newcastle upon Tyne NE15 9BE.
Tel 0191 264 4775.

North West
— Dr D Martlew, Pilkington Technology Centre, Hall Lane, Lathom, Ormskirk, Lancs. Tel 01695 54210.

Scottish
— Mr D A Rennie, United Glass Ltd, Glasshouse Loan, Alloa FK20 1PD.
Tel 01259 218822.

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— Miss R M Sales, 20 Blackbrook Drive, Sheffield S10 4LS.
Tel 0114 2306179.

NORTH AMERICA
— Dr A G Clare, School of Ceramic Engineering and Sciences, New York State College of Ceramics at Alfred University, 2 Pine Street, Alfred, NY 14802-1296, USA. Tel 607 871 2392.

INDIA
— Dr J Mukerji, Central Glass and Ceramic Research Institute, PO Jadavpur University, Calcutta 777 032, India. Tel 473 3496.



ELEVENTH INTERNATIONAL SYMPOSIUM ON NON-OXIDE AND NEW OPTICAL GLASSES

The final dates and venue of the Eleventh International Symposium on Non-Oxide Glasses and New Optical Glasses, IS(NOG)², to be held by the Society of Glass Technology have been agreed. The meeting will take place on Monday 7 to Thursday 10 September 1998, at Tapton Hall of Residence, Sheffield. Tapton Hall has more than 100 en-suite rooms available for participants and the Forte Crest Hotel is only a 10 minute walk away. The hall has a large meeting room for single conference sessions with a large room adjacent, which is suitable for extra poster sessions.

Sessions at the meeting will

cover: New glasses, chalcogenides, halides and others; synthesis; structure, properties and modelling; optical and electrical properties; rare earth doping; applications; and photonic devices. Extended abstracts of the papers will be available for participants and the full proceedings will be published in the *Journal of Non-Crystalline Solids*.

The first notice of the meeting has just been posted out to previous and potential participants, the call for papers will be posted out at the end of 1997. Further details of the meeting can be obtained from Jill Costello at the Society.



80TH ANNUAL GENERAL MEETING

The 80th Annual General Meeting of the Society of Glass Technology was held at the Raven Hotel, Droitwich at 10am on Saturday 3 May 1997.

Annual Report and Accounts

There were no questions on the published report and accounts which were accepted by a unanimous vote.

President

Mr R G Nickels proposed that Dr P Sewell be elected to serve a second term as President. This was seconded by Dr I H Smith and carried unanimously.

President-Designate

The President stated that Council had nominated Mr J F B Clark as President-Designate. This was seconded by Dr G R Mattocks and carried.

Election of Officers

The Honorary Secretary Mr W Simpson and Honorary Treasurer Mr R T Montgomery were elected to serve for another year.

Vice-President and Councillors

Mr P W Howard and Mr C R Staley were elected Vice-Presidents. Mr J F Andrews, Mr P J Firth, Dr P F Hart, Mr M J Hodgson and Miss R M Sales were elected councillors, following the retirement of five members after three years' service.

Revision of subscriptions from 1 January 1998

Membership subscriptions were increased in line with inflation, 2.7% (rounded up to the nearest 50p).

Auditors

Appointment of the auditors Holmes Widlake & Gibson was carried unanimously. The Treasurer pointed out how well they had coped with the recent changes in Charity Commission rules on accounting.

Vote of Thanks

Dr P Sewell thanked the outgoing Vice-Presidents and Councillors, his fellow Officers and also the office staff for all their hard work.

REACTIONS AT GLASS SURFACES

A joint one day conference on the reactions at glass surfaces will be held on 29 October by the Society of Glass Technology, with the Applied Solid State Chemistry Group of the Royal Society of Chemistry. The meeting will cover the broad topics of analyses at glass surfaces with coating growth processes. Guest speakers will give key presentations dealing with surface reactions on glass, glass/coat-

ing interface analysis and computer modelling of these interfaces. Facilities for poster presentations will be provided, giving details of the most recent research. The Pilkington Technology Centre at Lathom in Lancashire has been chosen as the venue for the meeting and use of the centre's facilities will be available to visitors. These include the lecture theatre and access to the new Glass Technology Exhibition.

The invited speakers are Professor N Greaves (Aberystwyth University); Dr D Holland (Warwick University); R A Chappell (Pilkington Group Research); Dr Liz Colbourn (Oxford Materials); Professor M Pemble (Salford University); Professor S Irvine (NEWI); and Professor M Hitchman (Strathclyde University). The papers and posters will be published in a special proceedings volume of *Topical Issues in Glass* published by the Society. Further details of the meeting can be obtained from Jill Costello at the Society.

1998 SPRING MEETING AND SGT AGM

The SGT's Spring Meeting, 'Glass Opportunities: The challenge of waste management', will be held at the Dunkenthal Hotel, Blackburn, Lancashire from Wednesday 13 to Friday 15 May 1998. The 81st Annual General Meeting will be held on Thursday 14 May after the Presidential Address which will be given at 4pm.

BORATE GLASSES, CRYSTALS AND MELTS

The Society of Glass Technology has recently published the proceedings of the Second International Conference on Borate Glasses, Crystals and Melts held at The Cosener's House, Abingdon in July 1996. The proceedings are dedicated to Professor Philip J. Bray, in recognition of his outstanding contribution to the science of borates. The single volume has 560 pages with the Plenary Lecture by Professor Bray; 10 invited papers, 43 papers and 12 posters. Dr Adrian Wright (Reading University), Dr Steve Feller (Coe College), and Dr Alex Hannon (Rutherford Appleton Laboratory) edited the proceedings and Dr Wright provided the indexing.

This is the first summation of the science of borate glasses, crystals and melts since the first borates conference, at Alfred University in June 1977, was published in 1978 by Plenum Press, New York (Volume 12 of the Materials Science Research Series).

Copies of the proceedings are available from the Society priced £50 for members and subscribers to the Society's journals and £60 for non-members. Orders can be sent to David Moore at the Society.



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